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MASTER

Indexed Bibliography on Tritium

Its Sources and Projections, Behavior, Measurement and Monitoring Techniques, Health Physics Aspects, and Waste Management

OAK RIDGE NATIONAL LABORATORY

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MASTER

ORNL-5057
UC-41 — Health and Safety

Contract No. W-7405-eng-26

Health Physics Information System

INDEXED BIBLIOGRAPHY ON TRITIUM

ITS SOURCES AND PROJECTIONS, BEHAVIOR, MEASUREMENT AND MONITORING TECHNIQUES, HEALTH PHYSICS ASPECTS, AND WASTE MANAGEMENT

M. N. Dixon
C. F. Holoway
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AUGUST 1975

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

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FOREWORD

The Health Physics Information System (HPIS) was established in January 1973 to respond to technical questions from persons within as well as outside the Health Physics Division of Oak Ridge National Laboratory and to assist research groups by developing bibliographic data files of reference material. Inquiries of a health physics nature may be directed to:

Health Physics Information System
Bldg. 4500 South, Room S-127
Oak Ridge National Laboratory
P. O. Box Y
Oak Ridge, Tennessee 37830

The documents which appear in this bibliography were retrieved from the Nuclear Safety Information Center (NSIC) data files. The NSIC was established in March 1963 at Oak Ridge National Laboratory to serve as a focal point for the collection, storage, evaluation, and dissemination of nuclear safety information. Inquiries concerning the capabilities and operations of NSIC may be directed to:

J. R. Buchanan, Assistant Director
Nuclear Safety Information Center
Oak Ridge National Laboratory
P. O. Box Y
Oak Ridge, Tennessee 37830

ACKNOWLEDGEMENTS

Ray L. Scott of the Nuclear Safety Information Center provided a search of the NSIC data files and advised in the preparation of this bibliography.

ABSTRACT

This bibliography contains 1291 documents which were retrieved from the Nuclear Safety Information Center (NSIC) data files using the keyword "tritium". For the purpose of this bibliography, the documents have been categorized as follows:

I	Sources and Projections
II	Operating Experience
III	Handling Procedures
IV	Measurement and Monitoring Techniques
V	Environmental Behavior
VI	Biological Behavior
VII	Health Physics Aspects
VIII	Waste Management
IX	Results of Environmental Monitoring
X	Non-Compliance and Accident Reports
XI	Responses to Environmental Impact Questions

Because of content, some of the documents appear in more than one category. Title, keywords, and abstract (when available) were used to categorize the documents.

Keyword, Author, and Permuted Title Indexes are provided for each category to simplify use of this document.

I Sources and Projections

I - SOURCES AND PRODUCTION

[illegible]
[illegible] UNITED STATES
[illegible]

[illegible] ARE ACCEPTABLY IN [illegible] PREMISES - (1) THE THREE ISOTOPES [illegible] THEIR HALF LIVES, (2) NUCLEAR [illegible] PRESENT SOURCE OF THESE ISOTOPES, (3) THE [illegible] ENVIRONMENT, AND (4) THE [illegible] OF THE WORLDS CAPACITY TO ACCEPT [illegible]

[illegible] U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] SAFETY AND CONTROL * REACTOR POWER * UNITED STATES * [illegible]

[illegible]
[illegible] THE [illegible] NUCLEAR REACTOR
[illegible] REPORT NO. [illegible]

[illegible] ALMOST CERTAIN TO IMPROVE GREATLY THE PRODUCTION [illegible] THE [illegible] AS ANTICIPATED [illegible] IN THE PAST [illegible] THE ENERGY RANGE OF SPECTROMETER STUDIES [illegible] IT WILL MOST ALLOW INSPECTION [illegible] THE NOISE LEVEL [illegible] DETECTOR, HEAT TRANSFER [illegible] AS IS TRITIUM PRODUCTION.

[illegible] REACTOR, TESTING

[illegible]
[illegible] STATES OF AMERICA
[illegible]
[illegible] TECHNICAL REPORTS SERIES NO. [illegible]

[illegible] WITH THE DEVELOPMENT OF NUCLEAR POWER, THE INTERNATIONAL [illegible] STUDY OF THE TECHNOLOGY AND ECONOMICS OF POWER [illegible] THE NEEDS OF THE DEVELOPING COUNTRIES. INFORMATION ON THE [illegible] NAMELY THOSE OF [illegible], PATHFINDER, [illegible] REACTOR [illegible], HIGH-TEMPERATURE GAS-COOLED REACTOR [illegible] IS PRESENTED. DEVELOPMENTS [illegible] IN THE CASE OF THOSE REACTORS WHICH HAVE [illegible]

[illegible] * CONTAINMENT * CONTAINMENT, HIGH PRESSURE * CONTAINMENT, LOW [illegible] * REACTOR, [illegible] * HYDRAULIC EFFECT * [illegible] OPERATIONS * REACTOR, ORGANIC COOLED * PATHFINDER [illegible] VESSELS * REACTOR, PRESSURE TUBE * REACTIVITY EFFECT * [illegible] * OPERATING EXPERIENCE SUMMARY * CRITICALITY EXPERIMENT * [illegible] MECHANISMS

[illegible]
[illegible]
[illegible]
[illegible]

[illegible] NATURAL GAS SAMPLES TAKEN FROM THE PROJECT RULISON [illegible] THAT [illegible] OF TRITIUM IS PRESENT IN GASEOUS FORM IN THE [illegible] NUCLEAR DETONATION NEAR GRAND VALLEY, [illegible]

AVAILABILITY - [illegible] WASHINGTON, D.C. 20545

[illegible] CHEMICAL ANALYSIS * GAS * CONCENTRATION * AGENCY, AEC

[illegible]
[illegible]
THE [illegible] SOURCES ABSORBED ON TITANIUM
[illegible] ENERGY AUTHORITY, [illegible]
[illegible]

THE [illegible] SOURCES ABSORBED ON TITANIUM WAS MEASURED WITH A

607399 *CONTINUED*
FLOW IONIZATION CHAMBER TO ASSESS THE POSSIBLE HAZARD THAT MAY ARISE FROM THESE SOURCES. IT WAS FOUND THAT THE RATE OF TRITIUM EVOLUTION WAS LESS THAN 20 MICROCURIES PER 8 HOURS PER CURIE OF ADSORBED TRITIUM. IT SEEMS UNLIKELY THAT THE EVOLVED TRITIUM WOULD PRESENT AN INGESTION OR INHALATION HAZARD. THE BREMSSTRAHLUNG RADIATION WAS ALSO MEASURED AND WOULD BE A NEGLIGIBLE HAZARD UNDER NORMAL CIRCUMSTANCES. SOURCES USED AS TARGETS FOR PARTICLE ACCELERATORS MAY PRESENT INGESTION OR INHALATION HAZARDS DUE TO LOSS OF PARTICULATE MATERIAL IF THE SOURCES ARE STORED IN THE OPEN LABORATORY.

HAZARD, RELATIVE * HAZARDS ANALYSIS * PERSONNEL EXPOSURE, RADIATION

000707
CHRISTENSEN J * CLESSA CR
PREDICTING PERFORMANCE OF DZO STEAM TURBINES IN BOILING HEAVY-WATER REACTORS
AB ATOMENERGI, STOCKHOLM, SWEDEN * STAL-LAVAL TURBINE CO., STOCKHOLM, SWEDEN
7 PAGES, 3 FIGURES, 4 REFERENCES, NUCLEONICS, 24(5), PP. 66-68 (MAY 1966)

ESTIMATES OF HEAVY-WATER LEAKAGE AND LIGHT-WATER CONTAMINATION WOULD INCREASE COST LESS THAN 0.1 MILL/KWH, BASED ON TESTS AND EXPERIENCE IN MODERN TURBINES. RADIOLYTIC GAS RECOVERY WOULD REQUIRE A RECOMBINER. TRITIUM IN TURBINE WOULD REQUIRE STEAM-CLEANING BEFORE MAINTENANCE.

REACTOR, GAS * NUCLEONICS * REACTOR, HWP

010526
GOODE JR
THE RELEASE OF TRITIUM AND KRYPTON-85 TO THE ATMOSPHERE DURING PROCESSING OF THO2 - UO2 REACTOR FUEL
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE
2 PAGES, ANS TRANSACTIONS 9(1): 21-22 (JUNE 1966), PRESENTED AT ANS ANNUAL MEETING, JUNE 20-24, 1966, DENVER, COLORADO

LABORATORY WORK - TWO SPECIMENS WERE CUT EIGHT TIMES TO SIMULATE PLANT OPERATION. THESE YIELDED 0.68 AND 0.75 CM3 OF GAS CONTAINING 3.63 AND 4.26 MCI OF KR-85 (0.83 AND 1.07% RELEASED), AND 2.98 AND 20.4 MICROCURIES OF TRITIUM, EQUIVALENT OF 0.04 AND 0.26 PERCENT OF THE THEORETICAL TOTAL. APPROXIMATELY 60 PERCENT OF THE TRITIUM RELEASED UP TO 0.10 PERCENT OF THE TOTAL CALCULATED TO BE FORMED) WAS FREED BY THE FIRST CUT AND THE REMAINDER ON SUCCEEDING CUTS.

*FISSION GAS RELEASE * KRYPTON * THORIUM * URANIUM OXIDE * WASTE TREATMENT, GAS * EXPERIMENT * *FUEL REPROCESSING

010702
GOODE JR
HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3956 *, 19 PAGES, 3 FIGURES, 4 TABLES, 11 REFERENCES, JUNE 1966, CFSTI, $2.00 CY, $0.50 MF

HOT-CELL EXPERIMENTS WITH PROTOTYPE THO2-UO2 POWER REACTOR FUEL SPECIMENS IRRADIATED TO 24,600 MWD/METRIC TON (TN) * U) SHOWED THAT UP TO 0.2 PERCENT OF THE FISSION-PRODUCED TRITIUM AND 1 PERCENT OF THE KR-85 WERE RELEASED WHEN THE FUEL WAS SHEARED INTO SHORT LENGTHS, IN OUR APPARATUS. ANOTHER 0.2 PERCENT OF THE TRITIUM AND THE BALANCE OF THE KRYPTON WERE RELEASED TO THE ATMOSPHERE WHEN THE FUEL WAS DISSOLVED TO PRE SOLVENT EXTRACTION FEED. THIS QUANTITY OF TRITIUM IS LESS THAN 0.5 PERCENT OF THE ESTIMATED 1200 CURIES OF H-3 THAT MAY BE SAFELY DISCHARGED TO THE ATMOSPHERE FROM A 0-TON-PER-DAY PROCESSING PLANT.

*FISSION GAS RELEASE * KRYPTON * THORIUM * ATMOSPHERIC POLLUTION * *WASTE DISPOSAL, ATMOSPHERIC * URANIUM DIOXIDE * *RADIOCHEMICAL PLANT SAFETY * *FUEL REPROCESSING

010902
ARMY TESTS TRITIUM-ACTIVATED EXIT MARKERS ON PLANES (LUMINOSITY AND LEAKAGE)
U.S. ARMY AVIATION MATERIAL COMMAND, ST. LOUIS, MISSOURI
1 PAGE, LETTER - U.S. ARMY AVIATION MATERIAL COMMAND TO DIVISION OF COMPLIANCE (AEC) - MAY 17, 1966

THE AVCOM RADIOLOGICAL PROTECTION OFFICER (RPO) CONDUCTED A FIELD SURVEY OF ARMY AIRCRAFT EQUIPPED WITH EXIT MARKERS. PE TESTED FOR LUMINOSITY AND RADIATION LEAKAGE. RESULTS WILL BE SUBMITTED TO U. S. ARMY MATERIAL COMMAND AND YOUR OFFICE BY 15 JUL 66. THE U.S. ARMY ENVIRONMENTAL HYGIENE LAB AT EDGEWOOD ARSENAL, MARYLAND, WILL COMPLETE THE LEAKAGE TESTS OF THOSE MARKERS SAMPLED AT THE FIELD SURVEY BEFORE THE TARGET DATE.

AVAILABILITY - AEC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL * *COMPLIANCE * *LEAK

011192
AEC UNCLASSIFIED PROGRAMS. QUARTERLY TECHNICAL PROGRESS REPORT, JANUARY - MARCH 1966
ATOMICS INTERNATIONAL
NAA-SR-11900 *, 170 PAGES, FIGURES, TABLES, JUNE 1966, CFSTI $5.00 CY, $1.00 MF

[illegible]
A PRELIMINARY STUDY OF TRITIUM IN A 2119 MWTHR FAST BREEDER INDICATE THAT 9000 CURIES PER YEAR MAY BE PRODUCED AND MAY CLEAR FE CONTAINS. THIS WOULD PROBABLY BE MORE OF A NUISANCE THAN A HAZARD. HYDRAULIC TESTS ON THE FUEL ELEMENTS SHOW CLAD IN SINTERED ALUMINUM POWDER FOR THE PRIMA CORE IS MORE SOUND IN ERROR BECAUSE THE PERIMETER HEAD ABOUT 40 PERCENT LOW. VARIOUS TEMPERATURE AND FLOW CORRELATIONS ARE HERE.

[illegible]. FAST • [illegible] EXPERIMENT • REACTOR, LMFR • REACTOR, ORGANIC COOLED • PRIMA CORE • [illegible] DESIGN

[illegible]
[illegible] • WASSELL [illegible]
PRELIMINARY OBSERVATIONS OF THE RELEASE OF TRITIUM FROM IRRADIATED BERYLLIA
[illegible] ATOMIC ENERGY AUTHORITY, HARWELL, ENGLAND
AERE-M-[illegible] P., 12 PAGES, 3 FIGURES, DECEMBER 1966, [illegible]

PRESTIMULATION ANNEALING EXPERIMENTS ARE REPORTED FOR NEUTRON-IRRADIATED BERYLLIA COMPACTS AND ZER POWDER CONTAINER PACK AN IRRADIATED COMPACT. RELEASE RATES WERE MEASURED IN THE TEMPERATURE RANGE 200 TO 1450 C. AN INITIAL BURST OF TRITIUM WAS OBSERVED ON ATTAINING TEMPERATURE IN EACH CASE, AND PROLONGED ANNEALING WAS NECESSARY AT MOST TEMPERATURES BEFORE TRUE BULK DIFFUSION RELEASE CONDITIONS WERE ESTABLISHED.

[illegible] • VOLATILIZATION • DIFFUSION COEFFICIENT

[illegible]
[illegible] TP
RELEASE OF TRITIUM FROM TRITIUM-LABELED LUMINOUS PAINTS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-2470 P., 11 PAGES, 3 FIGURES, 6 TABLES, JUNE 1966, CFSTI $1.00 CY, $0.50 MF

SAMPLES OF COMMERCIAL TRITIATED ORGANIC POLYMERS USED IN LUMINOUS PAINTS WERE TESTED FOR RELEASE OF TRITIUM. DURING THE DRYING PERIOD AFTER APPLICATION, TRITIUM RELEASE DECREASED ONLY SLIGHTLY WITH TIME. LESS OF TRITIUM BY THE [illegible] PAINT [illegible] EXPONENTIAL WITH RESPECT TO TEMPERATURE FOR CERTAIN PAINTS, AND FOR OTHERS A STEPWISE CHANGE WAS NOTED. THE TRITIUM WAS RELEASED CHIEFLY AS TRITIATED WATER.

[illegible] CONSERVATION • CONTROL • RADIOACTIVITY RELEASE

[illegible]
[illegible] F
IS NUCLEAR POWER WORTH THE RISKS
[illegible] PAGES, SCIENCE JOURNAL, [illegible], PP. 40-45 AUGUST 1970

[illegible] IS COMMERCIAL NUCLEAR TECHNOLOGY IS IMPORTANT. PROBLEM IS THAT RAPID SPREAD TO MORE COUNTRIES PUTS POTENTIAL HAZARDS PER [illegible]. SO FAR THIS THREAT HAS NOT REACHED STAGE WHERE WORLD PROPERTY IS ENDANGERED. THUS, SO FAR, NO MAJOR ACCIDENT ONLY BECAUSE COUNTRIES WITH ADVANCED [illegible]-TECHNOLOGY ARE THOSE WITH LONG HISTORIES OF INDUSTRIAL AND TECHNOLOGICAL EXPERIENCE. BUT THE TECHNOLOGY IS SPREADING INTO COUNTRIES WHICH DO NOT HAVE THIS BACKGROUND. HE DISCUSSES ALL RAMIFICATIONS OF THE TECHNOLOGY, FSP, NUCLIDE RELEASES FROM ORE REFINERY TO WASTE MANAGEMENT ROUTE. JUST ONE EXAMPLE IS THAT FISSION PRODUCTS PRODUCED IN 1 YR IN JUST 1 POWER REACTOR WILL CONTAIN SUFFICIENT SR-90 TO PROVIDE MAX. DOSE FOR WORLD POPULATION SEVERAL TIMES OVER. SURVEILLANCE TIME TO DECAY TO [illegible] IS ABOUT 1500 YR. IT IS DIFFICULT TO BE CONFIDENT THERE ARE MANY NATIONS IN WHICH SUCH WILL BE CARRIED OUT RESPONSIBILITY FOR THIS LENGTH OF TIME.

ECONOMICS • FISSION PRODUCT RELEASE • INSURANCE • REACTOR • INCIDENT, CONSEQUENCE • INCIDENT COMPUTATION • SIMULATION • UNITED KINGDOM • [illegible], POWER • POPULATION EXPOSURE • WASTE MANAGEMENT • ICRP • RADIOACTIVITY RELEASE • FABRICATION, NUCLEAR • SURVEILLANCE PROGRAM • INTERNATIONAL • DATA COLLECTION • RADIATION EFFECT • BENEFIT VS RISK • LEGISLATION • [illegible], SAFETY OF • NUCLEAR DEVICE AND EQUIPMENT • SOCIO/PHILOSOPHICAL CONSIDERATION • [illegible] FORECAST

[illegible]
PISSOT JR
PRODUCTION OF TRITIUM BY NUCLEAR WEAPONS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73270 P., 12 PAGES, JUNE 30, 1971

TRITIUM IN THE ATMOSPHERE TOTALS ABOUT 4500 MEGACURIES, ABOUT 45 TIMES THE COMPONENT FROM NATURAL PROCESSES. IN THE ABSENCE OF FURTHER ATMOSPHERIC TESTING OF THERMONUCLEAR WEAPONS, RETURN TO WITHIN 10% OF THE NATURAL LEVEL WILL REQUIRE ABOUT 100 YEARS. UNDERGROUND TESTING OF THERMONUCLEAR WEAPONS DOES NOT CONTRIBUTE SIGNIFICANTLY, COMPARED WITH NATURAL PROCESSES. ABOUT 0.1% OF THE TRITIUM FROM UNDERGROUND TESTS IS TRAPPED AS TRITIATED WATER IN THE GROUND. OF THE REMAINING PRESENT AS HT, ONLY A SMALL FRACTION IS RELEASED TO THE ATMOSPHERE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]CONTAINMENT, UNDERGROUND • FALLOUT • RAINOUT • TRACER, RADIOACTIVE • ATMOSPHERIC POLLUTION • ATMOSPHERIC CHEMISTRY • CRITICAL NUCLIDE PATHWAY • RESPONSE TIME • NUCLEAR EXPLOSION DEBRIS • PROMOTHIUM TRANSFER

013000
CARMAN RD
TRITIUM HAZARDS ASSOCIATED WITH NEUTRON GENERATORS. TECHNICAL BULLETIN NO. 105
MARTIN MARIETTA, COLORADO SPRINGS
MP-19032 0. 7 PAGES. NOVEMBER 1964. CFSTI

A POTENTIAL TRITIUM HAZARD EXISTS IN HIGH OUTPUT NEUTRON GENERATORS USING A DEUTERIUM-TRITIUM REACTION. TARGET REPLENISHING AND STRATEGICALLY PLACED ISOLATION VALVES, AS PROVIDED IN THE MARTIN NUCLEAR GROUP TYPE NEUTRON GENERATOR SERIES A-900 AND A-1000, WERE FOUND TO GREATLY REDUCE THE REQUIREMENT FOR OPENING THE SYSTEM. THEREFORE, THE TRITIUM HAZARD IS SIGNIFICANTLY LESSENED.

HAZARDS ANALYSIS • NEUTRON • ACCELERATOR

013002
TRITCHER LL • POYNE GP • CARMAN JP
TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
CONF-160 0. 20 PAGES. 13 FIGURES. 8 TABLES. 9 REFERENCES. PAGES 640-674 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS. PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GATLINBURG, TENN., NOVEMBER 1964. CFSTI $6.50 CY.

TRITIUM LEVELS HAVE FROM AN AVERAGE DROP OF 60 TRITIUM UNITS (T.U.) PER CONTINENTAL SITES IN THE NORTHERN HEMISPHERE TO AVERAGE PEAKS OF 2000 T.U. IN 1962 AND 4000 TO 5000 IN 1963. INDIVIDUAL PEAKS WERE HIGHER, REACHING 10,000 IN NORTHERN CANADA. LEVELS IN PRECIPITATION WERE LOWER IN 1964. THE PEAK YEAR APPEARS TO HAVE BEEN 1963. THE RATE OF DECREASE FROM 1963 TO 1964 IS LESS THAN THE COMPARABLE PERIOD 1959 TO 1961, POSSIBLY REFLECTING THE HIGHER ALTITUDES INVOLVED IN THE LAST TESTING. TRITIUM AND SR-90 DEPOSITION VALUES OVER THE GLOBE SHOW INTERESTING CONSISTENCIES THAT MAY PERMIT THE ESTIMATION OF TRITIUM CONCENTRATION FOR UNSAMPLED AREAS. THE HTO/SR-90 RATIO INCREASES TOWARD THE HIGH MID-LATITUDES IN THE NORTHERN HEMISPHERE. THE SOUTHERN-HEMISPHERE PRECIPITATION AMOUNTS ONLY 15 T.U. IN 1963 COMPARED TO SEVERAL THOUSAND TRITIUM UNITS FOR THE NORTHERN HEMISPHERE. IT IS ESTIMATED THAT IN 1962 AND 1963 THE DEPOSITION OF TRITIUM HAD BEEN APPROXIMATELY 44 OR 90 MC, DEPENDING ON WHETHER OR NOT OCEANIC EXCHANGE WAS INCLUDED IN THE CALCULATION. THIS WOULD LEAVE EITHER 124 OR 72 MC IN THE STRATOSPHERE BASED ON THE ASSUMPTION OF A 180-MC PRODUCTION IN 1961 AND 1962.

ATMOSPHERIC CIRCULATION, GLOBAL • FALLOUT • RAINOUT • STRATOSPHERE • STRONTIUM

013040
AEC EXEMPTS THE USE OF TRITIUM IN CERTAIN PRODUCTS
UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
PRESS REL. J-81 0. 1 PAGE. APRIL 1, 1966

THE ATOMIC ENERGY COMMISSION IS AMENDING ITS REGULATIONS TO EXEMPT FROM LICENSING THE POSSESSION AND USE OF TRITIUM CONTAINED IN A NUMBER OF CONSUMER PRODUCTS. THE AMENDMENTS TO COMMISSION REGULATIONS PART 30 AND PART 32 EXEMPT THE USE OF TRITIUM CONTAINED IN LUMINOUS THERMOSTAT DIALS AND POINTERS, AUTOMOBILE SPIRIT CHARGERS, AND MARINE COMPASSES. THE MANUFACTURE OR IMPORT OF THOSE ITEMS WILL REQUIRE A LICENSE FROM THE AEC, AS IS THE CASE WITH TIMEPIECES, AUTOMOBILE LOCK ILLUMINATORS, AND PRECISION BALANCES.

014004
FULLER RD • RUMBLE WP • MARBACH FW
NUCLEAR SAFETY, CHEMICAL REACTIONS. FISSION PRODUCT AND CONTAMINATION CONTROL
ATOMICS INTERNATIONAL
NAA-SR-12175 0. 8 PAGES. 5 FIGURES. 6 REFERENCES. QUARTERLY TECHNICAL PROGRESS REPORT AEC UNCLASSIFIED PROGRAMS, JULY-SEPTEMBER 1966. PAGES 193-100

THE OBJECTIVE OF THIS PROGRAM IS TO ELUCIDATE THE BEHAVIOR OF FISSION PRODUCTS RELEASED TO THE COOLANT IN A FAST SODIUM-COOLED LMFBR REACTOR DURING NORMAL OPERATION, IN ORDER TO PROVIDE INFORMATION NECESSARY FOR THE DEVELOPMENT OF FISSION PRODUCT TRAPPING TECHNIQUES IN SUCH SYSTEMS. THE DISPOSITION OF FISSION PRODUCTS DURING NORMAL OPERATION MUST BE ALSO KNOWN IN ORDER TO ASSESS THE CONSEQUENCES OF POTENTIAL ACCIDENTS. INFORMATION IS REQUIRED ON THE EXTENT OF FISSION PRODUCT RETENTION IN SODIUM COOLANT, THE RATE AND EXTENT OF RELEASE TO THE COVER GAS, AND THE RATE AND EXTENT OF PLATE-OUT ON SURFACES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, $3.00 COPY, $0.65 MICROFICHE

ACCIDENT • IODINE • KRYPTON • REACTOR, LMFR • NOBLE GAS • SODIUM • TRACER, RADIOACTIVE • XENON • FISSION PRODUCT TRANSPORT • OUT OF PILE EXPERIMENT • FILTER, TRAP • METAL, LIQUID • GAMMA EMITTER

014003
AEC EXEMPTS USE OF TRITIUM IN MARINE NAVIGATIONAL INSTRUMENTS
UNITED STATES ATOMIC ENERGY COMMISSION
PRESS REL. R-13 0. 1 PAGE. JANUARY 23, 1967

[illegible]
THE ATOMIC ENERGY COMMISSION IS AMENDING ITS REGULATIONS TO EXEMPT FROM LICENSING THE POSSESSION AND USE OF TRITIUM IN PORTABLE INCORPORATION IN MARINE NAVIGATIONAL INSTRUMENTS. THE COMMISSION REGULATES [illegible] A SIMILAR USE OF UP TO 950 MILLICURIES OF TRITIUM IN MARINE COMPASSES. UNDER THE PRESENT AMENDMENT, NO OTHER PORTABLE NAVIGATIONAL INSTRUMENT WOULD CONTAIN MORE THAN 250 MILLICURIES OF TRITIUM GAS, AND THE TRITIUM IN MARINE COMPASSES WOULD HAVE TO BE IN THE FORM OF GAS.

AVAILABILITY - AEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

REGULATION, AEC • INSTRUMENTS, MISC.

[illegible]
[illegible] • [illegible] • [illegible]
INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PWR NUCLEAR POWER PLANTS
BATTELLE MEMORIAL INSTITUTE
BMI-1707 •, 121 PAGES, OCTOBER 31, 1966

THE PRIMARY FISSION PROCESS IS THE MAJOR SOURCE OF TRITIUM, FOLLOWING USE OF LITHIUM-BASED RESIN IN 1963 INSTALLED AT THE RATE OF 0.7 A 10 TO THE 5TH TRITIUMS PER FISSION. THE PRESENCE TRITIUM DIFFUSES THROUGH THE CLAD. WATER SAMPLES WERE ASSAYED, AND A MATHEMATICAL MODEL DESCRIBING TRITIUM GENERATION AND MOVEMENT THROUGHOUT PWR PLANTS WAS DEVELOPED. THE RESULTING PROGRAM, TRICON, WAS EMPLOYED TO CALCULATE TRITIUM CONCENTRATIONS AT PR-3B DURING 1966. REPRESENTATIVE CALCULATED AND MEASURED CONCENTRATIONS WERE GOOD. POTENTIAL HEALTH HAZARDS FROM BOTH AIRBORNE AND WATERBORNE TRITIUM WERE CALCULATED. THE MOST ECONOMICAL SOLUTION AT PR-1 APPEARS TO BE THE REMOVAL OF TRITIATED EFFLUENT FROM THE PLANT SITE AT $1.40 PER GALLON, AND AT PR-3B TO BE THE EXPULSION OF TRITIATED EFFLUENT WATER TO AN ISOLATED AREA WHERE IT WILL FREEZE AND SINK DUE TO SAFE CONCENTRATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151. $3.00 COPY, $0.65 MICROFICHE

COMPUTER PROGRAM • COMPUTER, DIGITAL • REACTOR, PWR • WASTE DISPOSAL, LIQUID • HAZARDS ANALYSIS • PR 1 (PWR) • PR 3B (PWR) • MAIN COOLING SYSTEM • REACTOR, MILITARY

[illegible]
EXEMPTION TO
AEC EXEMPTS PIT FORM IDCF20 TO ALLOW TRITIUM DISCHARGE
MASS. INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 131151, PAGE 35, MARCH 27, 1967

AEC EXEMPTS PIT REACTOR FROM 10 CFR 20.2310(b) TO ALLOW DISCHARGE OF 20,000 GAL OF SECONDARY COOLANT CONTAMINATED WITH 12 CURIES OF TRITIUM. THE LIQUID WILL BE DISCHARGED TO SANITARY SEWER AND CHARLES RIVER SUCH THAT IT WILL BE REDUCED TO LESS THAN THE MPC.

EFFLUENT • REACTOR, PWR • REACTOR, RESEARCH • WASTE DISPOSAL, RIVER

[illegible]
AEC EXEMPTS USE OF TRITIUM IN GLOW LAMPS
ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
USAEC PRESS RELEASE J-254 •, 1 PAGE, NOVEMBER 8, 1966

THE ATOMIC ENERGY COMMISSION AMENDED PARTS 30 AND 32 OF ITS REGULATIONS TO PROVIDE LICENSE EXEMPTION FOR THE POSSESSION AND USE OF UP TO 10 MILLICURIES OF TRITIUM CONTAINED IN GLOW LAMPS. TRITIUM GAS GLOW LAMPS START MORE QUICKLY WHEN THE LAMPS ARE USED IN AREAS OF REDUCED LIGHT OR DARKNESS. SUCH LAMPS ARE USED IN A WIDE VARIETY OF ITEMS RANGING FROM GENERAL APPLIANCES TO COMPLICATED ELECTRONIC CIRCUITS. THE MANUFACTURE OR IMPORT OF THE GLOW LAMPS CONTAINING TRITIUM STILL WILL REQUIRE A LICENSE FROM THE AEC.

AVAILABILITY- USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C., 20545

REGULATION, AEC • AGENCY, AEC

[illegible]
CONSER RE • HAVE SV • POWER PS • SNYDER WS • STRAWNESS PG
DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I
OAK RIDGE NATIONAL LABORATORY, HEALTH PHYSICS DIVISION, TENN.
ORNL-4101 •, 210 PAGES, 13 FIGURES, 11 TABLES, 3 REFERENCES, MARCH 1967

THIS REPORT PRESENTS INFORMATION OBTAINED BY ORNL IN PHASE I OF DOSE-ESTIMATION STUDIES TO EVALUATE THE RADIOLOGICAL-SAFETY FEASIBILITY OF EXCAVATING AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. THE INFORMATION INCLUDES (1) METHODS FOR ESTIMATING EXTERNAL AND INTERNAL DOSE EQUIVALENTS, FOR QUANTIFYING THE TRANSFER OF RADIONUCLIDES THROUGH CRITICAL EXPOSURE PATHWAYS, AND FOR IDENTIFYING THE RADIONUCLIDES LIKELY TO BE CRITICAL, (2) CRITERIA FOR EVALUATING THE RADIOLOGICAL SAFETY OF THE OPERATION, AND (3) LISTS OF RADIONUCLIDES ARRANGED ACCORDING TO THE DOSE COMMITMENT THAT RESULTS FROM EXPOSURE TO A UNIT QUANTITY OF EACH RADIONUCLIDE.

[illegible]
AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA. $1.00 COPY, $0.65 MICROFICHE

[illegible] • DOSE • [illegible] • FALLOUT • FMC • [illegible] • [illegible] • [illegible] • [illegible] WATER, NUCLEAR [illegible] • DOSE CALCULATION, INTERNAL • HUMAN, ENVIRONMENTAL • NUCLEAR DETONATION • SOIL, NUCLEAR [illegible] • DOSE CALCULATION, EXTERNAL • NUCLEAR EXPLOSION EFFECTS • PERSONNEL EXPOSURE, RADIATION • [illegible] SAFETY AND CONTROL • MATHEMATICAL TREATMENT • CONCENTRATION • MAN

[illegible]
[illegible]
GENERATION AND RELEASE OF TRITIUM IN PW-TYPE NUCLEAR POWER PLANTS
BATTELLE MEMORIAL INSTITUTE
CONF-670[illegible] -- 2 PAGES. 0 REFERENCES. [illegible] TRANSACTIONS 1[illegible] PAGES 3[illegible] AND 3[illegible] (JUNE 1967). PRESENTED AT THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, SAN DIEGO, CALIFORNIA, JUNE 11-15, 1967

BATTELLE-COLUMBUS INVESTIGATED SOURCES AND MIGRATION MECHANISMS FOR TRITIUM IN PW-TYPE REACTORS. CALCULATIONS INDICATED THAT THE STEAM PLANT SOURCES WERE PRIMARY FISSION AND NEUTRON REACTIONS IN BORON CONTROL RODS, WITH TERNARY FISSION CONTRIBUTING [illegible] OF THE TOTAL.

[illegible] • FISSION PRODUCT RELEASE • FISSION PRODUCT, VOLATILE • REACTOR, PWR • [illegible] • [illegible] • [illegible] • NEUTRON • REACTOR, MILITARY

[illegible]
[illegible] • THOMAS J • JACOBS DG • DEVELY WJ
EVALUATION OF ENVIRONMENTAL HAZARDS FROM RELEASE OF KR-85 AND H-3 IN AN EXPANDING NUCLEAR FUEL REPROCESSING INDUSTRY
HEALTH PHYSICS DIVISION, OAK RIDGE NATIONAL LAB., TENN.
1 PAGE. ABSTRACT IN HEALTH PHYSICS 13, [illegible] (1967). PAPER PRESENTED AT THE TWELFTH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, WASHINGTON, D. C., JUNE 19-22, 1967

PRESENT STUDIES ARE CONCERNED WITH ESTIMATES OF THE DOSE EQUIVALENTS TO MAN THAT MAY RESULT FROM THE COMPLETE RELEASE OF KR-85 AND H-3 DURING REPROCESSING OF SPENT REACTOR FUEL. BASED ON ESTIMATES OF THE FUTURE-WORLD NUCLEAR POWER GROWTH, THE WORLDWIDE DISTRIBUTIONS OF THESE PARAMETERS IN YEAR 2000 MAY RESULT IN A TOTAL BODY DOSE RATE OF 1.0 MREM/YR FROM KR-85 AND A BONY TISSUE DOSE RATE OF 0.0071 MREM/YR FROM H-3. RISK TO THE WORLD POPULATION IS EVALUATED IN TERMS OF POTENTIAL EFFECT.

REVIEWS • RELEASE RATE • WASTE TREATMENT, GAS • DOSE CALCULATION, INTERNAL • GENE • WASTE DISPOSAL, GAS • DOSE CALCULATION, EXTERNAL • ENVIRONMENT • FUEL REPROCESSING

[illegible]
[illegible] PL
RADIOACTIVE WASTES FROM FISSION REACTORS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENN.
2 PAGES. REFERENCES. SCIENCE, 1[illegible] (1[illegible]), PAGES [illegible] (JAN. 9, 1967)

CALCULATION OF THE AMOUNT OF TRITIUM RELEASED FROM A HYPOTHETICAL FUSION REACTOR SHOWS THAT IT IS 20,000 TIMES THE AMOUNT RELEASED BY GENERATION OF AN EQUIVALENT AMOUNT OF ELECTRICITY BY A FISSION REACTOR. RELEASE OF THE TRITIUM GENERATED BY A POWER ECONOMY, IF THE NUCLEAR POWER WERE ALL FUSION, WOULD RESULT IN UNACCEPTABLE WORLDWIDE DAMAGES BY THE YEAR 2000.

FISSION PRODUCT RELEASE • REACTOR, POWER • NEUTRON

[illegible]
[illegible] L
INVENTORIES OF SELECTED LONG-LIVED RADIOISOTOPES PRODUCED DURING WEAPON TESTING
U.S. WEATHER BUREAU
12 PAGES. 3 FIGURES. 3 TABLES. REFERENCES. PAGES 43-54. FROM COLLOQUE INTERNATIONAL SUR LA POLLUTION RADIOACTIVE DES MILIEUX GAZEUX (RADIOACTIVE POLLUTION OF GASEOUS MEDIA). [illegible] I. SACLAY, NOVEMBER 17-18, 1965

THE OBSERVED ATMOSPHERIC DISTRIBUTIONS OF INVENTORIES OF STRONTIUM-90 AND CARBON-14 ARE REVIEWED AS A FUNCTION OF TIME. THE DEPOSITED GLOBAL STRONTIUM-90 AND ESTIMATED ATMOSPHERIC CONTENT ABOVE SAMPLING ALTITUDE ADDED TO THE ABOVE INVENTORIES ARE COMPARED WITH THE STRONTIUM-90 PRODUCTION BASED ON THE FISSION YIELDS ANNOUNCED BY THE U.S. ATOMIC ENERGY COMMISSION. PREDICTIONS OF THE FUTURE DISTRIBUTIONS OF STRONTIUM-90 AND CARBON-14 ARE GIVEN. BASED ON THE CESIUM-137/STRONTIUM-90 THEORETICAL AND OBSERVED RATIOS, ONE MAY CONVERT STRONTIUM-90 INVENTORIES AND PREDICTIONS TO THOSE FOR CESIUM-137. SIMILAR, BUT LESS CONVINCING REMARKS, APPLY TO TRITIUM-TO-CARBON-14 RATIOS IN ORDER TO CALCULATE TRITIUM INVENTORIES.

AVAILABILITY - PRESSES UNIVERSITAIRES DE FRANCE, 108, BOULEVARD SAINT-GERMAIN, PARIS VI, FRANCE

CARBON • CESIUM • ATMOSPHERIC DIFFUSION, GLOBAL • FALLOUT • SAMPLING, HIGH ALTITUDE • STRATOSPHERE • COMPARISON, THEORY AND EXPERIENCE • STRONTIUM • NUCLEAR DETONATION • MONITORING PROGRAM, ENVIRONMENTAL

007527
SAFETY ANALYSIS INTERDICTION OF NUCLEAR STORES
REYNOLDS ELECTRICAL AND ENGINEERING CORPORA. INC.
RED-20 ●. 141 PAGES. MAY 1960

THE CONTENT OF THIS PUBLICATION IS PRIMARILY DIRECTED TO DESCRIBING THE LONG-RANGE SAFETY STUDIES NECESSARY TO IMPROVE PROJECTION CAPABILITIES AND KEEP PACE WITH AN ACTIVE TESTING PROGRAM. THE DAY-TO-DAY DETONATION SAFETY ACTIVITIES NECESSARY TO SUPPORT THE TESTING PROGRAM ARE DESCRIBED TO THE EXTENT REQUIRED TO GIVE AN OVERALL, THOUGH LIMITED, VISION OF FUGO-RELATED SAFETY ACTIONS AND PROBLEMS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00 COPY. $0.65 MICROFICHE

DEPOSITION ● FALLOUT ● GROUND WATER ● SEISMOLOGY ● SURFACE WATER ● NUCLEAR DETONATION ● TRACER ● CONTAMINATION ● HYDROLOGY ● RADIATION SAFETY AND CONTROL ● WATER POLLUTION ● TRANSPORT PROPERTY ● AGENCY, ADC

007640
MOLLIS DC ● MARSHETT RL ● PUGGER RL ● BUCHANAN PS ● BUGGS DB
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATIONS
U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE. PUBLIC HEALTH SERVICE
PHS-PUBL. 999-RH-29 ●. 47 PAGES. 19 FIGURES. 5 TABLES. 8 REFERENCES. NOVEMBER 1967

TRITIUM-METALLIC TARGETS ARE FREQUENTLY USED IN MANY PARTICLE ACCELERATORS FOR THE PRODUCTION OF HIGH-ENERGY NEUTRONS. THE PURPOSE OF THIS STUDY WAS TO DEMONSTRATE THE PROBLEMS AND HAZARDS ASSOCIATED WITH THE USE OF THESE TRITIUM TARGETS SO THAT APPROPRIATE STEPS CAN BE TAKEN TO PROMOTE THE PERSONNEL RADIOLOGICAL HEALTH HAZARDS. THIS STUDY SHOWED THAT DEGRADEMENT OF TRITIUM TARGETS RESULTS IN THE LOSS OF ABOUT 1 TRITIUM ATOM PER EACH DEGRADING DEUTERON, AND THAT MOST OF THE TRITIUM IS IN A GASEOUS FORM WHEN IT LEAVES THE TARGET. IT WAS ALSO DETERMINED THAT A RELATIVELY SMALL AMOUNT OF THE TRITIUM RELEASED FROM THE TARGET ACTUALLY DEGRADES WITHIN THE ACCELERATOR SYSTEM. MOST OF THE TRITIUM LOST BY A DEGRADED TARGET IS TRAPPED IN THE ELEMENTS OF AN ION PUMP OR RELEASED THROUGH THE VACUUM SYSTEM EXHAUST.

AVAILABILITY - PUBLIC HEALTH SERVICE, WASHINGTON, D.C., FREE

DEUTERON, GAS ● DECONTAMINATION ● ACCELERATOR

007977
COBLEY RC
CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS
SAVANNAH RIVER LABORATORY
DPSPU-66-30-13 ● CONF-660607-1 ●. 15 PAGES. TABLES. MAY 1966. FROM 13TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

IN HEAVY-WATER-MODERATED REACTORS, TRITIUM IS FORMED AS NEUTRONS ARE ABSORBED BY THE HEAVY WATER. HAZARDS FROM TRITIUM RELEASED TO PERSONNEL ZONES DURING REPAIR AND MAINTENANCE OPERATIONS ARE MINIMIZED BY PROPER JOB EVALUATION AND SELECTION OF CORRECT PROTECTIVE EQUIPMENT. AT SAVANNAH RIVER PLANT, BASIC INFORMATION HAS BEEN DEVELOPED TO FACILITATE THIS PROCESS. DATA IS GIVEN RELATIVE TO OUTGASSING OF TRITIUM IN MODERATOR, AIRBORNE CONCENTRATION OF TRITIUM, CONCENTRATION OF TRITIUM IN SPILLED MODERATOR AND WATER, ASSIMILATION OF TRITIUM BY PERSONNEL THROUGH INHALATION AND BODY CONTACT, AND DOSE RECEIVED BY URINE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00 COPY. $0.65 MICROFICHE

REACTOR, HWR ● INHALATION ● ANALYTICAL TECHNIQUE ● HAZARDS ANALYSIS ● RADIATION SAFETY AND CONTROL ● WORKER ● MONITORING SYSTEM, RADIATION ● CONCENTRATION ● EXCRETION, URINE ● MAN

008129
JACOBS DG
SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
TID-24039 ● ORNL-NSIC-39 ●. 98P., DEC. 1968

AN ATTEMPT IS MADE IN THIS STATE-OF-THE-ART-REPORT TO SUMMARIZE SOME OF THE IMPORTANT PROPERTIES OF TRITIUM AND TO USE THESE PROPERTIES IN PREDICTING THE IMPACT OF DIVERSE RELEASES OF TRITIUM ON LOCAL AND WORLDWIDE POPULATIONS. DESPITE INADEQUACIES OF PRESENT INFORMATION ON THE BEHAVIOR OF TRITIUM, WE CAN CONCLUDE, IN OUR PRESENT POWER ECONOMY, TRITIUM POSES NO SEVERE WORLDWIDE EXPOSURE PROBLEMS. HOWEVER, IT WILL CONTINUE TO OFFER MONITORING AND ENVIRONMENTAL CONTAMINATION PROBLEMS. ALSO REPORTED IS INFORMATION CONCERNING SOURCES, PRODUCTION, MONITORING, REMOVAL, AND PROJECTED PRODUCTION OF TRITIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00 COPY. $0.65 MICROFICHE

DEPOSITION ● DIFFUSION ● DILUTION ● PHOTOMICROGRAPHY ● GROUND WATER ● OCEAN AND SEA ● FALLOUT ● STRATOSPHERE ● SURFACE CONTAMINATION ● CONDENSATION ● REACTOR, POWER ● THERMAL CONSIDERATION ● POPULATION EXPOSURE ● EVAPORATION ● HYDROLOGY ● RADIATION SAFETY AND CONTROL ● DISPERSION ● RADIOACTIVITY RELEASE ● ENVIRONMENT ● TROPOSPHERE ● FUEL REPROCESSING ● RADIATION MONITORS ● JACOBS

[illegible]
[illegible] A. • [illegible] DE
TRITIUM CONTENT OF ATMOSPHERIC METHANE AND [illegible]
UNIVERSITY OF [illegible], PORTUGUESE
7 PAGES. J. GEOPHYS. RES., 73, PAGES [illegible] APR. 15, 1968

SAMPLES OF LIQUID OXYGEN COLLECTED AT GROUND LEVEL NEAR [illegible], MISSOURI, HAVE BEEN PROCESSED FOR RECOVERY OF METHANE, AND THE TRITIUM CONTENT OF THESE SAMPLES IS DISCUSSED IN TERMS OF POSSIBLE SOURCES OF THIS RADIOACTIVITY. THE CONTINUAL RELEASE OF LIQUID METHANE BY NUCLEAR INDUSTRY IS INDICATED BY THE FACT THAT THE TRIM RATIO HAS NOT CHANGED APPRECIABLY DURING THE PERIOD 1954 TO 1966. ALTHOUGH THIS INDICATES IS COMPARABLE TO THE CHEMICAL LIFETIME EXPECTED FOR METHANE IN THE ATMOSPHERE.

[illegible] RELEASE • [illegible] DIFFUSION. CLIMATOLOGY • [illegible] POLLUTION

[illegible]
[illegible] S • [illegible] I
TRITIUM AND [illegible] IN ATMOSPHERIC METHANE
MAX-PLANCK INSTITUT FUER CHEMIE, MAINZ
5 PAGES. J. GEOPHYS. RES., 73, PAGES [illegible] APR. 15, 1968

TWO SAMPLES OF ATMOSPHERIC METHANE COLLECTED AT [illegible], GERMANY, AND GARY, INDIANA, NEITHER [illegible] HAVE BEEN ANALYZED FOR TRACE TRITIUM AND [illegible] CONTENT. RESULTS SHOW THE TRITIUM CONCENTRATION IN THE ATMOSPHERE APPEARS TO HAVE BEEN ESSENTIALLY CONSTANT SINCE 1956. THE FIRST THE FIRST SAMPLES WERE ANALYZED. EVIDENCE TENDENCIES TO EXPLAIN THE ORIGIN OF TRITIATED METHANE AND DISCUSSED AND REJECTED AS MORE LIKELY IMPROBABLE. THE DATA CAN BEST BE EXPLAINED BY ASSUMING THAT LEAKAGE OF TRITIATED METHANE FROM THE ATMOSPHERE FROM SOURCES IN NUCLEAR INDUSTRY LOCATED IN THE NORTHERN HEMISPHERE OCCURRED FOR A PERIOD OF YEARS PRIOR TO 1956. AND THEN THE LEAK WAS ESSENTIALLY CLOSED.

[illegible] RELEASE • [illegible] DIFFUSION. CLIMATOLOGY • [illegible] • [illegible] POLLUTION • GERMANY

[illegible]
TRITIUM IN GAS. PRESSURE VESSEL DESIGN CRITERIA. AND REVISED PAGES
GENERAL [illegible] CO.
[illegible] P. 150 PAGES. FIGURES. TABLES. [illegible] 1 TO 9. 1. [illegible] 1 LICENSE APPLICATION. AUG. 9, 1960. DOCKET 50-[illegible]

CONSISTS OF (1) REPLACEMENT PAGES. (2) ADDITIONAL INFORMATION ON THE PRESSURE VESSEL DESIGN CRITERIA. AND (3) TECHNICAL NOTES ON THE SIGNIFICANCE OF TRITIUM IN WATER REACTORS. DISCUSSION OF TRITIUM INCLUDES PROPERTIES. DEFINITION PRODUCTION. METHODS OF FORMATION. SIGNIFICANCE IN REACTORS. EXPERIENCE ON BWRS - SUPER-HEAT REACTORS - GE TEST REACTOR AND GNR OPERATING. SIGNIFICANCE IN WASTE DISPOSAL DETR LIQUID AND AIRBORNE. AND CONTROL OF T IN THE PRIMARY [illegible] CORE. A 1960 ANALYSIS OF AND DESIGN WATER WITH TEMPORARY BORON CONTROL CONTAINS UPON EXCESS REACTIVITY IN FIRST CORE INDICATES THE CONTAINS DO NOT CONTRIBUTE SIGNIFICANTLY TO TRITIUM CONCENTRATION IN REACTOR WATER.

AVAILABILITY - [illegible] PUBLIC DOCUMENT ROOM., 1717 H ST., WASH., D. C. 20545. 10.25 CENTS/PAGE

[illegible] • [illegible] • DESIGN CRITERIA • PRESSURE VESSELS • HAZARD. RELATIVE • CONTAMINATION. THERMAL AND [illegible] • [illegible]. SURFACE • REACTOR. INTERNAL SUPPORT • [illegible] • WASTE DISPOSAL. GAS • WASTE DISPOSAL. LIQUID • WASTE MANAGEMENT • RADIATION SAFETY AND CONTROL • REPORTING • PROPERTY. PHYSICAL • REPORT. PSAR • PROPERTY. CHEMICAL • CONTROL RODS

[illegible]
CARLE WD
ROLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED METHANE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH. BOULDER. COLO.
3 PAGES. J. GEOPHYS. RES., 72, PAGES 2751-2 [illegible] 15, 1967

TRITIATED METHANE IN THE ATMOSPHERE RESULTS FROM TROPOSPHERIC EXCHANGE OF METHANE WITH TRITIATED HYDROGEN THAT HAS MIGRATED DOWNWARD FROM THE STRATOSPHERE. SPECIFICALLY. IT IS SUGGESTED THAT METHYLENE MAY BE PRODUCED FROM METHANE BY ELECTRICAL DISCHARGES AND OTHER IONIZATION PROCESSES IN THE LOWER ATMOSPHERE. AN EXPERIMENTAL INVESTIGATION WAS PERFORMED TO DETERMINE WHETHER ANY ATMOSPHERIC CONSTITUENTS WOULD REACT PREFERENTIALLY WITH METHYLENE PREVENTING ITS REACTION WITH TRITIATED HYDROGEN. IT WAS CONCLUDED THAT IT IS HIGHLY UNLIKELY THAT REACTIONS OF METHYLENE PRODUCE TRITIATED METHANE IN THE ATMOSPHERE.

[illegible] REACTION • STRATOSPHERE • ATMOSPHERIC POLLUTION • ATMOSPHERIC CHEMISTRY • ELECTROSTATIC CHARGE • CHEMICAL KINETICS

[illegible]
PERTHUIS J • ROSIT J
REDUCTION OF RADIOACTIVE GASES IN THE CO2 COOLANT OF THE G2-G3 REACTORS
CENTRE DE PRODUCTION DE PLUTONIUM DE MARCOULE
CEA-R-3556 P. SEPT. 1968. 29P. (IN FRENCH)

THE CO2 COOLING THE REACTORS G2-G3 CONTAINS ACTIVATION GASES AND FISSION GASES. IT IS OF INTEREST

[illegible] MEDITERRANEAN

[illegible] TO ARRIVE THEIR CONCENTRATIONS. FOR EXAMPLE, IT IS ABLE TO REDUCE REPORTS THE [illegible] WHICH WOULD HAVE TO BE APPLIED IN THE CASE OF AN INCIDENT IN THE CIRCUIT. GAS-PHASE CHROMATOGRAPHY IS APPLIED [illegible] FOR CARRYING OUT ANALYSES. THE CHROMATOGRAM HAS SEPARATE PEAKS DUE TO TRITIUM, ARGON-41, KRYPTON-85 AND THE -133 AND -135 ISOTOPES OF XENON. BY INTEGRATING EACH PEAK IT IS POSSIBLE TO CALCULATE THE SPECIFIC ACTIVITY OF EACH PRODUCT. THE CONSTRUCTION OF AN APPARATUS FOR CARRYING OUT CONTINUOUS MEASUREMENTS IS UNDER CONSIDERATION.

AVAILABILITY - [illegible] COMPOSITION CHANGES IN THE U.S. AND OVERSEAS

ACTIVITY [illegible] - CHROMATOGRAPHY - FISSION GAS RELEASE - KRYPTON - NOBLE GAS - [illegible] - [illegible] - [illegible] - [illegible] - [illegible] - COOLANT CHEMISTRY - [illegible], COOLANT QUALITY - CALIBRATION

030779
[illegible] DE - [illegible] JC
[illegible] CONSIDERATIONS IN NUCLEAR POWER PLANTS
[illegible] AND [illegible], [illegible], VIRGINIA
[illegible] - OCTOBER 21, 1969, P. [illegible]

[illegible] MAJOR SOURCE OF RADIOACTIVITY ARE [illegible] DESIGN AND OPERATING [illegible]. [illegible] [illegible], CORROSION AND FISSION PRODUCTS. [illegible] ACCESSIBILITY FOR MAINTENANCE RELEASE [illegible] POINT I STEAM GENERATORS [illegible] A [illegible] OF THE [illegible] GAS. [illegible] [illegible] PERSONNEL [illegible] SPECIAL [illegible]. TRITIUM AND KRYPTON DURING REFUELING [illegible] AIR PURGE.

AVAILABILITY - [illegible] E. [illegible] JAMES G. [illegible], [illegible] AND [illegible], [illegible], VIRGINIA

FISSION GAS RELEASE - MAINTENANCE AND REPAIR - REACTOR, POWER - RADIATION SAFETY AND CONTROL

030209
[illegible] PE
PROJECT [illegible] FINAL OPERATIONAL RADIOACTIVITY REPORT AND THEN PRODUCTION TESTS
NEVADA OPERATIONS OFFICE, LAS VEGAS, NEVADA
NVO-182 - PNE-0-57 P. 36 PAGES, 5 TABLES, FEBRUARY 1972

[illegible] MOST OF THE SIGNIFICANT RADIOLOGICAL SURVEILLANCE DATA GENERATED DURING THE PRODUCTION TESTS OF PROJECT [illegible], A NUCLEAR GAS STIMULATION EXPERIMENT, [illegible] 30, 1969, IN [illegible], COLORADO. [illegible] INCLUDES DATA ON THE RADIOCHEMICAL AND CHEMICAL QUALITY OF THE FISSION GAS DURING THE TESTS. ARE ESTIMATES OF THE QUANTITIES OF Xe, [illegible], [illegible], AND [illegible] RELEASED TO THE ATMOSPHERE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON - [illegible] - MERCURY - MONITOR, [illegible] - MONITOR, AIR - MONITOR, GAS - NUCLEAR [illegible] - [illegible], BACKGROUND - RADIOACTIVITY RELEASE - SURVEILLANCE PROGRAM - [illegible], AREA - [illegible] - CONCENTRATION - [illegible] - BENEFIT VS RISK - [illegible] USE

030376
[illegible] DC - [illegible] PE - [illegible] DL - [illegible] PS - [illegible] DF
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION
U. S. DEPT. OF HEALTH, EDUCATION, AND WELFARE
U. S. PUBLIC HEALTH SERVICE PUBLICATION NO. [illegible] P. 47 PAGES, 15 FIGURES, 5 TABLES, AND 9 REFERENCES, FEB. 1969

TRITIUM-MATERIAL TARGETS ARE FREQUENTLY USED IN HIGH PARTICLE ACCELERATORS FOR THE PRODUCTION OF HIGH-ENERGY NEUTRONS. THE PURPOSE OF THIS STUDY WAS TO INVESTIGATE THE PROBLEMS AND HAZARDS ASSOCIATED WITH THE USE OF THESE TRITIUM TARGETS SO THAT APPROPRIATE STEPS CAN BE TAKEN TO MINIMIZE THE POTENTIAL RADIOLOGICAL HEALTH HAZARDS. THIS STUDY SHOWED THAT [illegible] OF TRITIUM TARGETS RESULTS IN THE LOSS OF ABOUT 1 TRITIUM ATOM FOR EACH [illegible], AND THAT MOST OF THE TRITIUM IS IN A GASEOUS FORM WHEN IT LEAVES THE TARGET. IT WAS DETERMINED THAT A SMALL AMOUNT OF TRITIUM RELEASE FROM TARGET ACTUALLY OCCURS WITHIN THE ACCELERATOR ITSELF, MOST OF THE TRITIUM LOST BY A [illegible] TARGET IS TRAPPED IN THE ELEMENTS OF AN ION PUMP OR RELEASED THROUGH THE VACUUM SYSTEM EXHAUST.

AVAILABILITY - U. S. DEPT. OF HEALTH, EDUCATION AND WELFARE, CONSUMER PROTECTION AND ENVIRONMENTAL HEALTH SERVICE, ENVIRONMENTAL CONTROL ADMINISTRATION

[illegible], RELEASE - VACUUM PUMP - [illegible] - RADIOACTIVITY RELEASE - [illegible] - ACCELERATOR - ENERGY LEVEL - GAS - [illegible]

030639
AEC EXEMPTS USE OF SELF-LUMINOUS PRODUCTS CONTAINING, TRITIUM, KRYPTON-85 AND PROMETHIUM-147
U.S. ATOMIC ENERGY COMMISSION
AEC PRESS RELEASE P-137 P. 2 PAGES, JULY 5, 1969

THE AEC HAS ESTABLISHED A NEW CLASS EXEMPTION FROM LICENSING FOR THE USE OF PRODUCTS CONTAINING TRITIUM, KRYPTON-85, AND PROMETHIUM-147 AND HAS INCORPORATED SAFETY STANDARDS FOR THEIR MANUFACTURE IN ITS REGULATIONS. USE OF SELF-LUMINOUS PRODUCTS WHICH MEET THE SPECIFIC SAFETY STANDARDS WILL BE EXEMPT FROM FURTHER REGULATORY CONTROL. LICENSES TO MANUFACTURE AND DISTRIBUTE PRODUCTS IN THIS CLASS WILL STILL BE REQUIRED. HOWEVER, LICENSES TO MANUFACTURE A PRODUCT WHICH

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[illegible] •. 13 PAGES. 2 TABLES. 36 REFERENCES. DECEMBER 1980

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9 PAGES. [illegible]. [illegible]

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9 PAGES. 3 TABLES. 12 REFERENCES. PUBLIC HEALTH REPORTS. [illegible]. PP. [illegible]. APRIL [illegible]

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13 PAGES. 8 FIGURES. 4 TABLES. 36 REFERENCES. NEW TECHNOLOGIES [illegible] [illegible]. [illegible]. PP. [illegible]-[illegible] [illegible]
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GENERAL CONFINEMENT
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22160

CARBON • CESIUM • IODINE • KRYPTON • MAZARD, RELEASE • STRONTIUM • ATMOSPHERIC POLLUTION • ACCIDENT, PROBABILITY OF • POPULATION EXPOSURE • PUBLIC • RADIOACTIVITY RELEASE • INTERNATIONAL • DATA COLLECTION • CANADA • U-PROPO, SAFETY OF • OPENED PLANT, NUCLEAR

GENERAL
GREEN JR • LESSLER RM
PRODUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-72850 V. 2 PAGES. TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY. 14(2). PP. [illegible] OCTOBER 1971

THE INDUSTRIAL APPLICATIONS OF THE PLOWSHARE CONCEPT OF COMMERCIAL EXPLOSIVES IS THE STIMULATION OF NATURAL GAS. THE DEGREE OF SUCCESS OF THIS AND OTHER APPLICATIONS MAY BE SIGNIFICANTLY AFFECTED BY THE AMOUNT OF TRITIUM PRODUCED BY THE NUCLEAR EXPLOSION. THE PRODUCTION OF DESIRABLE TRITIUM HAS BEEN THE SUBJECT OF CONTINUING RESEARCH AND EVALUATION. BOTH PUBLIC SAFETY AND ECONOMICS ARE CONSIDERED IN PLANNING THIS PRODUCTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22160

UNDERGROUND, UNDERGROUND • ECONOMICS • PLOWSHARE • TESTING • NUCLEAR DETONATION • POPULATION EXPOSURE • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • SAFETY EVALUATION

CANADA
JOHNS E • WOOD JE
EXPERIENCE WITH HEAVY WATER MANAGEMENT IN THE NRU/NRX REACTOR DURING OPERATION OF ITS SECOND FUEL CHARGE
AECL-[illegible] V. 97 PAGES. DECEMBER 1967

THE REACTOR WAS MADE CRITICAL ON ITS 2ND CHARGE FOR THE FIRST TIME IN MARCH 1962. AFTER A SERIES OF LOW POWER EXPERIMENTS AT VARIABLE PRESSURES AND TEMPERATURES, HIGH POWER OPERATION STARTED IN OCTOBER 1962. THE SECOND-CHARGE OPERATION ENDED ON 16TH DECEMBER, 1966. DURING THIS PERIOD THE PLANT HAS BEEN OPERATED AT VARIOUS POWER LEVELS UP TO 25 MW. THE POWER EXPERIMENTS INCLUDED TESTING OF FOUR DIFFERENT INSTRUMENTED FUEL ASSEMBLIES. HEAVY POISONING EXPERIMENTS, STEAM LOOP VARIATION EXPERIMENTS, REACTIVITY PERTURBATION EXPERIMENTS, FLUX AND VOID MEASUREMENTS AND NOISE MEASUREMENTS. BY THE END OF THE SECOND CHARGE OPERATION IN DECEMBER 1966, THE REACTOR HAD BEEN ON PRESSURE FOR ABOUT 22000 HRS., MOST OF THE TIME AT 20.5 AT 1230 C). THE INTEGRATED POWER ON THE SECOND CHARGE WAS 9940 MWD OR ABOUT 4500 MWD/TONT DISCHARGE. THIS REPORT DEALS WITH THE HEAVY WATER MANAGEMENT AND THE EXPERIENCE WITH LOSSES AND DEGRADATION OF HEAVY WATER DURING THE PERIOD.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

REACTOR, NRX • HEAVY WATER • REACTOR, NRU • OPERATING EXPERIENCE SUMMARY • NORWAY • MAIN COOLING SYSTEM • COOLANT QUALITY • LEAK

CHINA
TSAO CH • WENG PS
A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT
NATIONAL TSING HUA UNIVERSITY, HSINCHU, TAIWAN
9 PAGES. 11 REFERENCES. HE TSO H-C HSUEH. VOL. 6. PAGES 93-9 OCTOBER 1961 (IN CHINESE)

TRITIUM AND OTHER RADIOACTIVE NUCLIDES HAVE BEEN INDUCED IN THE TSING HUA OPEN-POOL REACTOR STORED COOLANT BY THE EXPOSURE OF VARIOUS AMOUNTS OF DEUTERIUM AND IMPURITIES EXISTING IN THE COOLANT WATER TO THE NEUTRONS AFTER SOME 6,000,000 HOUR OPERATION. A HEMOD DED RESIN WAS TRACER BY THE TRITIUM AND THE FISSION PRODUCT STANDARD SOURCES AND THEN PASSED THROUGH BY THE COOLANT SAMPLE OF WHICH 3 PARALLELISMS WERE DISCOVERED IN THE LIQUID SCINTILLATION. WITH AN AID OF A LIQUID SCINTILLATION COUNTER THE TRITIUM CONTENT WAS FOUND TO BE STAND -- 2.1 PERCENT T.W. THE REACTOR POWER OUTPUT CAN BE ESTIMATED FROM THE TRITIUM ACTIVITY, PARTICULARLY UNDER LONG TIME AND HIGH POWER OPERATION.

REACTOR • DEUTERIUM • SAMPLING • REACTANT CHEMISTRY • RESIN

GENERAL
JUSTIFICATION SUPPORTING TECH SPEC CHANGES AT THE NBS RESEARCH REACTOR
NATIONAL BUREAU OF STANDARDS
30 PAGES. 1 FIGURE. 2 REFERENCES. LETTER - NATIONAL BUREAU OF STANDARDS TO DIVISION OF REACTOR LICENSING - JANUARY 19, 1970. REPORT 90-100

THREE AUTOMATIC TRIPS (ON DEMAND, A RUNDOWN AND A SCRAM) ARE SET FOR LOW COOLANT LEVEL TRIP TO INDICATE AT SUCCESSIVE 6 INCH LEVEL. A SERIES OF TEMPERATURE AND VOID COEFFICIENT OF REACTIVITY MEASUREMENTS INDICATE A NEGATIVE VALUE IN ALL CASES. SINCE THE N-16 MONITOR IS A CONTINUOUSLY INDICATING DEVICE AND OPERATIONAL CHECKS PERFORMED DAILY, AN ANNUAL CALIBRATION CHECK IS SUFFICIENT. THE N-16 MONITOR ON THE SECONDARY COOLING SYSTEM, AND THE LIQUID LEVEL MONITOR ON THE D2O STORAGE TANK ARE SUFFICIENTLY RELIABLE SO THAT TRITIUM SAMPLING OF SECONDARY SYSTEM ON A MONTHLY BASIS IS SUFFICIENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

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[illegible]
[illegible] OF THE SAFETY OF THE [illegible] AND [illegible] REACTOR. [illegible]
[illegible] • [illegible] INC. • [illegible] FOR REACTOR SAFETY OF THE TUV, INC.
[illegible] PAGES. [illegible], [illegible] AND [illegible] REACTOR SAFETY [illegible], [illegible]

[illegible] ON THE [illegible] AND [illegible] REACTOR [illegible] [illegible] SEE SAFETY
REPORT ON THIS REACTOR. IT IS [illegible] THAT THE REACTOR WILL, [illegible] IN [illegible] OPERATION AND
IN [illegible] ACCIDENTS. [illegible] IN THE [illegible]. THIS PROPOSES THAT FURTHER
[illegible] [illegible] IN SECTION 12.3 IS SUPPLIED AND DOES NOT LEAD TO OBJECTIONS. THAT THE
[illegible] TESTS [illegible] IN SECTION [illegible] ARE CARRIED OUT SATISFACTORILY AND THAT RECOMMENDED TESTS
[illegible] IN SECTION [illegible] ARE CARRIED OUT BY INDEPENDENT EXPERTS.

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[illegible] • [illegible], [illegible] • [illegible] • [illegible]

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SAFETY [illegible] ON THE [illegible] OF A [illegible] WATER SYSTEM [illegible] AND [illegible] REACTOR IN THE [illegible]
AND ON THE [illegible] OF THE [illegible] WITH TWO CORES
[illegible] [illegible] [illegible], INC. • [illegible] FOR REACTOR SAFETY OF THE TUV, INC.
[illegible] PAGES. [illegible] AND [illegible] REACTOR SAFETY [illegible], JUNE 1969

THE CONDITIONS NAMED IN SECTION 7 ON THE [illegible] SHOULD BE INCORPORATED IN THE LICENSE. ASSUMING
THIS, THERE ARE NO OBJECTIVES AGAINST THE MODIFICATION AND COMMISSIONING OF THE REACTOR. NEITHER
IN NORMAL OPERATION, NOR IN CASE OF AN ACCIDENT IS AN INCREASE EXPECTED IN THE RADIOLOGICAL DOSE,
COMPARED TO THE SITUATION ALREADY APPROVED. REGARDING TESTS SEE EXPERT OPINION ON THE SAFETY OF
THE [illegible]. TUV HANOVER AND [illegible] OF THE TUV, MAY 1966, SECTION 8.

[illegible] - [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

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[illegible] • [illegible], [illegible] • [illegible] • [illegible]

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[illegible] [illegible]
ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. [illegible]
[illegible] PAGES. ATOMIC ENERGY CLEARING HOUSE, [illegible], PG 25-30 [illegible] 2, 1970

SPEAKER DEVELOPS A SECONDARY PRESENTATION OF POTENTIAL EFFECTS OF TRITIUM RELEASES. HE POINTS
OUT THAT MOST SPECIES SOURCE WOULD BE FROM FUEL REPROCESSING PLANTS, ALTHOUGH RELEASES TO WATER
REPRESENTING [illegible] CAN BE HIGHLY SIGNIFICANT. ASSUMING THE AEC ACCEPTS THE LINEAR-DOSE-RESPONSE,
NONTHRESHOLD, AND MINIMUM-PROPORTIONAL-CONCENTRATION CONCEPTS, [illegible] HE HAS FIGURES TO SHOW
POTENTIAL POPULATION MUTAGENIC EFFECTS ESPECIALLY AND [illegible]. HE DIVIDES COSTS DUE TO VARIOUS
RADIATION SOURCES PROPORTIONALLY. IN ADDITION HE STATES HIS CONSIDERED ACCEPTABLE GENETIC
RISK FROM T ITIUM. FROM THESE HE DEVELOPS HIS THESIS. HENCE, PLANNING MUST BE PREPARED TO
ACCEPT CERTAIN RISKS, AND THE AEC WOULD SERVE BEST BY BY ALERTING PUBLIC TO THEIR
RESPONSIBILITIES FOR TACKLING THE WHOLE RANGE OF ENVIRONMENTAL PROBLEMS. DECISIONS MADE NOW CAN
INFLUENCE CORPORATIONS TO COMP ATE FEA TURES.

CONSTRUCTION • DESIGN • CODES AND STANDARDS • CONGRESSIONAL ACTIVITY • FDC • [illegible] • STRONTIUM • [illegible],
POWER • [illegible] • [illegible] • RADIOACTIVITY RELEASE • WATER POLLUTION • FUEL REPROCESSING • CALVERT CLIFFS 1 (PWR) •
DATA COLLECTION • FOOD CHAIN • AQUATIC ECOLOGY • EFFECT, GENETIC • STANDARD [illegible] • INDUSTRY, NUCLEAR •
BIOLOGICAL CONTROL • OPPONENT • PSYCHOLOGICAL CONSIDERATION

[illegible]
IN THE UTILITIES
1 PAGE. NUCLEONICS NEWS, PG 4 OCTOBER 5, 1970

COOK COUNTY SANITARY DISTRICT MAY FILE SUIT AGAINST ELECTRIC MICHIGAN NUCLEAR POWER STATION. ITS
[illegible] POSITION IS THAT NO WASTE GO INTO LAKE MICHIGAN AND NO CHANGE WHATSOEVER IN THE
TEMPERATURE. IT OBJECTS TO TRITIUM AND TRITIUM INJECTION PLUS THREAT OF RADIOACTIVE LEAKAGE.
IT SEES PLANT DISCHARGES AS A THREAT TO CHICAGO WATER SUPPLY. (SEVERAL BIG STEEL PLANTS
PRESENTLY [illegible] SHORE.)

[illegible], [illegible] • WATER POLLUTION • THERMAL POLLUTION • COOK 1 (PWR) • COOK 2 (PWR) • AGENCY, MUNICIPAL •
[illegible] • OPPONENT • SPOKESMAN, STATE

[illegible]
[illegible] TO
REVIEW OF LOW-MASS [illegible] POTENTIALS A IN FAST REACTORS
ARGONNE NATIONAL LABORATORY, [illegible]
ANL-7030 P, 37 PAGES, 7 FIGURES, 8 TABLES, 17 REFERENCES, APRIL 1965

[illegible] (CONTINUED)
PRESENTS A LITERATURE REVIEW OF LC--MASS CHARGED-PARTICLE YIELDS IN FISSION. A SEMIEMPIRICAL METHOD FOR CALCULATING THE YIELDS OF HYDROGEN AND HELIUM ISOTOPES FROM FAST-NEUTRON FISSION OF URANIUM AND PLUTONIUM IS PRESENTED. TRITIUM PRODUCTION IN REACTOR FUELS IS ESTIMATED AT 377 CURIES PER METRIC TON OF U-235 AND 40 CURIES PER METRIC TON OF A [illegible] U-235/PU-239 THERMAL REACTOR FUEL HAVING A BURNUP RATING OF 20,000 MWD(T)-D. TRITIUM PRODUCTION IN FAST REACTORS IS ESTIMATED TO BE [illegible] LOWER FOR U-235 FUEL AND [illegible] HIGHER FOR PU-239 FUEL THAN FOR THERMAL REACTORS. A PLUTONIUM-FUELED FAST REACTOR IS ESTIMATED TO PRODUCE TWICE AS MUCH TRITIUM AS A URANIUM-FUELED THERMAL REACTOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

[illegible] BURNUP • RADIOISOTOPE • REACTOR PHYSICS

[illegible]
FRAAS AP • POSTMA H
PRELIMINARY APPRAISAL OF THE HAZARDS PROBLEM
OAK RIDGE NATIONAL LABORATORY, TN
ORNL-TM-2822 P. 37 PAGES, 5 FIGURES, 0 TABLES, 25 REFERENCES, APRIL 1970

PRELIMINARY ASSESSMENT OF THE HAZARDS PROBLEMS OF A D-T FUSION REACTOR TO PROVIDE SOME NOTION OF SERIOUSNESS OF THESE PROBLEMS. INHERENT CHARACTERISTICS OF MAGNETICALLY CONFINED PLASMAS APPEAR TO BE SUCH THAT ANY TENDENCY TOWARD GENERAL POWER OVERSHOOTS OR LOCAL HOT SPOTS WILL BE MORE THAN COMPENSATED BY OTHER FACTORS. TRITIUM PRODUCTION RATE WILL RUN ROUGHLY [illegible] TIMES THAT IN FISSION REACTOR. PLANT DESIGN CAN KEEP AT ABOUT THE SAME LEVEL AS IN CONVENTIONAL. FUSION REACTOR GIVES A FACTOR OF ROUGHLY 1,000,000 REDUCTION IN THE TOTAL BIOLOGICAL HAZARD POTENTIAL. AFTERHEAT IN A FUSION REACTOR IS LOWER BY A FACTOR OF ABOUT 40,000.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

ACTIVITY BUILDUP • ECOLOGY • DEUTERIUM • EXPLOSION • HAZARDS ANALYSIS • CONTAINMENT STRUCTURE • FISSION PRODUCT, AIRBORNE • RADIOACTIVITY RELEASE • HEAT GENERATION, INTERNAL • EQUIPMENT DESIGN • REACTOR, THERMONUCLEAR

[illegible]
JENKINS [illegible]
BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
CONF-690303 P. 11 PAGES, PP. 133-43 OF THE PROCEEDINGS OF A SYMPOSIUM ON BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE, LIVERMORE, CALIFORNIA, MARCH 5-7, 1969

THE RELEASES OF RADIONUCLIDES FROM REACTORS AND THE ENVIRONMENTAL EFFECTS OF THESE RELEASES HAVE BEEN STUDIED SINCE THE EARLY 1940S. CONTROLS BASED ON THE KNOWLEDGE GAINED FROM THESE STUDIES HAVE BEEN ADEQUATE TO MAINTAIN THE RADIATION EXPOSURE OF THE PUBLIC WELL WITHIN ACCEPTABLE LIMITS. THE SIGNIFICANT PATHWAYS OF EXPOSURE HAVE BEEN IDENTIFIED. OVER THE YEARS IMPROVED METHODS OF WASTE TREATMENT AND CONTAINMENT TECHNOLOGY FOR REACTORS HAVE EVOLVED TO THE POINT WHERE RELEASE OF WASTE HEAT FROM POWER REACTORS NOW APPEAR TO BE RECEIVING MORE PUBLIC ATTENTION THAN THE RELEASE OF RADIONUCLIDES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

[illegible] • ECOLOGY • FALLOUT • WASTE TREATMENT • CONTAINMENT P AND B • [illegible] RIVER PLANT • CHALK RIVER • RADIOISOTOPE • ENVIRONMENT • HANFORD SITE • REACTOR, PRODUCTION • RADIONUCLIDE TRANSFER

[illegible]
[illegible]
NUCLIDES OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF NUCLEAR POWER OPERATION
BROOKHAVEN NATIONAL LABORATORY
10 PAGES, 1 FIGURE, 15 REFERENCES, PAPER PRESENTED AT THE PUBLIC AFFAIRS WORKSHOP ON RADIATION AND MANS ENVIRONMENT, BUCK HILL, PA., APRIL 19-22, 1970

THE CATASTROPHIC POTENTIAL OF NUCLEAR PLANTS HAS BEEN GROSSLY OVEREXAGGERATED BY THEIR ADVERSARIES. SUCH RISKS AS DO EXIST HAVE BEEN PROVIDED FOR, FAR BEYOND THE DISASTER POTENTIAL OF ANY OTHER LARGE SCALE TECHNOLOGY. WITH REGARD TO ROUTINE EFFLUENTS, NUCLEAR PLANTS PRODUCE FAR LESS AIR POLLUTION THAN THEIR FOSSIL COUSINS. THE CONCENTRATIONS OF RADIOACTIVITY IN THEIR LIQUID EFFLUENTS ARE CONTROLLABLE AT LEVELS WELL BELOW RADIATION PROTECTION STANDARDS, AND POSE NO THREAT TO THE ENVIRONMENT.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVENUE, NEW YORK, NEW YORK 10022

ADMINISTRATIVE CONTROL • CODES AND STANDARDS • EFFLUENT • IODINE • KRYPTON • HAZARD, RELATIVE • ATMOSPHERIC POLLUTION • [illegible] • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • ENVIRONMENT

[illegible]
[illegible] DISCUSSES FUEL REPROCESSING
ATOMIC INDUSTRIAL FORUM, INC.
1 PAGE, INFO ISSUE NO. 27 (SUPPLEMENT), P. 5 (MAY 1970)

[illegible]

The div. of NFC Div. of Materials Licensing discusses the concern to environmentalists of increasing number of reprocessing plants, because these represent only operation in nuclear-industry fuel cycle where fission products are released. Krypton and tritium merit most attention. Local exposure from high-capacity plants may dictate a requirement to separate these from plant effluent [illegible] NFS plant, N. Valley, N.Y.). NRC feels it is practical to achieve a reduction in present effluent levels. Of course 3H-90 evolves in a fusion fueled plant, and C3-12? from fueling cause ignite from engineers of plants. The Accession Committee for Scientific Information reported excessive stratospheric release in NFS effluent. Based on NFS and N.Y. Dept. of Health data, NRC investigated and found within limits. Of described planned reprocessing plants of GE and Allied Chemical, NRC then plans for effluent control.

CODES AND STANDARDS • NRC • FISSION PRODUCT RELEASE • KRYPTON • RADIOACTIVITY RELEASE • NFS • FUEL REPROCESSING • NUCLEONICS WEEKLY • NATURE, FISH • CONCENTRATION • REPORT • USA • INDUSTRY, NUCLEAR • ORGANIZATION, CITIZEN • SPOKESMAN, NRC

005010
PAGE A
AUTHOR: PAGE CM, KRYPTON, TRITIUM
ATOMIC INDUSTRIAL FORUM, INC.
1 PAGE. ENVIR ISSUE NO. 27 SUPPLEMENTS, PP 5 MAY 1980

The Supv. of Environmental Monitoring of ONL discusses nuclides of concern in the Environmental aspects of nuclear power operations -- primarily tritium and krypton. Tritium appears to be of greatest concern. If the 1000 megawatt LWR pressurized water reactors each discharged 1000 curie into Long Island Sound, a person drinking this Sound water receive a ECSP of 0.0001 mrem. He states that the low levels of radiation associated with routine releases from reactors are not demonstrable but are within an improved reliability even considered high-level, dose-effect curves.

DOSE • FISSION GAS RELEASE • FISSION PRODUCT RELEASE • KRYPTON • [illegible], POWER • RADIOACTIVITY RELEASE • WATER POLLUTION • [illegible] COLLECTION • AQUATIC ORGANISM • RADIATION EFFECT • SPOKESMAN, NRC

005077
MEMO AA
RADIOACTIVE CONTAMINATION ARISING FROM THE PEACEFUL USES OF ATOMIC ENERGY - PAST, PRESENT, AND FORESEEABLE FUTURE
MINISTRY OF HOUSING AND LOCAL GOVERNMENT, LONDON
SH/PUB-220 • CONF-690317 P. 12 PAGES. PG. 15-26 OF THE PROCEEDINGS OF A SEMINAR ON AGRICULTURAL AND PUBLIC HEALTH ASPECTS OF ENVIRONMENTAL CONTAMINATION BY RADIOACTIVE MATERIALS, VIENNA, AUSTRIA, 1969

The development of environmental contamination is traced from the occasional contamination by natural radionuclides before the war to the present world-wide contamination by kr-85 and H-3 and local contamination by released fission products and damaged fuel. Techniques are available to limit this contamination to any desired level, except possibly in the case of tritium, and they should be sufficient for the control of environmental contamination as the industry grows. New developments such as nuclear civil explosives and power sources are discussed. Attention is drawn to the potentially serious hazard from loss of highly active sealed sources used in the field.

KRYPTON • HAZARD, RELATIVE • WASTE DISPOSAL • DECONTAMINATION • ENVIRONMENT • SOURCE, RADIATION, LOST

005079
PETERSON HT • MARTIN JE • DEWOLF CL • FRANCO PD
ENVIRONMENTAL TRITIUM CONTAMINATION FROM INCREASING UTILIZATION OF NUCLEAR ENERGY SOURCES
PUBLIC HEALTH SERVICE, WASHINGTON, D.C.
SH/PUB-220 • CONF-690317 P. 20 PAGES. PG. 55-66 OF THE PROCEEDINGS OF THE SEMINAR ON AGRICULTURAL AND PUBLIC HEALTH ASPECTS OF ENVIRONMENTAL CONTAMINATION BY RADIOACTIVE MATERIALS, VIENNA, AUSTRIA, 1969

Tritium is produced in nuclear reactors by ternary fission and by neutron capture reactions in B-10, Li-6, Li-7, N-14, and D2. The expanding use of nuclear reactors for power production will contribute additional amounts of tritium to the existing background levels due to atmospheric testing of nuclear devices and natural production by cosmic-ray interactions in the upper atmosphere. Production processes, data in the environment and in nuclear and thermonuclear energy sources, are reviewed.

TESTING • NUCLEAR INFORMATION • COSMIC RADIATION • CONTAMINATION • REACTOR POWER • ENVIRONMENT • POWER REPROCESSING

005080
JACSON DG • DORTCH CJ • KELLY PJ • DEWOLF CL
THEORETICAL EVALUATION OF CONSUMED PRODUCTS FROM PROJECT GASBUGGY. PHASE II - HYPOTHETICAL POPULATION EXPOSURES OUTSIDE SAN JUAN BASIN
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-4700 P. 27 PAGES. 10 FIGURES. 5 TABLES. 30 REFERENCES. FEBRUARY 1972

The hypothetical impact on the use of natural gas, produced by nuclear-stimulation stimulation, in west coast cities is considered from commercially useful nuclear explosives designed to produce low levels of tritium). Exposures of about 20 the permissible level result for homes heated with

092600 [illegible]
UNVENTED SPACE HEATERS, OR FROM GAS-FUELED POWERPLANT PLUMES AT THE PEAK CONCENTRATION DURING INVERSION PERIODS. UNDER CONDITIONS OF AVERAGE DAILY USAGE [illegible] GAS AND AVERAGE WIND FREQUENCIES AND SPEED. THE DOSE AT POINTS OF PEAK CONCENTRATION IS ABOUT 0.1% OF THE PERMISSIBLE LEVEL IN THE VICINITY OF THE LOS ANGELES BASIN AND 0.02% IN THE SAN FRANCISCO BAY AREA. EMPHASIZES SEVERAL GROUPS BELOW THE PERMISSIBLE LEVEL RESULT VIA THE PATHS - EMISSIONS FROM CARBON-BLACK MANUFACTURE, USE OF FERTILIZER CONTAINING AMMONIA MANUFACTURED FROM NATURAL GAS, FATS AND OILS PROCESSED WITH HYDROGEN MANUFACTURE FROM NATURAL GAS, OR ENTRAINING OF ALCOHOL DERIVED FROM ETHANE FROM NATURAL GAS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SIMULATION • PLOWSHARE • WASTE DISPOSAL, ATMOSPHERIC • AGRICULTURE • PLUME DEPOSITION • DOSE CALCULATION, INTERNAL • HAZARDS ANALYSIS • CRITICAL NUCLIDE PATHWAY • PERCOLATION, NUCLEAR • POWER PLANT, FOSSIL FUEL • [illegible], FOSSIL • RADIONUCLIDE UPTAKE • BIOACCUMULATION/TURNOVER • RADIONUCLIDE TRANSFER • INFO[illegible] • STIMULATION • RESOURCE, NATURAL

092945
MOUNTAIN JE • LEERMAKE JW
TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR
UNIVERSITY OF CINCINNATI
1 PAGES, 1 TABLE, 5 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 13(1), P. 220 (JUNE 1970)

TRITIUM PRODUCTION CYCLE OF THE SAN ONOFRE AND CONNECTICUT YANKEE REACTORS FROM TERNARY FISSION AND FROM BORON AND LITHIUM COOLANT ADDITIVES WAS EVALUATED. PRODUCTION OF TRITIUM WAS EVALUATED AS A FUNCTION OF VARIOUS PARAMETERS WHICH AFFECT THE REMOVAL RATE OF LI-7 FROM THE COOLANT. THE RELATIVE CONTRIBUTION OF EACH TRITIUM-PRODUCING REACTION WAS OBTAINED. AS WELL AS THE RELATIVE TRITIUM ACTIVITY PRODUCED BY EACH REACTION IN THE CORE AND REFLECTOR. TRITIUM RELEASE DATA FOR CONNECTICUT YANKEE WAS COMPARED TO THE TRITIUM ACTIVITY CALCULATED FOR THE BORON AND LITHIUM NEUTRON REACTIONS.

AVAILABILITY - J.E. MOUNTAIN, UNIVERSITY OF CINCINNATI, OHIO 45221

BORON • DECONTAMINATION • DIFFUSION • CLADDING • FISSION GAS RELEASE • REACTOR, PWR • POISON, SOLUBLE • REACTOR COOLANT • USAN CONFIG 1 (PWR) • STEEL, STAINLESS • RADIOACTIVITY RELEASE • ENVIRONMENT • LITHIUM • PLUM • PARAMETER

092948
THOMPSON TJ
AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS
1 PAGE, NUCLEAR INDUSTRY, PG 19 (JUNE 1970)

COMMISSIONER THOMPSON QUESTIONED INDUSTRY'S CAPABILITY TO BUILD N-POWER REACTORS WITH ZERO EFFLUENT AND THE ADVISABILITY OF BUILDING THEM. HE EXPRESSED THESE REMARKS AT THE S. INTERSTATE NUCLEAR BOARD BRIEFING FOR STATE AND LOCAL OFFICIALS. IT IS UNDERSTOOD THAT HIS VIEWS DIFFER FROM THOSE OF HIS FELLOW COMMISSIONERS. HE SAYS IT IS MISLEADING TO THE PUBLIC TO SAY OF EVEN SIMPLY ZERO RELEASE. THE TRITIUM WILL BE HELD AND RECIRCULATED UNTIL IT BUILDS UP TO SOME EQUILIBRIUM VALUE (20 YR). THEN IT STILL HAS TO GO INTO THE ENVIRONMENT. MINOR RELEASES FROM TIME TO TIME MAY IN THE LONG RUN PROVE TO BE ENVIRONMENTALLY BETTER THAN THE RELEASE OF A LARGE QUANTITY OF TRITIATED WATER.

FISSION PRODUCT RELEASE • REACTOR, POWER • WASTE MANAGEMENT • RADIATION EFFECT • INDUSTRY, NUCLEAR • [illegible], AEC • THOMPSON TJ

093040
PIPER AR
POTENTIAL APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.
TEI-057 0.

DIFFUSION • PLOWSHARE • WATER • ION EXCHANGE • SOIL • EQUIPMENT DEVELOPMENT

093097
HOFFER JH
FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.
DPSPU-69-30-100 0.

FISSION PRODUCT RELEASE • RIVER • SAVANNAH RIVER PLANT • PLANT

093969
LIBBY WF
RADIOACTIVE FALLOUT.
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 44 PAGES 830-839 1958

CARBON • FALLOUT • STRONTIUM • AIR • RADIOISOTOPE

052691
MARTELL EA
ARTIFICIAL RADIOACTIVITY FROM NUCLEAR TESTS UP TO NOVEMBER 1958.
NCAR-TN-59-666 + NP-8N-19 +.

CARBON + FALLOUT + STRONTIUM + AIR + RADIOISOTOPE

059739
PARKER RL
RADIOACTIVE WASTES FROM FUSION REACTORS.
SCIENCE 199 PAGES 83-86 1980

BOSE + WASTE DISPOSAL + REACTOR + RADIOISOTOPE

059649
BRINSKOR F
HISTORY OF THE MAJOR PULSES OF TRITIUM IN THE STRATOSPHERE.
SEE/BOC/10/73 +.

STRATOSPHERE

059118
BARTON CJ + FUTLER HP + CUMMING RJ + ROSNER PS
THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS
11 PAGES, 1 TABLE, 7 REFERENCES. NUCLEAR SAFETY, 13(3), PP. 229-235 (MAY-JUNE 1972)

A TRITIUM SYMPOSIUM SPONSORED BY THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY OF THE ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA AT LAS VEGAS WAS HELD IN LAS VEGAS AUG. 30 TO SEPT. 2, 1971. NEARLY 100 PAPERS WERE PRESENTED COVERING A BROAD RANGE OF TOPICS, INCLUDING TRITIUM PRODUCTION, ITS POWERS IN THE ENVIRONMENT, ENVIRONMENTAL RELEASE AND PERTINENCE, DETECTION AND MEASUREMENT, BIOLOGICAL EFFECTS, KINETICS, APPLICATIONS IN BIOLOGY AND MEDICINE, AND HEALTH PHYSICS. THIS ARTICLE TOUCHES ON ALL ASPECTS OF THE MEETING, BUT PAPERS OF PARTICULAR INTEREST IN THE FIELD OF NUCLEAR SAFETY ARE EMPHASIZED.

AIRBORNE RELEASE + ENVIRONMENTAL + MONITOR, LIQUID + MONITOR, AIR + ANALYTICAL TECHNIQUE + MONITORING SYSTEM, RADIATION

059112
KELLY RJ + BARTON CJ + MEYER AS + CHEN EN + BINNAN CW
THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-4775 +. 40 PAGES, FIGURES, TABLES, JULY 1972

DATA OBTAINED IN THIS PLANT TEST INDICATE THAT PROCESSING OF NATURAL GAS CONTAINING TRITIATED HYDROCARBONS AT LEVELS EXPECTED TO PREVAIL IN LARGE-SCALE EXPLOITATION OF THE NUCLEAR GAS-STIMULATION TECHNIQUE WILL NOT PRESENT SIGNIFICANT RADIATION EXPOSURE PROBLEMS FOR PLANT PERSONNEL. NO EVIDENCE OF EXCHANGE OF TRITIATED HYDROCARBONS WITH THE PLANT PROCESSING OIL WAS FOUND, AND IT SEEMS PROBABLE THAT PLANT OPERATORS IN ANY PROCESSING PLANT WOULD RECEIVE DOSES LESS THAN 1% OF NATURAL BACKGROUND FROM BREATHING AIR CONTAINING COMBUSTION PRODUCTS RESULTING FROM IN-PLANT USE OF THE TRITIUM-CONTAMINATED GAS AS FUEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLOWSHARE + NUCLEAR DETONATION + DOSE MEASUREMENT, INTERNAL + CONTAMINATION + PERSONNEL EXPOSURE, RADIATION + GAS + PLOWSHARE PROJECT + STIMULATION + RESOURCE, NATURAL

059998
ANALYSIS SHOWS NUSSCH GAS SAFE FOR POTENTIAL CUSTOMER USE
2 PAGES. NUCLEAR INDUSTRY, 19(1), PP. 31-32 (JANUARY 1972)

POTENTIAL CUSTOMERS OF NATURAL GAS FROM PROJECT NUSSCH WELL WILL RECEIVE LESS RADIATION FROM IT THAN THEY WOULD FROM THE SUN, IF THEY MOVED TO AN ELEVATION 80 INCHES HIGHER. OAK RIDGE NATIONAL LABORATORY SCIENTISTS PERFORMED THE ANALYSIS. REPORT OF STUDY IS BEING PUT INTO FINAL DRAFT. INITIAL CALCULATIONS WERE BASED ON LEVELS OF RADIOACTIVITY WHEN THE CAVITY WAS FIRST REENTERED IN SPRING OF 1970. BASED ON CRANDOCK AND DILUTION BY FRESH GAS FLOWING INTO CHIMNEY, FIRST YEAR AVERAGE TRITIUM WAS CALCULATED. EXPOSURE FROM KR-85 WAS LARGELY IGNORED, SINCE IT REPRESENTS LESS THAN 1% OF THE POTENTIAL EXPOSURE FROM TRITIUM. FROM THAT STARTING POINT, TYPES OF STRUCTURES, USE OF GAS STOVES, HEATERS AND REFRIGERATORS, NUMBER OF HEATING DAYS, WIND PATTERNS, PLUME DISPERSAL, ETC. WERE CONSIDERED.

PLOWSHARE + RADIATION IN PERSPECTIVE + POPULATION EXPOSURE + INDUSTRY, MINING + FUEL, FOSSIL + RADIATION EXPOSURE

002001
LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
BRANCHEAU, TO-2 P., 50 PAGES, 10 FIGURES, 23 TABLES, NOVEMBER 1970

LIQUID WASTE EFFLUENTS FROM NUCLEAR FUEL SERVICES WERE STUDIED DURING A SIX-MONTH PERIOD NOT THROUGH OCTOBER 1969. CONCENTRATIONS AND AMOUNTS OF INDIVIDUAL RADIONUCLIDES DISCHARGED FROM THE PLANT WERE MEASURED AND THE AMOUNTS OF SEDIMENTATION OF INDIVIDUAL RADIONUCLIDES IN THE LAGOON SYSTEM WERE ESTIMATED. TRITIUM, RUTHENIUM-106, STRONTIUM-90, CESIUM-137 AND CESIUM-134 WERE THE PRINCIPAL RADIONUCLIDES DISCHARGED TO THE ENVIRONMENT DURING THIS PERIOD. DURING JUNE AND NOVEMBER 1969 SIMULTANEOUS SAMPLING WAS CARRIED OUT AT THE POINT OF DISCHARGE OF THE WASTE AND SEVERAL LOCATIONS ON THE BUFFALO AND CATTARAUGUS CREEKS. TRITIUM, RUTHENIUM-106, AND STRONTIUM-90 WERE THE RADIONUCLIDES PRESENT IN THE HIGHEST CONCENTRATIONS IN THESE STREAMS DURING THESE PERIODS. STREAM DILUTION AND ADSORPTION FACTORS WERE CALCULATED FOR INDIVIDUAL RADIONUCLIDES AT VARIOUS LOCATIONS ALONG THE STREAM SYSTEM. A COMPARISON OF THE CONCENTRATIONS OF THE RADIONUCLIDES IN CATTARAUGUS CREEK WITH IDEALIZED DISCHARGE CONCENTRATIONS LIMITS. ALL RADIONUCLIDES WERE WELL BELOW CONCENTRATION LIMITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + MEASUREMENT + RUTHENIUM + STRONTIUM + REGULATION, AEC + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RADIOACTIVITY RELEASE + NFS + FUEL REPROCESSING + MONITORING PROGRAM, ENVIRONMENTAL + CONCENTRATION + SEDIMENT

003130
LEGER D + DUNLAP D + POTH E
TRITIUM EXTRACTION FROM HEAVY WATER IN NUCLEAR REACTORS
8 PAGES, GENERAL NUCLEAIRE, 1972?, PP. 135-142 (MARCH-APRIL 1970)

AS THE ACCUMULATION OF TRITIUM IN THE HEAVY WATER OF A REACTOR IS A VERY SERIOUS INCONVENIENCE, IT IS OF IMPORTANCE THAT ITS CONTINUOUS EXTRACTION BE DEVELOPED. VARIOUS METHODS ARE DESCRIBED, PARTICULARLY A PROCESS BASED ON THE CATALYTIC EXCHANGE WITH DEUTERIUM GAS FOLLOWED BY A DISTILLATION OF THIS DEUTERIUM. CALCULATIONS PERTAINING TO THIS METHOD LED TO A PROJECT FOR THIS PROCESS TO BE INSTALLED IN THE FRENCH-GERMAN HIGH FLUX REACTOR AT GRENOBLE.

DECONTAMINATION + HEAVY WATER + PUSSA + D AND D PROGRAM + GAS

003540
THOMAS PP
POSSIBLE CONTAMINATION OF GROUND WATER SYSTEM BY HIGH ENERGY PROTON ACCELERATORS
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY
UCRL-20131 + CONF-701100-4 P., 21 PAGES, 1970 SYMPOSIUM OF THE HEALTH PHYSICS SOCIETY, IDAHO FALLS, IDAHO, OCTOBER 1970

A GENERAL EVALUATION OF THE PROBLEM OF POSSIBLE GROUND WATER CONTAMINATION DUE TO THE RELEASE OF ACCELERATOR PRODUCED RADIONUCLIDES TO GROUND SPACE IS TO BE AN UNLIKELY PROBLEM FOR EXISTING AND PROJECTED HIGH ENERGY ACCELERATORS IN THE ENERGY REGION OF SEVERAL HUNDRED GEV.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BERYLLIUM + DILUTION + MPC + SURFACE CONTAMINATION + GROUND WATER, NUCLIDE OCCURRENCE + CONTAMINATION + HYDROLOGY + RADIOACTIVITY RELEASE + THERMAL NEUTRON + ACCELERATOR + MODEL

003004
OSTMANN PJ
TRITIUM SOURCES AND RELEASES TO THE ENVIRONMENT
ARGONNE NATIONAL LABORATORY
2 PAGES, 1 TABLE, 3 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 13(2), PP. 406-407 (NOVEMBER 1970)

DIFFERENT SOURCES OF TRITIUM PRODUCED IN NUCLEAR POWER PLANTS THROUGH TERNARY FISSION AND FROM BORON AND LITHIUM COOLANT ADDITIVES HAVE BEEN IDENTIFIED AND THE TRANSPORT MECHANISMS AND LEVEL OF TRITIUM ACTIVITY RELEASED TO THE ENVIRONMENT FROM POWER PLANTS AND FUEL REPROCESSING PLANTS HAVE BEEN EVALUATED. THE SIGNIFICANCE OF THESE TRITIUM LEVELS IN RELATIONSHIP TO THOSE PRESENT FROM NATURAL PROCESSES AND NUCLEAR WEAPONS TESTING AND IN REGARD TO BEING A SOURCE OF POPULATION EXPOSURE IS POINTED OUT.

AVAILABILITY - H.J. OSTMANN, ARGONNE NATIONAL LABORATORY, 9700 S. CASS AVENUE, ARGONNE, ILLINOIS

REACTOR, BWR + REACTOR, PWR + REGULATION, AEC + WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + WASTE MANAGEMENT + REPRODUCTION + PRODUCTION, NATF

003007
UNDUM CA
PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION
BATTELLE-NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-SA-3350 P., 15 PAGES, PRESENTED AT THE HEALTH PHYSICS SOCIETY ANNUAL MEETING, CHICAGO, ILLINOIS, JUNE 28-JULY 2, 1970

062047 (CONTINUED)

SUMMARIZES SOME IMPORTANT SOURCES OF ENVIRONMENTAL RADIATION, NAMELY TRITIUM AND KR-85. THE WORLDWIDE CONSEQUENCES OF CURRENT TRITIUM AND KR-85 RELEASE PRACTICES FROM 1965 TO THE YEAR 2000 ARE PRESENTED. SINCE IT APPEARS CERTAIN THAT SOME MIX OF NUCLEAR-FUELED AND FOSSIL-FUELED ELECTRIC POWER PLANTS WILL BE USED TO MEET NEEDS THROUGH THE YEAR 2000, THE QUANTITIES OF NON-RADIOACTIVE WASTE GENERATED BY FOSSIL-FUELED POWER STATIONS WILL ALSO BE PRESENTED. THE DATA IS PRESENTED WITHOUT ATTEMPT TO BALANCE THE RELATIVE BENEFITS OF EITHER ELECTRICAL-GENERATION METHOD OR THE WASTE PROCESSING ARE CENTRAL REQUIRED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DOSE * MISSION PRODUCT RELEASE * *NAVIGATION * *PLOWSHARE * SOURCE, RADIATION * TESTING * *AIR * NUCLEAR DETONATION * SOURCE, VOLUME * POPULATION EXPOSURE * *RADIOACTIVITY RELEASE * ENVIRONMENT * *FORECAST * *POWER PLANT, FOSSIL FUEL * CONCENTRATION * POLLUTION * *MAN * N-POWER FORECAST * INSTRUMENTS, MISC.

062170

JACOBS DG * KELLY PJ * BARTON CJ * BOWMAN CA * BRIGGS GB * CULBRANSEN WR * BOWEN PS * STRUNNESS FG

THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. FINAL REPORT, PHASE I - IMPACT OF HYPOTHETICAL RELEASES OF CONTAMINATED GAS IN THE SAN JUAN BASIN

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL-4646 *. 41 PAGES, SEPTEMBER 1971

THE ONLY LONG-LIVED RADIONUCLIDES FOUND IN THE GASBUGGY GAS WERE KR-85, H-3, AND LOW CONCENTRATIONS OF C-14. THE TRITIUM, WHICH WILL BE PRESENT IN NATURAL GAS COMBUSTION PRODUCTS AS HTO, HAS THE GREATER RADIOLOGICAL IMPACT AND IS CONSIDERED IN MORE DETAIL. THE CONCENTRATION OF THESE SPECIES IN THE CAVITY GAS DECREASED AS GAS REMOVED FROM THE WELL WAS REPLACED BY UNCONTAMINATED FORMATION GAS. *** VARIOUS PATHWAYS BY WHICH INDIVIDUALS LIVING WITHIN THE SAN JUAN BASIN COULD HYPOTHETICALLY BE EXPOSED TO RADIOACTIVITY FROM CONTAMINATED GAS ARE CONSIDERED. AND POTENTIAL DOSES ARE CALCULATED. WE CONCLUDE THAT OF THOSE PATHWAYS CONSIDERED, THE CRITICAL EXPOSURE PATHWAY WOULD BE DOMESTIC CONSUMPTION OF GAS FOR COOKING, AND THE CRITICAL POPULATION GROUP WOULD BE COMPOSED OF HOUSEHOLDS IN THE BLANCO CAMP ADJACENT TO THE BLANCO PROCESS PLANT. CALCULATED DOSES ARE MUCH LOWER THAN DOSE LIMITS SET BY NATIONAL AND INTERNATIONAL AUTHORITIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON * BARYTES * *PLOWSHARE * POPULATION EXPOSURE * *CRITICAL NUCLIDE PATHWAY * DOSE CALCULATION, EXTERNAL * *SAFETY EVALUATION * *GAS * CONSUMER PRODUCT * CONCENTRATION

062229

BARTON CJ * JACOBS DG * KELLY PJ

QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL POPULATION EXPOSURES IN METROPOLITAN AREAS

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

ORNL-TM-3330 *. 22 PAGES, MARCH 8, 1971

NATURAL GAS FROM THE GASBUGGY WELL COULD HYPOTHETICALLY HAVE BEEN USED EITHER IN LOS ANGELES OR IN SAN FRANCISCO IF IT HAD BEEN PUT INTO EL PASO NATURAL GAS COMPANY'S DISTRIBUTION SYSTEM INSTEAD OF BEING FLARED. POPULATION WEIGHTED AVERAGE DOSE EQUIVALENTS TO THE WHOLE BODY, CALCULATED WITH THE ASSUMPTION THAT THE GAS CONTAINS 1.0 PCI/CM3 OF TRITIUM AT THE POINT OF USE, ARE 0.024 MILLIREM/YEAR FOR INHABITANTS OF THE LOS ANGELES BASIN AND 0.007 MILLIREM/YEAR FOR PEOPLE IN THE SAN FRANCISCO BAY AREA. THE RADIATION DOSES FOR MAXIMUM EXPOSURE CONDITIONS IN THE ATMOSPHERE WERE ESTIMATED TO BE 0.19 AND 0.024 MILLIREM/YEAR, RESPECTIVELY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSIMETRY * FOG * *PLOWSHARE * REGULATION * *ACCIDENT, HYPOTHETICAL * *POPULATION EXPOSURE * DOSE CALCULATION, EXTERNAL * *INCINERATION * RADIOACTIVITY RELEASE * METEOROLOGY * *GAS * *CONSUMER PRODUCT * PROTECTIVE ACTION GUIDE * CONCENTRATION

062380

GOODJOHN AJ * PORTESCUE P

ENVIRONMENTAL ASPECTS OF HIGH-TEMPERATURE GAS-COOLED REACTORS

GULF GENERAL ATOMIC, SAN DIEGO, CALIFORNIA

GA-10947 *. 18 PAGES, 5 FIGURES, 2 TABLES, APRIL 2, 1971

CONCLUSIONS - TECHNIQUES ARE AVAILABLE THAT CAN REDUCE THE GASEOUS AND LIQUID RADIOACTIVE EFFLUENT FROM A HTGR PLANT TO NEGLIGIBLE LEVELS. REDUCTIONS IN THE EFFECTS OF WASTE-HEAT DISCHARGE CAN BE ACCOMPLISHED BY USING DRY COOLING TOWERS TO REJECT THE HEAT TO THE ATMOSPHERE RATHER THAN TO ADJACENT BODIES OF WATER. STEAM PLANTS ARE PENALIZED BY USING DRY COOLING TOWERS (CYCLE EFFICIENCY, FUEL-CYCLE COST, AND LOSS IN CAPACITY DURING HOT WEATHER). THE CLOSED-CYCLE GAS-TURBINE IS IDEALLY SUITED TO AIR COOLING AND APPEARS TO OFFER A VERY PRACTICAL LONG-TERM SOLUTION TO MINIMIZING THE EFFECTS OF WASTE-HEAT REJECTION ON THE ENVIRONMENT.

AVAILABILITY - A.J. GOODJOHN, GULF GENERAL ATOMIC COMPANY, P.O. BOX 608, SAN DIEGO, CALIFORNIA

BARYTES * WASTE DISPOSAL, GAS * WASTE DISPOSAL, LIQUID * WASTE MANAGEMENT * *HELIUM * COOLANT PURIFICATION SYSTEM * *REACTOR, HTGR * *THERMAL POLLUTION * *COOLING TOWER

002990
WECKS JM • PROVICH RJ • PCORCH PJ
NUCLEAR STEAM SUPPLY WATER CHEMISTRY RESEARCH
BABCOCK AND WILCOX COMPANY, LYNCHBURG, VIRGINIA
22 PAGES, 7 FIGURES, 5 TABLES, 17 REFERENCES, PAPER PRESENTED AT THE AMERICAN POWER CONFERENCE, CHICAGO, ILLINOIS, APRIL 20-21, 1971

THE NUCLEAR STEAM SUPPLY SYSTEM SUPPLIED BY THE BABCOCK AND WILCOX COMPANY IS DESCRIBED FROM A WATER CHEMISTRY VIEWPOINT. A PORTION OF THE RESEARCH PROGRAMS USED TO ESTABLISH THE WATER CHEMISTRY REQUIREMENTS FOR THIS SYSTEM ARE DISCUSSED. REACTOR COOLANT CHEMISTRY RESEARCH INCLUDES THE CHOICE OF AN ADDITIVE, MATERIALS BEHAVIOR, WATER ANALYSIS, AND COOLANT PURIFICATION. WATER CHEMISTRY RESEARCH FOR THE CVSC INCLUDES THE REMOVAL OF DISSOLVED AND SUSPENDED SOLIDS, BEHAVIOR OF BORIC ACID, CONDENSATE POLISHING, AND CHEMICAL CLEANING. MAINTENANCE AND CLEANLINESS DURING FABRICATION AND ERECTION, AND WATER QUALITY DURING INITIAL FILL AND COMMISSIONING ARE EQUALLY AS IMPORTANT AS CONTROL OF THE WATER CHEMISTRY DURING NORMAL RESTART, OPERATION, SHUTDOWN, AND REFUELING.

CORROSION • IODINE • GROSS BETA • GROSS GAMMA • CORROSION • NUCLEAR CHEMISTRY • NICKEL • ION EXCHANGE • SYSTEM DESCRIPTION • ZIRCALOY • SURFACE FILM CRYSTAL • COOLANT PURIFICATION SYSTEM • FLUORIDE • ADDITIVE • SOLID • EFFECT, PP

003203
MILLS RG
POTENTIAL DISADVANTAGES OF FUSION POWER REACTORS
PRINCETON UNIVERSITY, NEW JERSEY
4 PAGES, 11 REFERENCES, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, 1961, PP. 10-13 (FEBRUARY 1972)

AUTHOR CITES NEW OPTIMISM OVER POSSIBILITIES OF SUCCESSFUL FUSION REACTOR. I.E., TOKAMAK. NEW MACHINES ARE NEEDED TO DEMONSTRATE ABSENCE OF TWO POTENTIAL ADVERSE EFFECTS ISSUES. PROPERTIES TYPES OF MACHINES AND NEED FOR PRECISION. ALTHOUGH BREEDING RATIO NEED BE ONLY 1.01 OR LESS, I.E., A DOUBLING TIME AS SHORT AS 3 YR. REGARDING WASTE PRODUCTS, WILL NOT INVENTORY OF TRITIUM OPEN ALLOGRAMS ARE NEUTRON PLUS DOSE HAZARD. TRITIUM CAN THAT ESCAPES POSES NO APPARENT ECOLOGICAL PROBLEM. ACTIVATION OF REACTOR COMPONENTS WORK BE MEDIUM, BUT CUT UP AFTER USE AND COULD BE ALLOWED TO DECAY. FUEL COSTS WOULD NOT BE SIGNIFICANT AND WOULD RESULT IN POWER AT FEW THOUSANDTHS OF MILLIMILL. EVEN IF COMPONENTS WOULD HAVE TO BE REPLACED FREQUENTLY, CAPITAL COSTS WOULD BE LOW BECAUSE OF SMALL SIZING WITH LOW TRANSMISSION COSTS. FUEL SOURCE DEUTERIUM AND LITHIUM UNIVERSALLY FOUND AVAILABLE TO ALL.

ECONOMICS • HAZARD, RELATIVE • SIZING, REACTOR • WASTE DISPOSAL • ELECTRIC POWER • ACCIDENT, HYPOTHETICAL • RADIOACTIVITY RELEASE • DEVELOPMENT • SIZING, URBAN • REACTOR, THERMONUCLEAR • WASTE HEAT • POWER TRANSMISSION • N-POWER, SAFETY OF • ASCENT/P-BLOSOPHICAL CONSIDERATION

003002
THE BLASCO
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
3 PAGES, CHEM REVIEW, 41(1), PG. 7-9 (SPRING 1971)

ARTICLE DESCRIBES A SMALL THERMONUCLEAR GENERATOR CONCEPT, ONE THAT WOULD DEVELOP POWER AS LOW AS 20 MW (EL. 50,000 HP). A GENERATOR OF THIS SIZE WOULD BE SUITABLE FOR USE ON SHIPS AND SPACECRAFT, AND CONCEIVABLY EVEN AS USED TO ELECTRIFY RAILROADS AND SUPPLY POWER FOR HIGH-ENERGY-CONTENT STORAGE BATTERIES FOR AUTOMOBILES. HISTORICALLY, PROCESS WAS CONSIDERED AS MEANS FOR IGNITING FUSION IN A LARGE THERMONUCLEAR REACTOR. PROCESS WOULD CONSIST OF LASER IGNITION OF A DEUTERIUM-TRITIUM PELLET IN CENTER OF A MOLTEN LITHIUM WHIRLPOOL. CONTAINMENT IS NOT PROBLEM, WALL THICKNESS OF 12 FT SPHERICAL VESSEL IS THEORETICALLY 30 IN. BY INTRODUCING FINE BUBBLES IN VOL. IT COULD BE REDUCED TO 3-6 IN. AT PRESENT TIME, KIND OF HIGH-POWER LASER NEEDED HAS NOT BEEN DEVELOPED, BUT WORK ON SUCH IS UNDERWAY.

AVAILABILITY • OAK RIDGE NATIONAL LABORATORY, BUILDING 45-C NORTH, OAK RIDGE, TENNESSEE

DEUTERIUM • PRESSURE VESSELS • ELECTRIC POWER • LITHIUM • LASER • DEVELOPMENT • R AND D PROGRAM • REACTOR, THERMONUCLEAR • INDUSTRY, TRANSPORTATION

003703
POSTMA H
ENGINEERING AND ENVIRONMENTAL ASPECTS OF FUSION POWER REACTORS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
8 PAGES, NUCLEAR NEWS, 14(4), PG. 57-62 (APRIL 1971)

AUTHOR EMPHASIZES PROBLEMS ASSOCIATED WITH MANUFACTURE OF FUSION REACTOR FROM ENGINEERING STANDPOINT. TITLES OF TABLES ARE GIVEN HERE, BECAUSE THEY ARE INDICATIVE OF EXTENT OF DIFFICULTY AND COMPLEXITY OF PROBLEMS OFFERING THE SCIENTIST IN DEVELOPING FUSION PROCESS, ALSO THE VERY COMPREHENSIVE CHARACTER OF THE REPORT--REACTIONS (FUEL CYCLES AND REACTION ENERGY), ASSUMPTIONS (FUEL, OPERATION, CYCLE, REACTOR TYPE, AND OPTIONAL PROCESSES), ENGINEERING ASPECTS (E.G., MAGNETIC FIELD, MATERIALS, FUEL RESOURCES, MAGNETIC FIELD, BREEDING, TRITIUM (E.G., INVENTORY, PRODUCTION AND BURNUP RATES), MATERIALS CONSIDERATIONS, RADIATION DAMAGE (TO MATERIALS), INVENTORIES OF PRINCIPAL VOLATILE ISOTOPES (CO, PB AND FUSION AT 2000 MWT), STORED ENERGY IN-SAFETY OF LMFBR VS LWRBR), AND FINALLY A FUSION-FISSION HYBRID CONCEPT (ETA-PSC VS MSC).

RADIATION DAMAGE • RELEASE RATE • RADIOACTIVITY RELEASE • DEVELOPMENT • LITHIUM • SYSTEM DESCRIPTION • SAFETY EVALUATION • REACTOR PHYSICS • SURVEY • REACTOR, THERMONUCLEAR • SYSTEM ANALYSIS • COOLING DEVICE • N-POWER, SAFETY OF

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[illegible]

[illegible] AD • [illegible] AD • [illegible] JR • [illegible] AS
NATURAL TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN (T17021)
RESEARCH INSTITUTE OF TEMPLE UNIVERSITY, PHILADELPHIA, PENNSYLVANIA • LAMONT GEOLOGICAL OBSERVATORY, COLUMBIA UNIVERSITY, PALISADES, NEW YORK
2 PAGES, 1 TABLE, 7 REFERENCES. PHYSICAL REVIEWS, VOL. 93, PP. 250-251 (1954)

CO [illegible]. BEFORE MAN ADVANCES TOO MANY DECADES INTO THE NUCLEAR AGE IT IS IMPORTANT ON MAN TO ESTABLISH A PRE-NUCLEAR BASELINE FOR FUTURE REFERENCE. NUCLEAR STIMULATION OF NATURAL GAS WELLS FOR EXAMPLE WILL INTRODUCE TRITIUM INTO INDUSTRIAL AND HOUSEHOLD GAS. GROSSE, SCIENCE 111, 1 (1950) FOUND NATURAL TRITIUM IN NORTHERN SURFACE WATERS BY ENRICHING THE NATURAL H3 CONTENT 1 TO 10 MILLION FOLD ELECTROLYTICALLY. FELTGES, Z NATURFORSCH 5A, 430 (1950) ASSUMED THAT THE MOLECULAR HYDROGEN IN AIR HAS A MUCH HIGHER COMPARE MUCH HIGHER COMPARE OF COSMIC-RAY TRITIUM THAN ATMOSPHERIC WATER. PRESENT ATTEMPTS EXAMINED TRITIUM CONTENT OF MOLECULAR HYDROGEN FROM GROUND-LEVEL AIR USING 25 CC OF WATER PRODUCED FROM ATMOSPHERIC HYDROGEN IN THE RE-HE FRACTION OF AIR AT BUFFALO, NY. CORRESPONDING TO 60 TO 70 MILLION LITERS OF AIR (LIQUID AIR PRODUCTS CO). SAMPLES ENRICHED ABOUT 7 TIMES ELECTROLYTICALLY GAVE AN AVERAGE T/H RATIO OF 10.600 X 10^-10 CORRECTED FOR DECAY. LIQUID FOUND TRITIUM CONTENT OF MOLECULAR HYDROGEN ABOUT 1000 TIMES GREATER THAN FOR WATER IN CONTACT WITH THE HYDROGEN. O'BRIEN, PHY REV 91, 922 (1953). CALCD TOTAL H3 FORMATION RATE TO BE 0.4 TO 0.9 H3 ATOMS/ATM OF EARTH SURFACE/SEC.

[illegible] • AIR • [illegible] EXPOSURE • RADIATION, PUBLIC EDUCATION • MONITOR, NUCLEAR METEOROLOGY • GAS • RADIONUCLIDE VOLUME • ANIMAL, VERTEBRATE • PICOGRAM • PHYSIOLOGY/PATHOLOGY • [illegible], BACKGROUND

[illegible]

A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS
CONF-700101 P. 10 PAGES. PROCEEDINGS OF THE 5TH ANNUAL HEALTH PHYSICS SOCIETY MIDYEAR SYMPOSIUM, VOLUME II, PG. 200-277, (MAY-JUNE 1970)

LABORATORY OPERATIONS AT BROOKHAVEN SINCE ITS ESTABLISHMENT IN 1947 HAVE INCLUDED THE ROUTINE RELEASE TO THE ENVIRONMENT OF GASEOUS, HALOGEN, AIR PARTICULATE, AND H-3 RADIOACTIVITY IN REACTOR AIR EFFLUENTS AND OF BETA-GAMMA EMITTERS AND H-3 IN LOW-LEVEL LIQUID WASTES IN AMOUNTS COMPARABLE TO CURRENT RELEASES FROM POWER REACTORS. PAST AND CURRENT SURVEILLANCE DATA AT BNL HAVE BEEN EVALUATED FOR SHORT- AND LONG-TERM CHANGES IN RADIATION LEVELS ATTRIBUTABLE TO THESE OPERATIONS. ON THE BASIS OF THESE DATA, IT IS CONCLUDED THAT FEW CHANGES IN BACKGROUND SHOULD BE APPARENT, EVEN AFTER LONG-TERM OPERATION OF NUCLEAR POWER REACTORS.

EFFLUENT • PARTICLE • BETA EMITTED • REACTOR, POWER • AIR • [illegible] • RADIOACTIVITY RELEASE • GAMMA EMITTED • GAS • LIQUID • OPERATING EXPERIENCE • DATA COLLECTION • RECOMPARISON • EXPOSURE, BACKGROUND

[illegible]

SMITH JP • GELBART DS
TRITIUM EXPERIENCE IN BOILING WATER REACTORS
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
2 PAGES. TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 14(1), PAGES 100-101 (1971)

DUE TO THE LOW TRITIUM CONCENTRATIONS IN A BWR, KNOWLEDGE OF THE RELATIVE CONTRIBUTIONS FROM THE VARIOUS SOURCES THAT APPEAR IN REACTOR WATER IS GAINED ONLY BY INFERENCE. AUDIT OF 1970 OPERATIONS AT OYSTER CREEK INDICATED ABOUT 22 CI OF TRITIUM IN LIQUID EFFLUENTS. BASED ON OPERATING HISTORY, THE SOURCES ARE ESTIMATED TO BE 4 CI FROM DEUTERIUM IN REACTOR WATER, 6000 CI IN FUEL FROM FISSION, AND 2000 CI IN CONTROL MATERIAL, DURING THE YEAR. BY INFERENCE, IT APPEARS THAT ONLY A FEW TENTHS OF ONE PERCENT OF THE COMBINED FISSION AND CONTROL MATERIAL SOURCE IS TRANSFERRING TO REACTOR WATER. THIS EXPERIENCE INDICATES THAT OPERATION OF LARGE BOILING WATER REACTORS WILL CONTINUE TO PRODUCE INSIGNIFICANT RADIATION EXPOSURES FROM TRITIUM, BOTH ON PLANT AND IN THE ENVIRONS.

AVAILABILITY - JAMES P. SMITH, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

REACTOR, BWR • PRODUCTION

[illegible]

COHEN P
RADIOACTIVITY AND ITS FRACTIONATION DURING UNDERGROUND SHOTS IN A GRANITE MEDIUM
COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS, FRANCE
SPI/PUB-275 • CONF-700305 P. 11 PAGES, PP. 211-220 OF THE PROCEEDINGS OF A PANEL ON THE PEACEFUL USES OF NUCLEAR EXPLOSIONS HELD IN VIENNA, MARCH 2-6, 1970

RESULTS ARE PRESENTED ON SAMPLES OBTAINED FROM UNDERGROUND SHOTS IN THE SAHARA. SAMPLING METHODS FOR GASES AND SOLIDS ARE DESCRIBED. THE EVOLUTION OF THE RADIOACTIVE COMPOSITION OF THE GASES AS A FUNCTION OF SAMPLING TIMES AND SITES IS DISCUSSED (TRITIUM, AR-37, FISSION GASES). CERTAIN ACTIVATION PRODUCTS HAVE BEEN DETERMINED (TRITIUM, CA-45, AR-37). THE HOMOGENEITY OF FISSION PRODUCTS AND FISSIONABLE MATERIALS IN VITRIFIED SAMPLES HAS BEEN CONFIRMED IN GRANITE, THE VITRIFIED MASS OF WHICH IS 1500 T/KT.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

CALCIUM • FISSION GAS RELEASE • [illegible] • ACTIVATION PRODUCT • ARGON • SAMPLING • NUCLEAR DETONATION • ISOTOPIC FRACTIONATION • EXCAVATION, NUCLEAR • GAS • SOLID

[illegible]
THERMONUCLEAR DIVISION, ANNUAL PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1970
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-[illegible] [illegible] PAGES, FIGURES, TABLES, REFERENCES, AUGUST, 1971

EXTENSIVE PROGRESS REPORT. SAFETY-RELATED ITEMS - [illegible] [illegible] RADIOACTIVITY, TRITIUM, RADIATION DAMAGE, TRITIUM [illegible] AND [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

RADIATION DAMAGE - RADIOACTIVITY RELEASE - RADIONUCLIDE, [illegible] - [illegible], THERMONUCLEAR

[illegible]
[illegible]
BIOLOGICAL CONSIDERATIONS OF NONNUCLEAR INCIDENTS INVOLVING NUCLEAR WARHEADS
CALIFORNIA UNIVERSITY, LIVERMORE, LAWRENCE RADIATION LABORATORY
UCRL-[illegible] [illegible] PAGES, APRIL 1969

MATERIALS FREQUENTLY USED IN NUCLEAR WARHEADS ARE RECOGNIZED TO BE TOXIC. IN THE EVENT OF A NONNUCLEAR INCIDENT INVOLVING A WARHEAD, SOME OF THESE MATERIALS MAY BE [illegible]. PERTINENT PHYSICAL, CHEMICAL, AND BIOLOGICAL PROPERTIES OF THESE MATERIALS ARE PRESENTED. PREDICTION OF EXPOSURE AND CONTAMINATION LEVELS AND EVALUATION OF BIOLOGICAL CONSEQUENCES OF SUCH AN INCIDENT ARE SUMMARIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

[illegible] - [illegible] - [illegible] - [illegible] - [illegible] - HAZARD, [illegible] - [illegible] - ACCIDENT, HYPOTHETICAL - [illegible], NONNUCLEAR - [illegible] - MILITARY CONSIDERATION - ABSORPTION - BIOCHEMICAL - [illegible] - RADIATION EFFECT - [illegible] - [illegible] - [illegible] - SKIN - [illegible] - BIOLOGICAL CONTROL

[illegible]
WRIGHT [illegible]
[illegible] RADIATION FROM PRESSURIZED WATER REACTORS
6 PAGES, J. INST. NUCL. ENG., 12, PAGE [illegible], [illegible]-FEB, 1971)

RADIATION EFFECTS FROM IN A REGION CONTAINING NUCLEAR PLANTS ON [illegible] CENTER TO CENTER LOCATIONS ARE STILL QUITE NEGLIGIBLE. INFORMATION ON THE RADIONUCLIDE RELEASE IN LIQUID AND GASEOUS EFFLUENTS SHOULD BE COLLECTED TO ASSESS THE FUTURE ENVIRONMENTAL RADIONUCLIDE DISTRIBUTION. ALTHOUGH THERE IS NO SHORT RANGE PROBLEM FROM BUILD-UP IN THE BIOSPHERE, THE MANAGEMENT OF [illegible] AND TRITIUM SHOULD BE [illegible] WITHIN THE NEXT TWO DECADES.

[illegible] - REACTOR, [illegible] - RADIATION IN PERSPECTIVE - WASTE DISPOSAL, ATMOSPHERIC - [illegible] - WASTE DISPOSAL, RIVER - RADIONUCLIDE UPTAKE - [illegible] FORECAST

[illegible]
GOLL [illegible]
PROGRESS IN CONTROLLED THERMONUCLEAR RESEARCH
US ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
A/CONF.[illegible] [illegible] 17 PAGES, 10 FIGURES, [illegible] REFERENCES, 3 TABLES, PAPER PRESENTED AT THE FOURTH UNITED NATIONS INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, PP. 1-17, SEPT. [illegible], 1971

THE OBJECTIVE OF CONTROLLED THERMONUCLEAR RESEARCH IS TO PROVIDE A NEW AND DIFFERENT KIND OF ENERGY SOURCE. THE REQUIREMENTS FOR ACHIEVING USEFUL POWER FROM CONTROLLED THERMONUCLEAR REACTIONS ARE [illegible] TO HEAT A DILUTE GAS OF FUSION FUEL TO TEMPERATURES OF HUNDREDS OF MILLIONS OF DEGREES WHILE IT IS IN THE PLASMA STATE, [illegible] TO CONTAIN IT FREE FROM ANY CONTACT WITH MATERIAL WALLS OR FROM CONTAMINATION BY IMPURITIES LONG ENOUGH FOR A SIGNIFICANT FRACTION OF THE FUEL TO REACT, AND FINALLY [illegible] TO EXTRACT THE ENERGY RELEASED AND CONVERT IT TO A USEFUL FORM. PROGRESS TOWARD THIS APPLIED GOAL HAS BEEN CRITICALLY DEPENDENT UPON OUR KNOWLEDGE OF THE BEHAVIOR OF HIGH TEMPERATURE PLASMAS, TOGETHER WITH THE MEANS OF HEATING AND CONFINING THEM. DURING THE PAST FEW YEARS WE HAVE BEGUN TO REAP THE REWARDS OF INVESTMENTS IN FUNDAMENTAL STUDIES, AND PROGRESS ON [illegible] AND [illegible] HAS BEEN SUBSTANTIAL. THIS PAPER DESCRIBES THE RECENT PROGRESS IN THE UNITED STATES CONTROLLED THERMONUCLEAR RESEARCH PROGRAM.

AIRBORNE RELEASE - HAZARDS ANALYSIS - RADIATION SAFETY AND CONTROL - [illegible] - SYSTEM DESCRIPTION - [illegible] AND D PROGRAM - [illegible] - REACTOR, THERMONUCLEAR - RADIATION EFFECT

[illegible]
GRIMES [illegible] - [illegible] - WATSON [illegible]
REACTOR CHEMISTRY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING MAY 31, 1971
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-[illegible] [illegible] PAGES, AUGUST 1971

DEALS WITH MOLTEN SALT CHEMISTRY, CHEMICAL BEHAVIOR OF MOLTEN SALT REACTOR EXPERIMENT, MOLTEN SALT BREEDER STUDIES, SPECIAL STUDIES, AQUEOUS STUDIES, CHEMICAL SUPPORT FOR HIGH TEMPERATURE GAS-COOLED REACTORS, NUCLEAR SAFETY, SALT MINE REPOSITORY, SPECIAL RESEARCHES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

[illegible]
[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
[illegible] OF [illegible] [illegible] [illegible] WITH NUCLEAR EXPLOSIONS
[illegible] NATIONAL LABORATORY, TENNESSEE
[illegible] p., 99 PAGES, 70 FIGURES, 8 TABLES, 13 REFERENCES, SEPTEMBER 1971

[illegible] OF LABORATORY TESTS SIMULATING THE PROCESSING OF COPPER ORE WITH FRAGMENTS WITH NUCLEAR EXPLOSIVES PROGRAM THAT ONLY WITH SMALL FRACTIONS OF THE RADIOACTIVE FISSION PRODUCTS AND NEUTRON ACTIVATION PRODUCTS WILL BE DISSOLVED IN LEACHING WITH SULFURIC ACID. THEIRS GAS TRAPPED WITHIN WILL BE, BY DAD, THE COMPANY ACCOMPLISHED IN THE CONCENTRATING LEACH STAGE, ASSUMING USE OF A FUSION SOURCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible] JR.
[illegible] FOR CONTROLLED FUSION POWER
[illegible] OF CALIFORNIA, LOS ALAMOS SCIENTIFIC LABORATORY
P PAPER, NUCLEAR PROCEEDING INTERNATIONAL, [illegible], PP. [illegible] [illegible] 1971

[illegible] SURVEY OF PROSPECTS. DESCRIBES THE SEVERAL APPROACHES, PRESENTS [illegible] AND [illegible] OF EACH. POINTS OUT CLOSE CONNECTION BETWEEN FUSION-PRODUCED POWER AND THE HELIUM SUPPLY FOR COOLING SUPERCONDUCTING [illegible] USED IN MAGNETS COILS. BY ASSUMING A REASONABLE NUMBER OF FUSION POWER REACTORS BY YEAR 2000, THE REACTORS WILL PRODUCE A HELIUM SHORTAGE TO 7.6 B BILLION CUBIC FEET. THE U.S. RESERVE IS ONLY 1.3 B BILLION CUBIC FEET. SAYS THAT THE AMOUNT OF HELIUM PRODUCED IN THE FUSION REACTORS IS NEGLIGIBLE. WOULD LIKE PRESENT CONSUMPTION TO HELIUM TO BE REDUCED THROUGH HIGHER PRICE, AND WOULD PROPOSE A [illegible] TAX ON RELEASE OF HELIUM INTO THE ATMOSPHERE AFTER USE. HELIUM SEEMS TO BE THE KEY TO [illegible] USE OF THERMONUCLEAR FUSION ONCE THE PROCESS BECOMES TECHNOLOGICALLY SOUND.

EXPLOSIONS • FIRE • HELIUM • RADIOACTIVITY, [illegible] • SAFETY EVALUATION • [illegible] • [illegible], THERMONUCLEAR

[illegible]
[illegible] TO
NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL DEVELOPMENT
SCRIPPS INSTITUTION OF OCEANOGRAPHY, LA JOLLA, CALIFORNIA
[illegible] p., 10 PAGES, MARCH 15, 1971

GIVES AN EXAMPLE OF THE LEVITOC [illegible] SCHEMATIC [illegible] INFORMATION THAT HAS BEEN PRESENTED TO A [illegible]-QUALITY-CONTROL GROUP BY A TYPICAL [illegible]-[illegible] PLANT COMPANY. PRESENT REGULATIONS MAKE IT NECESSARY ONLY TO REMOTE CONCERN THE ACTIVITY DISCHARGED--SUFFICIENT TO AVOID PRESENTING STANDARDS. MORE APPROPRIATE FOR DESCRIBING ENVIRONMENTAL DAMAGE. A BETTER INSPECTION SHOWS THAT AT LEAST ONE NUCLIDE HAS ACCUMULATED IN AT LEAST TWO SPECIES. A SIMPLE CALCULATION SUGGESTS THAT THE MUCH LARGER AMOUNTS OF TRITIUM COMING FROM THAT PLANT PROBABLY HAS ALREADY ALTERED LOCAL AREAS OF THE COASTAL OCEAN MEASURABLY. IN FACT, THIS [illegible] THE [illegible] OF LEAPING TO INDICATE HOW THE OCEAN DISPOSES OF OTHER COASTAL POLLUTANTS. THESE ACTIVITIES CERTAINLY MUST NOW BE TAKEN INTO CONSIDERATION AS BACKGROUNDS--BY SCIENTISTS AT LEAST.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] AND STANDARDS • [illegible] • REACTOR, [illegible] • WASTE DISPOSAL, OCEAN • [illegible] I [illegible] • [illegible], ENVIRONMENTAL • [illegible], [illegible] • REACTOR POWER • [illegible] • [illegible] • [illegible] PROGRAM • REGULATION, FEDERAL • CONCENTRATION • OCEAN, PACIFIC

[illegible]
[illegible] AD • [illegible] DJ
CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIVES (CHAE) - PROGRESS REPORT FOR APRIL 1 TO JUNE 30, 1971
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
[illegible] p., 16 PAGES, 2 REFERENCES, 2 FIGURES, 2 TABLES, SEPTEMBER 1971

TESTS SIMULATING THE STORAGE OF NATURAL GAS IN A CAVITY FORMED WITH NUCLEAR EXPLOSIVES SHOWED ESSENTIALLY NO TRITIATED OF METHANE WHEN STORED IN CONTACT WITH ROCK SALT OR LEACHED SALT THAT HAVE CONTAMINATED WITH TRITIATED WATER. THE GAS HAS SLIGHTLY CONTAMINATED WITH TRITIATED WATER VAPOR. MORE THAN ONE OF THE TRITIATED WATER HAS REMOVED FROM SALT OR LEACHED SALT SAMPLE SUPPLIES OFFERS GAS STORAGE BY FLOODING THE STORAGE VESSEL WITH WATER AND LESS EFFICIENTLY BY PUMPING THE SYSTEM WITH AIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • TESTING • NUCLEAR EXPLOSION • CONTAMINATION • [illegible] CONTAINER • SIMULATION • GAS • [illegible] PRODUCT • BENEFICIAL USE, COMMERCIAL

[illegible]
[illegible]
[illegible] OF [illegible] EXPLOSIVES [illegible] WATER [illegible] DEVELOPMENT IN [illegible] PROGRAMS
[illegible], CALIFORNIA
[illegible] P., [illegible] PAGES, [illegible] 1971

[illegible] IS STUDIED IN RELATION TO THE [illegible] OF [illegible] PROCESSING. [illegible] LOW TO HIGH [illegible] SALINITY, AND LARGE [illegible] LOADS. [illegible] AND ARE [illegible] THAT THE CONSTRUCTION SITE IS LOCATED IN A [illegible] AREA. [illegible] MUST BE [illegible] BY SEVERAL CYCLES OF RECORDING AND [illegible] OF THE [illegible]. [illegible] WITH A STORAGE CAPACITY [illegible] THAN [illegible] ACRE-FT CAN DELIVER WATER AT A RATE LESS THAN [illegible]. WHICH IS THE [illegible] LIMIT OF PRICES TO IRRIGATION WATER. A [illegible] ACRE-FT RESERVOIR CAN DELIVER WATER AT A COST OF [illegible].

DESALINATION • SOURCE WATER, NUCLEAR [illegible] • NUCLEAR DESALINATION • [illegible], PRODUCTION • [illegible] • DISCHARGE OF WASTE • ECOSYSTEM, DESERT • [illegible] USE

[illegible]
[illegible] • [illegible] • [illegible] SD
[illegible] REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES • HYPOTHETICAL EXPLOSIVES IN [illegible] GAS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-3601 P., 34 PAGES, 7 FIGURES, 11 TABLES, 26 REFERENCES, OCTOBER 1971

[illegible] THAT [illegible] AIRDROP IN A [illegible] A SMALL CALIFORNIA COMMUNITIES WOULD HYPOTHETICALLY RECEIVE FROM USE OF A [illegible] GAS WERE CALCULATED. PRODUCTION TESTING OF THE WELL WAS RESULTED IN [illegible] OF THE TRITIUM THAT WAS ESSENTIALLY TRAPPED IN THE CAVITY. THE MAXIMUM DOSE IN THE [illegible] SYSTEM, WHICH [illegible] LITTLE [illegible] DILUTION OF [illegible] GAS, IS TO [illegible]. IRRADIATION AND SKIN ABSORPTION OF TRITIUM DISPERSED IN THE ATMOSPHERE GAVE WHOLE BODY DOSES ESTIMATED AT [illegible] LESS THAN 1 MILLI-[illegible]. WHOLE-BODY DOSES FROM [illegible] IN [illegible] GAS ARE ESTIMATED AT [illegible] OF THE TRITIUM DOSES.

AVAILABILITY • NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS • [illegible] • [illegible] • [illegible] • MONITOR, GAS • OPERATION SAFETY AND CONTROL • [illegible] • [illegible] • [illegible] • ABSORPTION • [illegible] • BENEFICIAL USE, COMMERCIAL

[illegible]
REPORT ON RELEASE OF RADIOACTIVITY FROM [illegible] REACTORS AND EFFLUENTS DURING 1970
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE, WASHINGTON, D.C.
9 PAGES, 4 TABLES, OCTOBER 1971

TABULATES RADIOACTIVITY RELEASED IN LIQUID AND GASEOUS EFFLUENTS FROM NUCLEAR POWER PLANTS DURING 1970. [illegible] WITH CAPACITY FACTORS OF LESS THAN 10% PER 1970 WERE INCLUDED. REVIEWS OF SAMPLING AND ANALYTICAL METHODS USED AT SOME FACILITIES WERE INAPPROPRIATE TO MEASURE TOTAL ACTIVITY. [illegible] SOME DATA ARE DIFFERENT FROM THOSE REPORTED BY THE FACILITIES. RADIOACTIVITY IN GAS FOR RELEASES WAS GENERALLY LOW IN COMPARISON WITH PERMISSIBLE LIMITS.

AVAILABILITY • SUP. PUBLIC DOCUMENT O. P. 1717 • STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

REACTOR, PWR • FISSION GAS RELEASE • FISSION PRODUCT RELEASE • REACTOR, PWR • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • RADIOACTIVITY RELEASE • REACTOR, HTGR

[illegible]
TAYLOR [illegible] • [illegible] [illegible]
[illegible] TRANSFER IN [illegible]
WESTINGHOUSE ADVANCED REACTORS DIVISION, PENNSYLVANIA
2 PAGES, 1 FIGURE, 1 TABLE, 3 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 15(1), PP. 438-439 JUNE 1972

PARAMETRIC ANALYSIS SHOWS TRITIUM RELEASE TO THE STEAM GENERATOR AT STEADY STATE VERSUS PRIMARY AND SECONDARY [illegible] RATES FOR A [illegible] UNIT. A FAULT SHOWS THE EFFECT OF [illegible] TRITIUM RELEASES AT THE SITE BOUNDARY, AS A [illegible], AND RELEASE FROM A 3.0- AND 100-MWEE UNITS PLANT. THE NRC GUIDELINE FOR ALLOWABLE INTEGRATED DOSE AT THE SITE BOUNDARY FOR GASES FOR [illegible] IS [illegible], WHICH IS [illegible] OF [illegible]. IT CAN BE SEEN FROM TABLE 1 THAT COLD TRAPPING IN THE [illegible]-MWEE PLANT WILL ADEQUATELY CONTROL TRITIUM TO AN ORDER OF MAGNITUDE LESS THAN THIS. FURTHER [illegible] MAY BE NECESSARY FOR TRITIUM CONTROL IN THE 1000-MWEE PLANT.

AVAILABILITY • C. A. TAYLOR, WESTINGHOUSE ELECTRIC CORPORATION, ADVANCED REACTORS DIVISION, BOX 158, MADISON, PENNSYLVANIA 15649

STEAM GENERATOR • REACTOR, [illegible]

[illegible]
[illegible] RG
POTENTIAL [illegible] OF FUSION POWER [illegible]

[illegible]
[illegible] UNIVERSITY, [illegible]
CONF-[illegible] p. 1 PAGES, FROM THE NUCLEAR SCIENCE SYMPOSIUM, SAN FRANCISCO, CALIFORNIA, NOVEMBER 3, 1971

CONCERNED NOT WITH THE DETAILS OF AND PARTICULAR MATHEMATICAL MODEL BUT RATHER WITH THE PHYSICAL ADVANTAGES OF A RESULTING SYSTEM. SHOWS A TYPICAL CROSS SECTION THAT MIGHT APPLY TO A VARIETY OF DEVICES. THE FUSED VACUUM CHAMBER CONTAINS A LOW DENSITY GASEOUS DT FUSION PLASMA OF VERY TEMPERATURE POSSIBLE FUEL. BETWEEN THE VACUUM WALL AND THE CONFINING FIELD COILS IS A BLANKET/SHIELD THAT MUST ABSORB MOSTLY OF TRITIUM IS CONSUMED IN THE REACTION, CARRIED THE ENERGY CARRIED BY THE NEUTRONS TO HEAT, AND SHIELD THE SUPERCONDUCTING COILS FROM NEUTRON AND GAMMA RAY DAMAGE. THE HEAT GENERATED MUST BE USED IN A HEAT ENGINE TO GENERATE ELECTRICITY. SUCH A SYSTEM WOULD HAVE A NUMBER OF ENVIRONMENTAL AND ECONOMIC ADVANTAGES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • HEAT SINK • HAZARDS ANALYSIS • WASTE MANAGEMENT • RELIABILITY, SYSTEM • [illegible] • [illegible], THERMONUCLEAR • COST, CAPITAL

[illegible]
[illegible] W
NUCLEAR POWER PLANT EMISSIONS
9 PAGES, [illegible], VE . [illegible] 143-7 [illegible] GER GERMANY

THE BASIS FOR, AND DEVELOPMENT OF STATUTORY LIMITATIONS FOR THE RELEASE OF RADIOACTIVE EMISSIONS FROM NUCLEAR POWER PLANTS ARE DISCUSSED. THE METHOD EMPLOYED VARIES FROM SITE TERRAIN CONDITIONS AND RADIAL DISTANCES ARE GIVEN. METHOD EMISSION IS USED TO ILLUSTRATE THE NEED FOR TAKING EMITTED RADIOACTIVE SUBSTANCES SO THAT POSSIBLE BIOLOGICAL ACCUMULATION CAN BE RECOGNIZED. (EN GERMAN)

[illegible], POWER • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • RADIOACTIVITY RELEASE

[illegible]
[illegible] JR • [illegible] GR
SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES ON THE ENVIRONMENT
LAWRENCE [illegible] LABORATORY, LIVERMORE
UCRL-[illegible] • CONF-[illegible]-14 p. 22 PAGES. FROM THE TRITIUM SYMPOSIUM LAS VEGAS, NEVADA, AUGUST 10, 1971

IN ACCORDANCE WITH CURRENT GUIDANCE, TRITIUM RELEASES MUST BE KEPT BELOW QUANTITIES WHERE MPC LEVELS ARE EXCEEDED, AND SHOULD BE KEPT AS LOW AS PRACTICABLE. DETERMINATION OF PRACTICABILITY REQUIRES AN ANALYSIS OF BENEFIT VERSUS RISK CONSIDERATIONS. SUCH AN ANALYSIS HAS BEEN PERFORMED FOR CERTAIN GENERAL CASES. IT IS BASED ON A NET VALUE OF $250 AS NET IS THE AMOUNT OF BENEFIT REQUIRED TO JUSTIFY A RADIATION EXPOSURE OF ONE MAN-REM AND CONSIDERS THE VARIOUS OF TRITIUM DISTRIBUTION IN THE BIOSPHERE AS WELL AS CERTAIN DEMOGRAPHIC FACTORS. IT ALSO ASSUMES THAT CONSTRAINTS IMPOSED BY EXPOSURE GROUPS ARE OBSERVED. THE ASSUMPTIONS AND CALCULATIONS ARE REVIEWED IN DETAIL. THE POSSIBLE SOCIAL AND MORAL IMPLICATIONS OF SUCH AN ANALYSIS ARE ALSO DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MPC • RADIATION IN PERSPECTIVE • RADIOACTIVITY RELEASE • ENVIRONMENT • RADIATION EXPOSURE • BENEFIT VS RISK • SOCIOPSYCHOLOGICAL CONSIDERATIONS

[illegible]
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE
EUROPEAN NUCLEAR ENERGY AGENCY, FRANCE
[illegible] PAGES. PARIS. EUROPEAN NUCLEAR ENERGY AGENCY, 1971

THE PRINCIPLES AND PRACTICES APPLIED TO RADIOACTIVE WASTE MANAGEMENT IN WESTERN EUROPE ARE REVIEWED. THE ORIGIN AND DISPOSAL TYPES OF RADIOACTIVE WASTES ARE DISCUSSED, AND DATA ON THE PRODUCTION OF GASEOUS, LIQUID, AND SOLID RADIOACTIVE WASTES IN WESTERN EUROPE DURING 1970 ARE PRESENTED. THE GENERAL SAFETY, TECHNICAL, AND ECONOMIC ASPECTS OF WASTE MANAGEMENT ARE REVIEWED. SPECIFIC TREATMENT AND STORAGE PRACTICES AT VARIOUS EUROPEAN NUCLEAR FACILITIES AND THE OUTSTANDING WASTE MANAGEMENT PROBLEMS, NAMELY SAFE PERMANENT STORAGE OF HIGH-LEVEL LIQUID WASTES AND THE CONTROL OF GAS AND TRITIUM RELEASES TO THE ENVIRONMENT, ARE DISCUSSED.

[illegible] • SAFETY REVIEW • WASTE DISPOSAL • WASTE STORAGE • WASTE DISPOSAL, EQUIPMENT • WASTE MANAGEMENT • RADIATION SAFETY AND CONTROL • GAS • LIQUID • SOLID • PRODUCTION

[illegible]
[illegible] W
ESTIMATION OF TRITIUM DISCHARGES FROM LOW-STREAMS
EUROPEAN COMPANY FOR CHEMICAL PROCESSING OF IRRADIATED FUEL, MOL, BELGIUM
[illegible]-TP-207 • NP-10797 p. 17 PAGES. [illegible] 1970

THE TRITIUM TRANSFERRED AS [illegible] TO THE [illegible] WASTE TREATMENT STATION AND DISCHARGED TO THE [illegible] DURING THE PERIOD JANUARY 1969 - JULY 1970 WAS COMPARED WITH THE CALCULATED AMOUNT OF [illegible] PRODUCED BY FISSION. THE DISCHARGES ARE DETAILED AND ONE OF THE CALCULATED QUANTITIES. IF SOURCES OF [illegible] PRODUCTION OTHER THAN FISSION ARE NEGLECTED AND A PRODUCTION RATE OF 14 NEUTRONS PER FISSION OF U-235 AND 22 NEUTRONS PER FISSION OF PU-239 IS ASSUMED. THE TIME DELAY BETWEEN

672781 [illegible]
[illegible] IN THE RIVER DOES NOT EXCEED 2 [illegible].

FUEL [illegible] • [illegible] • WASTE TREATMENT, [illegible] • [illegible] REPROCESSING

672949
[illegible]
TRITIUM IN MOLTEN-SALT REACTORS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
[illegible] PAGES, [illegible] TECHNOLOGY, [illegible], PP. [illegible] 1971-1972

MOLTEN-SALT [illegible] REACTORS ARE EXPECTED TO GENERATE TRITIUM AT A RATE OF ABOUT [illegible]. [illegible] WITH LITHIUM, AN ESSENTIAL [illegible] OF A [illegible] FUEL SALT, ARE THE MAJOR [illegible] OF THE TRITIUM. AT [illegible], THE OPERATING TEMPERATURE RANGE OF MOLTEN-SALT REACTORS, TRITIUM [illegible] THROUGH THE METAL WALLS OF THE REACTOR EQUIPMENT AND PIPING INTO THE [illegible]. MEASUREMENTS OF THE TRITIUM DISTRIBUTION IN THE MOLTEN-SALT REACTOR EXPERIMENT [illegible] INDICATED THAT ABOUT [illegible] OF THE TRITIUM ESCAPED FROM THE REACTOR SYSTEMS IN THIS WAY. [illegible] IN PLANT DESIGN, OR IN OPERATING CONDITIONS, HAVE THE POTENTIAL FOR [illegible] THE TRITIUM TO THE REACTOR SYSTEMS AND CONTAINMENT CELLS. RESEARCH IS IN PROGRESS TO PROVIDE THE [illegible] NECESSARY TO DESIGN A PLANT FOR SUITABLE CONTAINMENT AND DISPOSAL OF THE TRITIUM.

FUEL [illegible] • [illegible], MOLTEN SALT • [illegible] • MOLTEN FUEL • [illegible]

672509
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE
EUROPEAN NUCLEAR ENERGY AGENCY
[illegible] PAGES, [illegible] FIGURES, [illegible] TABLES, SEPTEMBER 1972

A [illegible] REVIEW OF PRACTICES APPLIED TO MANAGEMENT OF RADIOACTIVE WASTES IN WESTERN EUROPE. [illegible] THE [illegible] OF THE PROBLEM IS INDICATED BY [illegible] SAFETY FOR THE PERSONNEL AND THE ENVIRONMENT. [illegible] PUBLIC HEALTH AUTHORITIES AND [illegible], IN THE PUBLIC INTEREST, RADIOACTIVE WASTE [illegible]. THE [illegible] WASTE-MANAGEMENT PRACTICES ARE DESCRIBED AND [illegible] TO MAINTAIN THE HIGH STANDARDS OF ENVIRONMENTAL AND PUBLIC PROTECTION.

AVAILABILITY - EUROPEAN NUCLEAR ENERGY AGENCY

ADMINISTRATIVE [illegible] • [illegible] • ELEMENTS AND ISOTOPES • [illegible] • OPERATION • [illegible] DISPOSAL • WASTE STORAGE • WASTE TREATMENT • [illegible] • REACTOR, POWER • WASTE MANAGEMENT • [illegible] • [illegible] • [illegible] REPROCESSING

672901
[illegible]
ENVIRONMENTAL [illegible] OF TRITIUM
[illegible]
[illegible] PAGES, [illegible] FIGURES, [illegible] REFERENCES, FEBRUARY 1972

[illegible] PRESENT KNOWLEDGE WITH RESPECT TO THE TRITIUM BURDEN ON THE ENVIRONMENT. FOLLOWING A [illegible] OF THE MOST IMPORTANT CHARACTERISTICS THE THEORETICAL RELATIONSHIP BETWEEN TRITIUM [illegible] AND RADIATION [illegible] IS DEALT WITH. SOURCES OF ENVIRONMENTAL TRITIUM CONTAMINATION ARE THE TRITIUM PRODUCED BY NATURE AND IN NUCLEAR FISSION REACTORS, THE USE OF TRITIUM-CONTAINING [illegible], AND, ABOVE ALL, THE NUCLEAR WEAPON TESTS. THE TRITIUM RELEASED UNDERGOES A [illegible] OF THE CIRCULATING WATER. THE RADIATION BURDEN DUE TO THIS TRITIUM [illegible] AND [illegible] OF CONCENTRATION MEASUREMENTS AMOUNTS PRESENTLY TO [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

[illegible] • FISSION PRODUCT RELEASE • MEASUREMENT • [illegible] • [illegible], WEAPONS • FISSION PRODUCT [illegible] • REACTOR, [illegible] • [illegible] • [illegible] • [illegible] EVALUATION • CONCENTRATION

672929
[illegible]
SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS
[illegible], CALIFORNIA
[illegible] PAPER PRESENTED AT THE INTERNATIONAL MEETING ON THE TECHNOLOGY OF [illegible] AND THE ENGINEERING ASPECTS OF FUSION REACTORS, HELD IN AUSTIN, TEXAS ON NOVEMBER 20, 1972

A NUMBER OF PROBLEMS ASSOCIATED WITH THE USE OF TRITIUM IN FUSION REACTORS ARE [illegible] CONSIDERED. [illegible] ATTEMPTS AT DIRECT CONVERSION OF PLASMA ENERGY TO ELECTRICITY, WHILE OTHERS ARE OF GENERAL CONCERN. [illegible] OF THESE ARE CONSIDERED FROM THE POINT OF VIEW OF ONE WHO HAS WORKED WITH TRITIUM FOR SEVERAL YEARS. SPECIFIC AREAS [illegible] MASS TRANSFER OF TRITIUM IN LIQUID LITHIUM, ISOTOPIC [illegible], PRELIMINARY CALCULATIONS ON [illegible], ISOTOPIC [illegible], AND SOME THOUGHTS ON [illegible].

AVAILABILITY - [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

070000 *CONTINUED*

DURING A CORE CYCLE IS CALCULATED FOR THE BASE OF BASE LOAD OPERATION ASSUMING SEPARABILITY OF THE NEUTRON FLUX INTO SPACE, ENERGY, AND TIME MODES AS WELL AS A LINEAR DECREASE OF THE BORIC ACID CONCENTRATION IN COMPENSATION FOR BURNUP EFFECTS. SUBSEQUENTLY, ANALYTIC SOLUTIONS TO THIS PROBLEM ARE OBTAINED FOR SQUARE-WAVE LOAD-FOLLOWING ASSUMING BOTH TOTAL AND ONE PARTICULAR MODE OF PARTIAL COMPENSATION OF THE REACTIVITY TRANSIENTS DUE TO XENON POISONING BY BORIC ACID.

REACTOR, PWR • MATHEMATICAL TREATMENT • FUEL MANAGEMENT • PRODUCTION

070130
UNGERER WE • BREN MA
POWER FROM NUCLEAR FUSION — PROBLEMS AND PROMISES
UNIVERSITY OF TEXAS, AUSTIN • TEXAS ATOMIC ENERGY RESEARCH FOUNDATION, FT. WORTH

A VERY COMPREHENSIVE, UNDERSTANDABLE DISCUSSION OF THE MACHINES, REACTIONS, AND SCIENTIFIC PROBLEMS ASSOCIATED WITH DEVELOPMENT OF A THERMONUCLEAR REACTOR. DISCUSSED ALSO ARE POTENTIAL MATERIALS PROBLEMS; SINCE PETROLOGICAL MATERIALS WOULD BE SIMILAR TO THOSE NOW BEING INCORPORATED INTO LMFBRS, THIS LATTER TECHNOLOGY WILL PROVIDE NECESSARY DATA WHEN THERMONUCLEAR PLANTS BECOME A REALITY. TRITIUM PROBLEM IS ASSESSED, E.G., DOSE TO HUMANS FROM A 6-MILLION-MW GENERATOR WOULD NOT EXCEED THAT FROM NATURAL RADIOACTIVITY. DIRECT CONVERSION OF THE NUCLEAR ENERGY TO ELECTRICITY IS POSSIBILITY AND IS ESTIMATED THAT EFFICIENCY COULD BE 90%. NOTES THAT EVEN NON WASTE-HEAT PROBLEM IS CONSIDERABLE; THUS, DIRECT CONVERSION COULD ELIMINATE. NOT UNREALISTIC TO EXPECT COMMERCIAL REALIZATION IN THE 1990'S.

REACTOR DESCRIPTION • ELECTRIC POWER • MATERIAL • RADIOACTIVITY RELEASE • DIRECT ENERGY CONVERSION DEVICES • R AND D PROGRAM • THERMAL POLLUTION • REACTOR, LMFBR • REACTOR, THERMONUCLEAR • CONSTRUCTION • COMPONENT DESCRIPTION • THERMAL EFFICIENCY

070204
BINKLEY GP JR
CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE
TEXAS A&M UNIVERSITY
243 PAGES, 15 TABLES, 14 FIGURES, AUGUST 1971

SEA WATER FROM THE YUCATAN STRAIT IS THE MAJOR SOURCE OF TRITIUM FOR THE WESTERN GULF. SEA WATER FIRST CROSSES THE M-3 OF THE YUCATAN STRAIT, AND THEN TO THE WESTERN GULF. THE PHYSICAL PROPERTIES OF THE WATER MASS THAT EMERGES FROM THE SURFACE OF THE DEPTH OF THE SUBTROPICAL UNDERWATER, AND THE M-3 CONTENT, ARE MODIFIED BY MIXING PROCESSES AS THE WATER MOVES WESTWARD. THE INTEGRATED M-3 CONTENT OF THE WATER COLUMNS, TO A DEPTH OF 150 M, IS HIGHER IN THE WESTERN GULF THAN IN THE YUCATAN STRAIT. THIS EXCESS IS DUE TO THE INPUT OF M-3 FROM RUNOFF AND RAINFALL. A 2-BOX MODEL WAS DEVELOPED FOR THE MIXING AND EXCHANGE OF WATER MASSES IN THE UPPER LAYERS OF THE GULF OF MEXICO.

COMPUTER • DEPOSITION • OCEAN AND SEA • REACTOR, RESEARCH • SAMPLING • MIXING DEPTH • CROSS SECTION • CONCENTRATION • DISTRIBUTION • MODEL, DETERMINISTIC • METEOROLOGY • SPECTROMETRY

070099
ERIKSSON E
AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE
INTERNATIONAL METEOROLOGICAL INSTITUTE, SWEDEN
13 PAGES, 3 TABLES, 10 FIGURES, REFERENCES, TELLUS, NOVEMBER, PP. 110-130 (1965)

BOMB TRITIUM PRODUCED SINCE 1954 DURING BOMB TESTS WAS BY AND LARGE INJECTED INTO THE STRATOSPHERE. THE EXACT AMOUNTS ARE NOT KNOWN BUT VARIOUS ESTIMATES AGREE REASONABLY WELL. THE RATE OF THE BOMB PRODUCED TRITIUM IS DISCUSSED IN SOME DETAIL AND IT APPEARS THAT OCEAN SURFACES ARE VERY EFFECTIVE FOR WITHDRAWING ATMOSPHERIC TRITIUM. AVAILABLE DATA ON RAINFALL CONCENTRATIONS ARE ALSO REVIEWED AS WELL AS VARIOUS MODELS PUT FORTH TO EXPLAIN THE TRANSPORT OF TRITIUM IN NATURE.

OCEAN AND SEA • *TESTING • *ATMOSPHERIC POLLUTION • *NUCLEAR DETONATION • *PRECIPITATION • CONCENTRATION • TRANSPORT

070400
WEAVER CL • HOWARD FC • PETERSON HT
TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWERPLANTS
PUBLIC HEALTH SERVICE
9 PAGES, 5 TABLES, 1 FIGURE, 12 REFERENCES, PUBLIC HEALTH REPORTS, 84(4), PP. 363-371 (APRIL 1969)

TRITIUM, AN ISOTOPE OF HYDROGEN WITH AN ATOMIC MASS NUMBER OF THREE, IS PRODUCED IN NUCLEAR REACTORS IN SUBSTANTIAL QUANTITIES. ALTHOUGH TRITIUM IS ONE OF THE LEAST HAZARDOUS RADIOACTIVE NUCLIDES, ITS CONTINUED PRODUCTION AND LONG HALF-LIFE FOR RADIOACTIVE DECAY MAY LEAD TO INCREASED LEVELS IN THE ENVIRONMENT. BECAUSE TRITIUM IS AN ISOTOPE OF HYDROGEN, IT CAN BE METABOLIZED IN THE FORM OF TRITIATED WATER AND INCORPORATED INTO BODY FLUIDS AND TISSUES. THIS SOURCE OF POPULATION EXPOSURE REQUIRES THAT PUBLIC HEALTH AGENCIES BE AWARE OF THE SIGNIFICANCE OF TRITIUM AS AN ENVIRONMENTAL CONTAMINANT.

EFFLUENT • REACTOR, POWER • POPULATION EXPOSURE • ENVIRONMENT • ADSORPTION • CONCENTRATION • MAN

070901
MARTELL EA
ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC METHANE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH
11 PAGES, 2 TABLES, 4 FIGURES, REFERENCES. J. OF GEOPHYSICAL RESEARCH, 80(13), PP. 1799-1809 (APRIL 1975)

CONSIDERATION OF THE GLOBAL-RECORDED TRITIUM INVENTORY AND FEATURES OF THE GROSS AND DISTRIBUTION OF TRITIUM IN ATMOSPHERIC WATER VAPOR, HYDROGEN, AND METHANE PROVIDES A BASIS FOR REJECTING PREVIOUS EXPLANATIONS FOR THE INCORPORATION OF ARTIFICIAL TRITIUM INTO ATMOSPHERIC METHANE. IT IS CONCLUDED THAT TRITIATED HYDROGEN IS PRODUCED IN THERMONUCLEAR CLOUDS BY RADIATIVE DISSOCIATION OF WATER UNDER QUIESCENT CONDITIONS. THE OCCURRENCE OF TRITIATED METHANE IS EXPLAINED BY THERMOSPHERIC EXCHANGE OF METHANE WITH TRITIATED HYDROGEN WHICH HAS MIGRATED DOWNWARD FROM THE STRATOSPHERE. CHEMICAL AND ENERGY CRITERIA FOR THE EXCHANGE OF METHANE AND HYDROGEN IN THE LOWER ATMOSPHERE ARE DISCUSSED. HIGH TRITIUM CONCENTRATION OF PRECIPITATION FROM THUNDERSTORM RAINS IS PREDICTED.

HYDROGEN • WATER SPHERIC POLLUTION • NUCLEAR DETONATION • WATER VAPOR • GAS • REACTION, THERMONUCLEAR • INCORPORATION • CLOUD

077109
POSTER DF
SOURCES AND IMPORTANCE OF RADIOACTIVITY IN THE AQUATIC ENVIRONMENT
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-SA-4814 • CONF-750603-7 (PAPER NO. 21 •. 26 PAGES. PAPER PRESENTED AT THE 8TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1975.

THE BULK OF THE INVENTORY OF MAN-PRODUCED RADIONUCLIDES ON THE SURFACE WATERS OF THE EARTH HAS COME FROM WORLD-WIDE FALLOUT AND THIS WILL PERSIST IN THE AQUATIC ENVIRONMENT FOR SEVERAL DECADES TO COME. NEVERTHELESS, MAJOR SOURCES OF LIQUID EFFLUENTS ESPECIALLY FROM NUCLEAR POWER PLANTS AND FUEL PROCESSING PLANTS WILL CONTINUE TO CREATE ABOVE AMBIENT CONCENTRATIONS OF RADIONUCLIDES NEAR OUTFALLS. OTHER CONTEMPORARY SOURCES OF RADIOACTIVE MATERIALS TO SURFACE WATERS ARE NUCLEAR POWERED SHIPS, THE SEWERS FROM INSTITUTIONS THAT USE RADIOISOTOPES FOR MEDICAL, INDUSTRIAL, OR RESEARCH PURPOSES, THE DUMPING OF PACKAGES OF LOW LEVEL WASTE, AND THE DUMPING OF PROMPT OR SEALED SOURCES (E.G., SNAP DEVICES). THE USE OF NUCLEAR EXPLOSIVES FOR LARGE-SCALE ENGINEERING WORK COULD INCREASE BY ORDERS OF MAGNITUDE THE QUANTITIES OF RADIONUCLIDES INTRODUCED INTO A REGION BY ALL OTHER SOURCES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FEE-LIGHT • ELEMENTS AND ISOTOPES • FALLOUT • SOURCE, RADIATION • REACTOR, POWER • NUCLEAR DETONATION • RADIOACTIVITY RELEASE • WATER POLLUTION • FUEL REPROCESSING • COMMUNITY, AQUATIC • FUEL CYCLE • NPIS

077129
MATUSZEK JP • KUNZ CO • PAPPERIELLO CJ
CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES
NEW YORK STATE DEPARTMENT OF HEALTH
PAPER NO. 22 •. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (CONF-730603--)

THE RADIOBIOLOGICAL SCIENCES LABORATORY OF THE NEW YORK STATE DEPARTMENT OF HEALTH IS CONDUCTING A STUDY TO CHARACTERIZE THE GASEOUS RADIOACTIVE EFFLUENTS FROM NUCLEAR FACILITIES. AT THIS TIME, HOLD-UP TANK, COVER-GAS, STRIP-GAS AND STACK EFFLUENT SAMPLES FROM TWO PWRS, A BWR AND A GAS-COOLED REACTOR HAVE BEEN ANALYZED. GASEOUS SPECIES ARE CHROMATOGRAPHICALLY SEPARATED. THEN COUNTED IN GAS PROPORTIONAL COUNTING SYSTEMS. SPECTROMETRIC MEASUREMENTS HAVE RESULTED IN THE IDENTIFICATION AND QUANTIFICATION OF H-3 GAS HYDROGEN GAS, WATER AND METHANES, C-14 GAS METHANE AND CARBON DIOXIDE, RADIOGASES, KRYPTON, RADIONOBLES AND RADIOIODINE. EXPERIENCE IN SAMPLE COLLECTION, HANDLING, AND ANALYSIS ARE DISCUSSED WITH REGARD TO APPENDIX I REQUIREMENTS, PARTICULARLY WITH REGARD TO REPORTING REQUIREMENTS IMPOSED BY SAFETY GUIDE 21.

AVAILABILITY - JOHN W. MATUSZEK, NEW YORK STATE DEPARTMENT OF HEALTH, ALBANY, NEW YORK 12201

CARBON • EFFLUENT • CHROMATOGRAPHY • IODINE • KRYPTON • NRC • REGULATION • XENON • ARGON • MONITOR, GAS • PARAMETRICAL TECHNIQUE • RADIOLYTIC GAS • RGAS • RSPECTROMETRY • POWER PLANT, NUCLEAR • NRC REGULATORY GUIDE

077143
ROHWER PS • KELLY PJ
RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
PAPER NO. 85 •. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (CONF-730603--)

TRITIUM AND KRYPTON-85 ARE THE PREDOMINANT RESIDUAL MAN-MADE RADIONUCLIDES PRESENT IN NATURAL GAS PRODUCED FROM NUCLEARLY STIMULATED WELLS. SIMPLE COMPARISON OF CONCENTRATIONS OF THESE RADIONUCLIDES DOES NOT PROVIDE A GOOD INDICATION OF THE RELATIVE RADIOLOGICAL IMPORTANCE EVEN THOUGH A COMPARISON OF THEIR PRESENCE, 0.2 PCI/CM-3) KR-85, 0.3 PCI/CM-3) SUGGESTS THAT EQUAL CONCENTRATIONS OF TRITIUM AND KRYPTON-85 ARE OF NEARLY EQUAL RADIOLOGICAL SIGNIFICANCE. IN DISCUSSING THE FALLACY OF USING CONCENTRATIONS OR MPCS TO MAKE THIS PARTICULAR COMPARISON, DETAILED CONSIDERATION IS GIVEN TO EACH RADIONUCLIDE TO EMPHASIZE DIFFERENCES IN TYPE OF RADIATION EMISSION, PHYSICAL AND CHEMICAL FORM, UPTAKE BY MAN, AND REFERENCE TISSUE.

077193 (CONTINUED)
BIOLOGICALLY - U.S. ATOMIC, ENVIRONMENTAL SCIENCES DIVISION, OAK RIDGE NATIONAL LABORATORY, P.O. BOX Y, OAK RIDGE, TENNESSEE 37830

MONITORING • NPC • POPULATION EXPOSURE • RECONCENTRATION • HYDROLOGICAL ASSISTANCE • GAS • CONCENTRATION • DEFECT, GENETIC • RECOMBINATION • DEFECT, SOMATIC • STIMULATION • RESOURCE, NATURAL • PHYSICOCHEMICAL FORM • NPIS

077194
CROWDER CL
NON-MADE TRITIUM
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
5 PAGES, PP. 23-27 OF "TRITIUM", PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (EDITED)

THE TOPIC OF NON-MADE TRITIUM DIVIDES ITSELF INTO SEVERAL SUBTOPICS. THESE INCLUDE THE MECHANISMS FOR THE PRODUCTION OF NON-MADE TRITIUM, THE EXTENT OF THIS PRODUCTION AS COMPARED TO NATURAL MEANS OF PRODUCTION, PREDICTIONS OF THE RATE OF TRITIUM GENERATION BY HUMAN ACTIVITIES IN YEARS TO COME, SOME PROBLEMS CONCERNING THE MANAGEMENT OF NON-MADE TRITIUM, AND SOME CONCLUSIONS AS TO MEASUREMENTS FOR REDUCTION OF TRITIUM IN THE ENVIRONMENT.

FISSION PRODUCT RELEASE • MONITOR, ENVIRONMENTAL • WASTE MANAGEMENT • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • SAFETY EVALUATION • FORECAST • PRODUCTION • RECONCENTRATION • NPIS

077195
HOFFMAN DL
YIELDS OF TRITIUM DURING THE FISSIONING OF NUCLIDES OF INTEREST IN THE OPERATION OF NUCLEAR POWER REACTORS
ARGONNE NATIONAL LABORATORY
7 PAGES, PP. 30-37 OF "TRITIUM", PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (EDITED)

TRITIUM IS PRODUCED FROM FISSION. THE CONSEQUENCE OF THIS CAN BE USEFUL AROUND REACTORS. IT WILL BE VERY IMPORTANT TO THE FUTURE OF NUCLEAR POWER SOURCES TO KNOW THE ACTUAL YIELD OF TRITIUM SO THAT ALL PRECAUTIONS CAN BE EXERCISED TO LIMIT ANY POSSIBLE EFFECTS. IT SHOULD ALSO BE REMEMBERED THAT THERE ARE OTHER SOURCES OF TRITIUM WHICH ARE MORE PRODUCTIVE THAN THE FISSION PROCESS: NEUTRONS ON LI-6 AND NEUTRONS ON DEUTERIUM. VERY SMALL AMOUNTS OF LITHIUM IMPURITY CAN PRODUCE MUCH MORE TRITIUM THAN IS PRODUCED BY THE FISSION PROCESS.

DEUTERIUM • FISSION PRODUCT RELEASE • MEASUREMENT • REACTOR, POWER • MONITOR • LITHIUM • PRODUCTION • RECONCENTRATION • ENERGY SPECTRUM • BENEFIT VS RISK

077196
HOUTS R C, LONG J
TRITIUM PRODUCTION IN NUCLEAR REACTORS
OAK RIDGE NATIONAL LABORATORY, O.R., U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
10 PAGES, PP. 38-48 OF "TRITIUM", PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (EDITED)

NEW INFORMATION HAS BEGUN TO APPEAR ON ACTUAL MEASURED AMOUNTS OF TRITIUM GENERATED IN OPERATING REACTORS. FURTHERMORE, SOME NEW TRENDS ARE DEVELOPING IN DESIGNS AND MODE OF OPERATION OF POWER REACTORS, TRENDS THAT COULD HAVE A SIGNIFICANT EFFECT IN THE FUTURE ON THE RELEASE RATES OF TRITIUM FROM POWER REACTORS AND THE PLACES WHERE RELEASES OCCUR. THIS IS AN UPDATING OF THE REVIEWS OF TWO TO THREE YEARS AGO, CONCERNED WITH RATES OF TRITIUM PRODUCTION IN NUCLEAR POWER REACTORS, TAKING NEW INFORMATION INTO ACCOUNT.

REACTOR, GAS • REACTOR, BREEDER • REACTOR, HWR • REACTOR, MOLTEN SALT • REACTOR, PWR • REACTOR • REACTOR, HTGR • FORECAST • REACTOR, LMFBR • PRODUCTION • POWER PLANT, NUCLEAR

077198
LESSLER RM • GREEN JB • MOZER F
TRITIUM PRODUCTION IN PLOWSHARE APPLICATIONS
LAWRENCE LIVERMORE RADIATION LABORATORY, CALIFORNIA
10 PAGES, PP. 69-79 OF "TRITIUM", PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (EDITED)

DETONATION OF A NUCLEAR EXPLOSIVE PRODUCES SUBSTANTIAL AMOUNTS OF RADIOACTIVE MATERIALS. A SIGNIFICANT COMPONENT OF THIS MATERIALS IS TRITIUM, AND ITS PRODUCTION HAS BEEN THE SUBJECT OF CONTINUING RESEARCH AND EVALUATION WITHIN THE PLOWSHARE PROGRAM. A MAJOR GOAL OF THE PROGRAM HAS BEEN TO REDUCE, AS MUCH AS POSSIBLE, THE AMOUNT OF TRITIUM PRODUCED, WHILE DEVELOPING AN ECONOMICALLY ATTRACTIVE EXPLOSIVE SYSTEM FOR INDUSTRIAL APPLICATIONS. WITH THE CURRENT EMPHASIS OF PLOWSHARE SHIFTED FROM EXCAVATION TO UNDERGROUND ENGINEERING, TRITIUM HAS BECOME AN EVEN MORE IMPORTANT CONSIDERATION. IN NATURAL GAS STIMULATION AND STORAGE PROJECTS, FOR EXAMPLE, SOME TRITIUM COULD EXCHANGE WITH HYDROGEN IN METHANE FUEL.

CONTAINMENT, UNDERGROUND • FISSION PRODUCT RELEASE • PLOWSHARE • NUCLEAR DETONATION • RADIOACTIVITY RELEASE • GAS • CONSUMER PRODUCT • PRODUCTION • RESOURCE, NATURAL • NPIS

077197
PRODUCTION OF TRITIUM BY NUCLEAR WEAPONS
LAWRENCE LIVERMORE RADIATION LABORATORY, CALIFORNIA
7 PAGES, PP. 79-85 OF "TRITIUM", PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (EDITED)

[illegible]
THE EFFECTS OF NUCLEAR WEAPONS TESTS ON THE GLOBAL WORLD TRITIUM INVENTORY CAN BE SUMMARIZED AS FOLLOWS: (1) THE CONTAMINATION FROM FISSION WEAPONS IS NEGLIGIBLE, WHETHER THEY WERE TESTED IN THE ATMOSPHERE OR UNDERGROUND. (2) THE CONTAMINATION FROM THE THERMONUCLEAR TESTS THAT WERE CONDUCTED IN THE ATMOSPHERE IS LARGE. THE PRESENT INVENTORY IS APPROXIMATELY 45 TIMES THE NATURAL PRODUCTION AS A RESULT OF WEAPONS TESTING AND, EVEN IN THE ABSENCE OF FURTHER ATMOSPHERIC TESTS, WILL HAVE A SIGNIFICANT ADDED PERTURBATION ON THE NATURAL BACKGROUND FOR ABOUT 100 YEARS. (3) THE UNDERGROUND TESTING OF THERMONUCLEAR WEAPONS HAS NOT CONTRIBUTED SIGNIFICANTLY TO THE ATMOSPHERIC TRITIUM, EVEN WHEN THE CONTAINMENT HAS BEEN IMPERFECT.

RESSIKA PROJECT [illegible] • ATMOSPHERIC • WEAPONS • NUCLEAR DETONATION • REACTOR, THERMONUCLEAR • PRODUCTION • NOTES

[illegible]
SEMPERFICI [illegible]
ESTIMATION OF THE INCREASED RADIOACTIVITY IN THE GROUND WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 300 MEV HIGH ENERGY ACCELERATOR SITUATED IN A [illegible] SITE
BROOKHAVEN HIGH ENERGY LABORATORY, [illegible]
[illegible] PAGES. 3 FIGURES. 17 REFERENCES. [illegible] PHYSICS. 27(5), PP. 699-699 (NOVEMBER 1972)

ESTIMATES OF [illegible] PRODUCTION IN THE EARTH SHIELDING AND GROUND WATER AROUND A PROPOSED 300 MEV HIGH ENERGY ACCELERATOR SYSTEM IN A GRANITE [illegible] AT A PARTICULAR CHALK SITE STUDIED W-3, BE-7 AND P-32 HAVE SHOWN [illegible] DETAILED INVESTIGATION. CHEMICAL SCRUTINY ON FOUR CHALK ELUTRIATES BE-7 AND P-32 AS SIGNIFICANT CONTAMINANTS OF THE GROUND WATER SYSTEM. IN ADDITION, THE RELATIVELY SHORT RESIDENCE TIMES IN WATER IN REGIONS OF HIGH NEUTRON FLUX DENSITY AND SUBSEQUENT DILUTION IN THE GROUND WATER OF THE PARTICULAR SITE STUDIES ENSURE THAT TRITIUM CONTAMINATION WOULD BE INCONSEQUENTIAL.

[illegible]-BERYLLIUM • CHEMICAL REACTIONS • CALCULATION • GROUND WATER • MISTING • [illegible] • CONTAMINATION • [illegible] • [illegible] • SHIELDING • [illegible] • SAFETY EVALUATION • [illegible]

[illegible]
SUPUMASS [illegible] • [illegible] • [illegible] AL.
RELATIVE RISK FROM RADIONUCLIDES FOUND IN NUCLEARLY STIMULATED NATURAL GAS
BNL PHYSICS DIVISION, [illegible], TEXAS.
CONF-721104-4 [illegible] 27 PAGES. PAPER PRESENTED AT THE PANEL MEETING, HELD IN VIENNA ON NOV. 26, 1972

THE RISKS FROM PARENT RADIONUCLIDES POSSIBLY PRESENT IN NUCLEARLY STIMULATED NATURAL GAS ARE CONSIDERED. IN THESE STUDY - (1) RADIONUCLIDES ARE RANKED ON THE BASIS OF THEIR ESTIMATED RADIATION DOSE POTENTIALS; (2) RADIATION DOSES EXPECTED TO RESULT FROM GAS USAGE ARE COMPARED WITH ESTIMATED DOSES FROM OTHER NATURAL SOURCES; AND (3) RISK PROJECTIONS FOR THE ESTIMATED DOSES ARE COMPARED WITH OTHER RISKS ENCOUNTERED IN THE NORMAL ACTIVITIES OF LIFE IN TECHNOLOGICALLY DEVELOPED NATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT, [illegible] • ELEMENTS AND ISOTOPES • ARGON • MEASUREMENT • PLOWSHARE • SPONTANEOUS • NUCLEAR DETONATION • RADIUM • PRODUCTION FOR SALE • CONTAMINATION • GAS • CONCENTRATION • ESTIMATION • RESOURCE, NATURAL • DENSITY VS RISK • BENEFICIAL USE

[illegible]
HALPERN AN • MILLER CR • PERA RP, ET AL.
ENVIRONMENTAL RADIATION
ENVIRONMENTAL PROTECTION AGENCY
EPA/ESU-72-1 [illegible] 77 PAGES. PP. 7-76. AUGUST 1972

A MAJOR SOURCE OF RADIATION DOSE IN THE UNITED STATES IS NATURAL RADIATION. THE TOTAL ESTIMATED ANNUAL WHOLE-BODY DOSE INCREASES FROM 29.0 MILLION MAN-REM IN 1960 TO 41.7 MAN-REM IN THE YEAR 2000 FROM COSMIC AND NATURAL TERRESTRIAL SOURCES. THE INCREASE IS DUE EXCLUSIVELY TO INCREASES IN POPULATION SIZE. GLOBAL FALLOUT FROM NUCLEAR EXPLOSIVES TESTS CONTRIBUTED ABOUT 1 MILLION MAN-REM WHOLE-BODY IN 1960, A DROP OF 2.0 MILLION MAN-REM IN 1965, AND 0.0 MILLION MAN-REM IN 1970. FUTURE DOSES FROM FALLOUT FOR 1980 ARE PREDICTED TO BE 1.0 MILLION MAN-REM, INCREASING TO 1.0 MILLION MAN-REM IN 2000. THE INCREASE AGAIN BEING DUE TO POPULATION GROWTH. THE TOTAL DOSE CONTRIBUTED BY ALL OTHER MAN-MADE SOURCES INCREASES FROM 0.015 MILLION MAN-REM IN 1960 TO 0.15 MILLION MAN-REM IN 2000.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402 ($0.50/COPY)

DOSE • FALLOUT • [illegible] • RADIATION DOSAGE • SOURCE, RADIATION • TEST, WEAPONS • REACTOR, POWER • SOURCE, VOLUME • DOSE CALCULATION, INTERNAL • DEVELOPMENT • SAFETY EVALUATION • FUEL REPROCESSING • FORECAST • RADIATION EFFECT • RADIATION EXPOSURE • WHOLE BODY • EXPOSURE, BACKGROUND

[illegible]
[illegible]
THE PACIFIC NORTHWEST LABORATORY ANNUAL REPORT ON CONTROLLED THERMONUCLEAR REACTOR TECHNOLOGY - 1972
BATTELLE PACIFIC NORTHWEST LABORATORY
BNWL-1805 [illegible] 15 PAGES. PP. 33-42. NOVEMBER 1972

RESEARCH PROJECTS WERE CARRIED ON IN NEUTRONICS, CROSS SECTION THEORY, ECONOMICS, MATERIALS PROJECTS IN SEPARATE AREAS, AND SYSTEM MECHANICS. THE LATTER PROJECT IS AN EXAMPLE OF AN AREA

000096 RECONFIGURED
OF WORK THAT IS JUST BEING INITIATED. IN GENERAL, THE ABOVE PROJECTS REPRESENT A MARRIAGE OF THE CRITICAL NEEDS OF THE CTR ENGINEERING PROGRAM WITH THE SPECIFIC ABILITIES OF THE LABORATORY. THIS IS IN LINE WITH THE NEW CTR PROJECT EMPHASIS OF ONLY CARRYING OUT WORK WHICH AT THIS TIME FALLS WITHIN THE DUAL AREA OF CRITICAL PROGRAM NEED AND SPECIFIC BRW COMPETENCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GRAPHITE • HYDROGEN • PLUTONIUM • URANIUM • CROSS SECTION • REACTOR, THERMONUCLEAR

000097
WEBER CM
ANTICIPATED AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION STAY GENERAL
BATTELLE PACIFIC NORTHWEST LABORATORIES
BNWL-SA-3994 • CONF-700604-6. 13 PAGES. PAPER PRESENTED AT THE 1970 ANNUAL MEETING OF HEALTH PHYSICS SOCIETY, HELD IN CHICAGO ON JUNE 29, 1970

THE GENERATION OF ELECTRIC POWER BY EITHER FOSSIL OR FISSILE FUELS HAS LED TO THE CONTAMINATION OF THE ENVIRONMENT. THE DATA EXAMINED INDICATES THAT MORE CONTAMINATIONS ARE EXPECTED TO BE NORMAL FOR THE WORLDWIDE DISTRIBUTION OF TRITIUM AND KRYPTON THROUGH THE YEAR 2000. PRUDENT MANAGEMENT IN THE NUCLEAR POWER INDUSTRY WILL NEVERTHELESS INDICATE THAT SEPARATION AND STORAGE OF THESE RADIONUCLIDES TO PREVENT THEIR UNCONTROLLED RELEASE TO THE ENVIRONMENT SHOULD BE A SERIOUS OBJECTIVE TO BE REALIZED AS SOON AS PRACTICAL. PARTICULAR EXPOSURE CONDITIONS IN LOCAL AREAS WHERE TRITIUM AND KRYPTON ARE RELEASED—WHILE NOT DISCUSSED IN THIS PRESENTATION—NEED CAREFUL STUDY AND MAY DICTATE THE DEGREE OF INITIAL CONTROL REQUIRED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT • KRYPTON • FLOWSHEET • REGULATION • SOURCE, RADIATION • TESTING • REACTOR, POWER • REACTOR PRODUCTION • NUCLEAR DETONATION • PROPAGATION EXPOSURE • ENVIRONMENT • FORECAST • ENVIRONMENTAL CONTROL MEASURE • FUEL, FOSSIL • MICROORGANISMS • TRANSPORT, NUCLEAR • NO-POWER FORECAST

000098
GRAHAM J • CECHNICKA L
SOURCES OF TRITIUM AND ITS RADIOTOXICOLOGIC PROBLEMS
NEX-DD-2417 p. 10 PAGES. 1971

THE STUDY GIVES A SURVEY OF THE FORMATION AND SOURCES OF TRITIUM IN NATURE AND ITS RELEASE IN OPERATING NUCLEAR REACTORS AND TRIGGERING THERMONUCLEAR EXPLOSIONS. THE BIGGEST SOURCE OF TRITIUM IN NATURE IS BOMBARDING OF ATMOSPHERIC NITROGEN N-14 WITH SECONDARY NEUTRONS. THE OTHER SOURCES CONTRIBUTE ONLY TO AN INSIGNIFICANT EXTENT TO CREATE THE OVERALL AMOUNT OF NATURAL TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIOCONTAMINATION • BIOLOGY, RADIATION • REACTOR, POWER • NUCLEAR DETONATION • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • SAFETY EVALUATION • FUEL REPROCESSING • REACTOR, THERMONUCLEAR

000099
TAYLOR PA
THERMAL EFFECTS OF UNDERGROUND NUCLEAR EXPLOSION
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
9 PAGES. 8 FIGURES. 32 REFERENCES. NUCLEAR TECHNOLOGY, 10(2), PP. 189-193 (MAY 1971)

MOST OF THE ENERGY OF AN UNDERGROUND NUCLEAR EXPLOSION IS DEPOSITED NEAR THE SITE OF THE EXPLOSION AS HEAT. LABORATORY EXPERIMENTS ON SAMPLES THAT ARE MOSTLY FINE GRAIN MIXTURES OF QUARTZ AND CARBONATE SHOW THAT CO2 IS RELEASED AT TEMPERATURES AS LOW AS 500 C, EVEN UNDER A CO2 PRESSURE OF 50 ATM. IN THE FUTURE, THE RELEASE OF LARGE AMOUNTS OF CO2 MAY BE USED TO ADVANTAGE IN SECONDARY OIL RECOVERY AND IN THE RECOVERY OF HEAVY CRUDE OILS. BECAUSE OF THE GREAT REDUCTION IN VISCOSITY THAT RESULTS AS CO2 DISSOLVES IN THESE OILS. THE NUCLEAR CAVERN, WITH ITS LARGE VOID VOLUME, LARGE SURFACE AREA FOR CONTACTS, AND HIGH TEMPERATURES, IS A POTENTIAL HIGH PRESSURE VESSEL FOR CHEMICAL REACTION.

EXPLOSION • HYDROGEN • BLOWSPARE • MAGNESIUM DIOXIDE • STEAM • THERMODYNAMICS • THERMAL PROPERTY

000097
WOCHNING HG
SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-74057 REV. 1; CONF-721111-16 p. 44 PAGES. PAPER PRESENTED AT THE INTERNATIONAL MEETING ON THE TECHNOLOGY OF CONTROLLED THERMONUCLEAR FUSION EXPERIMENTS AND THE ENGINEERING ASPECTS OF FUSION REACTORS, HELD IN AUSTIN, TEXAS, ON NOVEMBER 20, 1972

A NUMBER OF PROBLEMS ASSOCIATED WITH THE USE OF TRITIUM IN FUSION REACTORS ARE YET TO BE CONSIDERED. SOME ARE PECULIAR TO PINCH MACHINES AND ATTEMPTS AT DIRECT CONVERSION OF PLASMA ENERGY TO ELECTRICITY, WHILE OTHERS ARE OF GENERAL CONCERN. SEVERAL OF THESE ARE CONSIDERED FROM THE POINT OF VIEW OF ONE WHO HAS WORKED WITH TRITIUM FOR SEVERAL YEARS. SPECIFIC AREAS MENTIONED INCLUDE LIQUID-PHASE MASS TRANSFER OF TRITIUM IN LIQUID LITHIUM, ISOTOPIC SEPARATION, PRELIMINARY CALCULATIONS ON PERMEATION BARRIERS, ISOTOPIC SWAMPING, AND SOME THOUGHTS ON MAINTENANCE.

000007 [illegible]
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] • [illegible] • [illegible] • MASS TRANSFER • PLASMA • PERFORMANCE, [illegible] • [illegible], THERMONUCLEAR

[illegible]
[illegible]
[illegible]
GENERAL ELECTRIC COMPANY
[illegible] 10 PAGES, 5 TABLES, AUGUST 1972

[illegible] TRITIUM [illegible] FROM THE FUEL, CLADDING, AND FISSION GAS OF FOUR STAINLESS STEEL CLAD, PINEX-TYPE FUEL RODS IRRADIATED IN A FAST FLUX. THE AVERAGE FUEL BURNUP [illegible] TO PROCEED PRIOR AT AVERAGE POWERS OF 11 TO 13 [illegible]. THE RESULT OF THIS STUDY SHOWED THAT LESS THAN 10 [illegible] OF THE TRITIUM PRODUCED WAS RETAINED IN THE FUEL. LITTLE OR NO TRITIUM WAS FOUND IN EITHER THE CLADDING OR FISSION GAS. IT IS BELIEVED THAT THE MAJORITY OF THE TRITIUM PRODUCED IN THE FUEL WAS RELEASED TO THE PRIMARY SODIUM COOLANT AND A PORTION OF THIS TRITIUM WILL EVENTUALLY EXPE[illegible] THE REACTOR COVER GAS. A PRELIMINARY ESTIMATE INDICATES THE PARTIAL PRESSURE OF TRITIUM IN THE COVER GAS WILL BE 2 TO 5 TORR [illegible] AT A COLD TRAP TEMPERATURE OF 121 C (250 F).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DIFFUSION • CLADDING • FUEL BURNUP • [illegible] • [illegible] • FISSION PRODUCT TRANSPORT • STEEL, STAINLESS • [illegible] • ZIRCALOY • REACTOR, [illegible] • FUEL ELEMENTS

000075
LARSEN AP • DUDEY RC • [illegible] RC • [illegible] AG
CHEMICAL ENGINEERING DIVISION GROUP, FIRST SECTION, AND GEOMETRY SEMIANNUAL REPORT, JANUARY-JUNE 1972
ARGONNE NATIONAL LABORATORY
ANL-7926 P. 40 PAGES, FIGURES, SEPTEMBER 1972

RESEARCH AND DEVELOPMENT EFFORTS IN THE [illegible], CROSS SECTIONS AND GEOMETRY PROGRAMS IN THE CHEMICAL ENGINEERING DIVISION OF ARGONNE NATIONAL LABORATORY ARE REPORTED FOR THE PERIOD JANUARY TO JUNE 1972. WORK IS REPORTED IN THE FOLLOWING AREAS: (1) DEVELOPMENT OF AN [illegible] SPECTROPHOTOMETRIC METHOD FOR THE DETERMINATION OF THE RARE-EARTH FISSION PRODUCTS AND APPLICATION OF THIS METHOD TO THE DETERMINATIONS OF BURNUP IN NUCLEAR FUELS; (2) DETERMINATION OF FAST FISSION YIELDS OF PLUTONIUM ISOTOPES AND OTHER FISSION PRODUCTS; (3) A SEARCH FOR A SPONTANEOUSLY FISSIONING ISOTOPE OF [illegible]; (4) MEASUREMENTS OF THE TRITIUM AND ALPHA PARTICLE YIELDS IN FAST-NEUTRON FISSION OF U-235 AND PU-239; (5) EVALUATIONS OF AVAILABLE DATA ON THE DIFFERENTIAL CROSS SECTIONS FOR THE [illegible] AND U-238(N,FISSION) REACTIONS; AND (6) MEASUREMENTS OF BETA FISSION RATES BY SOLID-STATE TRACK RECORDERS AND REACTION RATES BY FOIL ACTIVATION, IN THE COMPLEX FAST CRITICALITY MEASUREMENT FACILITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CERIUM • [illegible] • REACTOR, FAST • FUEL BURNUP • PLUTONIUM • LANTHANUM • CROSS SECTION • REACTOR, LARGE • SPECTROPHOTOMETRY, [illegible]

000077
STEVENS G
DETERMINATION OF THE RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED UO2 COMPACTS
BATTELLE PACIFIC NORTHWEST LABS, RICHLAND, WASH
BNWL-963-96 P. 142 PAGES, FIGURES, TABLES, JUNE 1972

THIS REPORT REFERS TO POST-IRRADIATION INVESTIGATIONS ON NEUTRON-IRRADIATED SINTERED UO2 COMPACTS. THE THERMOPHYSICO-MECHANICAL PROPERTIES OF THE SAMPLES SUCH AS DENSITY, POROSITY, AND YOUNG'S MODULUS IS DISCUSSED AS WELL AS THE RADIATION DAMAGE OF BOTH COMPOSITION AND LATTICE STRUCTURE, BY MEANS OF A SPECIALLY DEVELOPED VACUUM ASSEMBLY. THE RELEASE BEHAVIOR OF HELIUM WAS STUDIED BOTH ISOTHERMAL AND WITH A VARIABLE FUNCTION OF TEMPERATURE AND TIME. AN ABSOLUTE DETERMINATION OF THE TOTAL CONTENTS OF HELIUM AND TRITIUM IN THE SAMPLES IS ACHIEVED BY A CHEMICAL ANALYSIS. THE RESULTS ARE DISCUSSED, AND THEY ARE DESCRIBED QUANTITATIVELY BY THE APPLICATION OF A MODIFIED DIFFUSION THEORY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HELIUM • [illegible] • HELIUM • IN PILE EXPERIMENT • RADIONUCLIDE, INDUCED

000079
BAILEY JR • [illegible] S
SOME FEATURES OF THE IMPACT OF A FUSION REACTOR POWER PLANT ON THE ENVIRONMENT
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-721111-22 P. 30 PAGES. PAPER PRESENTED AT THE INTERNATIONAL MEETING ON THE TECHNOLOGY OF CONTROLLED THERMONUCLEAR FUSION EXPERIMENTS AND THE ENGINEERING ASPECTS OF FUSION REACTORS, HELD IN AUSTIN, TEXAS, NOV. 20, 1972

EXCEPTING TRITIUM, THERE WILL BE NO DIRECT RADIOACTIVE PRODUCTS OF THE POWER-PRODUCING FUSION

[illegible]
PROCESS. THIS DISCUSSES THE ABSENCE OF LARGE AMOUNTS OF LONG-LIVED RADIOACTIVE SUBSTANCES THAT CAN BE DISPERSED BY RECOIL OR SPECTRUM. IT ALSO DISCUSSES THE CONCENTRATION OF LARGE-SCALE AMOUNTS OF FISSION PRODUCTS AT FUEL REPROCESSING PLANTS, WITH THE RELATIVELY HIGH RELEASE RATES THAT ENCOUNTERED AND THE RISK OF LARGE ACCIDENTAL RELEASES AT FUTURE REPROCESSING PLANTS, WHERE NORMAL RELEASES ARE EXPECTED TO BE LOW.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD, VA. 22161

FISSION GAS RELEASE • ENVIRONMENT • FUEL REPROCESSING • [illegible]

[illegible]
THE POTENTIAL RADIOLOGICAL IMPLICATIONS OF NUCLEAR FACILITIES IN THE UPPER MISSISSIPPI RIVER BASIN IN THE YEAR 2000
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR DEVELOPMENT AND TECHNOLOGY
WASH-1209 V. 244 PAGES. 40 TABLES. 122 FIGURES. 159 REFERENCES. JANUARY 1972

THIS STUDY CONSIDERS THE RADIATION POTENTIALLY RECEIVED BY THE POPULATION OF THE UPPER MISSISSIPPI RIVER BASIN STUDY AREA WHICH MIGHT RESULT FROM THE OPERATION OF NUCLEAR POWER AND FUEL REPROCESSING FACILITIES IN THE YEAR 2000. THE RESULTS OF THE STUDY BASED ON THE SELECTED RADIOACTIVE-WASTE-TREATMENT SYSTEMS SHOWED THAT, ON THE AVERAGE THROUGHOUT THE REGION, THE POTENTIAL RADIATION AND AVERAGE INDIVIDUAL COULD RECEIVE IN THE YEAR 2000 WOULD BE INCREASED BY ROUGHLY 0.2 MILLIREM/YEAR BECAUSE OF THE PRESENCE OF NUCLEAR FACILITIES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

[illegible] • [illegible] • WASTE TREATMENT • FISSION PRODUCT TRANSPORT • [illegible], POWER • [illegible] • POPULATION EXPOSURE • CRITICAL NUCLEAR PATHWAY • [illegible] • POPULATION DISTRIBUTION • RADIOACTIVITY RELEASE • [illegible] • METEOROLOGY • [illegible] • FUEL REPROCESSING • [illegible], AREA • [illegible] • RIVERS, MISSISSIPPI • [illegible] • RADIATION EFFECT

[illegible]
SECTION B
THE RADIOLOGICAL IMPACT OF FUSION
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
6 PAGES. 2 TABLES. 2 FIGURES. NUCLEAR SYSTEMS. PP. 169-171 DECEMBER 16, 1971

FUSION REACTORS WILL ENTAIL THE HANDLING AND CONTROL OF SIGNIFICANT QUANTITIES OF RADIOACTIVE MATERIALS. HOWEVER, THE HARMFUL EFFECTS OF RADIATION FROM FUSION POWER ARE EXPECTED TO BE LESS SEVERE THAN THOSE FROM FISSION POWER. COMPARES BOTH QUALITATIVELY AND QUANTITATIVELY THE INVENTORIES OF RADIOACTIVE MATERIALS ANTICIPATED IN FUSION REACTORS WITH THOSE CHARACTERISTICS OF FISSION REACTORS.

[illegible] • [illegible] • [illegible], RELATIVE • WASTE DISPOSAL • REACTOR, POWER • [illegible] ANALYSIS • WASTE MANAGEMENT • FISSION PRODUCT ACTIVITY, GROSS • RADIOACTIVITY RELEASE • [illegible] • REACTOR, AREA • REACTOR, THERMONUCLEAR • PRODUCTION • COMPARISON

[illegible]
SECTION P
FUEL REPROCESSING
NEW YORK UNIVERSITY MEDICAL CENTER, NEW YORK
8 PAGES. PP. 290-298 OF "ENVIRONMENTAL RADIOACTIVITY", PUBLISHED BY ACADEMIC PRESS, INC., 1971 (BOOK)

WHEN A REACTOR CORE HAS REACHED THE END OF ITS USEFUL LIFE, ONLY A SMALL PERCENTAGE OF THE ZIRCALOY HULL HAVE BEEN TRANSMUTED TO ZIRCON AND OTHER TRANSURANIC ELEMENTS. THE CORE WITH ITS INVENTORY OF FISSION PRODUCTS AND LONG-LIVED ALPHA-EMITTING HEAVY RADIOELEMENTS IS THEN REMOVED FROM THE REACTOR STORED UNDER WATER IN THE FUEL STORAGE POOLS ASSOCIATED WITH THE REACTOR, AND THEN TRANSPORTED TO A FUEL-REPROCESSING PLANT IN WHICH THE SPENT FUEL IS CHEMICALLY TREATED TO: (1) CONVERT THE FISSION PRODUCTS INTO A FORM SUITABLE FOR LONG-TERM STORAGE; AND (2) RECOVER THE REMAINING ZIRCALOY AND THE TRANSURANIC ELEMENTS.

CESIUM • [illegible] • FISSION PRODUCT RELEASE • FUEL HANDLING • [illegible] • ALPHA EMITTER • PLUTONIUM • FUEL STORAGE • STRONTIUM • [illegible] • AIR • WATER, DRINKING • POPULATION EXPOSURE • OCCUPATIONAL EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL • TRANSURANIC ELEMENT • FUEL REPROCESSING • CONCENTRATION • RADIATION EXPOSURE • MAN • FOOD • NPTS • FUEL ELEMENTS

[illegible]
SECTION P
FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS
NEW YORK UNIVERSITY MEDICAL CENTER, NEW YORK
37 PAGES. PP. 310-353 OF "ENVIRONMENTAL RADIOACTIVITY", PUBLISHED BY ACADEMIC PRESS, INC., 1971 (BOOK)

THE USE OF NUCLEAR WEAPONS PRODUCES PARTICULATE CONTAMINATION ON A SCALE THAT, WHEN COMPOUNDED WITH THE EFFECTS OF BLAST AND FIRE, WOULD CREATE DRASTIC PROBLEMS FOR WHICH AT PRESENT THERE IS NO FORESEEABLE SOLUTION. FURTHERMORE, AS IS WELL KNOWN, THE PEACEFUL TESTING OF NUCLEAR WEAPONS IS CAPABLE OF PRODUCING WORLDWIDE CONTAMINATION AND WAS THE SUBJECT OF INTENSE WORLDWIDE CONCERN BETWEEN 1954 AND THE SIGNING OF A TEST-BAN AGREEMENT IN 1963. THIS CHAPTER DISCUSSES THE SUBJECT OF NUCLEAR AND THERMONUCLEAR EXPLOSIONS IN GENERAL AND THEN REVIEWS THE PARTICULAR DAMAGING CONSEQUENCES OF THE USE OF SUCH WEAPONS IN WAR.

003265 (CONTINUED)
GROUP • CESIUM • DEPOSITION • [illegible] • FISSION PRODUCT RELEASE • INGESTION • INHALATION • IODINE • PLUTONIUM • RADIATION DAMAGE • [illegible] • STRONTIUM • URANIUM • [illegible] • WEAPONS • ZIRCONIUM • RADIATION INJURY TREATMENT • ACCIDENT, HYPOTHETICAL • NUCLEAR DETONATION • DOSE CALCULATION, EXTERNAL • DECONTAMINATION • RADIOACTIVITY RELEASE • TOPOGRAPHY • MILITARY CONSIDERATION • NUCLEAR ATTACK • FORECAST • REACTOR, THERMONUCLEAR • CONCENTRATION • MORTALITY EFFECT • RADIATION EXPOSURE • LIVESTOCK • SKIN • CLOUD • SOCIOPSYCHOLOGICAL CONSIDERATION • [illegible]

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[illegible] AD
DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
[illegible]-42 P., 25 PAGES, JUNE 12, 1973

ENVIRONMENTAL STATEMENTS ISSUED FOR GAS-STIMULATION PROJECTS REQUIRE ESTIMATES OF SURFACE CONCENTRATIONS AND DOSE TO INDIVIDUALS FOR TRITIUM AND KR-85 FROM FLARING OF THE GAS AND FOR NOBLE GASES AND [illegible] FOR THE POSSIBLE, BUT UNLIKELY, "SEEP" AFTER DETONATION. THE PURPOSE OF THIS PAPER IS TO DETAIL THE PROCEDURES USED AT LAWRENCE LIVERMORE LABORATORY IN ARRIVING AT CONCENTRATION AND DOSE ESTIMATES THAT HAVE BEEN PRESENTED IN THE ENVIRONMENTAL STATEMENTS FOR RIO BLANCO [illegible] AND WAGON WHEEL [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE • IODINE • [illegible] • NOBLE GAS • SURFACE CONTAMINATION • NUCLEAR DETONATION • POPULATION EXPOSURE • DOSE CALCULATION, EXTERNAL • GAS • CONCENTRATION • STIMULATION • RESOURCE, NATURAL • BENEFICIAL USE • STATEMENT, ENVIRONMENTAL

003716
[illegible]
MAGNETIC CONTAINMENT FUSION: WHAT ARE THE PROSPECTS?
3 PAGES. 1 REFERENCE. SCIENCE, [illegible], PP. [illegible] (OCTOBER 20, 1972)

NONTECHNICAL REVIEW ARTICLE. NO DRAMATIC BREAKTHROUGHS HAVE OCCURRED RECENTLY IN THE PROGRAM OF FUSION BY MAGNETIC CONFINEMENT, AND CONTROLLED FUSION IS STILL FAR FROM A CERTAINTY. HOWEVER, MANY SCIENTISTS THINK THAT THE ANSWER TO THE QUESTION OF SCIENTIFIC FEASIBILITY WILL BE KNOWN WITHIN THE DECADE. IF THE COMPLEXITY OF THE FEASIBILITY EXPERIMENTS IS ANY INDICATION OF THE SOPHISTICATION OF A FUTURE FUSION REACTOR, THE DEVELOPMENT OF A COMMERCIAL REACTOR MAY BE AS [illegible] AND TEDIOUS AS THE PROCESS TOWARD PROVING THE PRINCIPLE.

SITING, REACTOR • POPULATION EXPOSURE • HAZARDS ANALYSIS • FORECAST • REACTOR, THERMONUCLEAR

005335
[illegible] GP
SODIUM TECHNOLOGY FINAL REPORT
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-[illegible] P., 50 PAGES, TABLES, FIGURES, REFERENCES, APRIL 1973

THE REPORT COVERS THE FOLLOWING ACTIVITIES: (1) THE DESIGN OF A MULTIPURPOSE SAMPLER FOR USE AT [illegible]. (2) THE PREPARATION OF [illegible] STANDARDS ON SPECIFICATIONS FOR MEASURING AND CONTROLLING THE PURITY OF SODIUM AND COVER GAS. (3) A COVER-GAS ANALYSIS SYSTEM FOR SEPARATING [illegible] FROM NOBLE-GAS FISSION PRODUCTS. (4) DEVELOPMENT OF A CALCULATIONAL MODEL TO DESCRIBE THE GENERATION AND TRANSPORT OF TRITIUM IN AN LMFBR. (5) WORK HAS BEEN CONTINUED ON DEVELOPING POST-EXPOSURE TESTING METHODS, AND A MATHEMATICAL MODEL HAS BEEN USED TO PREDICT THE MAGNITUDE AND RATE OF CARBON MIGRATION IN [illegible] SYSTEMS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION: SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CARBON • CODES AND STANDARDS • NOBLE GAS • SODIUM • ANALYTICAL MODEL • MASS TRANSFER • REACTOR, LMFBR • [illegible] • TECHNOLOGY • [illegible]

005619
STEINER D
THE NUCLEAR PERFORMANCE OF VANADIUM AS A STRUCTURAL MATERIAL IN FUSION REACTOR BLANKETS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4353 P., 34 PAGES, 10 TABLES, 2 FIGURES, 22 REFERENCES, OCTOBER 1973

THE AREAS CONSIDERED INCLUDE: (1) TRITIUM BREEDING; (2) NUCLEAR HEATING; (3) RADIATION EFFECTS RELATING TO MATERIAL DAMAGE; AND (4) NEUTRON-INDUCED ACTIVITY. IT IS CONCLUDED THAT: (1) THE TRITIUM BREEDING CHARACTERISTICS OF VANADIUM ARE SOMEWHAT SUPERIOR TO THOSE OF NIOBIUM; (2) NUCLEAR HEATING IN THE FIRST WALL OF THE BLANKET WILL BE SUBSTANTIALLY LOWER WITH VANADIUM THAN WITH NIOBIUM; (3) HELIUM AND HYDROGEN PRODUCTION IN THE FIRST WALL WILL BE SIGNIFICANTLY GREATER WITH VANADIUM THAN WITH NIOBIUM; AND (4) VANADIUM WILL EXHIBIT AN AFTERHEAT AND BIOLOGICAL HAZARD SEVERAL ORDERS OF MAGNITUDE LOWER THAN THAT OF NIOBIUM FOR TIMES-AFTER-SHUTDOWN OF ABOUT 100 DAYS AND GREATER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEUTERIUM • NIOBIUM • STRUCTURAL INTEGRITY • VANADIUM • REACTOR, THERMONUCLEAR • PROPERTY, MECHANICAL

[illegible]
[illegible] 6
[illegible] AND RELEASE OF TRITIUM IN NUCLEAR POWER PLANTS AND REPROCESSING PLANTS AND THE EXPECTED
[illegible] THE YEAR 2000
[illegible], INSTITUTE FOR [illegible] AND [illegible], [illegible], [illegible]
[illegible] PAGES. 71 REFERENCES. FEBRUARY 1972

[illegible] TRITIUM PRODUCTION IN COMMERCIAL AS WELL AS VARIOUS FOUR NUCLEAR WEAPONS AND NUCLEAR
FACILITIES. AN ESTIMATION OF TRITIUM INVENTORY FROM FUSION REACTORS IS ATTEMPTED. PROJECTION
[illegible] AND GLOBAL INVENTORY FOR THE YEAR 2000 ARE CALCULATED.

AVAILABILITY - [illegible], INSTITUTE FOR [illegible] AND [illegible], [illegible], GERMANY

REACTOR, POWER + GERMANY + FORECAST + REACTOR, THERMONUCLEAR + POLLUTION + INVENTORY, NUCLEAR

[illegible]
[illegible] F + [illegible] L
DISTRIBUTION OF TRITIUM IN A PRESSURIZED WATER POWER REACTOR PLANT
THE STATE INSTITUTE FOR TECHNICAL RESEARCH, FINLAND
7 PAGES. 1 TABLE. 5 FIGURES. 4 REFERENCES. NUCLEAR TECHNOLOGY, [illegible], PP. 430-434 DECEMBER 1971

A VERSATILE COMPUTER PROGRAM IS USED TO CALCULATE EFFECTS OF VARIATIONS ON SEVERAL REACTOR PLANT
CONDITIONS ON DISTRIBUTION OF TRITIUM IN PRIMARY SYSTEMS PROCESS WATERS OF A WATER-TYPE POWER PLANT.
[illegible] ON GASEOUS RELEASE. THE SPRING RESIN AND CHARCOAL GAS SEPARATION ACTIVITY OF ABOUT 15
MILLICURIES/SEC. [illegible] RELEASE OF ABOUT ONE PERCENT CONCERT VOLUME IS REQUIRED TO KEEP TRITIUM
ACTIVITY BELOW 0.5 MILLICURIES/CC. [illegible] OF RELEASE IS [illegible] AND [illegible] OF CHOICE TO AS TO
PRIMARY RELEASE OF FISSION AND CORROSION PRODUCT ACTIVITIES.

[illegible] PROGRAM + FISSION GAS RELEASE + REACTOR, PWR + [illegible] RELEASE

[illegible]
[illegible] DC
TRITIUM [illegible] IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES
BATTELLE CHEMICAL, NORTHWEST REACTOR TESTING STATION
BCP-[illegible] 0. [illegible] PAGES. 3 TABLES. 4 FIGURES. 8 REFERENCES. JANUARY 1971

TRITIUM WHICH IS PRODUCED FROM TERNARY FISSION IN NUCLEAR REACTORS WILL BE DELIVERED AND DISPERSED
THROUGHOUT THE [illegible] SYSTEMS IN THE FUEL REPROCESSING PLANTS. THE SOURCES OF TRITIUM
CONTAMINATIONS EXPECTED IN THE REPROCESSING PLANT STREAMS FOR DIFFERENT REACTOR TYPES ARE
[illegible]. THE REQUIREMENTS FOR TRITIUM CONTROL THROUGH RECYCLE AND ISOTOPIC SEPARATION ARE
DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] + FISSION GAS RELEASE + REACTOR, MOLTEN SALT + OCEAN AND SEA + SURFACE WATER + WASTE DISPOSAL +
[illegible] MANAGEMENT + REACTOR, LMR + FUEL REPROCESSING + REACTOR, HTGR + REACTOR, LMFBR + JACKETS

[illegible]
[illegible] T.
PARAMETRIC STUDY OF THE TRITIUM DISTRIBUTION IN THE FFTF
[illegible] ENGINEERING DEVELOPMENT LABORATORY
[illegible] 0. 20 PAGES. 4 TABLES. 1 FIGURE. 2 REFERENCES. FEBRUARY 1974

THIS PARAMETRIC STUDY INDICATES THAT TRITIUM RELEASE FROM THE FFTF CAN BE HELD TO LESS THAN 0.5
CI/DAY THROUGH EFFECTIVE COLD-TRAPPING OF THE SODIUM OF THE PRIMARY AND SECONDARY COOLANT
SYSTEMS. THIS RELEASE LEVEL IS A FACTOR OF BETWEEN 100 AND 1000 TIMES LESS THAN THE ALLOWABLE
STATUTORY RELEASE RATES FROM TRITIUM.

AVAILABILITY - LITTON[illegible] ON DISTRIBUTION; SEND REQUESTS TO ORNL TECHNICAL INFORMATION CENTER, P.O. BOX 62,
OAK RIDGE, TENN. 37830

SODIUM + [illegible] + FFTF (TH) + [illegible], TRIP + REACTOR, LMFBR + JACKETS

[illegible]
[illegible] EL + [illegible] SW + [illegible] CD
DISTRIBUTION AND RELEASE OF TRITIUM IN HIGH-TEMPERATURE GAS-COOLED REACTORS AS A FUNCTION OF DESIGN,
OPERATIONAL, AND MATERIAL PARAMETERS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4303 0. 90 PAGES. [illegible] TABLES, FIGURES, REFERENCES, JUNE 1974

TRITIUM WILL BE PRODUCED IN HIGH-TEMPERATURE GAS-COOLED REACTORS NOT ONLY BY FISSION, BUT ALSO TO
A SIGNIFICANT EXTENT BY REACTIONS OF NEUTRONS WITH BORON IN BURNABLE POISON AND CONTROL RODS,
WITH TRACE LITHIUM IMPURITY, AND WITH HE-3 OCCURRING NATURALLY IN THE HELIUM COOLANT FLOWING
THROUGH THE CORE. A PORTION OF THE TRITIUM THAT IS FORMED IN SOLIDS OR PURE MAY BE RELEASED TO
THE COOLANT. THIS TRITIUM EXCHANGES WITH THE HYDROGEN IN THE COOLANT AND WILL, IN PART, CHEMISORB
ON GRAPHITE. IN ADDITION, IT MAY LEAK WITH THE COOLANT FROM THE REACTOR VESSEL, BE ABSORBED IN
THE HELIUM PURIFICATION SYSTEM, OR PERMEATE SYSTEM WALLS INTO THE STEAM GENERATOR, WHERE AS A
RESULT OF NORMAL [illegible] OR LOSSES IT IS SUBJECT TO RELEASE TO THE ENVIRONMENT.

[illegible]
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM - FISSION PRODUCT RELEASE - MOLTEN SALT - FP. ST. [illegible] - STEAM [illegible] - [illegible]

[illegible]
[illegible] PROGRESS REPORT FOR THE PERIOD ENDING AUGUST 30, 1976
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
GA-A13520 [illegible] 65 PAGES, [illegible] 1976

THE [illegible] REACTOR [illegible] INTERACTIONS BETWEEN CORE MATERIALS AND COOLANT [illegible] FISSION PRODUCT TRANSPORT MECHANISMS. COAT [illegible] DEVELOPMENT AND TESTING. THE DEVELOPMENT AND TESTING OF [illegible] SYSTEMS, AND PHYSICS AND FUEL MANAGEMENT STUDIES. MATERIALS STUDIES INCLUDE [illegible] TESTS ON BOTH FUEL AND GRAPHITE. [illegible] PROCESS AND [illegible] RESULTS ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION GAS RELEASE - GRAPHITE - TESTING - FISSION PRODUCT TRANSPORT - MATERIAL - INFORMATION TESTING - [illegible] [illegible] - EQUIPMENT - [illegible] - [illegible], HTGR - FUEL MANAGEMENT - MODEL - [illegible]

[illegible]
[illegible]
[illegible]
[illegible]
PNL-[illegible] 4, 144 PAGES, 7 TABLES, 17 FIGURES, [illegible] 1979

[illegible] PASSES. INPUT [illegible] AND CALCULATIONAL RESULTS, AND PROGRAM LISTINGS ARE [illegible] THE COMPUTER CODES [illegible]. THE FORMULATES TRITIUM CONCENTRATIONS [illegible] AT THE [illegible] AND OPERATING [illegible] SWEEPS. [illegible] THE CALCULATES TRITIUM INVENTORIES AT ANY [illegible] DAY OF STEADY [illegible] OPERATIONAL, [illegible] SHUTDOWN, OR [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM - [illegible], [illegible] - [illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible] 52-59 (SEPTEMBER 1976)

[illegible] THE [illegible] REACTOR PROGRAM. THE MAJOR UNCERTAINTY WITH REGARD TO [illegible] EFFECTS ON [illegible] THE RATE AT WHICH TRITIUM ENTERS THE STEAM SYSTEM [illegible] IT IS RELEASED TO THE ENVIRONMENT. TRITIUM IS A SPECIAL PROBLEM BECAUSE OF ITS HIGH RATE OF [illegible] IS A [illegible] FROM LITHIUM IN THE FUEL SALT AND BECAUSE OF ITS [illegible] THROUGH METAL AT HIGH TEMPERATURES. THE KINETIC BEHAVIOR OF MOLTEN-SALT REACTORS [illegible] THE METHODS [illegible] IN THE MSBR, AND THERE IS AMPLE [illegible] THAT [illegible] PROCESSES ARE HIGHLY [illegible]. THE [illegible] THAT SPACE IS MUCH LESS INTENSE THAN IN STRUCTURAL CORES [illegible] IN THE FUEL IS [illegible] IN A LARGE MASS OF FUEL SALT.

REACTOR ANALYSIS - [illegible] - [illegible] - MOLTEN SALT - REACTOR DESCRIPTION - REACTOR KINETICS - [illegible] - [illegible] - ENVIRONMENTAL PROTECTION AGENCY REPORT

[illegible]
[illegible]
TRITIUM TRANSPORT IN [illegible]
[illegible] NATIONAL [illegible] HISTORY, [illegible]
[illegible] 1976

A [illegible] THE TRANSPORTATION AND DISTRIBUTION OF TRITIUM IN A [illegible] FAST [illegible] REACTOR. THE MODEL WAS [illegible] SUCCESSFULLY USED TO COMPARE TRITIUM [illegible] THE EXPERIMENTAL BREEDER REACTOR-II (EBR-II). PROJECTED TRITIUM [illegible] IN THE FAST [illegible] TEST FACILITY (FFTF) HAVE BEEN CALCULATED FOR A RANGE OF [illegible]. IT IS ESTIMATED THAT [illegible] TRITIUM WILL BE RELEASED [illegible] OF TRITIUM [illegible] PER DAY OF FULL POWER (400 MWT) OPERATION, COMPARED WITH THE [illegible] RELEASE [illegible] IS ABOUT A MILLIONTH WHEN OPERATING AT [illegible] MWT.

AVAILABILITY - LIMITED ASSUMPTIONS DISTRIBUTION [illegible] REQUESTS TO NTIS TECHNICAL INFORMATION CENTER, P.O. BOX 62, [illegible], TENN. 37830

COMPUTER PROGRAM - [illegible] - FISSION PRODUCT RELEASE - RELEASE RATE - FISSION PRODUCT TRANSPORT - [illegible] - [illegible] - [illegible]

[illegible]
[illegible] JR • [illegible] FS • [illegible] R
SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL AND ZIRCALOY-2
[illegible] STATE UNIVERSITY, [illegible]
[illegible] PAGES. 8 FIGURES. [illegible] REFERENCES. J. NUCLEAR MATERIALS. [illegible], PP. 307-324 OCTOBER 1973

TRITIUM DIFFUSION MEASUREMENTS DURING TRITIUM ANODIC [illegible] AUSTENITIC STAINLESS STEELS AND ZIRCALOY-2 EXPOSED TO [illegible] HYDROGEN TRANSPORT ON THE SURFACE OXIDES FROM IN THE BULK. [illegible] ABSORPTIONS OF TRITIUM RELEASE RATE. THESE MATERIALS INDICATE THAT THE RELEASE IS CONTROLLED BY A DIFFUSION CONTROLLED [illegible] THAT IS TWO TO THREE ORDERS OF MAGNITUDE LOWER THAN THE BULK DIFFUSION CONSTANT FOR TRITIUM IN STAINLESS STEEL AND SEVEN TO EIGHT ORDERS OF MAGNITUDE LOWER IN ZIRCALOY-2. A TWO-DIMENSIONAL CLASSICAL DIFFUSION MODEL WITH DIFFERENT DIFFUSION COEFFICIENTS IN EACH REGION HAS BEEN DEVELOPED WHICH APPEARS TO ADEQUATELY DESCRIBE THE SURFACE DATA FOR SHORT HEATING TIMES. RELEASE RATES AT LONG HEATING TIMES ARE APPARENTLY INFLUENCED BY TRAPPING OF HYDROGEN IN SURFACE FILMS. THE SURFACE EFFECTS ARE SEEN NOT TO BE DUE TO THE HELIUM WHICH IS INJECTED INTO THE SPECIMENS ALONG WITH THE TRITIUM.

DIFFUSION • HYDROGEN • ANALYTICAL MODEL • STEEL, STAINLESS • ZIRCALOY

[illegible]
[illegible] LE • MILLER DJ • JOHNSON AL
TRITIUM AND NOBLE-GAS FISSION PRODUCTS IN THE NUCLEAR FUEL CYCLE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-[illegible] •, 70 PAGES. 25 TABLES. 26 FIGURES. OCTOBER 1974

A REVIEW OF THE GENERATION OF TRITIUM AND NOBLE-GAS FISSION PRODUCTS IN NUCLEAR REACTORS IS PRESENTED. THE SOURCES OF TRITIUM CONSIDERED INCLUDE FISSION AND ACTIVATION OF POISONS AND IMPURITIES IN COOLANTS. THE NOBLE GASES INCLUDED IN THIS REVIEW ARE LIMITED TO FISSION PRODUCTS, WITH EMPHASIS ON THE LONG-LIVED SPECIES. REACTOR TYPES SURVEYED INCLUDE LIGHT WATER REACTORS, HIGH-TEMPERATURE GAS-COOLED REACTORS, AND LIQUID-METAL-COOLED FAST BREEDER REACTORS. DATA INDICATIVE OF THE NORMAL OPERATING PROCEDURES HAVE BEEN EXPANDED TO PROVIDE ESTIMATES OF THE QUANTITIES OF TRITIUM AND NOBLE GASES AND THEIR DELIVERIES EXPECTED AT VARIOUS POINTS ALONG THE FLOW PATH FOR BOTH GASEOUS AND LIQUID WASTE STREAMS. DATA ARE NORMALIZED TO AN EQUIVALENT TO 1000 MWE-YR TO PERMIT COMPARISON WITH PRESENT-GENERATION REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GAS • FISSION PRODUCT RELEASE • [illegible] • REACTOR, PWR • [illegible] • REACTOR, HTGR • REACTOR, LMFBR • FUEL CYCLE

[illegible]
SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS
WESTINGHOUSE ELECTRIC CORP., PA.
WCAP-8253 •, 207 PAGES. JUNE 11, 1974

THIS IS A COMPILATION OF OPERATING PLANT DATA THROUGH JUNE 1973 WHICH IS APPLICABLE TO THE EVALUATION OF PWR PRIMARY TREATMENT SYSTEMS AND THE CALCULATION OF RADIOACTIVE EFFLUENT SOURCE TERMS. CONCENTRATIONS OF FISSION AND CORROSION PRODUCTS IN THE RCS, IODINE SEPARATION FACTOR, PRIMARY TO SECONDARY LEAK RATES, AND TRITIUM RELEASE DATA FROM OPERATING WESTINGHOUSE PWR'S ARE PRESENTED. AN EXPECTED I-131 CONCENTRATION MODEL HAS BEEN DEVELOPED WHICH IS OFFERED AS A REPLACEMENT FOR THE INFERRED FUEL DEFECT MODEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545. [illegible] CENTS/PAGE -- MINIMUM CHARGE $3.00

FISSION CRITERIA • EFFLUENT • FISSION PRODUCT, IODINE • REACTOR, PWR • RELEASE RATE • WASTE TREATMENT • ANALYTICAL MODEL • REACTOR COOLANT • CORROSION • FISSION PRODUCT ACTIVITY, GASES • OPERATING EXPERIENCE • RADIATION SOURCE, INTERNAL • WESTINGHOUSE

[illegible]
WALLS CC • MILLER S • [illegible] EB
TRITIUM RETENTION IN EBR-II-IRRADIATED PERCH CARBIDE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-[illegible] •, 19 PAGES. 6 FIGURES. 13 REFERENCES. JUNE 1974

IRRADIATED BORON CARBIDE SAMPLES WERE ANALYZED AND SHOWED THAT ESSENTIALLY ALL THE TRITIUM PRODUCED BY THE NUCLEAR PROCESSES IS RETAINED BY THE BORON CARBIDE. RATES OF TRITIUM EVOLUTION AFTER IRRADIATION WERE MEASURED AND THE RESULTS INDICATE THAT TRITIUM IS SUBSTANTIALLY RETAINED IN BAC AT TEMPERATURES HIGHER THAN THOSE IN EBR-II, BUT CONSIDERABLE LOSS OCCURS AT TEMPERATURES ABOVE 700 C.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBIDE • FISSION PRODUCT RETENTION • RETENTION

[illegible]
SANDERS JP
HTGR SAFETY STUDIES PROGRESS REPORT FOR THE PERIOD ENDING DECEMBER 31, 1973
OAK RIDGE NATIONAL LABORATORY, TENNESSEE

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AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

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A CORRECTION OF [illegible] IS [illegible] TO [illegible] THE [illegible] SAFETY [illegible] [illegible]. THE FOLLOWING [illegible] IS AN ALPHABETICAL LISTING OF THE [illegible] [illegible] TO [illegible] ARTICLE [illegible] [illegible] [illegible].

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II Operating Experience

II - OPERATING EXPERIENCE

000091
RODRIGUEZ RL • ANDERSON LD
ASSESSMENT OF POTENTIAL RADIOLOGICAL HAZARDS FROM PROJECT DULCINEA
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-50701 •. 35 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 10, 1969

THIS REPORT EVALUATES THE OFF-SITE RADIOLOGICAL HAZARDS ASSOCIATED WITH THE PROPOSED RECOVERY AND TESTING OPERATIONS. UNDER PLACING OF THE NATURAL GAS IS BEGUN THE MAJOR STEPS TO BE DELEGATED WELL OF TRITIUM. THE REPORT THEREFORE CONSIDERS SPECIAL QUESTIONS CONCERNING THE BIOLOGY AND PHYSICS OF TRITIUM IN THE LIGHT OF THE DATA AVAILABLE IN THE LITERATURE. THE GENERAL CONCLUSIONS ARE THAT ORDINARY CALCULATIONS OF ASSUMED DOSE BASED ON ENERGY UNIFORMLY DISTRIBUTED THROUGHOUT A VOLUME ARE SUFFICIENT TO DESCRIBE THE ASSUMED EFFECTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GAS • BIOCHEMISTRY • PHYSIOLOGY • HAZARD, RELATIVE • TESTING • NUCLEAR EXPLOSION • DOSE CALCULATION, EXPERIMENT • RADIOBIOLOGY • GAS • OFF SITE • COMPOUND PRODUCT • ABSORPTION • DECONTAMINATION • RADIATION EFFECT

000092
SELECTED ITEMS OF INTEREST
SOUTHERN CALIFORNIA EDISON COMPANY
ORINDY 70-300 •. 8 PAGES, SAN ONOFRE SEMIANNUAL REPORT NO. 6, JULY 10, 1972, TYPE--PWR, NDS--WEST., NE--DOCKET

ONE OF A SERIES OF OPERATING REPORTS. TOPICS INCLUDE HOURS OF USE, SHUTDOWNS, RADIOACTIVITY LEVELS, RADIOAC RELEASES, TESTING, AND DESIGN CHANGES AND MAINTENANCE. ONE REACTOR WAS TAKEN OFF LINE TWICE. ONCE FOR A ROUTINE TURBINE TEST AND MISCELLANEOUS MAINTENANCE AND ONCE TO REPAIR A REHEATER TUBE LEAK AND TO MODIFY PACKING ON SEVERAL VALVES. DURING STARTUP, THE REACTOR WAS TRIPPED WHEN THE FOLLOWING ACCELERATION RATE WAS EXCESSIVE. ONE LIQUID RELEASES INCLUDED A TOTAL OF 1.01 CURIES OF BETA-GAMMA AND 2742 CURIES OF TRITIUM. GASEOUS RELEASES HAD A TOTAL OF 240 CURIES OF BETA-GAMMA AND 0.2 CURIES OF TRITIUM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

MAINTENANCE AND REPAIR • PROPERTY, OPERATIONS • REACTOR, PWR • SAN ONOFRE 1 (PWR) • MODIFICATION • RADIOACTIVITY RELEASE • GAS • LIQUID • OPERATING EXPERIENCE

000094
MORECRAFT WT
TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR
ATOMIC ENERGY OF CANADA, LIMITED, CHALK RIVER, ONTARIO, CANADA
6 PAGES, 2 FIGURES, 1 TABLE, 2 REFERENCES- AM. INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24- 07-08 (1963)- APCL-3097

TO CONTROL THE HAZARDS OF TRITIUM EXPOSURES AT THE NRX REACTOR OF ATOMIC ENERGY OF CANADA LIMITED, A LIMITED SAFETY PROGRAM EMPHASIZES EDUCATION, MONITORING, EXHAUST VENTILATION, PROTECTIVE CLOTHING, AND BIOCHEMICAL ANALYSES FOR TRITIUM IN THE BODY. THE DCRP STANDARD OF 5 X 10 MEMBS 6 MU C/CM 3 IS USED FOR MAXIMUM PERMISSIBLE EXPOSURE. TRITIUM RELEASE IS CONTROLLED BY OPERATIONAL PROCEDURES AND VENTILATION.

CANADA • HEALTH PHYSICS TRAINING • REACTOR, NRX • PERSONNEL PROTECTIVE DEVICE • RADIATION SAFETY AND CONTROL

000270
JACKSON DP
EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
15 PAGES, 4 FIGURES, 1 TABLE, 7 REFERENCES- MAY 1964, A/CONF. 28/P.173- PRESENTED AT THIRD U. N. INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, AUGUST 31-SEPTEMBER 9, 1964- INFO

THE PRINCIPAL FEATURES OF THE THREE SIMILAR U.K. HEAVY WATER HIGH FLUX RESEARCH REACTOR, DIDO AND PLUTO AT HARWELL AND THE DOUNREAY MATERIALS TESTING REACTOR ARE BRIEFLY RECALLED. BRIEF MENTION IS MADE OF THE HEALTH PHYSICS ARRANGEMENT TO DETECT AND CONTROL LEAKAGE OF RADIOACTIVE SPECIES FROM EITHER THE REACTOR OR EXPERIMENTS INTO THE ENVIRONMENT. EXPERIENCE OF TRITIUM IS PARTICULARLY DISCUSSED.

MONITOR, GENERAL PRACTICE • REACTOR, RESEARCH • UNITED KINGDOM • OPERATING EXPERIENCE SUMMARY

000301
MATICVUKMIROVIC Z • RIGHIMAR SV • DEMUKAMOV D • DOMAILOVIC L • MADZISEMOVIC M
DETERMINATION OF THE TRITIUM BUILD-UP IN A HEAVY WATER MODERATED REACTOR
BORIS KIDRIC INSTITUTE OF NUCLEAR SCIENCES, YUGOSLAVIA
10 PAGES, 2 FIGURES, 3 TABLES, 13 REFERENCES- MAY 1964, A/CONF. 28/P/704- PRESENTED AT THIRD U. N. INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, AUGUST 31-SEPTEMBER 9, 1964- INFO

FROM OCTOBER 1959 TO NOVEMBER 1963 THE BUILD-UP AND DISTRIBUTION OF TRITIUM WAS INVESTIGATED IN THE RA REACTOR AT VINCA, YUGOSLAVIA. AN INCREASE OF THE TRITIUM ACTIVITY FROM 7 TO 470 MICROCURIES PER MILLILITER OF HEAVY WATER WAS FOUND. THE TRITIUM BUILD-UP CORRESPONDS TO THE

004961 (CONTINUED)
REACTOR HEAVY WATER HISTORY. IT WAS SHOWN THAT TRITIUM DOES NOT ESCAPE SIGNIFICANTLY FROM THE HEAVY WATER WITH THE HYDROGEN GAS FORMED BY RADIOLYSIS. IT IS FURTHER DETAILED IN THE HEAVY WATER DOSE TO A RADIATION CONTROLLED CHEMICAL EXCHANGE REACTION AND KINETIC ISOTOPE EFFECTS.

REACTOR, HWR

004614
RUSSOMANO
DIFFUSION OF RADIOACTIVE GASES THROUGH FILMS
TAYLOR UNIVERSITY, UPLAND, INDIANA
4 PAGES, 2 FIGURES- ABSTRACT ONLY AVAILABLE. TID-7600- 7TH ANNUAL RADIOISOTOPE CONFERENCE. RESEARCH APPLICATIONS TO PHYSICAL SCIENCE AND ENGINEERING, APRIL 1-4, 1963, PP. 66-67- UNCLASSIFIED

THE RATE AT WHICH RADON, TRITIUM OR TRITIATED METHANE IS TRANSMITTED THROUGH THE SHEET OR FILM IS EVALUATED BY MEASURING CHANGES IN CONCENTRATION OF THE RADIOACTIVE GAS IN EACH FLASK AS A FUNCTION OF TIME. THESE CHANGES ARE EVALUATED BY WITHDRAWING DUPLICATE SAMPLES OF GAS PERIODICALLY FROM EACH FLASK INTO EVACUATED 1 ML. GLASS SAMPLING TUBES. RADON GAS SAMPLES ARE ASSAYED BY COUNTING THE GAMMA DECAY PRODUCTS WITH A WELL-TYPE NAI SCINTILLATION DETECTOR. THE TRITIUM CONTENT OF THE GAS SAMPLES IS ASSESSED WITH THE VIBRATING REED ELECTROMETER. GAS TRANSMISSION RATES HAVE BEEN INVESTIGATED AT ROOM TEMPERATURE, AT 0 DEGREE AND AT 100 DEGREE C. TYPICAL CURVES ARE SHOWN IN FIG. 2.

DIFFUSION • ELEMENTS AND ISOTOPES

004247
WOLLEFEN WF • PLEN FW • COOK JE • CARDINER DL • JONES DT • MARTIN A
HEALTH PHYSICS CENTRAL GB A.E.R.E. RESEARCH REACTORS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
87 PAGES, FIGURES, TABLES, REFERENCES, MARCH 1964, AERE-R 4520- UNCLASSIFIED

A BRIEF DESCRIPTION IS PROVIDED OF THE AERE REACTORS. THE HISTORY OF THE HAZARDS INVOLVED IN THEIR OPERATION IS SURVEYED AND CONTROL AND SAFETY MEASURES ARE DESCRIBED. POTENTIAL HAZARDS FROM TRITIUM EXPOSURE ARE REVIEWED. THE POWER AND FACILITIES FOR STORING SPENT FUEL ELEMENTS FROM DIDO REACTORS ARE DESCRIBED.

INCIDENT, EXPOSURE • REFUELING • EFFLUENT • FISSION PRODUCT RELEASE • FUEL HANDLING • DIDO • MONITOR, PERSONNEL • HAZARD, RELATIVE • FUEL STORAGE • UNITED KINGDOM • AERE • HPD • PLANT PROTECTIVE SYSTEM • MONITOR • PERSONNEL EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL • CONCENTRATION • HWR

004454
BAKKEN OK • FIRING JA • JAMES E • KNUDSEN HD • MOELLER T • PORFEIDE H
OPERATING EXPERIENCE WITH HBWR ON ITS SECOND FUEL CHARGE
INSTITUTE FOR ATOMENERGI, KJELLER, NORWAY
62 PAGES, FIGURES, TABLES, NOVEMBER 1964, NPR-46- UNCLASSIFIED

MEASUREMENTS MADE AT VARIOUS ELEMENT TEMPERATURE AT POWER TO ESTABLISH NORMAL LIMITS. FOUR HEAVY WATER-LOSS INCIDENTS- ONE WAS LEAKAGE IN REACTOR COOLANT THROUGH TWO SERIES VALVES LOCKED CLOSED WHEN COLD. HEATING VALVES ALLOWED A SLIGHT OPENING- RESULTANT VIBRATION CAUSED MORE LEAKAGE INTO A HOLDUP TANK. THE HOLDUP TANK WAS VENTED THROUGH A MOISTURE TRAP AND PLASTIC TUBING. THE PLASTIC TUBE COULD NOT WITHSTAND THE HIGH TEMPERATURE STEAM. THE LEAKAGE RESULTED IN A POWER LEVEL DECREASE CAUSED BY LOW REACTOR WATER LEVEL. NEW GRAPHIC PANELS WERE ADDED TO LESSEN MAL-OPERATION. UNIQUE WATER LEVEL DETECTION USES 2 NEUTRON DETECTORS.

ADMINISTRATIVE CONTROL • REACTOR, HWR • POWERPOUT HEAT FLUX • REACTOR, HWR • FAILURE, PIPE • SCRAM, REAL • OUT OF PILE EXPERIMENT • OPERATING EXPERIENCE SUMMARY • INCIDENT, EQUIPMENT • INSTRUMENT, LIQUID LEVEL • NORWAY • TECHNICAL SPECIFICATIONS • RADIATION SAFETY AND CONTROL

007127
ARTHUR DJ
CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATION, JANUARY-DECEMBER, 1966
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
23 PAGES- 1966, HW-90460- CFSTI

THE CONCENTRATION OF RADIONUCLIDES DETECTED IN GROUND WATER SAMPLES COLLECTED DURING 1965 AND 1966 FROM OVER 500 MONITORING WELLS AT BATTELLE NORTHWEST ARE REPORTED. IN ADDITION, GROSS BETA RESULTS OF WATER SAMPLES TAKEN FROM CONFINED AQUIFERS ARE PRESENTED AND THE RESULTS OF SPECIAL TRITIUM ANALYSES ARE REPORTED.

GEOLOGY • GROUND WATER • MONITOR, LIQUID • WASTE DISPOSAL • GROSS BETA • GROUND WATER, NUCLINE OCCURRENCE • GROUND WATER, TRACER • BATTELLE NORTHWEST

009977
KAPP W
TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966
TRACERLAB
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 122171- 93 (MARCH 21, 1966)

000002 [illegible]
[illegible] TRITIUM CONTAMINATED OBJECTS WERE [illegible], AND PLACED IN WASTE [illegible] TO BE REMOVED [illegible]. [illegible] DURING THE CLEANUP PRIOR TO PUTTING [illegible] A RECEIVING PROPERTY. TRITIUM MAY HAVE BEEN RELEASED.

WASTE DISPOSAL • OCCUPATIONAL EXPOSURE, RADIATION

000005
PARKER RW
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 2[illegible], 1966
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 17[illegible]- 20 MARCH 21, 1966

A TRITIUM EXPOSURE MAY RESULT IN A WHOLE BODY EXPOSURE OF 5 REM, DUE TO HANDLING TRITIATED WATER DURING PRODUCTION OF AN ORGANIC COMPOUND.

OCCUPATIONAL EXPOSURE, RADIATION • PRODUCTION, REACTOR

000007
HEALEAN CR
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 17[illegible]; PAGE 46, APRIL 11, 1966

A CHEMIST OPENED AN EVACUATED SYSTEM SEVERAL TIMES IN A HOOD, TO ADD MATERIAL TO TRITIATED WATER. HIS CUMULATIVE INTERNAL EXPOSURE WAS 6.26 REMS DURING A THREE-WEEK PERIOD.

OPERATOR, OPERATOR ERROR • OCCUPATIONAL EXPOSURE, RADIATION

000009
TRITIUM CONTAMINATION AT THEODORE R. SCHROEDER, INC.
DIVISION OF STATE AND LICENSEE RELATIONS, USAEC
2 PAGES, APRIL 16, 1966, ATOMIC ENERGY CLEARING HOUSE, 17[illegible], PAGES 20-21 (MAY 30, 1966)

AEC INSPECTION REVEALED THAT EMPLOYEES LEAVING TRITIUM PAINTING AREAS HAD [illegible] DISPERSED OF REMOVABLE TRITIUM ON THEIR HANDS AND STAFF SHOES. EMPLOYEES MAY [illegible] THEMSELVES WITH AN ULTRAVIOLET LIGHT USED FOR LUMINOUS PAINTS INSTEAD OF AGAINST TRITIUM. IN ADDITION, CONTAMINATED CLOTHES ARE DRYCLEANED WITHOUT WASHING, INADEQUATE CHANGE ROOMS EXIST, AND CONTAMINATED GLOVE HOLDERS ARE PASSED INTO UNRESTRICTED AREAS. AEC INDICATES THAT OTHER PAINTERS WITH CAREFUL HOUSEKEEPING CAN OPERATE WITHIN THEIR LIMITS.

DECONTAMINATION • OPERATORS, ADMINISTRATIVE CONTROL

010001
WRIGHT RB
TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 7, 1966
U. S. RADIUM CORPORATION
1 PAGE, JUNE 7, 1966, ATOMIC ENERGY CLEARING HOUSE, 17[illegible], PAGE 29 (JULY 4, 1966)

AN INDIVIDUAL DRESSED AVERAGED 30 PICOCURIES OF TRITIUM PER LITER FOR 7 [illegible]. ONE OF THE CONTAMINANTS MAY PRESENT EXPOSURE HAZARDS OF LEAKING TRITIUM-FILLED GLASS TUBES, AND BRING YOU CLOSE TO A FEDERAL GAS-FILLING PLANT.

OCCUPATIONAL EXPOSURE, RADIATION • EQUIPMENT, REACTOR • FAILURE, ADMINISTRATIVE CONTROL

010060
PENNOCK LE
YANKEE OPERATION REPORT NO. 66, FOR THE MONTH OF JUNE, 1966
YANKEE ATOMIC ELECTRIC COMPANY
15 PAGES, 2 FIGURES, JULY 27, 1966, DOCKET 50-29, PWR

REPORTS IN THIS SERIES WILL BE INDEXED AS PERTINENT ITEMS ARE REPORTED. SIXTY-HOUR CONTAINMENT LEAK RATE AVERAGED 0.011 PERCENT PER DAY, AND EXTRAPOLATED TO 0.13 PERCENT PER DAY AT TEST PRESSURES. A PH.D. CANDIDATE TESTED A PORTABLE GAMMA SPECTROMETER IN CONTAMINATED WATERS. NITROGEN BOTTLE INSTALLED FOR ALTERNATE AIR PRESSURE FOR VALVES IN STEAM-DRIVEN EMERGENCY BOILER FEED PUMP. PRIOR TO RESIN REMOVAL, IN-CORE INSTRUMENTS EVALUATED AT ABOUT 7.7, VS TOUGH 1.0, AND MINIMUM GAGE 9.70. FOLLOWING DILUTION, I-131 CONTENT DOUBLED. TRITIUM AVERAGED 7.6 PICOCURIES PER MILLILITER IN PC, AND SOME 495 PC GROSS BETA-GAMMA AND SO[illegible] 140 C TRITIUM DISCHARGED FROM WASTE-DISPOSAL SYSTEM.

REPORT, OPERATIONS • REACTOR, PWR • POISON, SOLUBLE • YANKEE ROWE (PWR) • UNIT SPOT

011010
COOPER G • KNIGHT GA • PRUE RC
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1965

[illegible] [illegible]
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-[illegible] c. 16 PAGES, 0 FIGURES, 3 TABLES, FEBRUARY 1966. AECL 00.40 CY

AN ANALYSIS OF OCCUPATIONAL RADIATION EXPOSURES RECEIVED BY WORKERS AT AECL SITES IN 1964 HAS BEEN CARRIED OUT ON VACUUM ACCOUNTING METHODS. RESULTS ARE PRESENTED IN TABLES AND GRAPHS.

MEASURE • DOSE MEASUREMENT, EXTERNAL • OCCUPATIONAL EXPOSURE, RADIATION

[illegible]
GRELLON CO
TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966
NEW ENGLAND NUCLEAR CORPORATION, OPTION, MASSACHUSETTS
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 1[illegible]500, PAGES 20-21 [illegible] 12, 1966

[illegible] DURING THREE WEEKS IN EARLY OCTOBER 1966, A TECHNICIAN RECEIVED 0.4 REM INTERNAL EXPOSURE FROM TRITIUM GAS TO THROUGHOUT AND VELOCITY ON HEAD. THE RADIOLOGICAL SAFETY TECHNICIAN WELL NOW REPORTED ON VELOCITY DURING ANY CONTAMINATION SURVEY. [illegible] DURING LATE OCTOBER, A JUNIOR CHEMIST RECEIVED AN INTERNAL TRITIUM EXPOSURE DUE TO UNNOTICED DECONTAMINATION OF A VACUUM LINE BECAUSE HIS SUPERVISOR FAILED TO REVIEW THE OPERATION.

OCCUPATIONAL EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL • FAILURE, ADMINISTRATIVE CONTROL

[illegible]
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM
SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE
CEND-[illegible] c. 190 PAGES, TABLES, SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM, LE VESINET, FRANCE, APRIL 16-20, 1964, IN FRENCH

THE 29 PAPERS, [illegible] WITH THE DISCUSSIONS FOLLOWING THESE PRESENTATIONS, PRESENTED AT THE SEMINAR AT LE VESINET ON PROTECTION AGAINST THE DANGERS OF TRITIUM ARE COMPILED.

AVAILABILITY - SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE, FREE.

FISSION PRODUCT RELEASE

[illegible]
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 1[illegible] PAGES 20-21 [illegible] 16, 1967

[illegible] RECEIVED 0.40 REM TRITIUM DOSE AFTER THE BREAKING OF A GLASS [illegible] VESSEL BY A SPRAYING GAS, WHILE INCORPORATING ITS CONTENTS OF TRITIUM INTO A PLASTIC.

[illegible], OPERATION FROM • OCCUPATIONAL EXPOSURE, RADIATION

[illegible]
[illegible] • [illegible] [illegible]
INVESTIGATION OF TRITIUM CONTAMINATION AND RELEASE IN PWR NUCLEAR POWER PLANTS
BATTELLE MEMORIAL INSTITUTE
BMI-1707 c. 121 PAGES, OCTOBER 31, 1966

THE PRIMARY FISSION PROCESS IS THE MAJOR SOURCE OF TRITIUM, FOLLOWING USE OF LITHIUM-BORED [illegible] IN 1964 CONTRIBUTED AT THE RATE OF 0.7 X 10 TO THE 5TH TRITIUMS PER FISSION. THE DISSOLVENT TRITIUM DIFFUSES THROUGH THE CLAD. WATER SAMPLES WERE ASSAYED, AND A MATHEMATICAL MODEL DESCRIBING TRITIUM GENERATION AND MOVEMENT THROUGHOUT PWR PLANTS WAS DEVELOPED. THE RESULTING PROGRAM, TRICON, WAS EMPLOYED TO CALCULATE TRITIUM CONCENTRATIONS AT PM-96 DURING 1965. AGREEMENT BETWEEN CALCULATED AND MEASURED CONCENTRATIONS WAS GOOD. [illegible] HEALTH HAZARDS FROM BOTH DISCHARGE AND WATERBORNE TRITIUM WERE CALCULATED. THE MOST PECUNIARY SOLUTION AT PM-1 APPEARS TO BE THE REFUSAL TO TRITIATED EFFLUENT FROM THE PLANT SITE AT $1.40 PER GALLON, AND AT PM-96 TO BE THE TRAPPING OF TRITIATED EFFLUENT WATER TO AN ISOLATED AREA WHERE IT WILL DECAY AND SUBLIME TO SAFE CONCENTRATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, $3.00 COPY, $0.65 MICROFICHE

COMPUTER PROGRAM • COMPUTER, DIGITAL • REACTOR, PWR • WASTE DISPOSAL, LIQUID • HAZARDS ANALYSIS • PM 1 (PWR) • PM 96 (PWR) • PRIMARY COOLING SYSTEM • REACTOR, MILITARY

[illegible]
JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967
JOHNS HOPKINS UNIVERSITY, BALTIMORE
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 1[illegible], PAGE 30, MARCH 13, 1967

JOHNS HOPKINS REPORTS FEB. 21, THAT 10 CURIES OF TRITIUM (IN URANIUM MONITORS) WERE RELEASED AS A GASEOUS TYPE GROUP AND THE UP DURING SPECTROSCOPY. THE SYSTEMS WERE PURGED TO 3 MPC AIR, WHICH SPECIMENS FOUND AT 0.1 MPC. VENTILATION SYSTEM SPREAD OF CONTAMINATION THROUGHOUT BUILDING.

[illegible]
INCIDENT OCCURRED AT 6 PM.

[illegible] • VENTILATION SYSTEM • INCIDENT • OCCUPATIONAL EXPOSURE, RADIATION

[illegible]
[illegible] AT US PROBE CORP., DEC. 15, 1966
U.S. PROBE CORPORATION
2 PAGES. ATOMIC ENERGY CLEARING HOUSE 19(11). PAGES 35-36, MARCH 15, 1967

U.S. PROBE CORP., REPORTS JAN. 26 THAT AN R AND D SECURITY GUARDED ARM CONTAINING TRITIUM FROM A LEADED GLASS TUBE FELL FROM FACILITY. LATE REPORTING IS DUE TO ORIGINAL USE OF SUPPOSEDLY TRITIUM ARC CAUSED INDICATED NO CONTAMINATION. IF THE SOLUBLE ARC VALUE IS USED, ACCURATE CONDITION HAD TRITIUM PLANT, AN UNDETERMINED QUANTITY. IN ADDITION, AIR FOR CHANGES INDICATED .00 TIMES HIGHER THAN AN INTENDED SAMPLE.

OPERATIONS, EQUIPMENT • SIMULATION • ARC • INCIDENT, EQUIPMENT • OCCUPATIONAL EXPOSURE, RADIATION

[illegible]
TRITIUM EXPOSURE AT U.S. PROBE CORP. JAN. 11, 1967
U.S. PROBE CORPORATION
1 PAGE. ATOMIC ENERGY CLEARING HOUSE 19(11). PAGE 36. MARCH 15, 1967

U.S. PROBE CORP., JAN. 25, REPORTS THAT A GAS PROBE WAS EXPOSED TO 1.44 MCI. DUE TO ITS AN ACCUMULATION OF PREVIOUS PROBED GASES WENT TO THE MACHINE. (2) OCCASIONAL CONTAMINATION OF SAMPLING-TRAPS CONTAINERS (DRY GAS METER). THE MACHINE IS COMPLETELY FACILITIZE AND NOT AT HOMES 1 HOURS VERSUS PRESSURE. ALTHOUGH THE AIR FLOW IS BARELY PERCEPTIBLE.

[illegible] • VENTILATION SYSTEM • INCIDENT • OCCUPATIONAL EXPOSURE, RADIATION • FACILITY, DESIGN CHANGE • FACILITY, ADMINISTRATIVE CONTROL

[illegible]
[illegible] REACTOR SYSTEM MONITORING DATA
NATIONAL COOPERATIVE POWER ASSOCIATION
COO-[illegible]-32 P. 61 PAGES. 30 FIGURES. SEPTEMBER 1966

[illegible] OF REPORT IS DATA ON NITROGEN-16 AND ARGON-41 ACTIVITY LEVELS IN PLANT LOCATIONS AND SYSTEMS. TRITIUM REACHES EQUILIBRIUM ABOUT 3 HOURS AFTER A CYCLE STARTUP, BUT ONLY 1/100th OF THAT EXPECTED. [illegible] IN COOLANT IS RELATED TO CRUD DEPOSITS, INDICATING THAT CRUD IS A MAJOR MECHANISM. REACTOR-OFFGAS SYSTEM [illegible], FILTER, ETC.) HAS TRIED OUT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

REACTOR, GAS • FLA GAMMA (ANY) • REPORT, OPERATIONS ANALYSIS • GAS GAS • MONITORING SYSTEM, RADIATION • SURVEILLANCE PROGRAM

[illegible]
JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE
JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD.
2 PAGES. ATOMIC ENERGY CLEARING HOUSE 19(11). PAGE 25 AND 26 AUGUST 14, 1967

(1)(ETTER, JUNE 6) INSPECTION AFTER A RELEASE OF 30 CURIES OF TRITIUM INTO AN UNRESTRICTED AREA ON FEBRUARY 20 REVEALED (1) TRITIUM PRODUCTION, BUT NO VALID ARC LICENSE. (2,3) SURVEYS FOR AIRBORNE TRITIUM WERE INADEQUATE. (4) THE INDIVIDUALS WERE EXPOSED TO ABOVE ARC FOR TRITIUM. (5-7) TRITIUM WAS SPILLED IN AN UNRESTRICTED, UNPOSTED AREA AND RECORDS NOT KEPT. (8) THE PROBLEM IN ITEM 4 AND THE RELEASE ITSELF WERE NOT REPORTED IN WRITING. THERE APPEARS TO BE A LACK OF CENTRAL CONTROL OF PROCUREMENT AND USE OF BY-PRODUCT MATERIAL, WITH NO ONE ASSIGNED OVERALL RESPONSIBILITY TO ENSURE COMPLIANCE WITH LICENSES.

AIRBORNE RELEASE • COMPLIANCE • INCIDENT • RADIATION SAFETY AND CONTROL • FACILITY, ADMINISTRATIVE CONTROL

[illegible]
[illegible] • [illegible]
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1966
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-2670 P. 14 PAGES. 4 FIGURES. 2 TABLES. FEBRUARY, 1967

AN ANALYSIS OF OCCUPATIONAL RADIATION EXPOSURES RECEIVED BY WORKERS AT AECL SITES IN 1966 WAS CARRIED OUT BY MACHINE RECORDING METHODS. RESULTS ARE PRESENTED IN TABLES AND GRAPHS.

AVAILABILITY - ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO, CANADA, $0.50 COPY

CANADA • DOSE • DOSE CALCULATION, INTERNAL • DOSE CALCULATION, EXTERNAL • OCCUPATIONAL EXPOSURE, RADIATION

071990
[illegible]
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2756 • CONF-670710-1 •. 17 PAGES, 6 FIGURES, 4 TABLES, 7 REFERENCES, JULY 1967, PRESENTED AT SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL, ALBUQUERQUE, N. MEX.

THE GROWTH OF THE TRITIUM ASPECT HAZARD IN THE NPU REACTOR BUILDING IS REVIEWED, AND THE METHODS AND PROMISING GADGETS INTRODUCED TO AIDED THE HAZARD UNDER CONTROL ARE OUTLINED. WHO RATINGS ARE CLASSIFIED AS PERMANENT, CAUTION, FORCE, OR NEGLIGIBLE. DEPENDING ON THE WHO CONCENTRATION IN WATER. SEVERAL EXPOSURES (20 MICROCURIES/LITER) ARE INVESTIGATED, AND A REPORT ON THE EXPOSURE INCIDENT IS DISTRIBUTED TO ALL BRANCHES. THE AVERAGE WHO DOSE RECEIVED IN 40 SEVERAL EXPOSURES IN 1966 WAS 230 MREM, RECEIVED MOSTLY FROM WHOLE AND NEGLIGIBLE EXPOSURES. THE LARGEST WHO EXPOSURE RESULTED IN A DOSE OF 4700 MREM, AND 10 OTHER SINGLE EXPOSURES WERE RECEIVED 400 MREM. MOST OF THESE RESULTED FROM INTAKE OF WHO VAPORS THROUGH THE UNVENTED SKIN OF WHO WEARING AIR-SUPPLIED MASKS AND CUTTING COVERALLS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

ADSORPTION • BIOMEDICAL • CANADA • DOSE • EXPECTED, MAX • DOSE CALCULATION, INTERNAL • CHALK RIVER • DEUTERIUM

071994
SELECTED CVTR OPERATING EXPERIENCE
CONSULTANT VIRGINIA NUCLEAR POWER ASSOCIATES, INC., PARK, S. C.
32 PAGES, MONTHLY OPERATING REPORT, OCTOBER 1966

SPC 201 - EVALUATED SENSITIVITY OF VARIOUS AIRBORNE-TRITIUM MONITORING INSTRUMENTS TO MIXTURES OF TRITIUM AND FISSION GASES IN CONTAINMENT FOLLOWING A FUEL FAILURE EARLY IN THE MONTH. SEVERE DEGRADED BY A FACTOR OF 10 THAN THE ACTUAL CONCENTRATIONS. ACTUAL TRITIUM CONCENTRATION OF THE MIXTURE WAS ONLY 1/5TH THAT INDICATED. SPC 201 - ON STARTUP AFTER THE SECOND REFUELING, AFTER 1.5 HR AT 900 POWER. A FUEL FAILURE OCCURRED. TESTS THE BEST OF THE KNOWN SHOWED THIS WAS DUE TO BURN AT CONTAINING MICRO-PORO-POROSITY FUELS, AND THE GAS BLOOD SEALED LESS THAN 10 FAILED FUEL, PROBABLY CSE DEG.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CVTR (PWR) • AVAILABIL, FUEL FEEDBACK • REACTOR, MAX • REPORT, OPERATIONS • REACTOR, PRESSURE PWR • REACTOR, PWR • SEALED • PRESSURE, AIR • INSTRUMENT, ABNORMAL INDICATION

071998
YANKEE OPERATION REPORT 91 - JULY 1966
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASS.
YA-7067 •. 9 PAGES, AUGUST 20, 1966, REPORT 90-70, TYPE--PWR, MOD--WEST., AF--STEAM • WESTEO

WITH THE INCORE PLUS WORK SYSTEM REQUIRED MORE ENTRY INTO CONTAINMENT. TRITIATED AIR WAS REDUCED FROM .71 TO 0.09 CURIES/CC BY DISPOSING STEAM INTO THE WORK CONTAINER. REACTOR SHUTDOWN FOR 7DY TO REPLACE A MAIN RC PUMP SEAL. RESTARTUP A SEVERE WATER HAMMER CAME FROM PARTIAL FILLING OF A HEATER SHELL DUE BROUGHT HOT WATER FROM NO. 1 HEATER THRU A COMMON DRAIN LINE. VAPOR EMBRITTLED LEAKAGE WAS 0.0008/DAY. FUEL HIGHER WAS 0.197 PPM BORON PER MONTHS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (75 CENTS/PAGE)

AIRBORNE RELEASE • CONTAINMENT, HIGH PRESSURE • FUEL HANDLING • INSTRUMENT, IN CORE • MAINTENANCE AND REPAIR • REPORT, OPERATIONS • REACTOR, PWR • TEST, LEAK RATE • OTHERWISE MECHANICAL EFFECT • YANKEE ROWE (PWR)

070007
INTERNAL EXPOSURE TO CHEMIST TO TRITIUM
NEW ENGLAND NUCLEAR CORP., BERGEN ST., BOSTON, MASS.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 140750, PAGE 19, JUNE 17, 1969

BEFORE, DAY OF ON APRIL 4, A JUNIOR CHEMIST WAS SYNTHESIZING AN ORGANIC COMPOUND CONTAINING TRITIUM IN A WORK HOOD VACUUM DITH A GAS CHROMATOGRAPH. HE RECEIVED A CALCULATED INTERNAL SHORT-TERM EXPOSURE OF 642 MREM FROM TRITIUM AND CARBON-14. EXPOSURE WAS FROM MULTIPLE CAUSES - (1) INCORRECT USE FOR DRIFT, (2) PLACING HEAD IN THE HOOD, (3) POSSIBLE RUPTURE OF RUBBER TUBING AND LEAKS. A NEW FACE SHIELD FOR HOOD WILL PREVENT FUTURE USE OF HEAD. RUBBER TUBING WILL BE CHANGED MONTHLY. CHROMATOGRAPH FILT PORTS WILL BE DIRECTED TO THE SIDE OF HOOD RATHER THAN TO FRONT.

REVIEW DOC • FAILURE, OPERATOR ERROR • OXIDIZATION • VENTILATION SYSTEM • OPERATIONAL EXPOSURE, INGESTION • MASSACHUSETTS

077006
[illegible]
ANALYSIS OF MONITORING EXPOSURES IN 1967
ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO
AECL-3001 •. 18 PAGES, 8 FIGURES, 2 TABLES, MARCH, 1968

[illegible]
EXPOSURES TO EXTERNAL BETA AND GAMMA RADIATION AND TO INTERNAL RADIATION FROM TRITIATED WATER [illegible] ARE ANALYZED AND COMPARED WITH EXPOSURES IN PREVIOUS YEARS. THE TOTAL, AVERAGE, AND HIGHEST EXPOSURES RECEIVED AT APCL SITES IN 1967 ARE GIVEN. ABOUT [illegible] OF THE EXTERNAL AND 100% OF THE INTERNAL EXPOSURE WAS RECEIVED AT CRNL, TO WHICH NEARLY 100% WAS RECEIVED BY OPERATING, MAINTENANCE AND RADIATION CONTROL PERSONNEL. MOSTLY IN THE NPD AND NRX REACTOR BUILDINGS. THE COMBINED DOSES FROM EXTERNAL AND INTERNAL EXPOSURES TO THE WHOLE BODY, FOR LFSSFS, AND SMN, AND THEIR DISTRIBUTION AMONG GROUPS AND INDIVIDUALS, ARE REPORTED BY CALENDAR YEAR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

KEYWORDS - MONITOR, PERSONNEL • GROSS BETA • GROSS GAMMA • CHALK RIVER • RADIATION SAFETY AND CONTROL • CONCENTRATION • NRX

[illegible]
CORLEY RE
COMPARING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS
SAVANNAH RIVER LABORATORY
DPSPU-66-30-13 • CONF-660807-1 •. 15 PAGES, TABLES, MAY 1966, FROM 19TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

IN HEAVY-WATER MODERATED REACTORS, TRITIUM IS FORMED AS NEUTRONS ARE ABSORBED BY THE HEAVY WATER. HAZARDS FROM TRITIUM RELEASED TO PERSONNEL DOSES DURING REPAIR AND MAINTENANCE OPERATIONS ARE PREDICTED BY PROPER USE AND EVALUATION AND SELECTION OF CORRECT PROTECTIVE EQUIPMENT. AT SAVANNAH RIVER PLANT, BASIC INFORMATION HAS BEEN DEVELOPED TO FACILITATE THIS PROCESS. DATA IS GIVEN RELATIVE TO BUILDUP OF TRITIUM IN MODERATOR, AIRBORNE CONCENTRATIONS OF TRITIUM, CONCENTRATION OF TRITIUM IN SPILLED MODERATOR AND WATER, ASSIMILATION OF TRITIUM BY PERSONNEL THROUGH INHALATION AND BODY CONTACT, AND DOSE RECEIVED BY URINE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

REACTOR, HWR • INHALATION • ANALYTICAL TECHNIQUE • HAZARD ANALYSIS • RADIATION SAFETY AND CONTROL • SAMPLING • CONTAMINATING SYSTEM, RADIATION • CONCENTRATION • EXCITATION, SPINE • NRX

[illegible]
SELECTED NORTH ROCK OPERATING EXPERIENCE
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NYD-3750-79 •. 20 PAGES, FIGURES, TABLES, OPERATING REPORT NO. 60-11, DECEMBER 20, 1964, DOCKET 50-213, TYPE-- PWR, NSS--WEST., AE--STONE • WEBSTER

NOS. 1 AND 4 STEAM GENERATORS CANNOT BE OPERATED AT DESIGN LEVEL WITHOUT CAVITATION. ANOTHER REACTOR SCRAMMED IN NOV. FOR NO KNOWN CAUSE, THE TURBINE INDICATING A REACTOR TRIP AND THE REACTOR INDICATING A TURBINE TRIP. ON RESTART, TURBINE LOADING RECORD PORTRAYS EXCEEDING 100 MW IN SECONDS DUE TO METAL FILINGS BINDING THE FEEDBACK SLEEVE OF THE PILOT VALVE. NO REASON HAS BEEN FOUND FOR THE SCRAM. OVERINJECTION OF 19 GPM STEAM INTO CONTAINMENT REDUCED TRITIUM CONCENTRATION BY A FACTOR OF 0.1 AND 25 GPM REDUCED BY 0. TRITIUM LEVEL DROP IMMEDIATELY ON STOPPING STEAM, FINDS THAT TO BEGIN DRAINING ON INSUFFICIENT TIME LEAD HAD ONLY NEW EQUILIBRIUM LEVEL TO BE REACHED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, FOR CRYSTAL -- MICROFICHE CHARGE $2.00

REACTOR RELEASE • ACCIDENT, COLD COOLANT • FAILURE, COMPONENT • CONTAINMENT, HIGH PRESSURE • REPORT, OPERATIONS • REACTOR, PWR • STEAM • CONNECTICUT YANKEE ATOMIC • INSTRUMENT, LIQUID LEVEL • SCRAM, SPURIOUS • FLOW BLOCKAGE • INSTRUMENT, ABNORMAL INDICATION • STEAM GENERATOR • TURBINE • PARTICLE CONTAMINANT • VALVES

[illegible]
WASCHKE RE • HOWARD JP
RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS
BABCOCK AND WILCOX, LYNCHBURG, VIRGINIA
TDS-60-80 •. OCTOBER 21, 1960, P. 46

IDENTIFIES MAJOR SOURCE OF RADIOACTIVITY AND RESULTANT DESIGN AND OPERATING PROBLEMS. ISOTOPES ARGON-41, CORROSION AND FISSION PRODUCTS, TRITIUM. IMPROVED ACCESSIBILITY FOR MAINTENANCE DECREASE INTERIM POINT I STEAM GENERATORS HAVE A REPLACEMENT OF TWO PER DAYS. IN-CORE INSTRUMENT REMOVAL REQUIRES SPECIAL SHIELDING. TRITIUM AND ARGON DURING REFUELING REQUIRE AIR PURGE.

AVAILABILITY - ROBERT E. WASCHKE AND/OR JAMES R. HOWARD, BABCOCK AND WILCOX, LYNCHBURG, VIRGINIA

FISSION GAS RELEASE • MAINTENANCE AND REPAIR • REACTOR, POWER • RADIATION SAFETY AND CONTROL

[illegible]
REPORTED JP • WEL G
DETECTION OF ATMOSPHERIC CONTAMINATION IN LABORATORIES OF HIGH ACTIVITY
CEN, SACLAY, FRANCE
CONF-651220 •. 5 PAGES, PAGES 40-4 OF CONGRES INTERNATIONAL SUR LA RADIOPROTECTION DANS L'UTILISATION INDUSTRIELLE DES RADIOISOTOPES, PARIS, 17-19, DECEMBER 1964, PARIS, SERVICE CENTRAL DE PROTECTION CONTRE LES

[illegible]
[illegible], 1967

THE DIFFERENT TYPES OF ATMOSPHERIC CONTAMINATION [illegible] AT THE RADIATION CONTROL [illegible] OF THE HIGH-ACTIVITY LABORATORY OF THE SACLAY CENTRE OF NUCLEAR STUDIES ARE GROUPED AND CLASSIFIED. THE [illegible] AND IONIZATION CHAMBERS USED AS RADIOACTIVE AEROSOL DETECTORS ARE DISCUSSED ACCORDING TO THE EFFECT OF VENTILATION OF THE LABORATORY ON ATMOSPHERIC CONTAMINATION.

[illegible] - [illegible], [illegible] - FRANCE - [illegible] - [illegible], [illegible] - PLUTONIUM - ATMOSPHERIC POLLUTION - POLONIUM - POLLUTION, INSTRUMENTAL - AEROSOL, RADIOACTIVE - ALPHA RADIATION - CONTAMINATION - RADIATION SAFETY AND CONTROL

[illegible]
WILLIS [illegible] - [illegible] - [illegible] - [illegible] - BRIGGS [illegible]
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION
U. S. DEPT. OF HEALTH, EDUCATION, AND WELFARE
U. S. PUBLIC HEALTH SERVICE PUBLICATION NO. [illegible], [illegible] PAGES, [illegible] FIGURES, [illegible] TABLES, AND [illegible] REFERENCES, FEB. 1968

TRITIUM-METALLIC TARGETS ARE FREQUENTLY USED IN MANY PARTICLE ACCELERATORS FOR THE PRODUCTION OF HIGH-ENERGY NEUTRONS. THE PURPOSE OF THIS STUDY WAS TO INVESTIGATE THE PROBLEMS AND HAZARDS ASSOCIATED WITH THE USE OF THESE TRITIUM TARGETS SO THAT APPROPRIATE STEPS CAN BE TAKEN TO MINIMIZE THE POTENTIAL RADIOLOGICAL HEALTH HAZARDS. THIS STUDY SHOWED THAT BOMBARDMENT OF TRITIUM TARGETS RESULTS IN THE LOSS OF ABOUT 1 TRITIUM ATOM FOR EACH [illegible] NEUTRON, AND THAT MOST OF THE TRITIUM IS IN A GASEOUS FORM WHEN IT LEAVES THE TARGET. IT WAS DETERMINED THAT A SMALL AMOUNT OF TRITIUM RELEASED FROM TARGET ACTUALLY REMAINS WITHIN THE ACCELERATOR ITSELF. MOST OF THE TRITIUM LOST BY A BOMBARDED TARGET IS TRAPPED IN THE ELEMENTS OF AN ION PUMP OR RELEASED THROUGH THE VACUUM SYSTEM EXHAUST.

AVAILABILITY - U. S. DEPT. OF HEALTH EDUCATION AND WELFARE, CONSUMER PROTECTION AND ENVIRONMENTAL HEALTH SERVICE, ENVIRONMENTAL CONTROL ADMINISTRATION

HAZARDS, RELATIVE - TRITIUM RELEASE - CONTAMINATION - RADIOACTIVITY RELEASE - NEUTRONS - ACCELERATOR - ENERGY LEVEL - GAS - HIGH

[illegible]
KATOH J - [illegible]
MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS
JAPAN ATOMIC ENERGY RESEARCH INST., TOKYO
7 PAGES, HOKEN BUTSURI, [illegible], PAGES 200-206 (JUNE 1968) (IN JAPANESE)

IN HANDLING RADIOACTIVE MATERIALS, VARIOUS KINDS OF PROTECTIVE CLOTHING MADE OF POLYMERIC FILMS ARE USED FOR PROTECTION. THE PERMEATION RATE OF TRITIATED HEAVY WATER AND ITS VAPOR THROUGH POLYMERIC FILM, SUCH AS PVC, POLYETHYLENE, AND RUBBER WAS MEASURED BY USING AN IONIZATION CHAMBER WITH A VIBRATING REED ELECTROMETER. ON THE BASIS OF THE RESULTS OBTAINED, INTERNAL EXPOSURE OF THE PERSON WEARING THE PROTECTIVE CLOTHING IS EVALUATED AND DISCUSSED.

CHAMBER, ION - HEAVY WATER - MEASUREMENT - PERSONNEL PROTECTIVE DEVICE - CONTAMINATION - MATERIAL - PERSONNEL EXPOSURE, RADIATION - RADIOISOTOPE - [illegible] - SAFETY EVALUATION - PLASTICS

[illegible]
SELECTED HADDAM NECK OPERATING EXPERIENCE
CONNECTICUT YANKEE ATOMIC POWER COMPANY
[illegible], 11 PAGES, HADDAM NECK OPERATION REPORT NO. [illegible], JULY 12, 1968, DOCKET 50-213, TYPE--PWR, MFG--WEST., AE--STONE - WEBSTER

[illegible] RATIOS RECALCULATED FOR OCT. 1967-MARCH 1968. BASED ON CORRECT MEASUREMENTS, MINIMUM WAS [illegible] (NORMAL) AND [illegible] ([illegible] EJECTION). TRITIUM RELEASE WAS 137 CURIES. CORE REACTIVITY DEPLETION IS APPROACHING THE DESIGN CURVE, AND A MORE DETAILED REACTIVITY [illegible] CHANGES FOR ALL NORMAL OPERATIONS. STEAM-GENERATOR LEVEL INSTRUMENTATION SENSITIVITY DECREASED, INDICATING CRUD BUILDUP IN THE UPPER LEVEL TAPS, REQUIRING BLOWDOWN AND FITTING MODIFICATION. LOOP-1 FLOW TRANSMITTER FAILURE CAUSED TRIP, AND TRANSMITTER WAS PLACED OUTSIDE SHIELDING FOR OPERATION AT REDUCED POWER. PRIMARY LEAK [illegible] ON [illegible] CHECK VALVE.

AVAILABILITY - AEC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545. [illegible] CENTS/PAGE -- MINIMUM CHARGE $2.00

REACTIVITY, EXCESS - [illegible] - REACTOR, PWR - CONNECTICUT YANKEE (PWR) - WASTE DISPOSAL, LIQUID - FAILURE, INSTRUMENT - INSTRUMENT, FLOW - INSTRUMENT, LIQUID LEVEL - [illegible] - INSTRUMENT, ABNORMAL INDICATION - [illegible] SYSTEM - STEAM GENERATOR

[illegible]
RAY JW
TRITIUM IN POWER REACTORS
BATTELLE MEMORIAL INSTITUTE, COLUMBUS LABORATORIES
8 PAGES, [illegible] FIGURES, 17 REFERENCES, REACTOR AND FUEL-PROCESSING TECHNOLOGY, 12(1), PAGES 19-26 (WINTER 1968-1969)

[illegible]

DISCUSSES HEALTH PHYSICS ASPECTS, PRODUCTION RATES IN POWER REACTORS, MIGRATION OF TRITIUM, AQUEOUS AND WATER, MIGRATION FROM FUEL PINS, CONTROL AND DISPOSAL. FOR A TYPICAL 3000-MWTH REACTOR, 40 CURIES/DAY IS PRODUCED BY FISSION. FOR 1000-MWTH PWR WITH GRAPHITE CHEMICAL SHIM, ADDITIONAL TRITIUM IS GENERATED AS A RESULT OF NEUTRON CAPTURE BY BORON. THE PRODUCTION GRADUALLY INCREASES UNTIL 30 CURIES/DAY IS PRODUCED AFTER 365 DAYS OF OPERATION.

RADIOACTIVITY BUILDUP • FISSION PRODUCT, VOLATILE • TRITIUM • IRRADIATION • WASTE DISPOSAL • REACTOR, POWER • REACTOR COOLANT • COOLANT CHEMISTRY • PRESSURE TEMPERATURE, RADIATION • CHEMICAL SHIM • MAIN COOLING SYSTEM • RADIATION EFFECT

070059
PEURA PA
TECHNICAL EVALUATION OF PM-1 NUCLEAR POWER PLANT
ENGINEERING DIVISION, U.S. ARMY ENGINEER REACTORS GROUP, CORPS OF ENGINEERS, FORT BELVOIR, VIRGINIA 22060
AD-[illegible] 0, 89 PAGES, 93 REFERENCES, DECEMBER 1960

TECHNICAL EVALUATION OF PM-1 NUCLEAR POWER PLANT. DESIGN OBJECTIVES AND REQUIREMENT ARE EVALUATED. STATE-OF-THE-ART ADVANCES ARE DISCUSSED. RECOMMENDATIONS FOR FUTURE WORK ARE TABULATED. MAINTENANCE WORK WAS DIFFICULT BECAUSE OF INACCESSIBILITY TO COMPONENTS. TRITIUM MONITOR DEVELOPED AT BOTH PM-1 AND PM-3A. HYDROGEN GENERATION AT PM-3A ONE HUNDRED PARTS PER MILLION A PROBLEM.

AVAILABILITY - FROM M. A. PEURA, ENGINEERING DIVISION, U.S. ARMY ENGINEER REACTORS GROUP, CORPS OF ENGINEERS, FT. BELVOIR, VIRGINIA 22060

HYDROGEN • REACTOR, PWR • WASTE DISPOSAL • PM 1 (PWR) • PM 3A (PWR) • REACTOR, MILITARY

080001
LOCKHEED PROVISIONAL OPERATING AUTHORIZATION DATA-4. CAVITY MONITORING AND LEAK DETECTION
ALLIS-CHALMERS
8 PAGES, LETTER TO P.A. HARRIS, ORL, OCTOBER 2, 1969, DOCKET 115-9, TYPE--PWR, REC--A.C., AE--SGT • LOWRY

AIR-ACTIVITY MONITORS SET UP IN REACTOR COMPARTMENT HOUSING REACTOR VESSEL AND PART OF PRIMARY STEAM AND WATER PIPING IN MARCH 1969. AIR-GRAB SAMPLES FROM CONTAINMENT CONTAIN CESIUM-134 AND NITROGEN-13. LEAKAGE FROM THE INTERMEDIATE HEAT STEAM GENERATOR PACKING OFFSETS IN TRITIUM ACTIVITY 3 X 10-2 MICROCURIES PER ML. LEAKAGE RATE NOW SUFFICIENT TO CREATE A SAFETY OR RADIATION HAZARD. MORE DETAILED CHECKS PLANNED FOR OCTOBER-NOVEMBER MAINTENANCE OUTAGE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

RADIOACTIVITY BUILDUP • REACTOR, PWR • CESIUM • MONITOR, AIR • NITROGEN • RADIOACTIVITY RELEASE • PACKOSSE (PWR) • SURVEILLANCE PROGRAM

090121
OPERATIONS REPORT FOR AUGUST 1969
SAXTON NUCLEAR EXPERIMENTAL CORPORATION
SNEC REPORT, 7 PAGES, AUGUST 1969

A LEAK IN TELEFLEX THREADLE PORT WAS SEALED OFF WITH A CONOSEAL AND CAP FOR ZERO POWER OPERATION. A REDESIGNED CONOSEAL GASKET WILL BE FABRICATED BEFORE POWER OPERATION IS RESTORED. A HOT LEAK TEST WAS PERFORMED ON THE REPAIRED INSTRUMENT PORT. TWENTY-TWO WESTINGHOUSE REACTOR OPERATOR TRAINEES WERE TRAINED. 0.129 CURIE OF TRITIUM RELEASED DURING PERIOD. NO SIGNIFICANT RADIATION EXPOSURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REPORT, OPERATIONS • REACTOR, PWR • SAXTON (PWR) • OPERATING • OPERATION • SNEC

090276
OPERATION REPORT NO. 69-2 FOR THE MONTH OF FEBRUARY 1969
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NYO 3950-32 P., 10 PAGES, OPERATION REPORT NO. 69-2, FEBRUARY 1969, DOCKET 50-213, TYPE--PWR, REC--WEST., AE--STONE • WEBSTER

ENVIRONMENTAL RELEASES - (1) GASEOUS, NONE, (2) LIQUID, 49,194 GAL (19.0) MICROCURIES BETA-GAMMA EMITTERS, 100-30 CURIES TRITIUM).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

FISSION PRODUCT RELEASE • REPORT, OPERATIONS • REACTOR, PWR • CONNECTICUT YANKEE (PWR) • DATA REPORTED • GAMMA EMITTER • OPERATING EXPERIENCE

[illegible]
SAN ONOFRE NUCLEAR GENERATING STATION OPERATING REPORT FOR THE MONTH OF JUNE 1990
SOUTHERN CALIFORNIA EDISON COMPANY
[illegible] 6, 6 PAGES, JUNE 1990

OPERATION WAS ROUTINE DURING THE MONTH. MAXIMUM PRESSURE EXPOSURE WAS 63 MREM. SO CURIES OF AIRBORNE ACTIVITY WAS RELEASED WITH THE GASEOUS WASTE. 3.07 CURIES OF ACTIVITY WAS RELEASED WITH LIQUID WASTE IN FORM OF TRITIUM.

AIRBORNE RELEASE • REACTOR, PWR • TRAINING • [illegible] • PRESSURE EXPOSURE, RADIATION • RADIOACTIVITY RELEASE • REPORT, OPERATIONS SUMMARY

[illegible]
DATION PRIMARY SEMI-ANNUAL OPERATIONS REPORT FOR [illegible] TO 1-31-[illegible]
CONSOLIDATED EDISON COMPANY OF NEW YORK
70 PAGES, SEMI ANNUAL OPERATIONS REPORT NO. 7, MARCH 19, 1990, [illegible]

A SHUTDOWN PROGRAM ACCOMPLISHED BY GRADUAL REDUCING OF REACTOR POWER LEVEL AND PRIMARY COOLANT TEMPERATURE EXTENDED THE CORE LIFE BY OVER 7 MONTHS. AT END OF SHUTDOWN, REACTOR POWER WAS 66 PERCENT OF NORMAL FULL POWER. THE LATCHING MECHANISM OF [illegible] CONTROL ROD BECAUSE OF WEAR DIMENSIONAL DETAIL OF PICKUP WEAR. [illegible] DURING OUTAGE FOR REFUELING, ALL CONTROL AND DRIVE MECHANISMS WERE DISASSEMBLED AND SUBMANGED. 250 CURIES OF TRITIUM RELEASED TO HUDSON RIVER.

[illegible] PRIMARY [illegible] • REACTOR, PWR • REACTOR, POWER • WASTE DISPOSAL, [illegible] • TEMPERATURE REACTIVITY EFFECT • RADIOACTIVITY RELEASE • [illegible], DESIGN CODES • [illegible] MANIPULATORS AND [illegible] • REPORT, OPERATIONS SUMMARY • CONTROL RODS

[illegible]
HADDAM NECK MONTHLY OPERATION REPORT FOR SEPTEMBER 1989
CONNECTICUT YANKEE ATOMIC POWER COMPANY
[illegible] 6, [illegible] PAGES, 1 FIGURE, OPERATION REPORT NO. 89-9, OCTOBER 19, 1989, [illegible]

NUMBERS 4 AND 5 CONTROL RODS SLIPPED IN AT START OF SEPT. THE RUT INVESTIGATION AND EXERCISING DID NOT DETECT ANY MALFUNCTION. STUDY OF RODS CONFIGURATION [illegible] PLANT AVAILABILITY 64.7 PERCENT. FEW LEAKY FUELS IN 10 PERCENTAGE WATER WAS PLUGGED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22161 $3.00 COPY, 90-04 REPORTING

AIRBORNE RELEASE • [illegible] • REACTOR, PWR • WASTE DISPOSAL, ATMOSPHERIC • [illegible] • WASTE DISPOSAL • LIQUID • [illegible], STEAM GENERATOR • FAILURE, TUBING • CONTROL RODS • HEAT EXCHANGERS

[illegible]
SELECTED ITEMS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY
3 PAGES, YANKEE OPERATION REPORT NO. 107 FOR JULY 1989, AUGUST 19, 1989, [illegible]

A STUCK TUBE WAS USED TO DETECT LEAK RATE FROM PRIMARY TO SECONDARY. LR [illegible] RATE ON NO.1 STEAM GENERATOR IS 3.7 GALLONS. [illegible] RATE FOR STEAM GENERATORS 2 AND 3 IS LESS THAN 1 GALLONS. A PLANT SHUTDOWN OCCURRED AS RESULT OF ELECTRICAL CONDITIONS CAUSED BY A POSITIVE GROUND ON THE 125 V BATTERY SYSTEM. THE MEAN COOLANT TRITIUM CONCENTRATION AVERAGED 0.044 MICROCURIES/ML. 0.65 MILLICURIES OF TRITIUM AS A GAMMA WERE RELEASED THROUGH STACK.

CLEARINGHOUSE - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22161 $3.00 COPY, 90-04 REPORTING

ACTIVITY RADIUM • AIRBORNE RELEASE • REPORT, OPERATIONS • REACTOR, PWR • STEAM, HEAT • [illegible] • STACK • RADIUM, INSTRUMENT • [illegible] SYSTEM • STEAM GENERATOR • ELECTRICAL CONNECTION • HEAT • BATTERIES, CHARGERS

[illegible]
SELECTED ITEMS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY
10 PAGES, YANKEE OPERATION REPORT NO. 104 FOR AUGUST 1989, SEPTEMBER 21, 1989, [illegible]

REACTOR WAS SHUTDOWN [illegible] FOR REFUELING AND MAINTENANCE. DURING SHUTDOWN, COOLANT TRITIUM CONCENTRATION WAS 0.[illegible] MICROCURIES/ML. DRAIN OF PRIMARY TO SECONDARY LEAK IN STEAM GENERATOR NO. 4 WAS INITIATED. [illegible] RATES WERE 5 TO 6 GPMD [illegible] WATER GRADES. [illegible] PROVISIONAL DECLARED EXPOSURE [illegible] DUE TO INADEQUATE HEALTH PHYSICS COVERAGE AND FAILURE TO [illegible] ON HEAD DISTURBED EACH TIME HE EXITED AND REENTERED AREA. [illegible] OPERATING DISCONTINUED [illegible] ASSEMBLY AND CHANGED ASSEMBLY AND REFUELING EQUIPMENT

[illegible]
AVAILABILITY - . CPS

ACTIVITY DUMPING • FUEL HANDLING • HEADLINE, OPERATOR FORMS • REPORT, OPERATIONS • REACTOR, PWR • YANKEE ROWE (PWR) • REPRESSURIZE PRESSURE, REACTOR • RADIATION SAFETY AND CONTROL • REFUELING • DISCHARGE, HUMAN FORMS • FUEL HANDLING MACHINE • FOUNDRY • MAIN COMPONENT SYSTEM • STEAM GENERATOR • LEAK • OPERATING PARAMETERS • FUEL ELEMENTS

[illegible]
SELECTED ITEMS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY
11 PAGES, YANKEE OPERATION REPORT NO. 189 FOR SEPTEMBER 1969, OCTOBER 77, 1969, TOPICAL 40-70, TYPE--PWR, MFG--WEST., AF--STEAM • WESTER

CORE 3-4 REFUELING CONTINUED. CORE 4 CRITICAL REACTOR SEPT. 17. NORMAL PHYSICS TESTING PERIOD. LEAK DEVELOPED ON HOLD DN DISCHARGE LINE TO RD. 4 STEAM GENERATOR AND THE PRESSURIZER LOW SET SAFETY VALVE HAS LEAKING. OUTAGE TIME FOR CORE 3-4 REFUELING WAS 94 DAYS. WASTE DISPOSAL. LIQUID RELEASES CONTAINED 10.44 CURIES OF TRITIUM. SECONDARY PLANT WATER DISCHARGED CONTAINED 0.78 CURIES, AND 1.39 CURIES WAS DISCHARGED VIA STACK.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REPORT, OPERATIONS • REACTOR, PWR • YANKEE ROWE (PWR) • STACK • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • PRESSURE RELIEF • REFUELING • LEAK • OPERATING PARAMETERS • VALVES • PIPES AND PIPE FITTINGS

[illegible]
OPERATION REPORT 69-10 FOR THE MONTH OF OCTOBER 1969
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NPO-3250-01 P. 14 PAGES, OPERATION REPORT NO. 69-10, OCTOBER 1969, REPORT 40-717, TYPE--PWR, MFG--WEST., AF--STEAM • WESTER

DURING OCTOBER 1969, RELEASED 26,909 MILLICURIES BETA-GAMMA AND 0.027 CURIE TRITIUM IN GASES - 17,200 CU FEET PLUS 2.41 MILLICURIES BETA-GAMMA AND 940.7 CURIES TRITIUM IN LIQUIDS - 107,900 GALS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

MISSION PRODUCT RELEASE • REPORT, OPERATIONS • REACTOR, PWR • CONNECTICUT YANKEE (PWR) • DATA SYSTEM • GAMMA EMITTER • OPERATING PARAMETER

[illegible]
SELECTED OPERATING PARAMETERS
YANKEE ATOMIC ENERGY COMPANY, MASSACHUSETTS
8 PAGES, YANKEE OPERATION REPORT NO. 76 FOR MONTH OF FEBRUARY 1967, PERIOD 17, 1967, TOPICAL 43-70, TYPE--PWR, MFG--WEST., AF--STEAM • WESTER

NO SHUTDOWNS OR SCRAMS OCCURRED DURING THE MONTH. CORE RADIOACTIVITY DEPOSITION WAS NORMAL AT 0.69 DECIMAL DELTA GPM PER 1000 HOT DAYTIME. THE PRIMARY-TO-SECONDARY LEAK RATE IS NO. 3 STEAM GENERATOR SLOWLY INCREASED FROM 142 GPM TO 434. WASTE-DISPOSAL LIQUID RELEASES EXCEED 206,000 GAL CONTAINING 10.44 MILLICURIES OF GAMMA AND 45.10 CURIES OF TRITIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

FUEL DAMAGE • REPORT, OPERATIONS • REACTOR, PWR • YANKEE ROWE (PWR) • WASTE DISPOSAL, LIQUID • RADIOACTIVITY RELEASE • STEAM GENERATOR • LEAK

[illegible]
OPERATION REPORT NO. 69-4 FOR THE MONTH OF MAY 1969
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NPO-3250-11 P. 14 PAGES, OPERATION REPORT NO. 69-4, MAY 1969, REPORT 40-717, TYPE--PWR, MFG--WEST., AF--STEAM • WESTER

[illegible] AT 1015 HR ON MAY 3, DECREASE IN DEMINERALIZATION DUE TO IMPROPER LINEUP OF VALVES, FAILS IN [illegible] RECOVERY DISTILLATES CONTAINED AT THE RESULTS WERE SEVERE RELEASING ABOUT 200 GAL OF [illegible] RADIOACTIVE RESIDUALS TO BE DISPOSED BETA 150 MILLICURIES OF BETA-GAMMA EMITTERS AND 3.76 CURIES OF TRITIUM. FLUSHED BETA WITH 26,000 GAL WATER TO DILUTE THE SPILL. [illegible] 1900-1700 HR ON MAY 6, DISCHARGED ABOUT 400 GAL OF RADIOACTIVE WASTE CONTAINED TO THE FLOOR OF THE [illegible]-RECOVERY BETA. [illegible] THE BETA CONTAMINATION LEVEL DROPS BACK, THEN CLEANED IT UP. VERY LITTLE RADIOACTIVE LIQUID OR GASEOUS WASTE WERE RELEASED TO THE ATMOSPHERE

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

MISSION PRODUCT RELEASE • REPORT, OPERATIONS • REACTOR, PWR • CONNECTICUT YANKEE (PWR) • DATA SYSTEM • CONTAMINATION • INCIDENT, EQUIPMENT • DISCHARGE, HUMAN FORM • GAMMA EMITTER • OPERATING PARAMETER

[illegible]
HIGH QUARTERLY PROGRESS REPORT, APRIL-JUNE 1969
INSTITUTE FOR ATOMENERGIE, HELSTIN, NORWAY
NPD-112 p. 127 PAGES, 41 FIGURES, 16 TABLES, 9 REFERENCES, AUGUST 1969

THREE SEGMENTS ACCURATE BECAUSE OF (1) OPERATOR ERROR, (2) ELECTRICAL FAULT IN INSTRUMENT, AND (3) ROD DROP. A 120 LEAK FROM THE REACTOR IS DISCUSSED IN LENGTH IN WHICH FISSION GASES WERE RELEASED TO THE REACTOR HALL. THE PERSON HAD A TRITIUM INTAKE OF 2000 MICROCURIES, WITH AN ESTIMATED DOSE OF 500 MILLIREMS. SUMMARIZES RESEARCH ON COMPUTER CONTROL OF REACTOR, AND IRRADIATION TESTING OF FUEL ASSEMBLIES.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND NORWAY

REACTOR, RUN + FUEL ELEMENT + HEAVY WATER + REACTOR, RUN + FAILURE, OPERATOR ERROR + REPORT, OPERATIONS + ASCHAN, ARNE + FAILURE, INSTRUMENT + NORWAY + IRRADIATION TESTING + RADIOACTIVITY RELEASE + MAIN COOLING SYSTEM + COMPUTER CONTROL + DELTA + OPERATING EXPERIENCE

[illegible]
TSAI CH + WANG DS
A PRELIMINARY STUDY ON TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT
NATIONAL TSING HUA UNIVERSITY, HSINCHU, TAIWAN
9 PAGES, 12 REFERENCES, HO TSU H-C HSUEH, VOL. 6, PAGES 51-9 (OCTOBER 1969) TEN CHINESE)

TRITIUM AND OTHER RADIOACTIVE NUCLIDES HAVE BEEN PRODUCED IN THE TSING HUA OPEN-POOL REACTOR WHICH COOLANT BY THE EXPOSURE TO NEUTRON ANDANDS AN DEUTERIUM AND IMPURITIES EXISTING IN THE COOLANT WATER TO THE NEUTRONS AFTER STAY 5.600.000 HOUR OPERATION. A MIXED ION RESIN WAS TRACED BY THE TRITIUM AND THE FISSION PRODUCT STANDARD SOURCES AND THEN PASSED THROUGH BY THE COOLANT SAMPLE OF WHICH 1 MILLILITERS WERE DISSOLVED IN THE LIQUID SCINTILLATOR. WITH AN AID OF A LIQUID SCINTILLATION COUNTER THE TRITIUM CONTENT WAS FOUND TO BE 4700 +- 2.1 PERCENT T.U. THE REACTOR POWER OUTPUT CAN BE ESTIMATED FROM THE TRITIUM ACTIVITY, PARTICULARLY UNDER LONG TIME AND HIGH POWER OPERATION.

RECEIVED + ABSORPTION + SAMPLING + RECOLANT CHEMISTRY + RESIN

[illegible]
MONTHLY NUCLEAR OPERATION REPORT FOR MONTH OF DEC. 1969
CONNECTICUT YANKEE ATOMIC POWER COMPANY
12 PAGES, OPERATION REPORT NO. 69-12, DECEMBER 1969, DOCKET 50-213, TYPE--PWR, NFG--WEST., AE--STONE + WEBSTER

PLANT WAS OPERATED PASS-LOADED AT POWER LEVELS BETWEEN 600 AND 800 MWE EXCEPT FOR A DECREASE TO 320 MWE FOR WORK ON TRANSMISSION LINE. AUTOMATICALLY REDUCED TO 470 MWE BECAUSE OF MALFUNCTION IN CIRCUITRY OF POWER RANGE CHANNEL AND ALSO REDUCED TO 400 MWE FOR TURBINE VALVE TESTS. NO PLANT SHUTDOWNS. NO ABNORMAL OCCURRENCES. 149.000 GAL OF LIQUID WASTE CONTAINING 750 CURIES TRITIUM RELEASED TO RIVERS. 5 CURIES OF GASEOUS WASTE RELEASED IN 1969 FY. MAXIMUM PERSONNEL EXPOSURE WAS 900 MREM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REPORT, OPERATIONS + REACTOR, PWR + CONNECTICUT YANKEE (PWR) + BETA EMITTER + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + NORTHEAST PENNSYLV, RADIATION + GAMMA

[illegible]
YANKEE NUCLEAR POWER STATION OPERATING REPORT FOR DECEMBER 1969
YANKEE ATOMIC ELECTRIC COMPANY
10 PAGES, YANKEE OPERATION REPORT NO. 108, NOVEMBER 1969, DOCKET 50-29, TYPE--PWR, NFG--WEST., AE--STONE + WEBSTER

LEAKAGE FROM PRIMARY TO SECONDARY SYSTEM IN NO. 1 STEAM GENERATOR INCREASED TO 120 GAL/DAY. REACTOR POWER WAS REDUCED FOR TURBINE CONTROL VALVE TEST. 24 CURIES OF TRITIUM WERE RELEASED WITH THE LIQUID WASTE. LESS THAN 7 MILLICURIES OF TRITIUM WERE RELEASED WITH THE GASEOUS WASTE. PLANT OPERATED NEARLY 90 PERCENT OF THE TIME

FAILURE, EQUIPMENT + ANALYSIS, OPERATIONS + REACTOR, PWR + YANKEE ATOMIC (PWR) + STEAM GENERATOR + LEAK

[illegible]
SELECTED OPERATING EXPERIENCE
YANKEE ATOMIC ELECTRIC COMPANY
10 PAGES, YANKEE OPERATING REPORT NO. 61, FEBRUARY 27, 1969, DOCKET 50-29, TYPE--PWR, NFG--WEST., AE--STONE + WEBSTER

ONE OF A SERIES OF REPORTS. TOPICS - SUMMARY, CHEMISTRY REACTOR PLANT PERFORMANCE TURBINE PLANT PERFORMANCE, INSTRUMENT AND CONTROL HEALTH AND SAFETY, DESIGN CHANGES, PLANT OPERATIONS, AND RADIOACTIVE WASTE DISPOSAL - LIQUID, BETA/GAMMA, 9.1 MILLICURIES - TRITIUM, 112.8 CURIES. GASEOUS DISCHARGES WERE 46.76 MILLICURIES BETA-GAMMA AND 167 MILLICURIES TRITIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

041923 <CONTINUED>
REPORT, OPERATIONS • REACTOR, PWR • YANKEE ROWE (PWR) • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID •
OPERATING EXPERIENCE

041924
SELECTED ITEMS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY
11 PAGES, YANKEE OPERATION REPORT NO. 67, MARCH 29, 1966, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE •
WEBSTER

AN ABNORMAL OCCURRENCE WAS EXPERIENCED WHEN A FALSE HIGH POWER LEVEL (600 MWT) WAS INDICATED WHILE OPERATING IN A 1 OUT OF 1 MODE. THE RECORD CHANNEL SIGNAL WAS OFFSCALE ON THE COMPUTER. ••• MONTHLY WASTE DISPOSAL - SOLIDS, - 104.6 MILLICURIES - LIQUID, 29 MILLICURIES BETA-GAMMA AND 150.29 CURIES TRITIUM - GASEOUS, 71.04 MILLICURIES. ••• A SPECIAL TEST INDICATED HIGHER RADIOACTIVITY WITH HIGHER PH OF PRIMARY COOLANT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00
COPY, $0.65 MICROFICHE

REPORT, OPERATIONS • REACTOR, PWR • OSCOOP, REAL • YANKEE ROWE (PWR) • WASTE DISPOSAL, GAS • WASTE DISPOSAL,
LIQUID • WASTE DISPOSAL, SOLID • AVAILABILITY, INSTRUMENT • DINSTRUMENT, POWER RANGE • GENERATION • OPERATING
EXPERIENCE

041927
SELECTED OPERATING EXPERIENCE
YANKEE ATOMIC ELECTRIC COMPANY
10 PAGES, YANKEE OPERATION REPORT NO. 69, JUNE 24, 1966, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE •
WEBSTER

ONE OF A SERIES OF REPORTS. TOPICS - OPERATION SUMMARY, MAINTENANCE, INSTRUMENT AND CONTROL, REACTOR PLANT PERFORMANCE, SECONDARY PLANT PERFORMANCE, CHEMISTRY, HEALTH AND SAFETY OPERATION. ROUTINE WASTE RELEASES FOR MAY WERE 1.52 MILLICURIES BETA-GAMMA, 204 CURIES TRITIUM IN LIQUID, AND 330 MILLICURIES GASEOUS BETA-GAMMA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00
COPY, $0.65 MICROFICHE

REPORT, OPERATIONS • REACTOR, PWR • YANKEE ROWE (PWR) • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID •
OPERATING EXPERIENCE

041959
MONTHLY OPERATIONS REPORT FOR JANUARY 1970 FOR YANKEE
YANKEE ATOMIC ELECTRIC COMPANY, MASSACHUSETTS
7 PAGES, YANKEE OPERATION REPORT NO. 109, JANUARY 1970, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE •
WEBSTER

DURING MONTH, LOAD VARIED BETWEEN 104.0 MWE AND 109 MWE, WITH 3 LEAK REDUCTION TO 190 MWE FOR TURBINE THROTTLE-VALVE TEST AND ISOLATION OF LOOP 4 AND LATER LOOP 2 FOR MAINTENANCE WORK. LEAK RATE FROM PRIMARY TO SECONDARY INCREASED FROM 179 TO 162 GAL PER DAY (PRIMARY NO. 1 STEAM GENERATOR). 1,040 CURIES OF TRITIUM DISCHARGED IN 607,290 GAL LIQUID WASTE. 9 CURIES OF TRITIUM AND 4 CURIES BETA-GAMMA IN GASEOUS WASTE. PLANT-CAPACITY FACTOR WAS 97.5 PERCENT FOR MONTH

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00
COPY, $0.65 MICROFICHE

REPORT, OPERATIONS • REACTOR, PWR • YANKEE ROWE (PWR) • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • LEAK

041962
MADDAM BEAR MONTHLY OPERATION REPORT FOR JAN., 1970
CONNECTICUT YANKEE ATOMIC POWER COMPANY
50213-1 •, 10 PAGES, MADDAM BEAR OPERATION REPORT NO. 70-1, JANUARY 1970, DOCKET 50-213, TYPE--PWR, MFG--
WEST., AE--STONE • WEBSTER

PLANT OPERATED BETWEEN 595 AND 606 MWE EXCEPT FOR 4 ROUTINE TURBINE-VALVE TESTS. NO PLANT SHUTDOWNS AND NO ABNORMAL OCCURRENCES. 1070 CURIES OF TRITIUM RELEASE IN 181,700 GAL LIQUID WASTE, AND 0.010 CURIE IN GASEOUS WASTE RELEASED DURING THE MONTH. PLANT-CAPACITY FACTOR FOR MONTH WAS 90.4 PERCENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00
COPY, $0.65 MICROFICHE

REPORT, OPERATIONS • REACTOR, PWR • CONNECTICUT YANKEE (PWR) • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID

041970
OPERATIONS REPORT FROM NDS REACTOR FOR OCTOBER-DECEMBER 1969
NATIONAL BUREAU OF STANDARDS
19 PAGES, LETTER TO DRL FROM NBS, OPERATIONS REPORT NO. 7, FEBRUARY 19, 1970, DOCKET 50-184

[illegible]
REACTOR OPERATED AT FULL 10 MWT THROUGHOUT THIS PERIOD. 15.0 MWH ENERGY WAS PRODUCED. NO SHUTDOWN OCCURRED AND NO ABNORMAL OCCURRENCES. CONTAINMENT TEST FOR MAIN REACTOR WAS RUN AND SHUT-DOWN-TO-STEP FOR LEAKS. COLD TRAP INSTALLED IN HELIUM SWEEP LINE. SOME CHANGES MADE IN REACTOR SAFETY SYSTEM. 19 SOIL SAMPLES TAKEN IN THE AREA AND ANALYZED. NO SIGNIFICANT CHANGE. .020 CURIE TRITIUM DISCHARGED TO SEWER WITH EFFLUENT WASTE. 0.1 CURIE ARGON-41 AND 0.1 CURIE TRITIUM RELEASED AS GASEOUS WASTE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REPORT, OPERATIONS • REACTOR, RESEARCH • REACTOR SAFETY SYSTEM • ARGON • CONTAINMENT INTEGRITY • SAMPLING • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • HELIUM • SOIL • RAS

[illegible]
SEMI ANNUAL OPERATING REPORT FOR SAN ONOFRE FOR JULY TO DECEMBER 1969
SOUTHERN CALIFORNIA EDISON COMPANY
9 PAGES, LETTER TO AEC DIVISION OF REACTOR LICENSING FROM SOUTHERN CALIFORNIA EDISON COMPANY, FEBRUARY 17, 1970, DOCKET 50-206, TYPE--PWR, MFG--WEST., AE--ANCHTEL

REACTOR PLANT GENERATED 1.34 MILLION MWH OF ELECTRICITY DURING REPORT PERIOD. ON 10-09-69, PLANT WAS SHUT DOWN FOR 7 DAYS WHEN INTAKE STOP GATE ESCUTCHEON COVER DROPPED INTO INTAKE TUNNEL. ON 10-29-69, REACTOR WAS SHUT DOWN TO REPAIR THE PORT VALVES ON THE PRESSURIZER INSTRUMENT COLUMN. STARTUP AFTER 60 HR. 3931 CURIES OF TRITIUM AND 4 CURIES OF BETA-GAMMA WAS RELEASED IN 1,289,000 GAL. OF WATER. 2.5 CURIES OF TRITIUM AND 240 CURIES OF BETA-GAMMA WAS RELEASED IN 15,440,000 CUBIC FEET OF GASEOUS WASTE. VIBRATION-TESTS PROGRAM OF CORE COMPONENTS WAS COMPLETED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

OPERATIONS, EQUIPMENT • REPORT, OPERATIONS • REACTOR, PWR • OSAN PROGRAM I (PWR) • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • HEAT SINK • ASSUMPT • INFORMATION ANALYSIS • OPERATING EXPERIENCE • VALVES

[illegible]
REFERENCE 50
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES
E. I. DUPONT DE NEMOURS AND COMPANY, AIKEN, S.C.

DISPOSAL OF RADIOACTIVITY TO THE GROUND WAS MADE LIMITED TO THE DISTILL OF SOLID WASTE AND THE DISCHARGE OF VERY-LOW-LEVEL WASTE TO OPEN SEEPAGE BASINS. NO RADIONUCLIDES HAVE BEEN DETECTED IN GROUNDWATER FROM THIS SOURCE. SEEPAGE BASIN OPERATION OF RADIONUCLIDES WAS FOUND LESS SATISFACTORY. ALL OF THE RADIONUCLIDES RELEASED TO THE SEEPAGE BASINS, EXCEPT PLUTONIUM, HAVE BEEN DETECTED IN THE SURROUNDING GROUNDWATER. TRITIUM IS NOT ADSORBED AND THUS SERVES AS A USEFUL GROUNDWATER TRACER. STRONTIUM 90 IS POORLY ADSORBED ON LOCAL SOIL AND IS DETECTABLE IN SAND LAYERS, AT CONCENTRATIONS LESS THAN THE RADIOACTIVITY CONCENTRATION GUIDE, AS FAR AS 500 FEET FROM THE BASINS. THE PATH OF RADIONUCLIDE MIGRATION FROM SEEPAGE BASINS IS DETERMINED BY THE GEOLOGY AND HYDROLOGY OF EACH AREA.

ADSORPTION • GUIDE • GEOLOGY • STRONTIUM • TRACER, RADIOACTIVE • WASTE DISPOSAL, TERRESTRIAL • GROUND WATER, NUCLIDE OCCURRENCE • SAVANNAH RIVER PLANT • HYDROLOGY • STANDARD • MONITOR, AREA • CONCENTRATION

[illegible]
YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 110 - FOR MONTH OF FEBRUARY 1970
YANKEE ATOMIC ELECTRIC COMPANY, WESTFORD, MASSACHUSETTS
6 PAGES, YANKEE OPERATION REPORT NO. 110 FOR FEBRUARY 1970, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE • WEBSTER

GROSS GENERATION FOR MONTH WAS 117,910 MWHRS. PRIMARY TO SECONDARY LEAK RATE IN NO. 1 STEAM GENERATOR INCREASED FROM 187 TO 240 GAL/DAY. PRIM COOLANT ANION CONCENTRATION DECREASED FROM 692 PPM TO 500 PPM. TRITIUM CONCENTRATION DECREASED FROM 2.07 MICROCURIES/ML TO 1.49 MICROCURIES/ML. 95.8 CURIES OF TRITIUM RELEASED FROM PRIMARY AND 44.7 CURIES FROM SECONDARY GASEOUS RELEASE 2.39 CURIES OF BETA-GAMMA. AVERAGE PERSONNEL EXPOSURE WAS 46 MREM. MAXIMUM EXPOSURE WAS 240 MREM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

REPORT, OPERATIONS • REACTOR, PWR • YANKEE ROWE (PWR) • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • OPERATIONAL EXPOSURE, RADIATION • FAILURE, TUBING • STEAM GENERATOR

[illegible]
HADDAM NECK OPERATION REPORT FOR FEBRUARY 1970
CONNECTICUT YANKEE ATOMIC POWER COMPANY
17 PAGES, HADDAM NECK OPERATION REPORT NO. 70-2 FOR THE MONTH OF FEBRUARY 1970, DOCKET 50-213, TYPE--PWR, MFG--WEST., AE--STONE • WEBSTER

PLANT PUT OUT 102,450 MWH OF ELECTRICITY AND 474 CURIES OF TRITIUM WITH LIQUID WASTE, 1.4 CURIES OF BETA-GAMMA IN LIQUID WASTE, 49 CURIES OF IN GASEOUS WASTE, AND 7 CURIES OF IN GASEOUS WASTE. ON FEBRUARY 19, REACTOR DROPPED TO 70% OF FULL POWER. 8 LEAK DETECTORS PRIMARY AND SECONDARY IN

[illegible]
NO. 4 STEAM GENERATOR HAS TRACED WITH THE TRITIUM ACTIVITY AND CALCULATED TO BE 4 TO 10 GAL/DAY [illegible]. 23. INCREASE TO 1700 GAL/DAY BY FEB. 18. HIGHEST RADIATION EXPOSURE WAS 741 MREM. AVERAGE FOR ALL PERSONNEL WAS 175 MREM.

AVAILABILITY - NTIS PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. FOR CFSTI/PAPER -- MINIMUM CHARGE $2.000

KEYWORDS • CANADA, OPERATIONS • REACTOR, PHW • HEAVY-WATER TRITIUM (PHW) • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • FAILURE, TUBING • STEAM GENERATOR • LEAK

[illegible]
[illegible]-[illegible]
EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN BIOLOGY
PHILIPS GLOEILAMPENFABRIEKEN, N.V., EINDHOVEN, NETHERLANDS
4 PAGES, TRIZIEKENDIT SPECIAL CONFERENCE, VOL. 42, PG 344-7 (1964)

WHEN IT WAS NECESSARY TO USE A RADIOACTIVE SUBSTANCE IN THE MASS PRODUCTION OF A CERTAIN TYPE OF RADIO TUBES THE HYDROGEN ISOTOPE TRITIUM H-3 WAS CHOSEN. PREFERENCE WAS GIVEN TO TRITIUM AS A GAS AND NOT IN A CHEMICAL COMBINATION. IN CASE THE GAS IS ACCIDENTALLY INHALED IT IS NOT DEPOSITED IN AN ORGAN OR TISSUE. INSTEAD THE TRITIUM IS DISSOLVED IN THE BODY FLUIDS AND RAPIDLY EXCRETED BY THE KIDNEYS. OCCASIONALLY SMALL AMOUNTS OF TRITIUM WERE FOUND IN THE URINE OF MEN WORKING WITH THE ISOTOPE.

DEPOSITION • INHALATION • GAS • INDUSTRIAL SAFETY • TELEVISION • EXCRETION, URINE • BODY FLUID

[illegible]
THREE MI
PLR RIVER REACTOR SYSTEM MONITORING DATA
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-651-40 P., 64 PAGES, JUNE 30, 1967

PRESENTS IN-PLANT MONITORING DATA FOR THE PLR RIVER REACTOR FOR PERIOD JULY 1, 1966 THROUGH JUNE 30, 1967.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

KEYWORDS • EFFLUENT • HELIUM RIVER (PLR) • FUEL INTEGRITY • TESTING • SAMPLING • SURVEY, RADIATION • RADIATION SAFETY AND CONTROL • S.STEP DESCRIPTION • SAFETY ANALYSIS • OPERATING EXPERIENCE

[illegible]
SAFETY REPORT FOR THE CORE ARRANGEMENT WITH THE FISSIONING MEDIUM - SUPPLEMENT TO THE SAFETY REPORT SUBMITTED TO THE LICENSING AUTHORITY IN APRIL 1966 REGARDING THE RESEARCH AND MEASUREMENT REACTOR (FRM)
FEDERAL INSTITUTE OF PHYSICS AND TECHNOLOGY, BRUNSWICK
77 PAGES, 7 FIGURES, SUPPLEMENT TO THE SAFETY REPORT SUBMITTED TO THE LICENSING AUTHORITY IN APRIL 1966 REGARDING THE RESEARCH AND MEASUREMENT REACTOR (FRM), AUGUST 1968

THE FRM RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK, IS PROPOSED TO CONSIST OF TWO FISSIONABLE GASES, WITH A HEAVY-WATER TANK IN-BETWEEN, AND A REAR TANK IN THE VICINITY OF THIS TANK. THE SAFETY REPORT AND REPORT PERTAIN TO THIS REACTOR. AMONG THE MANY SAFETY QUESTIONS CONSIDERED ARE STEP REACTIVITY CHANGES, CONTROL AND STABILITY TRITIUM. LEAK EVACUATION IN A REACTIVITY ACCIDENT, NUCLEAR ACCIDENTS.

AVAILABILITY - PHYSIKALISCH-TECHNISCHE BUNDESANSTALT, BRUNSWICK, GERMANY

CONTROL SYSTEM • DEUTERIUM • REACTANT, REACTIVITY • REACTOR DYNAMICS • REACTOR STABILITY • REACTOR, RESEARCH • GERMANY • REACTOR, INTERACTING • REACTOR, PWR TYPE • SAFETY ANALYSIS

[illegible]
EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK
TECHNISCHER SACHVERSTÄNDIGEN VEREINIGUNG HANNOVER INC. • INSTITUTE FOR REACTOR SAFETY OF THE TÜV, INC.
90 PAGES, FIGURES, RESEARCH AND MEASUREMENT REACTOR SAFETY EVALUATION, NOV 1968

EXPERT OPINION ON THE RESEARCH AND MEASUREMENT REACTOR BRUNSWICK FROM REPORTED SAFETY REPORT ON THIS REACTOR. IT IS CONCLUDED THAT THE REACTOR WILL, WITHIN ITS NORMAL OPERATION AND IN CRITICAL ACCIDENTS, CAUSE UNDUE RADIATION IN THE SURROUNDINGS. THIS PROMISES THAT FURTHER DECONTAMINATION PLISTED IN SECTION 11.1 IS SUPPLIED AND HAS NOT LEAD TO OBJECTIONS, THAT THE INITIAL TESTS LISTED IN SECTION 8.71 AND CARRIED OUT BY INDEPENDENT EXPERTS.

AVAILABILITY - TECHNISCHER SACHVERSTÄNDIGEN-VEREIN HANNOVER E.V., GERMANY

PROCEDURES AND MANUALS • REACTOR, RESEARCH • SAMPLING METHOD • GERMANY • REACTOR, INTERACTING • RADIOACTIVITY RELEASE • REACTOR, PWR TYPE • SAFETY ANALYSIS • LEAK RATE

[illegible]
MISCELLANEOUS LICENSING MATERIAL REGARDING THE RESEARCH AND MASSACHUSETTS REACTOR [illegible]
TECHNOLOGICAL SUPERVISORY ASSOCIATION [illegible], INC. + INSTITUTE FOR REACTOR SAFETY OF THE TUV, INC.
[illegible] PAGES, FROM LICENSING MATERIAL, 1969

CONSTRUCTION PERMIT ALSO OF INTERVENORS, CONTENTIONS, CONDITIONS, PARTICULARLY INVOLVING WASTE DISPOSAL. FIRST SUPPLEMENTARY LICENSE REGARDING INSTALLATION AND USE OF FOUR CONTROL-ROD-FUEL ELEMENTS, WITH CONDITIONS. OPERATING LICENSE WITH 70 CONDITIONS. MODIFICATION OF ONE OF THE CONDITIONS OF THE OPERATING LICENSE CONCERNING CAPABILITY TO NEW FUEL ELEMENT ARRANGEMENTS. CONSTRUCTION AND OPERATING PERMIT FOR THE ARRANGEMENT WITH TWO FISSIONABLE REGIONS AND A HEAVY-WATER TANK IN ARTWORK, AND 14 CONDITIONS WITH THEIR JUSTIFICATIONS.

AVAILABILITY - INSTITUT FUR REACTORSICHERHEIT REP TUV E.V., GERMANY

HEAVY WATER + REACTOR, RESEARCH + WASTE HANDLING + RECONSTRUCTION PERMIT PROCESS + REACTOR, INTERACTING + REACTOR, POOL TYPE + OPERATING LICENSE PROCESS + CONTROL RODS

[illegible]
THOMPSON TJ
THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS
ATOMIC ENERGY COMMISSION
[illegible] PAGES, ATOMIC ENERGY CLEARING HOUSE, 19[illegible], PG 20-31 [illegible] 5, 19[illegible]

PLENARY PRESIDENTIAL TESTIMONY AT JOINT HEARING ON ENVIRONMENTAL EFFECTS OF ALL TYPES OF POWER STATIONS. THOMAS THOMPSON RECOMMISSIONER, ARCO SUPPLIES FOUR TABLES SHOWING GASEOUS AND LIQUID EFFLUENTS FROM 14 LICENSED NUCLEAR REACTORS IN 1967, 11 IN 1968. AND A COMPARISON OF RELEASES FOR THE TWO YEARS. THE ACTUAL RELEASES IN CURIES. THE CONCENTRATION LIMITS FOR EACH REACTOR AS SET FORTH IN OFFICIAL REGULATORY DOCUMENT STANDARDS FOR PROTECTION AGAINST RADIATION, 10 CFR, PART 20: -- T.P.. PERCENTAGES FOR RELEASED FOR FISSION AND CORROSION PRODUCTS AND CURIES FOR TRITIUM HALOGENS, AND WHOLE GASES ARE GIVEN. BASED ON THESE TWO SETS OF FIGURES, THE PERCENTAGES OF LIMITS ARRIVED AND PERMISSIBLE CONCENTRATIONS ARE LISTED FOR EACH REACTOR.

BIG ROCK POINT (PWR) + BONUS (BWR) + COSTS AND STANDARDS + CONGRESSIONAL ACTIVITY + DRESDEN 1 (BWR) + ELK RIVER (BWR) + FORT ST VRAIN + HUMBOLDT BAY (BWR) + INDIAN POINT 1 (PWR) + NOBLE GAS + PATHFINDER (BWR) + PEACH BOTTOM 1 (HTGR) + SANTEE (PWR) + TARIFF RATE (PWR) + REACTOR, POWER + SAN ONOFRE 1 (PWR) + REGULATION, AEC + REACTOR + RADIOACTIVITY RELEASE + LICENSE (BWR) + OSTROFSKY, AEC + THOMPSON T,

[illegible]
LARSON CE
THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS
US. ATOMIC ENERGY COMMISSION
[illegible] PAGES, ATOMIC ENERGY CLEARING HOUSE, 19[illegible], PG 32-34 [illegible] 5, 19[illegible]

PLENARY PRESIDENTIAL TESTIMONY AT JOINT HEARING ON ENVIRONMENTAL EFFECTS OF ALL TYPES OF POWER STATIONS. C. E. LARSON RECOMMISSIONER, ARCO DISCUSSED SMALL NUCLEAR RELEASES AND DISCHARGE OF SUBSTANTIAL QUANTITIES OF LOW-TEMPERATURE HEAT DURING NORMAL REACTOR OPERATION. HE QUOTES NAT. ACAD. OF SCI. -- THAT RADIATION IS MORE UNDERSTOOD ENVIRONMENTAL HAZARD, THAT VASTLY LESS IS KNOWN ABOUT OTHER CHEMICAL AGENTS, AND THAT ONLY RECEIVING RADIATION HAS THERE BEEN DETERMINATION TO MINIMIZE RISK AT ALMOST ANY COST. HE STATES (1) SIGNIFICANT FACTS AND FIGURES ON TRITIUM AND FISSION, (2) CURRENT N-PLANTS ARE MORE EFFICIENT THAN AVERAGE CURRENTLY OPERATING STEAM PLANTS, AND (3) 5 SPECIFIC OBJECTIVES OF 8 AND 0 PROGRAMS SUPPORTED BY AEC TO DETERMINE FACTORS ASSOCIATED WITH THERMAL EFFECTS.

CONGRESSIONAL ACTIVITY + FISSION + SITING, REACTOR + ATMOSPHERIC POLLUTION + REACTOR POWER + RADIOACTIVITY RELEASE + ENVIRONMENT + WATER POLLUTION + THERMAL POLLUTION + NO-POWER, SAFETY OF + PERMANENT + OSTROFSKY, AEC

[illegible]
MOUNTAIN JR + LEONARD JH
TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR
UNIVERSITY OF CINCINNATI
[illegible] PAGES, [illegible] FIGS, 5 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 13(1), P. 220 (JUNE 1970)

TRITIUM PRODUCTION CYCLE OF THE SAN ONOFRE AND CONNECTICUT YANKEE REACTORS FROM TERNARY FISSION AND FROM BORON AND LITHIUM COOLANT ADDITIVES WAS EVALUATED. PRODUCTION OF TRITIUM WAS EVALUATED AS A FUNCTION OF VARIOUS PARAMETERS WHICH AFFECT THE REMOVAL RATE OF LI-7 FROM THE COOLANT. THE RELATIVE CONTRIBUTION OF EACH TRITIUM-PRODUCING REACTION WAS OBTAINED, AS WELL AS THE RELATIVE TRITIUM ACTIVITY PRODUCED BY EACH REACTION IN THE CORE AND REFLECTOR. TRITIUM RELEASE DATA FOR CONNECTICUT YANKEE WAS COMPARED TO THE TRITIUM ACTIVITY CALCULATED FOR THE BORON AND LITHIUM ADDITION REACTIONS.

AVAILABILITY - J.H. MOUNTAIN, UNIVERSITY OF CINCINNATI, OHIO 45221

BORON + DECONTAMINATION + DIFFUSION + MODERATING + FISSION GAS RELEASE + REACTOR, PWR + POISON, SOLUBLE + REACTOR COOLANT + NEAR CROPP 1 (PWR) + STEEL, STAINLESS + RADIOACTIVITY RELEASE + ENVIRONMENT + LITHIUM + DIFFUSION + PARAMETER

048572
LOESCHER JE • CHISSLER RI
RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES.
BUREAU OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND
BRH/DER-70-2 • PB-190717 •, 77 PAGES, MARCH 1970

SUMMARIZES DISCHARGES OF RADIOACTIVE MATERIAL TO THE ENVIRONMENT FROM NINE SELECTED NUCLEAR POWER FACILITIES AND EVALUATES THE DISCHARGES TO POWER PRODUCED AND PLANT MAINTENANCE OPERATIONS. THE FACILITIES REPRESENT THREE MAJOR REACTOR TYPES - PRESSURIZED WATER, BOILING WATER, AND HIGH-TEMPERATURE GAS. FACILITIES WHICH INCLUDED TO REPORT REPRESENT UNIQUE REGIONS NOT BEING CONSTRUCTED IN THE PRESENT GENERATION OF POWER PLANTS, OR THEY ARE SIMILAR PLANTS SIMILAR IN DESIGN TO THOSE WHICH ARE INCLUDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ADMINISTRATIVE CONTROL • BIG ROCK POINT (BWR) • REACTOR, BWR • DRESDEN 1 (BWR) • EFFLUENT • REACTOR, GCR • HADDAM NECK (PWR) • INDIAN POINT 1 (PWR) • PEACH BOTTOM 1 (HTGR) • REACTOR, PWR • PRESSURIZED WATER (PWR) • REACTOR, POWER • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • ENVIRONMENT • REPORT, OPERATIONS SUMMARY • REACTOR, WATER • OPERATING EXPERIENCE • DATA COLLECTION • RECOMMENDATION • INDUSTRY, NUCLEAR

058209
ASHLEY C
EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JULY THROUGH DECEMBER 1968.
DPSPU-66-30-1 • DPSPU-66-30-2 • DPSPU-67-30-1 • DPST-67-30-2 • DPST-68-30-1 • DPST-68-30-2 •.

CESIUM • CESIUM • COBALT • RIVER • RUTHENIUM • STRONTIUM • ZIRCONIUM • CHROMIUM • MANGANESE • RUTHENIUM • SAVANNAH RIVER PLANT • RADIOISOTOPE • ENVIRONMENT • EFFECT • TRANSPORT • PLANT • POND INTAKE

058305
DECKERT SB
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.
JOURNAL OF GEOPHYSICAL RESEARCH 67 PAGES 6969-6976 1962

GROUND WATER • RIVER • WASTE DISPOSAL • SAVANNAH RIVER PLANT • RADIOISOTOPE • TRANSPORT • PLANT

059042
HOFLER GC
EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AFCL REACTOR STACK.
AFCL-1910 •.

DILUTION • STACK • AIR • PRECIPITATION • REACTOR • RATE • AFCL • TRANSPORT

059407
HORTON JH
FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.
DPSPU-67-30-300 •.

FISSION PRODUCT RELEASE • RIVER • SAVANNAH RIVER PLANT • PLANT

059829
GAMERTSFELDER CC
STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF RADIOBIOLOGY AND ENVIRONMENTAL PROTECTION
75 PAGES, FIGURES, TABLES, STATEMENT PRESENTED AT THE AEC RULEMAKING HEARINGS ON EFFLUENTS FROM LIGHT WATER COOLED NUCLEAR POWER REACTORS, JANUARY 20, 1972

DISCUSSES THE OPERATING EXPERIENCE OF WATER LIGHT-WATER-COOLED REACTORS WITH RESPECT TO DISCHARGES OF RADIOACTIVE MATERIALS IN LIQUID AND GASEOUS EFFLUENTS, INCLUDING THE COMPOSITION AND QUANTITIES OF WASTES RELEASED AND THE RESULTING DOSES TO PEOPLE AT THE BOUNDARY AND ELSEWHERE IN THE SURROUNDINGS.

AVAILABILITY - C. C. GAMERTSFELDER, ASST. DIR., USAEC DIVISION OF RADIOLOGICAL AND ENVIRONMENTAL PROTECTION, WASHINGTON, D. C.

EFFLUENT • HPC • WATER, DRINKING • OPERATING EXPERIENCE SUMMARY • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • POPULATION EXPOSURE • DOSE MEASUREMENT, EXTERNAL • DOSE CALCULATION, EXTERNAL • RADIOACTIVITY RELEASE • CONCENTRATION

059112
BELLY RJ • BANTAN CJ • HOYER AS • CHEN PW • BOWMAN CR
THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-4775 •, 41 PAGES, FIGURES, TABLES, JULY 1972

[illegible]
DATA [illegible] IN THIS REPORT [illegible] INDICATE THAT PROCESSING OF NATURAL GAS CONTAINING TRITIATED HYDROCARBONS AT LEVELS EXPECTED [illegible] IN LARGE-SCALE REPRESENTATION OF THE NUCLEAR GAS-STIMULATION TECHNIQUE WILL NOT PRESENT SIGNIFICANT RADIATION EXPOSURE PROBLEMS FOR PLANT PERSONNEL. [illegible] OF TECHNIQUES AS PRESENTLY [illegible] WITH THE PLANT PROCESSING [illegible] WAS [illegible], BUT IT SEEMS PROBABLE THAT PLANT OPERATORS IN ANY PROCESSING PLANT WOULD RECEIVE DOSES LESS THAN 1% OF NATURAL BACKGROUND FROM [illegible] AND CONTAINING COMBUSTION PRODUCTS RESULTING FROM TO-PLANT USE OF THE TRITIUM-CONTAMINATED GAS AS FUEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

KEYWORDS - NUCLEAR EXPLOSIONS • GAS, PERMEABILITY, EXPLOSIVE • STIMULATION • [illegible], RADIATION • GAS • RESERVOIR PRODUCT • STIMULATED • [illegible], NATURAL

[illegible]
SAKAL LA
[illegible] RADIATION EXPOSURES FROM NUCLEAR POWER REACTORS
[illegible] PAGES. ARCHIVES OF ENVIRONMENTAL HEALTH, 22(4), PP. 447-449 (APRIL 27, 1971)

IN ASSESSING RADIATION EXPOSURE [illegible] FROM N-REACTORS, AUTHOR DESCRIBES REACTOR OPERATION, RADIOLOGICAL EFFECTS OF SIGNIFICANT RADIONUCLIDES, AND PRIMARY DOSES FROM EXPOSURE. HE DISCUSSES POSSIBLE AMOUNTS IN DRINKING WATER, FISH, AND AIR. TRITIUM AND [illegible] ARE SPECIAL CONSIDERATIONS, I.E., THEIR HALF-LIVES. HE NOTES THAT RADIATION FROM N-POWER PLANTS MUST BEEN CONSISTENTLY WITH PERMISSIBLE STANDARD LEVELS.

KEYS - FISSION PRODUCT RELEASE • REACTOR • HAZARD, RELATIVE • WATER • AIR • POPULATION EXPOSURE • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • ANIMAL, FISH • RADIATION EFFECT • RADIATION EXPOSURE • [illegible], SEC • NUCLEAR PLANT, NUCLEAR

[illegible]
[illegible] 1 • [illegible] 3
INVESTIGATION OF ZO-7 [illegible]
[illegible] TEMPERATURE [illegible] NATIONAL REACTOR INSTITUTE, [illegible]
[illegible] P. 17 PAGES, 1970

THE [illegible] OF TRITIUM TARGETS IN NEUTRON GENERATORS, AS INDICATED ALSO BY THE EXPERIMENTS, DOES NOT LEAD TO THE DETACHMENT OF IRRADIABLE ZO-7 [illegible] OR SIGNIFICANT ACTIVITY. HIGH ACTIVITY PARTICLES LARGER THAN 10 MICRONS IN DIAMETER MAY APPEAR OCCASIONALLY IN THE [illegible] ZONE. THOUGH THEY CAN [illegible] IN THE NASAL-PHARYNGEAL TRACT, THE ZO-7 CONTAMINATION OF THE LOWER RESPIRATORY TRACT HAS NOT TO BE FEARED. THE ZO-7 PARTICLES DETACHED FROM THE TARGET MAY CONTAMINATE THE SKIN SURFACE OF THE OPERATORS AND RESULT IN AN INTERNAL CONTAMINATION DUE TO PERCUTANEOUS ABSORPTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

KEYWORDS - PHYSICAL • OPERATING • ABSORBED PROPERTIES • [illegible] • OPERATING EXPERIENCE

[illegible]
SELECTED ITEMS OF INTEREST
CANADIAN [illegible] CORPORATION
[illegible] 1155-77 P. 24 PAGES, EXCESS [illegible] MONTHLY REPORT FOR JUNE 1970, TRPT--[illegible], [illegible]--A.C., AP--SGI • LEWRY

THERE WERE EIGHT SCRAMS - (1) THREE BY SPURIOUS HIGH PRESSURE SIGNALS, (2) THREE FROM HIGH FLUX RESULTING FROM STARTING FEED WATER PUMPS, (3) [illegible] SCALING RANGE CHANGE, (4) [illegible] SCALING RANGE WITH [illegible] FAILURE, (5) ONE FROM INDICATED LOW DECIMALATING FLOW FROM GAS IN SECTION LINES, (6) ONE FROM [illegible] TURBINE [illegible] OFF ONLINE DURING CONTROL. [illegible] ACTIVITY IN LOWER REACTOR CAVITY WAS TRACED TO LEAKAGE FROM FUEL-ELEMENT STORAGE WELL [illegible] TRITIUM LEVEL IN CAVITY WITH REACTOR [illegible] WAS SAME AS THAT DURING REACTOR OPERATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, [illegible] • FAILURE, EQUIPMENT • FAILURE, [illegible] • [illegible], OPERATIONS • [illegible], [illegible] • INSTRUMENT, FLOW • SCRAM, SPURIOUS • EXCESS [illegible] • LEAK • OPERATING EXPERIENCE

[illegible]
LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
[illegible] 70-7 P. 19 PAGES, 19 FIGURES, 21 TABLES, NOVEMBER 1970

LIQUID WASTE EFFLUENTS FROM NUCLEAR FUEL SERVICES WERE STUDIED DURING A SIX-MONTH PERIOD MAY THROUGH OCTOBER 1969. CONCENTRATIONS AND AMOUNTS OF INDIVIDUAL RADIONUCLIDES DISCHARGED FROM THE PLANT WERE MEASURED AND THE AMOUNTS OF SEDIMENTATION OF INDIVIDUAL RADIONUCLIDES IN THE LAGOON SYSTEM WERE ESTIMATED. TRITIUM, RUTHENIUM-106, STRONTIUM-90, CESIUM-137 AND CESIUM-134 WERE THE PRIMARY RADIONUCLIDES DISCHARGED TO THE ENVIRONMENT DURING THIS PERIOD. DURING JUNE AND NOVEMBER 1969 SIMULTANEOUS SAMPLING WAS CARRIED OUT AT THE POINT OF DISCHARGE OF THE WASTE AND SEVERAL LOCATIONS ON THE BUFFALO AND CATTARAUGUS CREEKS. TRITIUM, RUTHENIUM-106, AND STRONTIUM-90 WERE THE RADIONUCLIDES PRESENT IN THE HIGHEST CONCENTRATIONS IN THESE STREAMS DURING THESE PERIODS. STREAM DILUTION AND ABSORPTION FACTORS WERE CALCULATED FOR INDIVIDUAL RADIONUCLIDES AT VARIOUS LOCATIONS ALONG THE STREAM SYSTEM. A COMPARISON OF THE CONCENTRATIONS OF THE

[illegible]
RADIONUCLIDES IN CATTARAUGUS COUNTY WITH REPORTED DISCHARGE CONCENTRATIONS LEVELS. ALL
RADIONUCLIDES WERE NEAR BELOW CONCENTRATION LIMITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION • MEASUREMENT • DETERMINATION • STRONTIUM • ORGANIZATION, ARC • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • GAS • FUEL REPROCESSING • MONITORING EQUIPMENT, ENVIRONMENTAL • CONCENTRATION • SAMPLING

[illegible]
COCHRAN JB • SPRAY DG • MADDOX RJ • SPECHT A
AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT
PUBLIC HEALTH SERVICE, BUREAU OF RADIOLOGICAL HEALTH, MARYLAND
BRH/DER-70-1 •, 70 PAGES, 11 FIGURES, 16 TABLES, 17 REFERENCES, JULY 1970

DESCRIBES STUDIES CARRIED OUT AT AN OPERATING NUCLEAR FUEL REPROCESSING PLANT FOR THE PURPOSES OF CHARACTERIZING THE STACK EFFLUENT, MEASURING THE ENVIRONMENTAL LEVELS OF ACTIVITY DUE TO COMPONENTS OF STACK RELEASE, AND EVALUATING INSTRUMENTATION AND METHODOLOGY USED TO SAMPLE NOTE AT THE STACK AND IN THE ENVIRONMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT • FOOTING • EXPOSURE • MEASUREMENT • SAMPLING • OSTACK • ORGANIZED, ENVIRONMENTAL • PRODUCTION EXPOSURE • METEOROLOGY • FUEL REPROCESSING • INSTRUMENTS, MISC.

[illegible]
[illegible]
ZIRCALOY - CLAD UO2 FUEL ROD FABRICATION PROGRAM. QUARTERLY PROGRESS REPORT 11, MAY - JULY 1970
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-10217 •, 57 PAGES, AUGUST 1970

PROGRESS REPORT ON STUDY TO DETERMINE THE [illegible] FUEL RODS (ZIRCALOY-2 CLADDING, UO2 • [illegible]). DESCRIBES FABRICATION AND ANALYSIS OF THE RODS (CAMMA SCANNING, DIMENSIONAL MEASUREMENTS, EXAMINATIONS OF DE-CLADDED RODS, NEUTRON RADIOGRAPHY OF RODS, GAS COLLECTION, AND ANALYSES OF CLADDING FOR TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING • FISSION GAS RELEASE • [illegible] • FLOW • CORE • ZIRCALOY • [illegible] • SURFACE HEAT TRANSFER • EXPANSION • FUEL ROD

[illegible]
OECD HIGH-TEMPERATURE REACTOR PROJECT DRAGON. 11TH ANNUAL REPORT 1969-1970
ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, PARIS (FRANCE)
OPTIMAG •, 197 PAGES, 1970

THE OPERATION OF THE REACTOR EXPERIMENT PROCEEDED WITH FEW INTERRUPTIONS. REPORT FROM THE REPLACING OF FUEL ELEMENTS DURING THE FIRST HALF OF THE PERIOD. DESPITE THE EXISTENCE OF SERIOUS CORROSION IN THE PRIMARY CIRCUIT HEAT EXCHANGERS, DURING THE YEAR THE REPLACEMENT OF TWO COMPLETE NEW SETS OF HEAT EXCHANGERS (ONE WITH STEEL, AND THE OTHER WITH INCONEL 600 TUBES) WAS COMPLETED AND THE SETS WERE DELIVERED TO DRAGON. NEW SECONDARY CIRCUIT PUMPS WERE ALSO PROCURED TO REDUCE THE FLOW INSTABILITY ON THE SECONDARY SIDE OF THESE HEAT EXCHANGERS, AND TO INCREASE THEIR HEAT REMOVAL CAPACITY BY 25 %. IT WAS ALSO PLANNED TO COMPLETE THE MODIFICATIONS OF BOTH CORES OF THE THERMAL CHARGE AND TO START UPON THE REACTOR EXPERIMENT FOR AN EXTENDED PERIOD FROM MARCH 1970 FOR THE REPLACEMENT OF THE PRIMARY HEAT EXCHANGERS AND FOR MODIFICATIONS TO THE SECONDARY CIRCUIT TO TAKE THE NEW PUMPS. IN THE EVENT, DELAYS OF MORE INCIDENCE OF THE FAILURES AT THE END OF THE PRODUCTION OF CORE 1, AND DELAYS THE NEW PUMPS WERE AVAILABLE, IT WAS DECIDED TO BRING FORWARD THE PROGRAMME FOR THE INSTALLATION OF THE NEW MILD STEEL HEAT EXCHANGERS AND THE SECONDARY CIRCUIT MODIFICATION.

FABRICATION • REACTOR, GCR • GRAPHITE • REACTOR, GRAPHITE MODERATED • MAINTENANCE AND REPAIR • WATER ATMOSPHERE • COOLANT CHEMISTRY • CORROSION INTEGRITY • METHOD • REPORT, OPERATIONS SUMMARY • REACTOR PHYSICS • REACTOR, HTGR • HEAT EXCHANGERS • FUEL ELEMENTS

[illegible]
YANKEE NUCLEAR POWER STATION, OPERATION REPORT NO. 170, FOR APRIL 1971
YANKEE ATOMIC ELECTRIC COMPANY, WESTBORO, MASSACHUSETTS
ORNLRT-[illegible]-151 •, 8 PAGES, FIGURES, TABLES, REPORT TO DIVISION OF REACTOR LICENSING (NRC) FROM YANKEE ATOMIC ELECTRIC COMPANY, MAY 21, 1971, DOCKET 50-29, TYPE--PWR, NRC--WEST., AF-- STAGE • WESTCO

NO ABNORMAL OCCURRENCES DURING THE REPORT PERIOD. THE PROGRAM OF DECONTAMINATION OF ALL PRIMARY AUXILIARY AND WASTE DISPOSAL INSTRUMENTATION WAS CONTINUED. THE IODINE-131 SPECIFIC ACTIVITY AVERAGED 6.0 X 10(-4)MCI MICROCURIES/ML. THE IODINE 131/133 ATOMIC RATIO AVERAGED 7.10, INDICATING NO SIGNIFICANT CHANGE IN THE PROPORTION OF FUEL CLAD DEFECTS DURING THE MONTH. WASTE DISPOSAL LIQUID RELEASES TOTALED 23,005 GAL, CONTAINING 0.007 MC OF GROSS BETA-GAMMA ACTIVITY AND 77.02 CURIES OF TRITIUM. GASEOUS ACTIVITY ADD 3.50 MC OF TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] REFERENCES
[illegible] • REACTOR, PWR • WASTE DISPOSAL • REPROCESSING WASTE GASES • GROSS BETA • GROSS GAMMA • INSTRUMENT CALIBRATION • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • PARKWAY, CLEARING • REPORT, OPERATIONS SUMMARY

004775
[illegible]
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER STORAGE
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER NUCLEAR LABORATORY, CANADA
AECL-2770 •. 17 PAGES, 6 FIGURES, 3 TABLES, 7 REFERENCES, 1967

[illegible] THE EXPERIENCE GAINED FROM OPERATION OF NPD VARIOUS THROUGH THE VARIETIES SUCH OF NEW HEAVING AIR-SUPPLIED MASKS AND CERTAIN OPERATIONS. [illegible] IS PROVIDED TO THE AIR IN VICINITY OF THE NPD REACTOR WHICH IS WATER-COOLED. [illegible] INCORPORATED. AVERAGE WATER ABOUT THE REACTOR WAS 0.17 CURIES IN 1966-67. A TRITIATED WAS RECEIVING AND HANDLING FROM SUCH A CONTA. 40 [illegible]. [illegible] SINCE [illegible] AVERAGE WAS ONLY [illegible] AS FAST PASTE NO. 5[illegible], [illegible] TO [illegible]. THEY SHOULD HAVE RECEIVED 320, BUT ACTUALLY GOT 120 [illegible]. IN [illegible] LESS THAN OVER THE REACTOR, 1000 [illegible] THE LIMIT SET BY CANADIAN LAW. AVERAGE DOSES TO THE OPERATING PERSONNEL IN 1966 WERE 700 [illegible] WERE = 1.2 • [illegible] GAMMA RAYS. AVERAGE [illegible] RECEIVED BY [illegible] FROM EXPOSURE [illegible] 792 [illegible]. [illegible] EXPOSURE IN THESE [illegible] CONTAINS 20 RECOMMENDED PER LITER OR MORE AND [illegible] LEVEL [illegible] TO A [illegible] ASSUMED 9 [illegible]. [illegible] WITH 7 TO 10 [illegible] ARE CLASSIFIED AS HAVING [illegible] CONTAM. AIR-SUPPLIED MASKS [illegible] OF [illegible] DAILY EXPOSURE EXCEEDS [illegible] HOURS. BUT NOT ALWAYS [illegible] WHEN CONTA WAS [illegible] 7 OR 9 RECOMMENDED PER LITER OR [illegible]. [illegible] EQUAL PARTS OF [illegible] ARE ADSORBED THROUGH SKIN AND LUNGS. [illegible] PERMISSIBLE WITH MASKS.

[illegible] • [illegible] AND STANDARDS • DOSE • DOSE CALCULATION, INTERNAL • PERSONNEL EXPOSURE, OCCUPATIONAL • [illegible] • [illegible] • [illegible] • [illegible] • REACTOR, HEAVY • EXPOSURE, SKIN • [illegible] • LEGISLATION

004790
[illegible] • [illegible]
CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT
E.I. DU PONT DE NEMOURS & COMPANY, • SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA
7 PAGES, 19 REFERENCES, 3 TABLES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 2-, PAGE 270-275, 1969.
[illegible]

[illegible] INC. [illegible]. TRITIUM IS PRODUCED AS AN UNWANTED BYPRODUCT [illegible] IN THE REACTORS, [illegible] IRRADIATION. [illegible] OF [illegible] TO ASSIMILATE 1 MCI OF [illegible] VS AIR ACTIVITY IN [illegible] TO MONITOR [illegible] PER DIFFERENT TYPES OF [illegible] AND SOIL CONTAMINATION. STACK MONITORS GIVE CONTINUOUS RECORD OF [illegible] COUNTS. TRITIUM EXPOSURE RECORD BY SAVANNAH AS FOLLOWS - YEAR, NO. OF ASSAYS, [illegible] WITHIN BETWEEN 0.97 AND 1.0 MCI, [illegible] WITHIN GREATER THAN 1.0 MCI - 1964, 7190, -, 0 - 1965, 7910, -, 7 - 1966, 7270, -, 19 - 1967, 6970, -, 40 - 1968, 1600, 107, 39 - 1969, 7900, 1[illegible], 22 - 1970, 2770, 652, 70 - 1971, 7900, 401, 77. AT [illegible] OF CONTACT GREATER THAN 20 MCI/M IN 79 CASES THE MEAN HALF-LIFE EXCEEDED 10 DAYS. THE AVERAGE WEEKLY [illegible] OF [illegible] IN [illegible] FROM 3 [illegible] DATIFIES AND 7 [illegible] WAS 7 X 10 (FROM -0) MCI/CC, THE AVERAGE WEEKLY [illegible] IN [illegible] WITH WAS TYPE OF LIMIT SUGGESTED BY ICRP FOR LARGE POPULATIONS. AVERAGE AIR [illegible] WAS 0.5 MCI/CC X 10 (FROM -0), WITH WEEKLY [illegible] OF 4.0, AND [illegible] AVERAGED 10 X 10 (FROM -0) WITH WEEKLY [illegible] OF 100. [illegible] NOS. 6070, 6071, 6150 PER ANNUAL SAVANNAH RIVER DATA ON TRITIUM.

[illegible] • [illegible] • WATER • AIR • [illegible] • [illegible], ENVIRONMENTAL • SAVANNAH RIVER PLANT • POPULATION EXPOSURE • OCCUPATIONAL EXPOSURE, RADIATION • RADIOACTIVE WASTE • ANIMAL, VERTEBRATE • PHYSIOLOGY/PATHOLOGY • REACTOR, [illegible] • [illegible] • [illegible] • EXPOSURE, BACKGROUND

004800
A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS
(1968-70)100 •. 10 PAGES, PROCEEDINGS OF THE 5TH ANNUAL HEALTH PHYSICS SOCIETY MIDYEAR SYMPOSIUM, VOLUME II, PG. 266-277, [illegible] 1970

LABORATORY OPERATIONS AT BROOKHAVEN SINCE ITS ESTABLISHMENT IN 1946 HAVE INCLUDED THE ROUTINE RELEASE TO THE ENVIRONMENT OF GASEOUS, HALOGENS, AIR PARTICULATE, AND H-3 RADIOACTIVITY IN REACTOR AND EFFLUENTS AND OF BETA-GAMMA EMITTERS AND H-3 IN LOW-LEVEL LIQUID WASTES IN AMOUNTS COMPARABLE TO CURRENT RELEASES FROM POWER REACTORS. PAST AND CURRENT SURVEILLANCE DATA AT BNL HAVE BEEN EVALUATED FOR SHORT- AND LONG-TERM CHANGES IN RADIATION LEVELS ATTRIBUTABLE TO THESE OPERATIONS. ON THE BASIS OF THESE DATA, IT IS CONCLUDED THAT FEW CHANGES IN BACKGROUND SHOULD BE APPARENT, EVEN AFTER LONG-TERM OPERATION OF NUCLEAR POWER REACTORS.

EFFLUENT • PARTICLE • BETA EMITTER • REACTOR, POWER • AIR • GAS • RADIOACTIVITY RELEASE • GAMMA EMITTER • GAS • LIQUID • OPERATING EXPERIENCE • DATA COLLECTION • MECHANISM • EXPOSURE, BACKGROUND

005292
[illegible] • [illegible]
MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT
7 PAGES, AMERICAN NUCLEAR SOCIETY TRANSACTIONS, 14(1), PAGE 167-169, JUNE 1971

DETAILS THE VARIOUS METHODS OF MONITORING FOR TRITIUM IN ITS VARIOUS FORMS. POINTS OUT THE DIFFICULTIES OF CONTINUOUS MONITORING FOR LOW TRITIUM [illegible] CONCENTRATIONS. THE SAVANNAH RIVER PLANT IS A PRODUCER OF TRITIUM, AND CONSEQUENTLY THE MONITORING OF TRITIUM IN GASES, LIQUIDS, AND

005252 [illegible]
[illegible] ENVIRONMENTAL MEDIA HAS BEEN OF MAJOR IMPORTANCE SINCE STARTUP IN THE 1960S.

MONITOR, LIQUID • MONITOR, STACK • MONITOR, AIR • MONITOR, GAS • MONITOR, ENVIRONMENTAL • SAVANNAH RIVER PLANT • RADIATION MONITORS

005472
SMITH JR • GALBOT DS
TRITIUM EXPERIENCE IN BOILING WATER REACTORS
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
7 PAGES. TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 14(1), PAGES 100-101 (1971)

DUE TO THE LOW TRITIUM CONCENTRATIONS IN A BWR, KNOWLEDGE OF THE RELATIVE CONTRIBUTIONS FROM THE VARIOUS SOURCES THAT APPEAR IN REACTOR WATER IS GAINED ONLY BY INFERENCE. AS OF 1970 CONDITIONS AT OYSTER CREEK INDICATED ABOUT 22 CI OF TRITIUM IN LIQUID EFFLUENTS. BASED ON OPERATING HISTORY, THE SOURCES ARE ESTIMATED TO BE A 6 CI FROM DEUTERIUM IN REACTOR WATER, 4000 CI IN FUEL FROM FISSION, AND 2000 CI IN CONTROL MATERIAL DURING THE YEAR. BY INFERENCE, IT APPEARS THAT ONLY A FEW-TENTHS OF ONE PERCENT OF THE CONTROL FISSION AND CONTROL MATERIAL SOURCE IS TRANSFERRING TO REACTOR WATER. THIS INFERENCE INDICATES THAT INNOVATION OF LARGE BOILING WATER REACTORS WILL CONTINUE TO PRODUCE INSIGNIFICANT RADIATION EXPOSURES FROM TRITIUM, BOTH IN PLANT AND IN THE ENVIRONS.

AVAILABILITY - JAMES M. SMITH, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

REACTOR, BWR • REACTOR

005993
WRIGHT JF
ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS
4 PAGES. J. INST. NUCL. ENG., 12, PAGE 6-12, JAN-FEB, 1971

RADIATION EFFECTS EVEN IN A REGION CONTAINING NUCLEAR PLANTS ON 37-MI CENTER TO CENTER LOCATIONS ARE STILL QUITE NEGLIGIBLE. INFORMATION ON THE RADIONUCLIDE RELEASE IN LIQUID AND GASEOUS EFFLUENTS SHOULD BE COLLECTED TO ASSESS THE FUTURE ENVIRONMENTAL RADIONUCLIDE DISTRIBUTION. ALTHOUGH THERE IS NO SHORT RANGE PROBLEM FROM BUILD-UP IN THE ENVIRONMENT, THE MANAGEMENT OF RADIATION AND TRITIUM SHOULD BE INVESTIGATED WITHIN THE NEXT TWO DECADES.

ENVIRONMENT • REACTOR, PWR • RADIATION IN PERSPECTIVE • WASTE DISPOSAL, ATMOSPHERIC • WATER • WASTE DISPOSAL, RIVER • RADIONUCLIDE INVENT • N-POWER FORECAST

006297
REGENTS FR
ZIRCALOY-CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT 13, NOV. 1970 TO AUG. 1971
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-10969 P. 20 PAGES. 5 REFERENCES. 12 FIGURES. 4 TABLES. AUGUST 1970

PROGRESS REPORT ON STUDY OF PERFORMANCE OF SA-1 FUEL RODS ZIRCALOY-2 CLADDING. UO2 FUEL. DESCRIBES FABRICATIONS AND ANALYSES OF THE RODS GAMMA SCANNING. DIMENSIONAL MEASUREMENTS. EXAMINATION OF DE-CLADDED RODS. AUTOMA RADIOGRAPHY OF RODS. GAS COLLECTION, AND ANALYSIS OF ELECTRIC FOR TRITIUM.

AVAILABILITY - F. H. REGENTS, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

CLADDING • FISSION GAS RELEASE • FUEL DAMAGE • FLAW • CRAP • ZIRCALOY • OPERATIONAL • SURFACE FILM DEPOSIT • EXPERIMENT • FUEL ROD

006706
REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE, WASHINGTON, D.C.
9 PAGES. 4 TABLES. OCTOBER 1971

TABULATES RADIOACTIVITY RELEASED IN LIQUID AND GASEOUS EFFLUENTS FROM NUCLEAR POWER PLANTS DURING 1970. NEW REACTORS WITH CAPACITY FACTORS OF LESS THAN 100 FOR 1970 WERE EXCLUDED. REVIEWS OF SAMPLING AND ANALYTICAL METHODS USED AT SOME FACILITIES WERE INCONSISTENT IN MEASURING TOTAL ACTIVITY. CORRECTIONS WERE MADE. THEREFORE SOME DATA ARE DIFFERENT FROM THOSE REPORTED BY THE UTILITIES. RADIOACTIVITY IN EFFLUENT RELEASES WAS OFTEN GENERALLY LOW IN COMPARISON WITH PERMISSIBLE LIMITS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, FOR CENTS/PAGE -- MINIMUM CHARGE $2.00)

REACTOR, BWR • FISSION GAS RELEASE • FISSION PRODUCT RELEASE • REACTOR, PWR • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • RADIOACTIVITY RELEASE • REACTOR, HTGR

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HANSON CA
OAKER RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS

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AVAILABILITY - JAMES A. [illegible], [illegible] [illegible], [illegible] [illegible], [illegible] [illegible], [illegible] [illegible], [illegible]

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17 PAGES, 0 TABLES, 2 REFERENCES. PRESENTED AT THE COMMISSION OF THE COMMUNITIES INFORMATION SYMPOSIUM ON
RADIOPROTECTION, APPLIED TO THE PROTECTION OF [illegible] HEALTH PHYSICS, SEPTEMBER 1977

[illegible] FROM THE [illegible] NUCLEAR PROGRAMME. [illegible] EFFECTS [illegible]
STUDIES. [illegible] CONCENTRATIONS IN [illegible] WATER [illegible] 1973 [illegible] DISCHARGES. [illegible]
[illegible] BACKGROUNDS, ABOUT 15 [illegible] DISTRIBUTED. [illegible] AND LABORATORY STUDIES [illegible] ON [illegible]
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[illegible] AS [illegible] ABOUT [illegible] FOR A [illegible] OF [illegible] WATER [illegible] 500.

AVAILABILITY - [illegible] FOR [illegible] PUBLICATIONS IN THE [illegible] COMMUNITIES. [illegible] 1977. [illegible]

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[illegible] - [illegible] PAGES. [illegible] - [illegible] [illegible] TO [illegible] OF [illegible]
[illegible] - [illegible] 31, 1977. [illegible] [illegible]

[illegible] LIQUID AND GASEOUS RADIOACTIVITY RELEASE BY [illegible] FROM [illegible] REACTOR. [illegible] RELEASES
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AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. [illegible]

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[illegible] ASPECTS OF THE RELEASE OF RADIOACTIVITY AND [illegible] OF THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA
[illegible] NUCLEAR LABORATORIES, CANADA
[illegible] - 87 PAGES, 9 FIGURES, 10 TABLES, 27 REFERENCES. [illegible] 1977

[illegible] PAPER AND TALKS ARE INCLUDED. [illegible] PUBLISHED [illegible] TOPICS INCLUDE
NUCLEAR [illegible], [illegible], [illegible] LIMITS, [illegible] TO [illegible] [illegible]
REACTORS DURING [illegible]. THE [illegible] CYCLES [illegible] TO [illegible] [illegible] [illegible] TO
GASEOUS [illegible]. [illegible] [illegible] [illegible] [illegible] TRITIATED [illegible]
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[illegible].

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] GAS • [illegible] • [illegible] • [illegible] • [illegible]
[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]
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[illegible] JR • [illegible] CO • [illegible] C J
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[illegible] NO. 77 •, [illegible] PRESENTED AT THE [illegible] HEALTH PHYSICS SOCIETY [illegible], [illegible]
[illegible], JUNE 17, 1977 ISSN [illegible]

THE [illegible] SCIENCES LABORATORY OF THE NEW YORK STATE DEPARTMENT OF HEALTH IS CONDUCTING A
STUDY TO CHARACTERIZE THE GASEOUS RADIOACTIVE EFFLUENTS FROM NUCLEAR FACILITIES. AT THIS TIME,
[illegible]-UP TUBE, [illegible]-GAS, [illegible]-GAS AND STACK EFFLUENT SAMPLES HAVE BEEN TAKEN. A [illegible] AND A GAS-
[illegible] DETECTOR HAVE BEEN ANALYZED. GASEOUS SPECIES AND [illegible] SEPARATED. THESE
[illegible] IN GAS [illegible] SYSTEMS. SPECTROMETRIC MEASUREMENTS HAVE [illegible] IN THE
[illegible] AND QUANTIFICATION OF [illegible] GAS, [illegible] AND [illegible]. [illegible] GAS [illegible]
AND [illegible], [illegible], [illegible], [illegible] AND [illegible]. [illegible] IN [illegible]
[illegible], [illegible], AND ANALYSIS ARE DISCUSSED WITH [illegible] TO [illegible] [illegible]
[illegible] WITH [illegible] TO DETECTING [illegible] INCLUDED BY SAFETY [illegible] [illegible].

AVAILABILITY - JOHN [illegible], [illegible], NEW YORK STATE DEPARTMENT OF HEALTH, ALBANY, NEW YORK 12201

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible], GAS •
[illegible] • [illegible] GAS • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] [illegible]

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U.S. ENVIRONMENTAL PROTECTION AGENCY

[illegible] PAGES, [illegible] TABLES, 2 FIGURES, [illegible] REFERENCES, [illegible]

A STUDY WAS CONDUCTED AT [illegible] FUEL SERVICES, INC. [illegible] TO [illegible] THE STACK TRITIUM [illegible] IN THE GASEOUS AND WATER VAPOR FORMS, [illegible] PLANT OPERATIONS, [illegible] SELECTIVE SITES AROUND THE PLANT [illegible] STACK AND IN THE ENVIRONMENT, AND [illegible] THE PLANT [illegible] STACK [illegible]. DATA [illegible] THE [illegible] AIR SAMPLING STATIONS AROUND THE SITE [illegible] THE PLANT [illegible] TO THE ATMOSPHERE IS SMALL.

AVAILABILITY - U.S. ENVIRONMENTAL PROTECTION AGENCY, [illegible], WASHINGTON, D.C. 20460

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TECHNICAL EVALUATION OF THE [illegible] NUCLEAR POWER PLANT AND RELATED PROGRAMS

U.S. ARMY ENGINEER REACTOR GROUP, CORPS OF ENGINEERS

[illegible] PAGES, [illegible] REFERENCES, [illegible]

THIS REPORT PRESENTS A TECHNICAL EVALUATION OF THE [illegible] NUCLEAR POWER PLANT AND RELATED PROGRAMS. [illegible]

AVAILABILITY - U.S. ARMY ENGINEER REACTORS GROUP, ENGINEERING DIVISION, CORPS OF ENGINEERS, FT. BELVOIR, VA. 22060

[illegible] OPERATING EXPERIENCE [illegible] MILITARY [illegible] OPERATING EXPERIENCE

[illegible]

[illegible]

[illegible] NEUTRON-IRRADIATED [illegible] COMPACTS

[illegible], WEST GERMANY

[illegible] PAGES, FIGURES, TABLES, JUNE 1972

THIS REPORT REFERS TO POST-IRRADIATION INVESTIGATIONS ON NEUTRON-IRRADIATED [illegible] COMPACTS. THE [illegible] PROPERTIES OF THE SAMPLES SUCH AS DENSITY, POROSITY, AND [illegible] IS DISCUSSED AS WELL AS THE [illegible] COMPOSITION AND LATTICE STRUCTURE. BY MEANS OF A SPECIALLY [illegible] VACUUM ASSEMBLY, THE RELEASE [illegible] OF HELIUM WAS STUDIED [illegible] AS A VARYING FUNCTION OF TEMPERATURE AND TIME. [illegible] OF THE TOTAL CONTENTS OF HELIUM AND TRITIUM IN THE SAMPLES IS [illegible] BY A CHEMICAL ANALYSIS. THE RESULTS ARE DISCUSSED, AND THEY ARE [illegible] QUANTITATIVELY BY THE APPLICATION OF A [illegible] DIFFUSION THEORY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] HELIUM [illegible]

[illegible]

[illegible] APRIL 1979

[illegible] ELECTRIC CO.

10 PAGES, [illegible] NO. 140, APRIL 1979, [illegible]

THE [illegible] OUTAGE WAS COMPLETED AND THE REACTOR PHYSICS TESTING STARTED ON APRIL [illegible]. TOTAL TIME FOR THE OUTAGE WAS [illegible] DAYS. [illegible] CONTAINMENT [illegible] RELEASE OF TRITIUM AS [illegible] CURIES FROM THE [illegible] CONTAINMENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, FOR [illegible] -- MINIMUM CHARGE $2.00

[illegible] RELEASE [illegible] FAILURE, [illegible] OPERATIONS [illegible] REACTOR, PWR [illegible] TESTING [illegible] RADIOACTIVITY RELEASE [illegible] REACTOR PHYSICS [illegible] OPERATING EXPERIENCE

[illegible]

RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER STATIONS IN THE EUROPEAN COMMUNITY-DISCHARGE DATA RADIOLOGICAL ASPECTS

COMMISSION OF THE EUROPEAN COMMUNITIES

[illegible]
[illegible] PAGES, 12 TABLES, 20 REFERENCES, NOVEMBER 1972

ABSTRACT: [illegible] DATA FOR [illegible] 1970, 1971 [illegible] RADIOACTIVE WASTE DISCHARGES. IN THE CASE OF GASEOUS EFFLUENTS A DISTINCTION IS MADE BETWEEN NOBLE GASES. [illegible] AND I-131; AND IN THE CASE OF LIQUID EFFLUENTS, BETWEEN THE TOTAL ACTIVITY INCLUDING TRITIUM AND TRITIUM ALONE. THE DISCHARGE DATA ARE COMPARED WITH THE DISCHARGE LIMITS AND THE BASELINE POWER STATIONS. FOR THE LIQUID EFFLUENTS, THE AVERAGE WEEKLY CONCENTRATIONS RELATED TO THE SPECIFIC [illegible] ARE SHOWN, EXPRESSED AS A PERCENTAGE OF THE MAXIMUM PERMISSIBLE CONCENTRATION IN DRINKING WATER. AN EVALUATION IS MADE OF THE MAXIMUM [illegible] DOSE TO THE PUBLIC AND THIS DOSAGE IS COMPARED WITH THE RADIOLOGICAL PROTECTION STANDARDS IN FORCE AND WITH THE NATURAL RADIATION BACKGROUND. FOR EACH STATION THE RATIO OF ACTIVITY DISCHARGED TO ENERGY PRODUCED IS GIVEN.

AVAILABILITY - COMMISSION OF THE EUROPEAN COMMUNITIES, DIRECTORATE GENERAL OF SOCIAL AFFAIRS, DIRECTORATE FOR HEALTH AND SAFETY, DG XVII/D, 29, RUE ALCIDE DE GASPERI, LUXEMBOURG (GRAND DUCHY OF LUXEMBOURG)

DETECTOR, GAS • EFFLUENT • FISSION PRODUCT RELEASE • FISSION PRODUCT, [illegible] • [illegible] • [illegible], GAS • [illegible] • [illegible], [illegible] • [illegible], POWER • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • [illegible] • [illegible] • [illegible] • [illegible] • RADIOACTIVITY RELEASE • [illegible]

[illegible]
[illegible] OF
[illegible] DISPOSAL CONTROL - NUCLEAR POWER DEPARTMENT AND THE [illegible]
U.S. 1973. [illegible] AND [illegible]; [illegible] OF [illegible] WASTE
[illegible] 70-1 •, 70 PAGES, 7 TABLES, 40 REFERENCES, JANUARY 1973

[illegible] DISCHARGE DATA INDICATE THAT THEY DISCHARGE ONLY SMALL QUANTITIES OF RADIOACTIVE WASTES IN COMPARISON TO THOSE LICENSED EVENTS UNDER NORMAL OPERATING CONDITIONS. THIS SITUATION IS A RESULT OF CAREFUL WASTE MANAGEMENT PRACTICE, [illegible] SAFEGUARDS, AND [illegible] OPERATIONS. ONLY TRITIUM AND NOBLE GASES OF NOT REFERRED TO CONVENTIONAL WASTE TREATMENT PROCESSES AND THEREFORE ARE USUALLY THE ONLY RADIONUCLIDES THAT ARE DISCHARGED IN ANY SIGNIFICANT QUANTITIES. THESE DISCHARGES HAVE BEEN DISCHARGED. HOWEVER, AT RATES WELL BELOW THOSE SPECIFIED BY THE AEC.

AVAILABILITY - U.S. DEPT. OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, ENVIRONMENTAL CONTROL ADMINISTRATION, BUREAU OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND 20852

[illegible] • EFFLUENT • FISSION PRODUCT RELEASE • [illegible] GAS • WASTE MANAGEMENT • [illegible] PLANT, NUCLEAR • [illegible]

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[illegible] JR • [illegible] • [illegible] B
SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN NON-STAINLESS STEEL AND ZIRCALOY-2
NORTH CAROLINA STATE UNIVERSITY, RALEIGH
[illegible] PAGES, 8 FIGURES, 16 REFERENCES, J. NUCLEAR MATERIALS, [illegible], PP. 307-315, DECEMBER 1973

TRITIUM DIFFUSION MEASUREMENTS FOLLOWING TRITIUM ION IMPLANTATION INTO AUSTENITIC STAINLESS STEELS AND ZIRCALOY-2 EXPOSED SEALED HYDROGEN TOGETHER. IN THE SAMPLE OPENING THAN IN THE BULK. [illegible] OF TRITIUM RELEASE [illegible] THESE MATERIALS INDICATE THAT THE RELEASE IS CONTROLLED BY A DIFFUSION CONDITION THAT IS TRUE IN THESE MEDIUM OR HIGHER TEMP THAN THE BULK DIFFUSION CONDITION FOR TRITIUM IN STAINLESS STEEL AND SLOWS IN FOLLOW SAMPLES. IN ADDITION LIKELY IN ZIRCALOY-2. A TWO-DIMENSIONAL CLASSICAL DIFFUSION MODEL WITH DIFFERENT DIFFUSION CONDITIONS IN EACH DIMENSION HAS BEEN DEVELOPED WHICH ADMITS TO ADEQUATELY REPRESENT THE SURFACE DATA FOR SHORT HEATING TIMES. [illegible] DATA AT LONG HEATING TIMES ARE APPARENTLY INFLUENCED BY TRAPPING OF HYDROGEN IN SURFACE FILMS. THE SURFACE EFFECTS ARE [illegible] NOT YET OF [illegible] IN THE [illegible] WHICH IS INJECTED INTO THE SPECIMENS ALONG WITH THE TRITIUM.

DIFFUSION • HYDROGEN • ANALYTICAL MODEL • STEEL, STAINLESS • ZIRCALOY

[illegible]
SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS
WESTINGHOUSE ELECTRIC CORP., PA.
WCAP-8183 •, 707 PAGES, JUNE 11, 1974

THIS IS A COMPILATION OF OPERATING PLANT DATA THROUGH JUNE 1973 WHICH IS APPLICABLE TO THE EVALUATION OF THE RADIOACTIVE TREATMENT SYSTEMS AND THE CALCULATION OF RADIOACTIVE EFFLUENT SOURCE TERMS. CONCENTRATIONS OF FISSION AND CORROSION PRODUCTS IN THE RCS, ICONIC SEPARATION FACTORS, PRIMARY TO SECONDARY LEAK RATES, AND TRITIUM RELEASE DATA FROM OPERATING WESTINGHOUSE PLANTS ARE PRESENTED. AN EXPECTED I-131 CONCENTRATION MODEL HAS BEEN DEVELOPED WHICH IS PROVIDED AS A REFERENCE FOR THE INDIVIDUAL PLANT DEVELOPMENT MODEL.

AVAILABILITY - NUCLEAR SAFETY DEPT., 1717 H STREET, WASHINGTON, D. C. 20455, FOR COPIES/PAGE -- [illegible] CHARGE [illegible]

FISSION CONTROL • EFFLUENT • FISSION PRODUCT, IODINE • [illegible], GAS • RELEASE RATE • WASTE TREATMENT • ANALYTICAL MODEL • [illegible] CORROSION • CORROSION • FISSION PRODUCT ACTIVITY, GROSS • [illegible] • [illegible], INTERNAL • WESTINGHOUSE

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A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED BY EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH ARE KEYED TO IT.

ABSORPTION
[illegible]
ACCELERATOR
[illegible]
ACCIDENT
[illegible]
ACCIDENT, COLD COOLANT
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ACCIDENT, REACTIVITY
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III Handling Procedures

III - HANDLING PROCEDURES

GD0000
[illegible]
TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR
ATOMIC ENERGY OF CANADA, LIMITED, CHALK RIVER, ONTARIO, CANADA
4 PAGES, 2 FIGURES, 1 TABLE, 7 REFERENCES- [illegible], INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 20- 09-00 (1959)- DEC.-1959

TO CONTROL THE HAZARDS OF TRITIUM EXPOSURE AT THE NRU REACTOR OF ATOMIC ENERGY OF CANADA LIMITED, A VARIED SAFETY PROGRAM EMPHASIZES CONTROL, MONITORING, FORCED VENTILATION, PROTECTIVE CLOTHING, AND BIOCHEMICAL ANALYSES FOR TRITIUM IN THE BODY. THE TEMP STANDARD OF 5 R TO WHOLE & RD EACH 3 YS USED FOR MAXIMUM PERMISSIBLE EXPOSURE. TRITIUM RELEASE IS CONTROLLED BY OPERATIONAL PROCEDURES AND VENTILATION.

CANADA • HEALTH PHYSICS TRAINING • REACTOR, NRU • PERSONNEL PROTECTIVE DEVICE • RADIATION SAFETY AND CONTROL

GD0070
[illegible]
EXPERIENCE OF OPERATION AND USE OF THE U.S. HIGH-FLUX RESEARCH REACTORS
UNITED EUROPEAN ATOMIC ENERGY AUTHORITY, BRUSSELS
15 PAGES, 4 FIGURES, 1 TABLE, 7 REFERENCES- NOV 1964, A/CONF. 28/P.123- PRESENTED AT THIRD U. N. INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, AUGUST 31-SEPTEMBER 9, 1964- TRPD

THE PRINCIPAL FEATURES OF THE THREE SIMILAR U.S. HEAVY WATER HIGH FLUX RESEARCH REACTORS, BORG AND FLORA AT HARWELL AND THE DANISH MATERIALS TESTING REACTOR ARE BRIEFLY RECALLED. GREAT ATTENTION IS PAID TO THE HEALTH PHYSICS ARRANGEMENT TO DETECT AND CONTROL LEAKAGE OF RADIOACTIVE SPECIES FROM EITHER THE REACTOR OR EXPERIMENTS INTO THE ENVIRONMENT. EXPERIENCE OF TRITIUM IS PARTICULARLY DISCUSSED.

REACTOR, GENERAL PRACTICE • REACTOR, RESEARCH • HARWELL STUDIES • OPERATING EXPERIENCE SUMMARY

GD0081
SWANSON JE
EVALUATION OF PLASTIC FILMS FOR PROTECTIVE SUITING
E. I. DU PONT DE NEMOURS AND COMPANY
20 PAGES, 8 TABLES, 6 REFERENCES- DP-530, NOVEMBER 1960- DTS

A LAMINATE OF SARAN AND POLYVINYL CHLORIDE FILM WAS FOUND TO BE THE BEST OF SEVERAL FILMS TESTED FOR USE IN SUITING FOR PROTECTION OF PERSONNEL IN ATMOSPHERES CONTAINING TRITIUM. CANDIDATE FILMS WERE EVALUATED BY MEASURING THE PERMEABILITY TO AND DIFFUSION RATES OF TRITIATED WATER VAPOR, AND BY MEASURING THE DETECTION AND EDGE OF SPREAD OF TRITIUM ACTIVITY. AN IMPROVED CELL FOR MEASURING THE PERMEABILITY OF POLYMER FILMS WAS DEVELOPED AS A MEANS OF EVALUATING THE FILMS. THE CELL UTILIZES THE IONIZING PROPERTIES OF THE RADIATION FROM TRITIUM TO DETECT THE CONCENTRATION OF TRITIATED WATER VAPOR DIFFUSING THROUGH THE TEST FILMS.

FABRICATION • PERSONNEL PROTECTIVE DEVICE • RADIOISOTOPE • TEST, BENCH • FUEL REPROCESSING • FUEL CONVERSION • FUEL ELEMENTS

GD0027
[illegible]
TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966
TRACERLAB
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12:129- TO MARCH 31, 1966

VARIOUS TRITIUM CONTAMINATED OBJECTS WERE BROKEN OPENED, AND PLACED IN WASTE DRUMS TO BE CEMENTED IN. EITHER DURING THE CEMENT POURING OR PUSHING DOWN A FLOATING OBJECT, TRITIUM MUST HAVE BEEN RELEASED.

WASTE DISPOSAL • PERSONNEL EXPOSURE, RADIATION

GD0025
[illegible]
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12:129- TO MARCH 31, 1966

A TRITIUM EXPOSURE MAY RESULT IN A WHOLE BODY EXPOSURE OF 4 RMM, DUE TO HANDLING TRITIATED WATER DURING PRODUCTION OF AN ORGANIC COMPOUND.

PERSONNEL EXPOSURE, RADIATION • PRODUCT, NONREACTOR

GD0000
[illegible] CO
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12:159 PAGE 44, APRIL 11, 1966

[illegible] [illegible]

A [illegible] GROUP ON [illegible] SYSTEM STUDIES, [illegible] IN A [illegible], TO [illegible] THE [illegible] [illegible]. [illegible] [illegible] [illegible]

[illegible]

[illegible]

[illegible]

[illegible] (CONTINUED)
THE SUITS ARE USED BY [illegible] AND MUST BE PROTECTED AGAINST RADIOACTIVE CONTAMINATION. THE [illegible] SUITS WITH CLEAN AIR SUPPLY ARE [illegible] USED IN PRESENCE OF TRITIUM. THE PHYSIOLOGICAL CONDITIONS EXISTING IN THE [illegible] SUITS AND THEIR PERMEABILITY FOR TRITIUM HAVE BEEN STUDIED.

[illegible] • [illegible] PROTECTIVE [illegible] • [illegible] SAFETY AND CONTROL

[illegible]
[illegible]
[illegible] OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
[illegible] • CONF-[illegible] [illegible] PAGES, [illegible] FIGURES, [illegible] TABLES, [illegible] REFERENCES. JULY [illegible]. PRESENTED AT SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL, ALBUQUERQUE, N. MEX.

THE [illegible] OF THE TRITIUM [illegible] IN THE [illegible] REACTOR BUILDINGS IS [illegible], AND THE METHODS AND [illegible] USED TO KEEP THE [illegible] UNDER CONTROL ARE OUTLINED. [illegible] ARE CLASSIFIED AS [illegible], [illegible], OR [illegible], DEPENDING ON THE [illegible] CONCENTRATION IN [illegible]. [illegible] EXPOSURES AND [illegible] ARE INVESTIGATED, AND A REPORT OF THE [illegible] [illegible] IS DISTRIBUTED TO ALL [illegible]. THE [illegible] DOSE RECEIVED BY [illegible] [illegible] IN [illegible] WAS [illegible], [illegible] FROM [illegible] AND [illegible] EXPOSURES. THE LARGEST [illegible] EXPOSURE RESULTED IN A DOSE OF [illegible], AND [illegible] SINGLE EXPOSURES HAVE EXCEEDED [illegible]. MOST OF THESE [illegible] FROM [illegible] OF [illegible] THROUGH THE [illegible] [illegible] AND COTTON [illegible].

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

[illegible] • [illegible] • CANADA • [illegible] • [illegible] • [illegible] CALCULATION, TRITIUM • CHALK RIVER • [illegible]

[illegible]
[illegible]
[illegible] THOUGHTS ON TRITIUM CONTAMINATION
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-[illegible] • CONF-[illegible] [illegible] PAGES, [illegible]

[illegible] THAT PLASTIC BAGS SHOULD NOT BE USED WHEN DEALING WITH TRITIUM LEAKAGE OR CONTAMINATION. IN A FEW HOURS A PLASTIC BAG [illegible] THE PERSONNEL EXPOSURE RATE FROM A CONTAMINATED OBJECT A [illegible].

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[illegible] AND HANDLING • [illegible] • LEAK [illegible]

[illegible]
[illegible]
STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT CRNL
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER [illegible]. CHALK RIVER NUCLEAR LABS.
[illegible] • CONF-[illegible] [illegible] PAGES, [illegible] FIGURES, [illegible] REFERENCES. [illegible]. FROM SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL, ALBUQUERQUE, N. MEX.

IONIZATION CHAMBERS AND PLASTIC SCINTILLATION DETECTORS ARE USED TO MEASURE TRITIATED WATER [illegible] [illegible] IN AIR DOWN TO [illegible] MICROCURIE/CU. METER. THEIR RESPONSES TO GAMMA BACKGROUND ARE REDUCED [illegible] SUBTRACTING THE IONIZATION CURRENT FROM A [illegible] SEALED IONIZATION CHAMBER AND BY SCINTILLATION PULSE HEIGHT ANALYSIS. THE [illegible] OF [illegible] THROUGH [illegible] HAS BEEN STUDIED EXPERIMENTALLY BY EXPOSING VOLUNTEERS TO [illegible]. RESPIRATORS WITH CHARCOAL FILTERS HAVE BEEN SHOWN TO HOLD UP PASSAGE OF [illegible]. AN AUTOMATIC [illegible] ALLOWS WORKERS TO MEASURE THEIR OWN BODY BURDENS OF TRITIUM IN TWO MINUTES.

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CANADA • [illegible], AIR • CHALK RIVER • [illegible] • [illegible] • RADIATION MONITORS

[illegible]
[illegible] EXPOSURE OF CHEMIST TO TRITIUM
NEW ENGLAND NUCLEAR CORP., [illegible] ST., BOSTON, MASS.
1 [illegible]. [illegible] CLEARING HOUSE [illegible], PAGE [illegible], [illegible] 17, [illegible]

[illegible], [illegible], A JUNIOR CHEMIST WAS SYNTHESIZING AN ORGANIC COMPOUND CONTAINING TRITIUM IN A [illegible] WITH A GAS CHROMATOGRAPH. HE RECEIVED A CALCULATED [illegible] EXPOSURE OF [illegible] FROM [illegible] TRITIUM AND CARBON-14. EXPOSURE WAS FROM MULTIPLE CAUSES - (1) [illegible], (2) PLACING HEAD IN THE HOOD, (3) POSSIBLE [illegible] OF RUBBER TUBING AND [illegible]. A [illegible] DESIGN FOR HOOD WILL [illegible] ENTRY OF HEAD. RUBBER TUBING WILL BE CHANGED [illegible]. [illegible] WILL BE DIRECTED TO THE SIDE OF HOOD RATHER THAN TO [illegible].

[illegible] BOX • FAILURE, [illegible] HOOD • [illegible] • [illegible] SYSTEM • [illegible] EXPOSURE, RADIATION • RADIOISOTOPE

[illegible]
[illegible] • [illegible] • [illegible]
A [illegible] FOR [illegible] [illegible] [illegible] [illegible] [illegible] TO [illegible]
[illegible] [illegible] [illegible] [illegible], [illegible] [illegible] [illegible], [illegible], [illegible]
[illegible] [illegible] [illegible] [illegible]. 17 PAGES. 12 FIGURES. 7 REFERENCES. [illegible]

[illegible] STEP-BY-STEP [illegible] UTILIZING [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] USING A [illegible] [illegible]. [illegible] IS [illegible] ONLY TO THE [illegible] TYPE OF [illegible]. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible]

• [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

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[illegible]

[illegible]

[illegible]

[illegible]
[illegible]
[illegible]

[illegible]
[illegible] • [illegible] CONTROL • [illegible] • [illegible] SAFETY • [illegible] DESCRIPTION • [illegible] • [illegible]

[illegible]
[illegible] OF • [illegible]
[illegible] SUMMARY REPORT - [illegible] [illegible] CONTROL - [illegible] OF [illegible] AND [illegible] MATERIALS. [illegible] REPORT
[illegible] OF [illegible] [illegible] AND [illegible], [illegible] CONTROL
[illegible]-TR-[illegible]-1 v. [illegible] PARTS, [illegible], [illegible], [illegible], [illegible] 1972

[illegible] SYSTEM IS [illegible] AT [illegible] [illegible] AN [illegible] CONTROL [illegible] [illegible] WITH [illegible] [illegible] CONTROL [illegible] [illegible], SAFETY STANDARDS FOR THE PURCHASE OF [illegible] AND [illegible] MATERIALS. THE PACKAGE IS NOT A [illegible] [illegible] [illegible] TO [illegible] [illegible] CONDITIONS.

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[illegible] • [illegible] CONTROL

[illegible]
[illegible] [illegible] • [illegible]
[illegible] [illegible] [illegible] CONTROL AND [illegible] OF [illegible] [illegible]. 1960-[illegible]. 1970
[illegible] LABORATORY, [illegible]
[illegible]-[illegible] v. [illegible] PARTS, SEPTEMBER 5, 1972

[illegible] DOCUMENT PREPARED TO PROVIDE A SOURCE OF INFORMATION ON RECENT LITERATURE ON SUBJECTS RELATING TO THE CONTROL, [illegible], AND [illegible] OF [illegible]. [illegible] [illegible] [illegible] PLACED ON LITERATURE THAT RELATES TO THE [illegible] [illegible] AND CONTROL [illegible] AND THE PROCESSES OF [illegible] [illegible] [illegible]. THE [illegible] CONTAINS [illegible] OF THIS DOCUMENT [illegible] FROM [illegible] TO JANUARY 15, 1972, AND INCLUDES [illegible] JOURNAL AND [illegible] LITERATURE. [illegible] AND [illegible] INDEXES ARE PROVIDED AND A SPECIAL SUBJECT-[illegible] [illegible] PRESENTED.

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[illegible] • [illegible] AND [illegible] • [illegible] • [illegible] SAFETY AND [illegible] • [illegible] CONSTRUCTION
• [illegible], [illegible]

[illegible]
[illegible] [illegible]
[illegible] AND [illegible] [illegible] AND [illegible] [illegible] DATA [illegible] TO [illegible] INSPECTION
[illegible] FOR [illegible] AND TECHNOLOGY, [illegible]
8 PARTS, 2 FIGURES, 21 REFERENCES, [illegible], [illegible], [illegible]-[illegible] [illegible] 1972

[illegible] DISCUSSION OF THE DEVELOPMENT OF [illegible] [illegible] TO FACILITATE [illegible] [illegible] OF [illegible] [illegible] [illegible] AND [illegible].

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]
[illegible], [illegible]

[illegible]
[illegible] [illegible]
A SURVEY OF [illegible] [illegible] PROBLEMS IN [illegible] [illegible]
[illegible] [illegible] LABORATORY, [illegible]
[illegible]-[illegible]-[illegible] v. [illegible] PARTS, 2 FIGURES, 7 REFERENCES, [illegible] 1972

THE PROBLEMS IN [illegible] [illegible] IN [illegible] [illegible] [illegible] AND [illegible] AND [illegible]. THE MOST [illegible] PROBLEMS [illegible] TO BE [illegible] WITH [illegible] OF [illegible] [illegible] OF [illegible] IN THE [illegible] OF [illegible] [illegible]. THE NEED TO CONTROL THE RATE OF [illegible] [illegible] TO THE [illegible] SYSTEM AND THUS TO THE [illegible] [illegible] SEVERE LIMITATIONS ON ALLOWABLE [illegible] CONFIGURATIONS AND PRESSURES IN BOTH THE [illegible] AND [illegible] [illegible] PLENUM. POSSIBLE [illegible] [illegible] AND [illegible] AND [illegible] USING THE [illegible] DATA [illegible] [illegible]. THE MOST [illegible] PROCESSES FOR [illegible] FROM [illegible] OF [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] AND [illegible].

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[illegible] [illegible] SYSTEM • [illegible] [illegible] CONTROL • [illegible] [illegible] • [illegible] • [illegible] • [illegible]
[illegible], [illegible]

[illegible]
[illegible] [illegible] [illegible]
A [illegible] SYSTEM FOR A [illegible]-[illegible] [illegible] [illegible] TO [illegible] THE [illegible] [illegible] [illegible]
[illegible], [illegible] AND [illegible] [illegible], [illegible] [illegible] CENTER
[illegible] 73-2 v. [illegible] PARTS, FIGURES, [illegible] 1972

A [illegible] [illegible] INCORPORATING A [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible], [illegible], AND [illegible] ON A TYPICAL [illegible]-[illegible] [illegible] [illegible]. THE [illegible] [illegible] SYSTEM [illegible] THE FOLLOWING [illegible] [illegible] - [illegible] [illegible] [illegible] OF THE [illegible] [illegible] [illegible] THE [illegible]

[illegible]

[illegible]

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[illegible]

[illegible]
[illegible] CO
[illegible] PROTECTION [illegible] FOR TRITIUM. A [illegible] OF [illegible] [illegible]
[illegible] PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
[illegible]-50-[illegible] p. [illegible] PAGES, JULY [illegible]

[illegible] A [illegible] OF [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] WITH TRITIUM AND TRITIUM COMPOUNDS.

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[illegible] AND STANDARDS • [illegible] • [illegible] AND [illegible] • [illegible] • [illegible] SAFETY AND CONTROL

[illegible]
[illegible] W. • CHEN [illegible]
[illegible] PHYSICS ASPECTS OF TRITIUM [illegible] AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE
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UCRL-[illegible] • CONF-[illegible]-[illegible] p. 39 PAGES, FIGURES, JANUARY [illegible], [illegible]

[illegible] THE PURPOSES A FACILITY FOR CHEMISTRY [illegible] OF LAWRENCE RADIATION LABORATORY TO PERFORM EXPERIMENTAL WORK WITH TRITIUM [illegible] [illegible] AND GASES. AN [illegible] [illegible] [illegible] IN THIS FACILITY IS TRITIUM. THE FACILITY IS DESIGNED TO SATISFY [illegible] OF THE [illegible] OF TRITIUM. THIS PAPER DEALS PRIMARILY WITH THE STANDARDS AND CONTROLS [illegible] THAT [illegible] THE PURPOSES TO SATISFY [illegible] THEIR LARGE QUANTITIES OF TRITIUM. THE [illegible] STUDY INCLUDES TRITIUM STORAGE [illegible], STAND [illegible] [illegible], SIN [illegible] TECHNIQUES, AND [illegible] SAFETY TECHNIQUES, [illegible] SAFETY SUPPORT IS PROVIDED BY HEALTH PHYSICS ASSISTANCE [illegible] THE [illegible] [illegible] TO SUPPORT THE CHEMISTRY DEPARTMENT.

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[illegible] • FISSION GAS [illegible] • [illegible], [illegible] SALT • [illegible] AND [illegible] • [illegible] [illegible] • [illegible] • [illegible] MANAGEMENT • [illegible], [illegible] • [illegible] REPROCESSING • [illegible], [illegible] • [illegible], [illegible] • [illegible]

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[illegible]-[illegible] p. [illegible] PAGES, FIGURES, DECEMBER [illegible]

THE PURPOSE OF THIS REPORT IS TO ASSEMBLE IN AN [illegible] [illegible] [illegible] [illegible] AND [illegible] [illegible] [illegible] WITH TRITIUM [illegible] AND [illegible], MAINTENANCE, [illegible] AND [illegible], AND [illegible] AND [illegible] SYSTEMS. THIS REPORT [illegible] THE [illegible] AND [illegible] TO [illegible] TECHNOLOGY AND [illegible] TRITIUM CONTROL SYSTEMS AND [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. [illegible]

WASTE [illegible] • WASTE [illegible] • WASTE DISPOSAL, GAS • [illegible] SYSTEM, [illegible] • [illegible] [illegible] • [illegible]

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IV Measurement and Monitoring Techniques

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[illegible]

PROCEDURES FOR DETERMINATION OF STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL SAMPLES
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
[illegible] PAGES, FIGURES, TABLES, REFERENCES, [illegible]

THIS IS A MANUAL OF METHODS USED AT THE PUBLIC HEALTH SERVICES SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY FOR THE DETERMINATION OF STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL SAMPLES. THE PROCEDURES ARE INTENDED FOR USE IN THE PROCESSING OF RELATIVELY LARGE NUMBERS OF SAMPLES IN A PROGRAM OF [illegible] ENVIRONMENTAL RADIOLOGICAL SURVEILLANCE. THE MANUAL IS DIVIDED INTO SECTIONS ON MILK, FOOD, BIOTA, SILT, SOIL, WATER, AND COUNTING PROCEDURES. APPENDICES COVER PREPARATION OF REAGENTS AND TABLES OF SELECTED RADIONUCLIDE DECAY AND [illegible] FACTORS.

[illegible]

[illegible]
AN ANALYZER FOR RADIOACTIVE GAS
THE DOW CHEMICAL COMPANY, GOLDEN, COLORADO
10 PAGES, 5 FIGURES, 4 REFERENCES- MAY 11, [illegible] CFSTI

THE OPERATION OF DRY BOXES SOMETIMES RESULTS IN THE RELEASE OF TRITIUM CONTAMINANTS IN A PARTICULAR WORK AREA. SINCE PEOPLE INHABIT THIS AREA DAILY, IT WAS CONSIDERED NECESSARY BY THE HEALTH PHYSICS STAFF THAT AN AUTOMATIC AND CONTINUOUS AIR MONITORING INSTRUMENT BE MADE AVAILABLE. THE INSTRUMENT WAS TO PROVIDE AUDIBLE AND VISUAL ALARMS IN THE EVENT A CONTAMINANT SHOULD ACCIDENTALLY [illegible]. AN INSTRUMENT THAT CAN CONTINUOUSLY MONITOR AIR FOR TRITIUM HAS BEEN DEVELOPED. IT UTILIZES A FLOW TYPE IONIZATION CHAMBER AND A VIBRATING REED ELECTROMETER. A RESPONSE TO NORMAL ROOM BACKGROUND IS [illegible] 10 MINUS [illegible] AIR. THE [illegible] ACCEPTED MPC IS 2.0 X 10 MINUS [illegible] AIR. ITS OPERATION IS COMPLETELY AUTOMATIC. THE ANALYZER IS NOW IN ROUTINE USE.

[illegible] PROTECTIVE DEVICE • RADIATION MONITORS

[illegible]
VERHAGEN BT • SELLSCHOP JP
ENRICHMENT AND ASSAY OF NATURALLY OCCURRING TRITIUM
UNIVERSITY OF WITWATERSRAND, JOHANNESBURG
11 PAGES, [illegible] FIGURES, [illegible] TABLES, REFERENCES- [illegible], PROCEEDINGS OF THE NATIONAL CONFERENCE ON NUCLEAR ENERGY HELD IN PRETORIA, SOUTH AFRICA APRIL 5-8- PAGE [illegible]-110 OF NATIONAL CONFERENCE ON NUCLEAR ENERGY- APPLICATION OF ISOTOPES AND RADIATION

THE MAJOR PROBLEMS ASSOCIATED WITH THE MEASUREMENT OF NATURALLY OCCURRING TRITIUM ARE CONSIDERED. THE POTENCY OF ASSAY BY A COMBINATION OF THERMAL DIFFUSION ENRICHMENT AND GAS COUNTING IS ARGUED.

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LOS ALAMOS SCIENTIFIC LABORATORY
[illegible]

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[illegible]
[illegible]
CONTINUOUS SAMPLING AND MEASUREMENT OF AIRBORNE ACTIVITY. SESSION III
[illegible]
30 PAGES, 10 FIGURES, 1 TABLE, 10 REFERENCES- 1967. [illegible]
[illegible]

THE METHODS EMPLOYED FOR ENVIRONMENTAL SAMPLING AND MEASUREMENT FOR BOTH PARTICULATE AND GASEOUS AIRBORNE CONTAMINATION ARE DESCRIBED. A BRIEF DESCRIPTION IS GIVEN OF THE INSTRUMENTS THAT ARE IN CURRENT OPERATIONAL USE FOR CONTINUOUSLY MONITORING THE AIR FOR CONTAMINATION. A SUMMARY IS MADE OF NEW INSTRUMENTS AND TECHNIQUES AT PRESENT UNDER DEVELOPMENT.

[illegible]

[illegible]
[illegible]
A COLD STRIP APPARATUS FOR SAMPLING TRITIUM IN AIR
ATOMIC ENERGY ESTABLISHMENT, TROMBAY, INDIA
2 PAGES, 1 TABLE, 1 REFERENCE- HEALTH PHYSICS 11(4)- 313-314 (APRIL, 1965)

A COLD STRIP APPARATUS IS DESCRIBED FOR SAMPLING TRITIUM IN AIR. THE APPARATUS IS MORE CONVENIENT TO USE THAN THE NORMAL MOISTURE TRAP.

HUMIDITY, RELATIVE * MONITOR, AIR * SAMPLING

[illegible]
[illegible]
A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN URINE
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL AND ALDERMASTON

[illegible]

[illegible]

[illegible]

MAINTENANCE AND REPAIR • INSTRUMENT, AIR SAMPLING • MONITOR, AIR

[illegible]

MEASUREMENTS SUITABLE FOR AIR MONITORING RESULTS FROM A CONSIDERATION OF THE POTENTIAL PATH OF THE DOSE. THE MEASUREMENT OF THE INHALED DOSE FROM RADIOACTIVE AEROSOLS, RADIOIODINE AND TRITIUM IS THE MAIN OBJECT OF THIS STUDY. [illegible] IN CONCLUSION, A BRIEF [illegible] IS GIVEN OF THE AIR-MONITORING SYSTEM OF [illegible]

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FILTER SYSTEM • IODINE • INSTRUMENT, AIR SAMPLING • MONITOR, AIR • AEROSOL, RADIOACTIVE • MONITOR, SURFACE • GERMANY • MONITORING SYSTEM, RADIATION • RADIATION MONITORS

[illegible]
A PORTABLE TRITIUM-IN-AIR MONITOR
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
AECL-[illegible], 17 PAGES, [illegible] FIGURES- JULY 196[illegible]

THE SCINTILLATIONS PRODUCED BY BETA RAYS FROM TRITIUM ARE DETECTED BY TWO PHOTOMULTIPLIER TUBES. THE INSTRUMENT WAS DESIGNED FOR USE NEAR HEAVY WATER REACTORS WHERE STRONG GAMMA FIELDS ARE LIKELY. THE INSTRUMENT IS COMPENSATED AGAINST GAMMA. UNDER THESE CONDITIONS, THE INSTRUMENT CAN DETECT [illegible] OF TRITIUM [illegible] MICRO-MICRO CURIE PER CC OF AIR. THE RESPONSE TIME IS ONE MINUTE.

[illegible]

011310

BURT [illegible] • [illegible]

A METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR

ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL

JOURNAL OF NUCLEAR ENERGY [illegible], PAGES [illegible], 6 FIGURES, 7 REFERENCES, 1966

[illegible]

DECONTAMINATION • REACTOR, [illegible] • INSTRUMENT, AIR SAMPLING • [illegible], AIR

011470

[illegible] • BURT [illegible]

A METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR

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[illegible] 10 PAGES, JUNE 1965, [illegible]

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[illegible]
[illegible] JR • PAPER ON
APPARATUS FOR CONCENTRATION AND MEASUREMENT OF LOW TRITIUM ACTIVITIES
[illegible] • [illegible] 17 PAGES, 5 FIGURES, 3 TABLES, 25 REFERENCES, PAGES 450-470.
PRESENTED AT INTERNATIONAL [illegible] WITH TRITIUM DATING [illegible], PULLMAN, WASHINGTON, AUG 7-11, 1965

USEFUL INFORMATION AND HYDROLOGICAL INFORMATION CAN BE OBTAINED FROM MEASUREMENTS OF THE NATURAL TRITIUM CONTENT OF PRECIPITATION, SURFACE WATER AND GROUND WATER. PROJECTS IN WHICH NATURAL TRITIUM IS USED GENERALLY REQUIRE THE MEASUREMENT OF LARGE NUMBERS OF SAMPLES AND CONSEQUENTLY THE ASSAY SYSTEM SHOULD BE DESIGNED TO MEASURE A MAXIMUM NUMBER OF SAMPLES. THE SYSTEM DESCRIBED IS DESIGNED FOR DOING CONCENTRATION AND MEASUREMENT OF A MAXIMUM NUMBER OF SAMPLES WITH ACTIVITIES GREATER THAN 0.5 T.U. WITH AN ACCURACY OF ABOUT PLUS OR MINUS 5% OR PLUS OR MINUS 0.5 T.U.

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KEYWORDS • ANALYTICAL TECHNIQUE • METEOROLOGICAL SUPPORT • HYDROLOGY • CONCENTRATION

[illegible]
AUTHOR(S) [illegible] • [illegible] • [illegible]
TRITIUM CONCENTRATION OF [illegible] WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
INSTITUTE FOR TECHNICAL [illegible] AND TECHNICAL [illegible] COMPANY
CONF-690[illegible] • [illegible]-[illegible]-CONF-[illegible]-190 p. 10 PAGES, 7 FIGURES, 12 REFERENCES, PAGES 471-480, PRESENTED AT INTERNATIONAL CONGRESS-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1969

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN ENTERS WITH STANDARD TO FIELD STRENGTH. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN [illegible]-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION. A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND [illegible], AND PRIMARY BACKGROUND [illegible] IS [illegible]. WITH A GEOMETRIC VOLUME OF THE COUNTER, TRITIUM COUNTED OF 2.9 LITERS, THE [illegible] BACKGROUND IS 7.[illegible] PLUS OR MINUS 0.[illegible] CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TO 105 A SAMPLING CONTAINS [illegible] OF 1.[illegible] CPM WHEN THE STRONG PRESSURE IS 750 MM HG. [illegible] BACKGROUND, TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY, AND LONG-TERM STABILITY ARE STUDIED. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM RAINS AND RIVER STUDY TAKEN BETWEEN 1961 AND 1964 SHOW [illegible] MIXING IN THE [illegible], [illegible] THE MIXING LAYER AND A FACTOR 5 SMALLER THAN THE DEEP MIXING. [illegible] MIXING [illegible] BY A FACTOR OF 2.

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COUNTER • [illegible] WATER, NUCLIDE OCCURRENCE • ANALYTICAL TECHNIQUE • [illegible]

[illegible]
AUTHOR(S) [illegible] • SMITH WD
CONCENTRATION, STORAGE, AND DETERMINATION OF TRITIUM AT ACTIVITY LEVELS OF [illegible] DOWN TO [illegible] 10[illegible] MILLI PERCENT
UNIVERSITY OF TENNESSEE
CONF-690[illegible] • [illegible]-[illegible]-CONF-[illegible]-190 p. 14 PAGES, 7 FIGURES, 11 REFERENCES, PAGES 491-504, PRESENTED AT INTERNATIONAL CONGRESS-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1969

NATURALLY OCCURRING OR ARTIFICIALLY ADDED TRITIUM IS A VALUABLE TRACER IN MANY GEOPHYSICAL AND HYDROLOGICAL INVESTIGATIONS. FROM THE POINT OF VIEW OF ANALYTICAL CHEMISTRY, WHICH IS THE SUBJECT MATTER OF THIS PAPER, THESE STUDIES INVOLVE DETERMINATION OF TRITIUM, USUALLY IN WATER, AT TWO DIFFERENT LEVELS OF ACTIVITY, NAMELY THE ACTIVITY LEVEL OF THE [illegible] OF A HOLE[illegible] AND THE FAR LOWER LEVEL OF A PCU TRITIUM UNITS (T.U.).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $0.00 CY

TRACER, RADIOACTIVE • ANALYTICAL TECHNIQUE • HYDROLOGY

[illegible]
AUTHOR(S) [illegible] • SFELLSCHOP JP
TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES
UNIVERSITY OF THE WITWATERSRAND, SOUTH AFRICA
CONF-690[illegible] • [illegible]-[illegible]-CONF-[illegible]-190 p. 12 PAGES, 9 FIGURES, PAGES 499-470, PRESENTED AT INTERNATIONAL CONGRESS-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1969

DATA ARE PRESENTED ON THE TRITIUM CONTENT OF SOME SUBTERRANEAN WATERS OF SOUTH AFRICA. A THERMAL DIFFUSION SYSTEM WAS USED FOR ENRICHMENT OF TRITIUM. COUNTING IS DONE WITH A GAS PROPORTIONAL COUNTER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $0.00 CY

COUNTER • ANALYTICAL TECHNIQUE • GROUND WATER, NUCLIDE OCCURRENCE • SOUTH AFRICA

[illegible]
TRANSLATED •
MEASUREMENT OF TRITIUM AT NATURAL LEVELS
NSJ-TR-[illegible] p. 10 PAGES, TRANSLATED FROM [illegible] 1971 PAGES [illegible], [illegible]

TO MEASURE THE CONCENTRATION OF TRITIUM IN NATURAL WATERS, THE DISTILLED SAMPLE AND NORM WERE PUT INTO AN ELECTROLYTIC CELL, AND, BY USING ELECTRODES OF NI AND STAINLESS STEEL, ELECTROLYSIS WAS CARRIED OUT AT 0.1[illegible] AMPERE OF CURRENT DENSITY AND 10.4 C. WHEN THE VOLUME OF SAMPLE WAS CONDENSED TO 1/12 OF THE INITIAL VOLUME, THE CONCENTRATION OF T WAS 4 TO 10 TIMES AS MUCH AS THAT IN THE INITIAL SAMPLE. THE INITIAL CONCENTRATION OF T CALCULATED FROM THE MEASURED VALUE ON THE BASIS OF THE CONCENTRATION RATIO OF HEAVY WATER WAS IN AGREEMENT WITH THE ACTUAL CONCENTRATION OF T. THE HYDROGEN GENERATED BY CONTACTING THE SAMPLE WATER WITH A MG CHIP AT 470 TO 500 C FILLED THE COUNTING TUBE. THE COUNTING TUBE IS SURROUNDED BY ANTICOINCIDENCE TUBES. THE CONTENTS OF T IN RIVER WATER AND TAP WATER AT SEVERAL PLACES IN JAPAN WERE MEASURED. IN 1969, THE CONTENT OF T IN TAP WATER WAS ABOUT 100 T.U.

[illegible]
AVAILABILITY - PDP SALE BY THE SPECIAL LIBRARIES ASSOCIATION TRANSLATION CENTER, JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO ILLINOIS 60616. $1.50 COPY. $0.50 [illegible]

[illegible]

[illegible]
U S SAVANNAH CHANGE 4 - DISC. ADMINISTRATION AND TESTING
DIVISION OF REACTOR LICENSING, UNITED STATES ATOMIC ENERGY COMMISSION
9 PAGES. FEBRUARY 5, 1969. DOCKET NO. 50-[illegible]

CHANGES ALLOWED ARE - (1) CHANGE IN [illegible] TITLES, (2) PROVIDE FOR TRITIUM MONITORING IN WATER DISCHARGE, (3) LESS STRINGENT PURGE[illegible] MODELS, (4) CLOSEST DEPARTURE RESPONSIBILITY [illegible] STAFF HEALTH PHYSICIST, (5) ALTER CHANGE 30 AND 31 REQUIREMENTS OF RADIATION MONITORING DURING FUELING TASKS, AND (6) ALLOW PART PURGE OF A DRY TEST BETWEEN 1 HOUR PAST SHUTDOWN A FULLER PURGE OF 1000 TO 1000.

AVAILABILITY - STAFF PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ADMINISTRATIVE CONTROL • DOCTRINE, MILITARY • US SAVANNAH (SHIP) • DOCTRINE, PUB • WASTE DISPOSAL • TEST, GAS FILTER • CONTAINMENT FILTERING SYSTEM • MECHANICAL SPECIFICATIONS • SAFETY EVALUATION • RADIATION MONITORS

[illegible]
[illegible] BY • [illegible] G
THE DETECTION OF TRITIUM IN AIR WITH IONIZATION CHAMBERS
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-[illegible] P. 22 PAGES. 10 FIGURES. 5 REFERENCES. OCTOBER 1960

METHODS FOR DETECTING TRITIUM IN AIR IN THE PRESENCE OF GAMMA RADIATION HAVE BEEN MADE BY [illegible]. CONCEIVABLY, A SEALED IONIZATION CHAMBER FILLED AN IONIZATION CHAMBER WHICH CAN SAMPLE THE SURROUNDING AIR. THE EFFECTIVE VOLUME OF THE GAMMA CHAMBER IS FOUND TO VARY BY THE SEALED CHAMBER, AND ONLY THE REFERENCE IN CHAMBER FROM THE PAIR OF CHAMBERS IS MEASURED. IN THIS WAY A: [illegible] AS ONE OF THE GAMMA CONTRIBUTION TO THE IONIZATION CURRENT IN THE GAS IN CHAMBER CAN BE CORRECTED BY CONTROLLED [illegible]. SAMPLING RATES ARE [illegible] FOR THE DIFFERENT TIMES OF THE MONITORS TO BE LESS THAN ONE MINUTE.

AVAILABILITY - ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO $1.00 COPY

INSTRUMENT, NUCLEAR • MONITOR, PERSONNEL • CHAMBER, ION

[illegible]
LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
STI-DOC-TEPAD P. 190 PAGES. 47 FIGURES. 10 TABLES. 6 APPENDICES. TECHNICAL REPORTS SERIES NO. 60. AUGUST 1966

THIS MANUAL CONTAINS LECTURE MATERIAL AND LABORATORY EXERCISES APPLICABLE TO A BASIC COURSE ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH. BASIC CONCEPTS OF NUCLEAR PHYSICS, RADIATION DETECTION, AND HEALTH PHYSICS ARE DISCUSSED, AND APPLICATIONS OF THE BASIC PRINCIPLES ARE DISCUSSED. FIFTEEN LABORATORY EXERCISES ARE GIVEN TO ILLUSTRATE THE USE OF VARIOUS RADIATION DETECTION INSTRUMENTS. IT OFFERS FOUR TRACER STUDIES IN RATS, MICE, AND FOWLS. ONE SHOWS THE ACUTE EFFECTS TO RADIATION ON RATS. THE MATERIAL IS WELL ORGANIZED, AND EACH SECTION IS FOLLOWED BY A BIBLIOGRAPHY. THE APPENDICES PROVIDE INFORMATION PERTINENT TO THE STUDIES.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, NEW YORK OR VIENNA, $4.00 COPY

BIOMEDICAL • EFFICACY • COURSE • ADMINISTRATION • HEALTH PHYSICS TRAINING • TRACER, RADIOACTIVE • ANIMAL • ADMINISTRATION • OPERATION EFFECT • RADIATION MONITORS

[illegible]
[illegible] G
ATMOSPHERIC TRITIUM, MEASUREMENT AND APPLICATION
CENTRE D ETUDES NUCLEAIRES DE SACLAY, FRANCE
CEA-R[illegible]-70 P. 70 PAGES. FIGURES, TABLES, REF. [illegible] FRENCH

THE POSSIBLE PROBLEMS OF ATMOSPHERIC TRITIUM ARE REVIEWED AND DISCUSSED. DESCRIPTIONS INCLUDING [illegible] ANALYSIS AND THERMAL DIFFUSION AND TRANSFORM GAS COUNTERS AND LIQUID SCINTILLATION COUNTERS CONSTRUCT WHICH CAN BE USED FOR DETERMINING ATMOSPHERIC TRITIUM CONCENTRATIONS. FIGURES ILLUSTRATE THE USE TO ATMOSPHERIC TRITIUM FOR OBSERVING A CERTAIN NUMBER OF [illegible] AND GEOCHEMICAL PROBLEMS.

AVAILABILITY - COPIES OF DOCUMENTATION AND C.E.A., CENTRE D ETUDES NUCLEAIRES DE SACLAY, B.P. NO. 2, GIF-SUR-YVETTE, FRANCE

COUNTER • COMPUTATIONAL TECHNIQUE • HYDROLOGY • METEOROLOGY • RADIATION MONITORS

[illegible]

LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN PHARMACOLOGY. TECHNICAL REPORTS SERIES NO. [illegible]

INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA

STI-DOC-TR001 [illegible]. 144 PAGES, 70 FIGURES, 9 TABLES, [illegible], 1966

GENERAL AND BASIC INFORMATION ENCOMPASSING THE PROPERTIES OF PARTICLES AND RADIATIONS, THE METHODS OF RADIATION DETECTION, THE APPLICATION AND USES OF THE BASIC PROPERTIES OF RADIOISOTOPES AND RADIATIONS, AND THE PRECAUTIONS AND PROTECTIVE NECESSARY FOR THE SAFETY OF THE INDIVIDUAL IN THEIR USE AND INCLUDED IN LECTURE FORM.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, NEW YORK OR VIENNA, $9.50

CONFERENCE • METHODS • COMPUTE • DOSE • TRACER, RADIOACTIVE • TRACER, GAS • ANALYTICAL TECHNIQUE • RADIATION SAFETY AND CONTROL • RADIOBIOLOGY • RADIATION EFFECT

[illegible]

[illegible] JR • [illegible] CH

A METHOD FOR PREDICTING SURFACE CONTAMINATION OF SMOOTH DATA SUBSTRATES

OHIO STATE UNIVERSITY

9 PAGES, 4 TABLES, 8 REFERENCES, PAGES 179 TO 189 OF SURFACE CONTAMINATION, PERGAMON PRESS, NEW YORK, PROCEEDINGS OF A SYMPOSIUM HELD AT GATLINBURG, TENN., JUNE 1964

THE PURPOSE OF THIS REPORT IS TO SHOW HOW THE TECHNIQUE OF LIQUID SCINTILLATION COUNTING OF PURE STRONG CAN BE APPLIED TO THE PROBLEM OF EVALUATING SURFACE DAMAGES CONTAMINATED WITH SOFT BETA EMITTERS. FACTORS TO BE CONSIDERED IN APPLICATION OF THE METHOD ARE - (1) THE COUNTING EFFICIENCY, WHICH CAN BE AFFECTED BY THE TYPE OF FILTER PAPER, THE COMPOSITION OF THE COUNTING SOLUTION, AND THE SOLUBILITY OF THE RADIOCONTAMINANT IN THE COUNTING SOLUTION, AND (2) THE PARAMETERS WHICH INFLUENCE THE SHAPE TEST SUCH AS SURFACE POROSITY, WET OR DRY SWAP, ETC.

AVAILABILITY - PERGAMON PRESS, 44-01 21ST ST., LONG ISLAND CITY, NEW YORK 11101

SURFACE CONTAMINATION • DATA SYSTEMS • DECONTAMINATION

[illegible]

[illegible] TH • [illegible] LA

MEASUREMENT OF TRITIUM SURFACE CONTAMINATION

ARMED FORCES RADIOBIOLOGY RESEARCH INST., BETHESDA, MD.

AD-[illegible] • [illegible] • [illegible] [illegible]. 18 PAGES, REFERENCES, JULY 1964. FROM INTERNATIONAL SYMPOSIUM ON RADIOLOGICAL PROTECTION OF THE WORKER BY THE DESIGN AND CONTROL OF HIS ENVIRONMENT, BRUSSELS, BELG.

DESCRIBES SEVERAL METHODS FOR MEASURING TRITIUM SURFACE CONTAMINATION IN WORKER, ACCELERATOR, AND TRITIUM GAS[illegible] EQUIPMENTS. THE PROBLEMS ASSOCIATED WITH THE DETERMINATION OF GENERALIZED NON-PROPORTIONAL COUNTING ARE DISCUSSED. A NEW METHOD OF UTILIZING SPECIAL HOMOGENEOUS SWIPE PAPERS COUPLED TO A LIQUID SCINTILLATION SYSTEM IS DESCRIBED. THE DATA FROM SINGLE CHANNEL AND CHANNEL PAIRED LIQUID SCINTILLATION COUNTING TECHNIQUES, VARIOUS SWIPE PAPERS AND VARIOUS TRITIUM ADSORPTION METHODS ARE PRESENTED WITH A STATISTICAL ANALYSIS. VARIOUS FACTORS AFFECTING LIQUID SCINTILLATION COUNTING OF TRITIUM ARE DISCUSSED. THIS METHOD GIVES ABOUT 70% EFFICIENCY WITH GOOD STATISTICS. VARIOUS IN EFFICIENCY AND VERY POOR COUNTING STATISTICS FOR NON-PROPORTIONAL COUNTING OF TRITIUM ON SWIPE PAPERS. FROM THE STANDPOINT OF SURFACE COUNTING EFFICIENCY, REPRODUCIBILITY OF COUNTS, EASE OF COUNTING, AND PHYSICAL STRENGTH, THE WHATMAN HOMOGENEOUS NO-1 PAPER COUPLED TO DIOXANE WAS BEST FOR GENERAL TRITIUM SURFACE-CONTAMINATION MEASUREMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA., $1.00 COPY, $0.65 MICROFICHE

RECEIVED • MEASUREMENT • DOSE • DECONTAMINATION • DETECTION PROBE • ACCELERATOR • STATISTICAL ANALYSIS

[illegible]

[illegible] PY

MONITORING FOR TRITIUM AT LOW LEVELS

ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO. CHALK RIVER NUCLEAR LABS.

AECL-[illegible] • CONF-[illegible]-6 [illegible]. 4 PAGES, 10 FIGURES, 4 REFERENCES, JULY 1967, PROCEEDINGS OF IAEA SYMPOSIUM ON INSTRUMENTS AND TECHNIQUES FOR THE ASSESSMENT OF ENVIRONMENT RADIOACTIVITY IN NUCLEAR OPERATIONS, VIENNA, AUSTRIA

DIRECT MEASUREMENT OF TRITIATED WATER VAPOR [illegible] TO 100 AT LEVELS BELOW 1 MRC (10%) IS DIFFICULT WITH EXISTING INSTRUMENTS OR PORTABLE MONITORS. HOWEVER, AN INDIRECT MEASUREMENT CAN BE ACHIEVED BY MAKING PERIODIC GROSS DETERMINATIONS OF THE AMOUNT OF TRITIUM ADSORBED BY THE SEMBERS AND ARE CHEMICALLY PROBED. IN ADDITION, INDIVIDUAL GROUPS MAY BE ESTIMATED INDIRECTLY. FOR THIS APPROACH TO BOTH MONITORING TO BE USEFUL TO A HEALTH PHYSICIST, DEPTH, DIRECT MEASUREMENT OF HOW SAFENT IS NEEDED. IF WELL EFFECT BODY BURDENS OF TRITIUM RESULTING FROM CHRONIC EXPOSURES TO 0.05 INCIDE. WHICH IS NEEDED FROM A GENERAL ATTACHED TO THE ANALYSIS, A SAMPLE IS QUANTITATIVELY METERED AND MIXED WITH LIQUID SCINTILLATOR AND THE TRITIUM ACTIVITY IS THEN MEASURED. THE ASSAY TAKES LESS THAN 2 MIN. PERFORMANCE OF THE INSTRUMENT IS SUBSTANTIALLY CHECKED BY PROCESSING STANDARD AND BACKGROUND SAMPLES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $1.00 COPY, $0.65 MICROFICHE

ABSORPTION • COUPLED • ANALYTICAL TECHNIQUE • CHALK RIVER • DECONTAMINATION • DETECTION, WATER • MAN • RADIATION MONITORS

[illegible]
[illegible] • [illegible]
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[illegible]

[illegible] - [illegible]

[illegible] AND [illegible] ACTIVITIES IS CARRIED OUT USING AN OPEN-[illegible] [illegible]. THE [illegible] RESULTS ARE OBTAINED BY PASSING A CURRENT OF [illegible] [illegible] CL AND [illegible] [illegible]. THIS PROCESS MAKES IT POSSIBLE TO ACHIEVE A DECONTAMINATION FACTOR OF [illegible] TO 4 HR. IN A VARIANT, THE OPERATION HAS TO BE PERFORMED TO [illegible] TO ACHIEVE A DECONTAMINATION FACTOR OF [illegible]. [illegible]-CHEMICAL OR ELECTROLYTIC [illegible] AND [illegible]. [illegible] IS LIMITED BY CORROSION [illegible]. A STUDY OF THE [illegible] OF THE DECONTAMINATION [illegible] IT POSSIBLE TO ASCERTAIN THAT THIS [illegible] DEGREE [illegible] THE PROCESS USED.

AVAILABILITY - [illegible] DISPOSITION LITERATURE IN THE U.S. AND [illegible]

[illegible] - [illegible], [illegible]

[illegible]

LEBEDEV CL - [illegible]
[illegible] FOR DYNAMIC CALIBRATION OF [illegible]
[illegible] LAB., [illegible] OF CALIF., LIVERMORE
[illegible] - [illegible] P., 4 PARTS. PAGE IS [illegible] OF [illegible] [illegible] [illegible] NO. [illegible], 7 FIGURES, 2 TABLES.
AUGUST 1967

[illegible] A TECHNIQUE FOR [illegible] [illegible] IN [illegible]. [illegible] TO [illegible] [illegible] CHECKS. THE [illegible] WAS [illegible] [illegible] AS A [illegible].

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[illegible] CALIBRATION - [illegible], [illegible]

[illegible]

[illegible] BY
[illegible] AND TECHNIQUES IN [illegible] HEALTH PHYSICS AT [illegible]
[illegible] ENERGY OF CANADA LTD., CHALK RIVER [illegible]. CHALK RIVER NUCLEAR LABS.
[illegible] - [illegible] P., 10 PARTS, 17 FIGURES, 7 REFERENCES, [illegible], [illegible], PAPER [illegible] ON INSTRUMENTATION, [illegible], AND PROBLEMS IN HEALTH PHYSICS [illegible] CONTROL, [illegible]. [illegible].

[illegible] CHAMBERS AND PLASTIC SCINTILLATION DETECTORS ARE USED TO MONITOR [illegible] WATER [illegible] [illegible] IN AIR [illegible] IN 0.5 [illegible]. [illegible]. THE [illegible] TO [illegible] BACKGROUND AND [illegible] THE BY SUBTRACTING THE [illegible] CURRENT FROM A CONTINUOUS [illegible] [illegible] CHAMBER AND BY SCINTILLATION PULSE HEIGHT ANALYSIS. THE [illegible] OF [illegible] [illegible] [illegible] HAS BEEN STUDIED EXPERIMENTALLY BY [illegible] [illegible] TO [illegible] [illegible]. [illegible] WITH [illegible] [illegible] HAVE BEEN SHOWN TO HOLD UP [illegible] OF [illegible]. AN [illegible] [illegible] [illegible] TO [illegible] [illegible] [illegible] OF [illegible] IN THE [illegible].

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[illegible] - [illegible], [illegible] - [illegible] - [illegible] - [illegible] - [illegible] - [illegible] - [illegible]

[illegible]

HOLLAND JF
PROBLEMS ARISING IN THE STUDY OF [illegible] CONTAMINATION OF THE [illegible] ATMOSPHERE
U.S. ATOMIC ENERGY COMMISSION
15 PAGES, 12 FIGURES, 1 TABLES, 17 REFERENCES, PAGES 79-90, FROM COLLOQUY INTERNATIONAL SUR LA POLLUTION RADIOACTIVE DES MILIEUX GAZEUX RADIOACTIVE POLLUTION OF GASEOUS MEDIA. [illegible] 1. SACLAY [illegible] 12-16, 1967

[illegible] CAN BE INTRODUCED INTO THE [illegible] [illegible], STRATOSPHERE, [illegible], AND [illegible] LEVELS OF THE ATMOSPHERE BY [illegible] AND MILITARY USES OF NUCLEAR ENERGY. EXAMPLES OF PEACEFUL USES WITH [illegible] RADIOACTIVITY INTO THESE REGIONS ARE PROPULSION SYSTEMS AND AUXILIARY POWER SUPPLIES FOR [illegible]-SPACE VEHICLES. THE PRODUCTION AND TRANSPORT CONTROL OF THE DISTRIBUTION AND FALLOUT OF SUCH CONTAMINANTS PRESENTS A NUMBER OF [illegible] SCIENTIFIC PROBLEMS. AN OUTLINE IS GIVEN OF THE STUDY COORDINATED PROGRAMS OF SAMPLING-DEVICE DEVELOPMENT, ANALYTICAL METHODS DEVELOPMENT, SAMPLE COLLECTION AND ANALYSIS, AND METEOROLOGICAL POLLUTION OF DATA.

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[illegible] - [illegible] - [illegible] - [illegible] - [illegible] - [illegible] - [

[illegible] DEPARTMENT
PORTS, POWER INDICATION AND WARNING FACILITIES, AND THE SYSTEM IS MADE FROM INCONSPICUOUS PARTS
WITH GOOD OPERATING YIELDS. THE STANDARD 1944A RADIOACTIVE GAS MONITORS ARE USED IN EACH UNIT,
AND THE SYSTEM HAS BEEN ADEQUATE FOR ALL OPERATIONAL MONITORING REQUIREMENTS. DURING
MONITORING IN THE EVENT OF PARTICIPATION FROM THE REACTOR WORKERS IS ANALYZED.

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REACTOR, TEST • [illegible] • MONITORING, GAS • [illegible] • [illegible] • MANUAL • [illegible]

[illegible]
[illegible] P
THE USE OF WATER IS A SAMPLING METHOD FOR TRITIUM [illegible]
[illegible]-[illegible] LABORATORY, RICHLAND, WASHINGTON
[illegible]-CC-[illegible] 0. 13 PAGES, [illegible]

A SAMPLING TECHNIQUE FOR AIRBORNE TRITIUM [illegible] WAS DEVELOPED AND TESTED FOR USE IN [illegible]. THE
TECHNIQUE EMPLOYS A GAS WASH BOTTLE FILLED WITH [illegible] DISTILLED WATER THROUGH WHICH AIR IS
BUBBLED AT A CONSTANT FLOW RATE. THE METHOD IS RAPID, RELIABLE, AND SENSITIVE AND HAS BEEN
SHOWN USEFUL A VARIETY OF FIELD CONDITIONS. ADDITIONALLY, A TECHNIQUE IS DESCRIBED FOR
DETERMINING THE AMOUNT OF TRITIUM [illegible] SURFACE CONTAMINATION. [illegible] OF [illegible] IN
[illegible] THE [illegible] EFFICIENCY OF THE TECHNIQUE. IT IS POSSIBLY USED FOR QUALITATIVE
MEASUREMENTS AS A TRACE INDICATOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] CONTAMINATION • [illegible] • [illegible] • [illegible] • [illegible] TECHNIQUE • [illegible]

[illegible]
A NEW FAMILY OF TRITIUM MONITORING EQUIPMENT [illegible] COMPLETE PERSONNEL PROTECTION
SANDIA CORPORATION
SC-M-[illegible]-[illegible] 0. 10 PAGES, MARCH [illegible]

DESCRIBES A COMPLETE TRITIUM MONITOR WHICH INCLUDES THE PRIMARY COMPONENTS OF A NEW CONTINUOUS
MONITORING SYSTEM. THE COMPONENTS ARE A TRITIUM [illegible]-MONITOR, [illegible], [illegible] UNIVERSITY
PIT, GAS-[illegible] CONTROLLER, AND A TRITIUM-MONITORING CHAMBER.

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MONITOR, PERSONNEL • [illegible] SAFETY AND CONTROL • [illegible] ASSISTANCE • [illegible] • [illegible] •
[illegible] MONITORS

[illegible]
[illegible] PC
[illegible] TRITIUM [illegible] MONITORING SYSTEM
SAVANNAH RIVER LABORATORY
[illegible]-[illegible]-[illegible] • [illegible]-[illegible]-[illegible] • [illegible]-[illegible]-[illegible]-[illegible] 0. 9 PAGES, REFERENCES, [illegible] TEST, FROM [illegible] SYMPOSIUM ON
INSTRUMENTS AND TECHNIQUES FOR THE ASSESSMENT OF AIRBORNE RADIOACTIVITY IN NUCLEAR OPERATIONS, VIENNA,
AUSTRIA

TRITIUM IS PRODUCED IN HEAVY-WATER-MODERATED REACTORS THROUGH NEUTRON CAPTURE BY DEUTERIUM. THE
RATE OF TRITIUM PRODUCTION IS A FUNCTION OF NEUTRON FLUX AND IRRADIATION TIME. ANY TRITIUM
OXIDE, SUPERFICIALLY PRODUCED, IS DISPERSED TO THE ATMOSPHERE DIRECTLY OR VAPORIZATION UNDERGO THE
MODERATOR IS PRESENT, AND FINALLY ON THE SURFACES OF PIPE DURING DISCHARGED. THE DIFFERENT HEALTH
HAZARD OF ONE OF TRITIUM DEPOSITED FIRMLY DIRECTLY THROUGH THE SKIN OR THROUGH THE GASTROINTESTINAL
SYSTEM. THIS HAZARD IS BEST CONTROLLED BY THOROUGHLY TRAINING PERSONNEL, ADEQUATELY MEASURE THE
CONDITIONS TO WHICH PERSONS ARE EXPOSED, AND PRESCRIBING PROPER PROTECTIVE CLOTHING. AT THE
SAVANNAH RIVER PLANT, ALL THESE MEANS ARE USED TO MAINTAIN EFFECTIVE CONTROL.

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RIVER PLANT • [illegible] • RADIATION SAFETY AND CONTROL • [illegible] • RADIATION MONITORS

[illegible]
[illegible] AD • [illegible] II • [illegible] JR • [illegible] T
THE [illegible] OF [illegible] AND [illegible] ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO HYDROLOGY AND
[illegible]. FINAL REPORT
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
[illegible]-[illegible]-1 0. 110 PAGES, MAY 1967

THE [illegible] CONTROLLED [illegible] TO [illegible] BETWEEN THE U.S. [illegible] ENERGY COMMISSION AND THE AGENCY FROM
[illegible] JANUARY 1963 TO BE [illegible] 1967. THE AIM OF THE PROJECT WAS OF [illegible] GREATLY AS THE
[illegible] OF TRITIUM [illegible] AS THE [illegible] OF ENVIRONMENTAL LEVELS OF TRITIUM IN NATURAL
WATERS, AND, THROUGH THE [illegible] TO PARTICIPATING SAMPLING [illegible] THE WORLD CONTROL
[illegible] OF THE [illegible] IN [illegible] WITH [illegible], THE [illegible] OF AN [illegible] PICTURE OF THE GLOBAL

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OCCURRENCE OF TRITIUM IN PRECIPITATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00 COPY, $0.65 MICROFICHE

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AN INVESTIGATION OF A PORTABLE TRITIUM SAMPLER
[illegible] NATIONAL LABORATORY, NEW MEXICO
LA-[illegible] P., 12 PAGES, 5 FIGURES, 6 TABLES, 3 REFERENCES, APR 1960

INVESTIGATION OF A PORTABLE TRITIUM SAMPLER INDICATES COLLECTION CHARACTERISTICS SIMILAR TO REPORTED HUMAN BODY UPTAKE RATES FOR TRITIUM GAS AND TRITIATED WATER VAPOR. THE SAMPLER COLLECTOR CONSISTED OF A DRY GAS WASH BOTTLE WITH A FRITTED GLASS TIP ON THE INLET AND DISTILLED WATER AS THE COLLECTING MEDIUM. TESTS WERE MADE UNDER BOTH LABORATORY AND FIELD CONDITIONS, AND THE EFFECTS OF VARYING THE FLOW RATE, WATER VOLUME, AND WATER TEMPERATURE WERE INVESTIGATED. A FLOW-THROUGH IONIZATION CHAMBER DETECTOR WAS USED TO MONITOR THE TRITIUM CONTAMINATING SAMPLES, AND THE COLLECTED TRITIUM WAS DETERMINED BY LIQUID SCINTILLATION COUNTING. THIS COLLECTOR CAN SELECTIVELY SAMPLE TRITIATED WATER VAPOR IN THE PRESENCE OF TRITIUM GAS, AND ALLOWS THE HEALTH PHYSICIST TO MAKE A BETTER ASSESSMENT OF TRITIATED WATER VAPOR CONTAMINATIONS IN AIR.

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ACCURACY OF METHODS AND INTERCOMPARISON OF RESULTS OF [illegible] MEASUREMENTS
[illegible] NUCLEAR RESEARCH CENTER, [illegible]
CONF-[illegible] P., 17 PAGES, PP. [illegible] OF RADIATION DOSE MEASUREMENTS. THEIR PURPOSE, PREPARATION, AND REQUIRED ACCURACY IN PARTICIPATION PROJECTION, PARIS. EUROPEAN NUCLEAR ENERGY AGENCY, 1967

TRITIUM IN THE HUMAN BODY CAN BE ASSESSED WITH A HIGH DEGREE OF ACCURACY BY MEASUREMENT OF TRITIUM EXCRETED IN URINE IF THE MEASUREMENTS ARE NOT LONGER THAN SOME WEEKS AFTER THE INTAKE TAKES AND IF THE MEASUREMENTS ARE REPEATED SUFFICIENTLY SO THAT THE HALF-TIME OF EXCRETION WILL BE KNOWN. LATER MEASUREMENTS MADE IN THIS DATA INDICATE THAT THE FRACTION OF TOTAL-BODY TRITIUM CONTAINED IN THE BODY WATER DECREASES WITH TIME.

[illegible], [illegible] • [illegible] • [illegible] TECHNIQUE • [illegible], [illegible] • [illegible] • [illegible], [illegible] • [illegible]

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JACOBS DG
SOURCES OF TRITIUM AND ITS EFFECTS UPON REPLACE TO THE ENVIRONMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
TID-[illegible] • ORNL-[illegible]-70 P., [illegible], DEC. 1969

AN ATTEMPT IS MADE IN THIS STATE-OF-THE-ART-REPORT TO SUMMARIZE SOME OF THE IMPORTANT PROPERTIES OF TRITIUM AND TO USE THESE PROPERTIES IN PREDICTING THE IMPACT OF DIFFERENT RELEASES OF TRITIUM ON LOCAL AND WORLDWIDE POPULATIONS. EFFORTS INCLUDE ATTEMPTS TO PROVIDE INFORMATION ON THE EFFECTS OF TRITIUM, AS CAN CONCLUDE, IN ONE PERSON PARTS PERSON, TRITIUM FEEDS TO SPECIFY WORLDWIDE PERSONAL PROBLEMS. HOWEVER, IT WILL CONTINUE TO SERVE MODELING AND PHYSIOLOGICAL CONSIDERATIONS PROBLEMS. ALSO PROVIDED IS INFORMATION CONCERNING SOURCES, PRODUCTION, [illegible], [illegible], AND PROJECTED PRODUCTION OF TRITIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00 COPY, $0.65 MICROFICHE

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AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

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[illegible] 4 PAGES. PAGES 73-7 OF CONGRES INTERNATIONAL SUR LA RADIOPROTECTION DANS L UTILISATION INDUSTRIELLE DES RADIOELEMENTS. PARIS. 13-14 DECEMBRE 1964. PARIS. SOCIETE FRANCAISE DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS. 1967

THE PROBLEMS INVOLVED IN THE MEASUREMENT OF RADIOACTIVITY IN LIQUIDS AND GASES ARE DISCUSSED, AND THE SENSITIVITIES NECESSARY FOR MONITORING DEVICES ARE DERIVED FROM DIRECTIVES OF THE ICRP CONCERNING THE MAXIMUM CONCENTRATIONS OF RADIOISOTOPES. SOME SOLUTIONS TO THESE PROBLEMS ARE DESCRIBED, AND ILLUSTRATED BY RESULTS OF MEASUREMENTS IN AIR AND WATER. METHODS FOR THE INCREASE OF DETECTOR SENSITIVITY ARE DISCUSSED AND METHODS OF SAMPLE PREPARATION, INCLUDING MECHANICAL SEPARATION OF ADSORBTS, ADSORPTION OF ADSORBTS ON ACTIVATED CHARCOAL, AND CONCENTRATION OF AQUEOUS SOLUTIONS BY EVAPORATION AND DESICCATION. THE METHODS USED TO MEASURE I-131 CONTENT OF ATMOSPHERE AND MILKING CONTENT OF WATER AND DESICCATION.

PRODUCT • ADSORBT • ADC • MEASUREMENT • MONITOR, LIQUID • WATER • MONITOR, GAS • AIR • CHARCOAL • ADSORBL, RADIOACTIVE • EVAPORATION • ICRP • SENSITIVITY • RADIOISOTOPE • RADIATION SENSITIVI

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[illegible] • [illegible]
SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MONITORING WITH TRITIUM
RADIOLOGICAL SCIENCES LAB., ALBANY
9 PAGES. [illegible]. 2. PAGES 77-8 (SEPT. 1969)

A TECHNIQUE FOR WIDE-AREA STACK EFFLUENT DISPERSION MONITORING IS DESCRIBED USING TRITIATED WATER AS A TRACER. THE SAMPLER CONSISTS OF INDICATING SILICA-GEL IN A PIREX-GLASS-SCREW BOX CONVENIENTLY PLACED IN THE FIELD ALONG SAMPLING LINES DOWNWIND FROM THE STACK. THE ADSORBED WATER VAPOR IS REMOVED FROM THE SILICA GEL BY VACUUM DISTILLATION AND THE TRITIUM CONTENT DETERMINED BY LIQUID SCINTILLATION COUNTING. THIS TECHNIQUE HAS BEEN USED SUCCESSFULLY TO DISTANCES 10 MILES FROM A STACK TO FUNDAMENTALLY DETERMINE THE C-SHAPE OF A STACK EFFLUENT FROM A NUCLEAR FUELS REPROCESSING PLANT WHICH ALREADY CONTAINED SOME TRITIATED WATER.

EQUIPMENT • TRACER, RADIOACTIVE • STACK • DISPERSION • GAS GAS • WATER VAPOR • GAS SITE

[illegible]
[illegible] • [illegible] C • [illegible] US
A PROPANE BUBBLE CHAMBER AS A LOW LEVEL COUNTER FOR TRITIUM AND CARBON-14
JOHNSTON LABORATORIES, INC., BALTIMORE, MARYLAND
7 PAGES. 8 FIGURES. 9 REFERENCES. IEEE TRANSACTIONS ON NUCLEAR SCIENCE, NS-16(1). PAGES 100-106 (FEBRUARY 1969)

A BUBBLE CHAMBER WAS OFTEN OPERATED AS A COUNTER WITH THE PROPANE FILLING BEING NEARLY SUPERHEATED SO THAT IT IS SENSITIVE TO THE LOW ENERGY EMITTED BY A FEW ELECTRONS EMITTED IN TRITIUM BETA DECAY. EXPERIMENTAL TECHNIQUES ARE DESCRIBED USING QUARTZ CHAMBERS OF 10 ML VOLUME OPERATED AT 99 C. THESE PLATEAUS ARE DESCRIBED IN A PLOT OF THE CHAMBER COUNTING RATE AGAINST THE SUPERHEAT PRESSURE (SUPERHEAT PRESSURE EQUALS VAPOR PRESSURE AT 99 C MINUS EXPANSION PRESSURE). THESE WERE USED TO ALPHA PARTICLES (70-40 PSI) DECREAS PRESSURE (70-40 PSI) AND ELECTRONS (140-120 PSI). THE CHAMBER BACKGROUND COUNTING RATE WAS STABLE AND REPRODUCIBLE FOR LONG TIMES.

AVAILABILITY - J.P. WITTS, JOHNSTON LABORATORIES, INC., 7017 BALTIMORE AVENUE, BALTIMORE, MARYLAND 21219

COUNTER • CHAMBER • COUNTER • DESIGN STUDY • BUBBLE • RADIATION MONITORS

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[illegible] US • [illegible] US
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE ULRC DIVISION OF DIVISION AND MANAGEMENT. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION
BATTELLE NORTHWEST, RICHLAND, WASHINGTON
BNWL-1000(PT. 3) 3 v., 40 PAGES. 3 FIGURES. 1 TABLE. JULY 1969

DISCUSSES INSTRUMENTS USED IN VARIOUS MONITORING METHODS AND TECHNIQUES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

MONITORING • COUNTER • SOLID STATE DEVICE • [illegible] • RADIATION SAFETY AND CONTROL • BATTELLE NORTHWEST • [illegible] • INSTRUMENTS, MISC.

[illegible]
[illegible]
MONITORING OF GASEOUS EFFLUENTS FROM REACTORS
ATOMIC ENERGY ESTABLISHMENT, WINFRITH (ENGLAND)
AEEW-M-891 9., 10 PAGES, TABLES, 7 REFERENCES, APRIL 1969

TECHNIQUES DEVELOPED AND USED AT THE ATOMIC ENERGY ESTABLISHMENT, WINFRITH, FOR MONITORING DISCHARGES OF RADIOACTIVE GASES FROM REACTOR SYSTEMS ARE DESCRIBED, AS WELL AS TECHNIQUES USED FOR CONTINUOUSLY MONITORING FOR SMALL (MILLICURIES) RELEASES OF [illegible] IN THE PRESENCE OF MUCH LARGER QUANTITIES (HUNDREDS OF CURIES) OF INERT GASES. DIFFICULTIES ENCOUNTERED IN THE USE OF THESE MONITORS ARE ALSO DISCUSSED, AND BRIEF MENTION IS MADE OF THE TECHNIQUE USED FOR MEASURING RELEASES OF TRITIATED WATER VAPOR.

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AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DEVELOPMENT • TRITIUM • MONITORING, STACK • NUCLEAR GAS • UNITED KINGDOM • INSTRUMENTS, AIR SAMPLING • MONITORS, GAS • WASTE DISPOSAL, GAS

[illegible]
MULLINS JR • [illegible] • [illegible]
TECHNIQUES FOR MONITORING AND ANALYSIS OF ENVIRONMENTAL TRITIUM
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA
6 PAGES, 2 TABLES, 0 REFERENCES. IN: TRANSACTIONS OF NUCLEAR SCIENCE, 19(1), PP. 177-180 FEBRUARY 1972

> MONITOR SAMPLING TECHNIQUES ARE ACCEPTABLE FOR ENVIRONMENTAL TRITIUM, ALTHOUGH ATTENTION MUST BE PAID TO THE CHEMICAL AND PHYSICAL STATE OF THE TRITIUM. LIQUID SCINTILLATION AND GAS COUNTING METHODS ARE WELL ACCEPTABLE FOR COUNTING TRITIUM, WITH GAS COUNTING OFTEN THE MOST SENSITIVE. SENSITIVITIES FOR TRITIUM CAN BE INCREASED GREATLY BY ELECTROLYTIC ENRICHMENT BEFORE COUNTING.

KEYWORDS • INSTRUMENT, AIR SAMPLING • MONITOR, AIR • SAMPLING • AIR • ANALYSIS • TECHNIQUE • ENVIRONMENT • INVESTIGATION

[illegible]
BROWN S • [illegible] CM • [illegible] JF • [illegible] DJ
A TRITIUM PROPORTIONAL COUNTER WITH GAMMA COMPENSATION
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-[illegible]-1 • 5 PG, 4 FIGURES, 1 TABLE, REFERENCES, APRIL 1969

> A LARGE AREA, THIN WINDOW, GAS PROPORTIONAL COUNTER DESIGNED AS A TRITIUM MONITOR IS BEING FIELD TESTED AS A PROTOTYPE SYSTEM. A TEMPORAL GAIN IN SENSITIVITY FOR 1 MPC OF HTO IS ACCEPTABLE/MOST AND A DECREASE IN BACKGROUND HAS BEEN ACHIEVED. THE INSTRUMENT WILL INDICATE AND RECORD THE COUNT RATE CORRESPONDING DIRECTLY TO THE TRITIUM AIR CONCENTRATION EXPRESSED AS MPC OR M-91. EVEN IF THE AREA BACKGROUND CHANGES UP TO 4 MR/HR IN A GAMMA RADIATION FIELD. THE ELECTRONICS CIRCUITRY AND OPERATIONAL CHARACTERISTICS ARE DESCRIBED.

CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $.300 COPY, $0.65 MICROFICHE

COUNTER • BETA EMITTER • MONITOR, AIR • INSTRUMENT, COMPONENT • TEST, INSTRUMENT RESPONSE • EQUIPMENT DESIGN • RADIATION MONITORS

[illegible]
BROWN CT • [illegible]
THE DETECTION OF TRITIATED WATER USING A PLASTIC-SCINTILLATOR FLOW CELL
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-[illegible]-1 • 5 PG, 5 FIGURES, 1 TABLE, REFERENCES, APRIL 1969

> IN A PRELIMINARY WORK REPORT, IS DESCRIBED A SYSTEM FOR THE DETECTION OF TRITIUM AND ACTIVITY IN NATURAL GAS. THE SENSITIVITY OF THE SYSTEM FOR TRITIUM IS NOT SATISFACTORY FOR CONCENTRATIONS BELOW 0.0001 MICROCURIE/CC. THIS IS DUE TO THE INTERFERENCE FROM THE 670-KEV BETA FROM KR-85. A TECHNIQUE WHICH CAN REDUCE THIS INTERFERENCE INVOLVES CHANGING THE METHOD AND COUNTING THE WATER WHICH IS FORMED. THE TRITIATED METHANE IS CONVERTED TO TRITIATED WATER, WHICH SHOULD BE FREE OF ACTIVITY. THIS REPORT DESCRIBES THE RESULTS OF THE PRELIMINARY INVESTIGATION OF A PLASTIC-SCINTILLATOR FLOW CELL WHICH CAN BE USED TO COUNT THE TRITIATED WATER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

COUNTER • ACTIVITY • MONITOR, GAS • ANALYTICAL TECHNIQUE • INSTRUMENT, COMPONENT • INSTRUMENT, FLOW • TEST, INSTRUMENT RESPONSE • RADIATION MONITORS

[illegible]
PAGE 7
STUDY ON THE VARIATION OF TRITIUM AND C-14 CONCENTRATIONS IN THE ENVIRONMENT
KYUSHU NATIONAL UNIVERSITY, FUKUOKA, JAPAN
10 PAGES, NPO PHYSICAL INFORM, VOLUME 0, PAGES 1-10 [illegible] (JAPANESE LANGUAGE)

> A STUDY WAS MADE ON THE VARIATION OF TRITIUM AND C-14 CONCENTRATIONS IN THE ENVIRONMENT EMPLOYING GAS COUNTING AND THE LIQUID SCINTILLATION COUNTING METHODS. THROUGH THE EXPERIMENT IT WAS FOUND THAT THE DIGNITY OF MERIT OF THE NEW SCINTILLATION SYSTEM FOR THE TRITIUM CONCENTRATION MEASUREMENT WAS 10X AND THE MINIMUM DETECTABLE CONCENTRATION WAS 147 PM 1.8 T.U.

KEYWORDS • COUNTER • MEASUREMENT • [illegible] • ENVIRONMENT • TEMPERATURE • GAS • LIQUID • CONCENTRATION • FOOD

[illegible]
BRETT DJ
LOW-LEVEL TRITIUM MEASUREMENTS AND HYDROLOGICAL APPLICATIONS
WESTON WINSCALE ATOMIC ENERGY UNIVERSITY, WARRINGTON, ENGLAND

[illegible]
[illegible] 0. 8 PAGES. PP. 10-17 OF NUCLEONIC INSTRUMENTATION, LONDON. INSTITUTION OF ELECTRICAL ENGINEERS. 1968. POST CONFERENCE ON NUCLEONIC INSTRUMENTATION, READING, ENGLAND

TRITIUM MEASUREMENTS CAN MAKE A SIGNIFICANT CONTRIBUTION TO MANY STANDARD GEOLOGICAL INVESTIGATIONS ON GROUNDWATER ORIGINS, MOVEMENT AND PERMEABILITIES. A LABORATORY HAS BEEN SET UP AT U.K.A.E. FOR TRITIUM MEASUREMENTS IN SAMPLES OF NATURAL WATER. THE APPARATUS AND TECHNIQUES CURRENTLY USED AT U.K.A.E. FOR THESE MEASUREMENTS ARE DESCRIBED.

AVAILABILITY - U.K. ATOMIC ENERGY AUTHORITY, WINFRIDH, ENGLAND

GEOLOGY • GROUND WATER • MEASUREMENT • ANALYTICAL TECHNIQUE • [illegible]

[illegible]
LOCATION OF
LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
3 PAGES. ANALYTICAL BIOCHEMISTRY. VOL. 20. PAGES 445-7 DECEMBER 1967

A METHOD IS DESCRIBED FOR DETERMINING RADIOACTIVITY IN TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS. THE PROTEIN IS FIRST ELUTRIATED FROM THE GEL BY DISSOLVING THE GEL WITH 70 PERCENT HYDROGEN PEROXIDE. THE DRY PROTEIN IS THEN BROUGHT INTO INTIMATE CONTACT WITH THE SCINTILLATION SOLVENT BY MEANS OF A NEW SOLUBILIZING AGENT. LIQUID SCINTILLATION SPECTROMETRY IS USED TO COUNT THE SAMPLES AND ALL STEPS ARE DONE IN SCINTILLATION VIALS UNDER CONDITIONS CONSIDERED OPTIMAL FOR NO LOSS OF TRITIUM RADIOACTIVITY. THE RESULTS ON REPRODUCING RADIOACTIVITY IN INCREASING AMOUNTS OF ALBUMIN-H3 ARE TABULATED. IT WAS FOUND THAT AS THE AMOUNT OF SERUM IS INCREASED THERE IS A CORRESPONDING INCREASE IN THE NET ACTIVITY OF THE SERUM ALBUMIN

ANALYTICAL TECHNIQUE • SPECTROMETRY, DATA • EQUIPMENT DESIGN • LIQUID • PROTEIN

[illegible]
HAZARDS CONTROL PROGRESS REPORT NO. 30, MAY-AUGUST 1969
CALIFORNIA UNIVERSITY, LIVERMORE, LAWRENCE RADIATION LABORATORY
UCRL-50007-69-2 P. 82 PAGES. 40 FIGURES, 7 TABLES, 26 REFERENCES. AUGUST 1969

TOPICS DISCUSSED - (1) THERMOLUMINESCENCE-DOSIMETRY PERSONNEL MONITORING SYSTEM, BADGE CHARACTERISTICS, LABELING, AND BADGE CHANGING. (2) DEVELOPMENT OF AN AUTOMATIC BADGE READER, (3) ELECTRONICS OF THE BADGE READER, (4) A SURFACE-CONTAMINATION SYSTEM, (5) A DEMASSER TECHNIQUE FOR TRITIUM IN WATER, (6) A METHOD FOR DETERMINING DENSITIES OF A SINGLE DOPING CRYSTAL IN THE DETECTOR CELL, AND (7) DETERMINATION OF NEUTRON SCATTERING IN THE LMD-SCATTER CELL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $1.00 COPY, $0.65 MICROFICHE

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MEASURE E • MEASURE I • MEASURE S
SAMPLE COMBUSTION APPARATUS FOR LIQUID SCINTILLATION COUNTING
[illegible] INDUSTRIES, CORP., JAPAN
6 PAGES. PROCEEDINGS [illegible], VOLUME 19, PAGES 294-9 (1968) (IN JAPANESE)

PREPARATION OF SAMPLES FOR LIQUID SCINTILLATION COUNTING BY THE COMBUSTION METHOD WAS STUDIED. DIFFERENT KINDS OF BIOLOGICAL SAMPLES SUCH AS PLANT AND ANIMAL TISSUES ARE USED IN STUDIES USING LIQUID SCINTILLATION COUNTING. IN THIS METHOD, AN H3-AND C14-LABELED SAMPLE IS PLACED IN AN OXYGEN FILLED GLASS, AND CONVERTED TO THE CO2 CATALYST. COMBUSTION CONDITIONS FOR SEVERAL SAMPLES AND COLLECTION METHODS FOR H2O AND CO2 WERE INVESTIGATED. A CIRCULAR FLOW COLLECTION METHOD WAS APPLIED TO THE COLLECTION, AND COLLECTION EFFICIENCIES FOR H2O WERE FOUND TO BE 99 PERCENT WERE OBTAINED FOR H2O AND CO2, RESPECTIVELY. AS A RESULT OF THESE COMBUSTION RESULTS, A SAMPLE COMBUSTION APPARATUS WAS CONSTRUCTED AS A COMMERCIAL PRODUCT.

CARBON • COUNTER • ANALYTICAL TECHNIQUE • COMBUSTION • EQUIPMENT DESIGN • LIQUID • COMMERCIAL PRODUCT

[illegible]
HOLLAND JB
COMBUSTION SAMPLES FOR LIQUID SCINTILLATION COUNTING
UNIVERSITY OF TENNESSEE, MEMPHIS
11 PAGES. NUCLEUS (CHICAGO). NO. 20. PAGES 1-11 (JANUARY 1969)

THE COMPARTMENT COMBUSTION METHOD, WET, SEALED-TUBE, MEYER-TRAIN, MEYER BOMB, AND MEYER FLASK ARE ALL DISCUSSED PLUS THE STANDARDIZATION OF USE FOR COMBUSTION OF BIOLOGICAL SAMPLES CONTAINING C-14, TRITIUM, S-35, OR P-32 FOR DETERMINATION BY LIQUID SCINTILLATION COUNTING. THE METHODS ARE ALSO SUITABLE FOR DOUBLE-LABELED SAMPLES WITH TWO BETA EMITTING ISOTOPES. IN SOME CASES, THE COMBUSTION PRODUCTS CONTAINING THE ISOTOPES CAN BE SEPARATED AND COUNTED SEPARATELY. WHILE FOR OTHER METHODS THEY ARE MOST COMMONLY COMBINED, COUNTED AGAIN AFTER SEPARATION OF ONE COMPONENT IS DETERMINED, AND THE SECOND ENTITY DETERMINED BY DIFFERENCE

CARBON • COUNTER • PHOSPHORUS • SULFUR • ANALYTICAL TECHNIQUE • EQUIPMENT DESIGN

041090
[illegible]
COUNTING OF TRITIATED COMPOUNDS AND PAPER CHROMATOGRAMS
UNIVERSITY OF CHIBA
4 PAGES. INTERNATIONAL JOURNAL OF APPLIED RADIATION AND ISOTOPES, VOL. 19, PAGES 1064-9 SEPTEMBER 1968

FACTORS THAT MUST BE CONSIDERED IN THE SELECTION OF COUNTING METHODS FOR LABELED SUBSTANCES ON PAPER CHROMATOGRAMS ARE DISCUSSED. SOME RESULTS ARE TABULATED FOR THE COUNTING EFFICIENCY FOR DIFFERENT-WETS ON DRY AND PAPER USING VARIOUS SCINTILLATORS - ALSO FOR TRIBUTYL-WETS AND DIFFERENT. INCLUDING QUENCHING DUE TO THE PAPER.

RADIOACTIVE TECHNIQUE • PAPER MEASUREMENT, EFFICIENCY • COMPARISON

041095
[illegible] J • PLEWA AM
RADIATION-INDUCED H-3 FORMATION IN AROMATIC HYDROCARBONS SATURATED WITH TRITIATED WATER
TECHNICAL UNIVERSITY, POLAND
4 PAGES. BULLETIN POLSKIE AKADEMIA NAUK WARSAW. SERIES DES SCIENCES CHIMIQUES, VOL. 14, PAGES 591-4 [illegible]

THE EFFECTS OF GAMMA RADIOLYSIS OF BENZENE AND TOLUENE, SATURATED WITH TRITIATED WATER, WERE STUDIED. NO H-3 FORMATION OCCURRED WHEN NONRADIOACTIVE SAMPLES OF BENZENE AND TOLUENE SATURATED WITH TRITIATED WATER WERE STORED FOR ANY LENGTH OF TIME. THE ACTIVITIES OF THE IRRADIATED SAMPLES WERE DETERMINED, IN THE ABSENCE AND PRESENCE OF GAMMA RADIATION AND INCREASED WITH THE ACTIVITY OF THE TRITIATED WATER USED FOR SATURATION. THE YIELDS OF TRITIUM, DEFINED AS THE RATIO OF THE FINAL SPECIFIC ACTIVITY OF BENZENE OR TOLUENE TO THE INITIAL SPECIFIC ACTIVITY OF THE RESPECTIVE SATURATED PRODUCTS AND IRRADIATION, WAS FOUND TO BE INDEPENDENT OF THE ACTIVITY OF THE TRITIATED WATER. THE FORMATION WAS NOT SUFFICIENT FOR PRACTICAL TRITIUM TOLUENE.

WATER • GAMMA EMITTER • SPECTROMETRY, DATA • COMPARISON

042760
COSTES C • [illegible] F • [illegible] J • [illegible] M
STUDIES ON THE DECONTAMINATION OF WATER TO LEVELS BELOW TRITIATED WATER. 1. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS BASED ON USE OF POTABLE WATER IN PLANT PROTOTYPES
CENTRE NATIONAL DE RECHERCHES AGRONOMIQUES, FRANCE
19 PAGES. ANNALES DE PHYSIOLOGIE VEGETALE, VOL. 6, PG 193-19 [illegible] FRENCH

REVIEWS THE USE OF H-3 AND BETA-LABELED WATER FOR STUDY OF PLANT METABOLISM. IN ADDITION TO A SURVEY OF EXPERIMENTAL RESULTS, TECHNIQUES FOR COUNTING TRITIUM IN BIOLOGICAL SYSTEMS ARE DESCRIBED. INCLUDING USE OF GAS COUNTERS AND SCINTILLATION COUNTERS, CHARACTERISTICS OF VARIOUS SCINTILLATORS, MEASUREMENT PROCEDURES FOR H-3, SIMULTANEOUS COUNTING OF H-3 AND C-14, AND THE EFFECT OF EXTINCTION.

BIBLIOGRAPHY • COUNTER • MEASUREMENT • WATER • REVIEW • DESCRIPTION • CHARACTERISTICS • VEGETATION • CONCENTRATION • TOXICITY

042904
SUTTA-PRADEEP V
METHODS OF DETECTING AND PROTECTING AGAINST TRITIUM
CEA-R-3950 • [illegible]-0187 •, 39 PAGES, DECEMBER 1967

DISCUSSES THE DANGERS POSED BY TRITIUM - ITS DETECTION, APPARATUS USED, PROTECTION OF PERSONNEL IN AN ATMOSPHERE CONTAMINATED WITH TRITIUM, THE DIFFUSION OF TRITIUM IN THE ATMOSPHERE, DECONTAMINATION, ETC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DECONTAMINATION • ATMOSPHERIC DIFFUSION • ATMOSPHERIC POLLUTION • CONTAMINATION • OCCUPATIONAL PHYSIOLOGY, RADIATION • RADIATION SAFETY AND CONTROL • RADIATION HAZARDS

042909
ALDERDICE [illegible] • HAYES LM
ANALYTICAL TECHNIQUES FOR THE USE AND CONTROL OF TRITIUM AT SAVANNAH RIVER
DU PONT DE NEMOURS E.I. AND COMPANY, SAVANNAH RIVER LABORATORY
DP-771 •, 19 PAGES, SEPTEMBER 1962

METHODS OF TRITIUM ANALYSIS THAT ARE USED TO MONITOR THE OPERATION, HEALTH HAZARD AND TO CONTROL PROCESSES FOR TRITIUM PRODUCTION AT SAVANNAH RIVER ARE REVIEWED. THE ANALYTICAL APPLICATIONS OF TRITIUM PRODUCED IN FISSION ARE ALSO DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

FISSION PRODUCT RELEASE • MONITORING, PERSONNEL • HAZARD, RELATIVE • ANALYTICAL TECHNIQUE • SAVANNAH RIVER PLANT • TRITIUM, DATA

[illegible]
[illegible]
A RAPID-FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN
MIAMI UNIVERSITY, FLORIDA
TID-25905 p. 6 PAGES, FEBRUARY 1, 1970

PROPOSES A PROTOTYPE FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN. WITHIN A FEW WEEKS IT WILL BEGIN TO UNDERGO TEST. AND FINAL SPECIFICATIONS WILL BE DETERMINED. THE HARDWARE WILL COLLECT SIMULTANEOUSLY ONE SAMPLE OF ATMOSPHERIC HYD, AND ONE OF HY, FOR EACH SAMPLING PERIOD OF 5 TO 15 MINUTES. IT IS DESIGNED FOR USE IN AN AUTOMOBILE OR IN AN AIRCRAFT WITH PRESSURIZED CABIN. DURING THE REMAINING PART OF THE POST CONTACT JOBS, WE WILL TAKE THE FIELD UNIT IN A CAR, STATION WAGON OR SMALL VAN, AND DRIVE THROUGH A COLD FRONT COLLECTING SAMPLES OF ATMOSPHERIC HYD AND HY FROM BOTH AIR MASSES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA • HYDROGEN • TESTING • ATMOSPHERIC POLLUTION • SAMPLING • AIR • INSTRUMENTS, MISC.

[illegible]
BLACK S • HOUSTON D • BARLOW P
[illegible] TECHNIQUES IN WATER MONITORING BY PROPORTIONAL COUNTERS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-70194 p. 10 FIGURES, 2 TABLES, 13 REFERENCES, OCTOBER 25, 1967

USE OF PROPORTIONAL COUNTERS IS DESCRIBED FOR MONITORING TRITIUM IN AIR, IN WATER (BOTH GROUND), AND ON CONTAMINATED SURFACES. THE SYSTEM FOR WATER IS BASED ON COUNTING ACETYLENE PRODUCED BY REACTION WITH CALCIUM CARBIDE. SENSITIVITY, IN MICROCI/LITER, IS 1 PER COUNTING WITH AN INTERNAL PROPORTIONAL COUNTER AND 10 WITH AN IONIZATION CHAMBER. ACETYLENE IS PASSED THROUGH A MOLEC SIEVE INTO THE PROPORTIONAL COUNTER AND FLUSHED TO THE ATMOSPHERE. THE PEAK COUNT IS RECORDED AFTER ABOUT 6 MIN OF ACETYLENE GENERATION. IN PREPARATION FOR THE NEXT SAMPLE THE REACTION VESSEL AND WORK TUBE ARE HEATED TO REMOVE RESIDUAL CONTAMINATION, AND THE COUNTER IS FLUSHED WITH COMMERCIAL-GRADE METHANE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COUNTER • MONITOR, LIQUID • SURFACE CONTAMINATION • WATER • MONITOR, GAS • ANALYTICAL TECHNIQUE • MONITOR, ENVIRONMENTAL • LIQ

[illegible]
[illegible]
TRANSISTORIZED PORTABLE TRITIUM CONTAMINATION MONITOR
CENTRAL LABORATORY FOR RADIOLOGICAL PROTECTION, POLAND
CLRP-PO/0 p. 9 PAGES, 1 FIGURE, 6 REFERENCES, 1969 (IN POLISH)

FULLY TRANSISTORIZED PORTABLE TRITIUM CONTAMINATION MONITOR WITH PORE IONIZATION CHAMBER WAS DEVELOPED. MONITOR WAS APPLIED FOR SURFACE CONTAMINATION MEASUREMENTS FROM THE LEVEL OF 40 DETECTED. MONITOR HAS A TEMPERATURE DRIFT OF 0.4 DIV/°C, [illegible] TEMP, [illegible] LOWER THAN 0.4 DIV/DAY, AND CURRENT DRAIN OF 1 MA.

AVAILABILITY - . NUCLEAR ENERGY INFORMATION CENTER OF THE POLISH GOVERNMENT COMMISSION FOR USE OF NUCLEAR ENERGY, PALACE OF CULTURE AND SCIENCE, WARSAW, POLAND

MONITOR, SURFACE • POLAND • CONTAMINATION MONITORS

[illegible]
TRITIUM MONITOR
[illegible] RIVER LABORATORY
CRRF-1071 p. 1969

A PORTABLE MONITOR IS DESCRIBED WHICH ACCURATELY MEASURES TRITIUM CONCENTRATIONS BETWEEN 0.0001 AND 0.1 MICROCURIES/CC OF AIR. THE INSTRUMENT CONSISTS OF AN AIR PUMP, DEHUMIDIFIER, IONIZATION CHAMBER, LOGARITHMIC ELECTROMETER-AMPLIFIER AND A HIGH VOLTAGE POWER SUPPLY. AN INTERNAL RECHARGEABLE 12-V BATTERY POWERS THE MONITOR. A CONNECTION IS PROVIDED SO THAT AN EXTERNAL 12-V BATTERY CAN BE USED IF THE MONITOR IS NEEDED FOR EXTENDED PERIODS OF TIME. AFTER CALIBRATION BY COMPARISON WITH A GAMMA MONITORING SYSTEM UNDER VARYING LEVELS OF TRITIUM ACTIVITY, READINGS WERE REPRODUCIBLE WITHIN 6-10%. (FOR DETAILS SEE TID-4100 SUPPL. 599 (SEE ALSO NSA 24: 14[illegible]).

[illegible]MENT, AIR SAMPLING • MONITOR, GAS • INSTRUMENT, SURVEY, [illegible]NCE • RADIATION MONITORS

[illegible]
[illegible]
STANDARDIZATION OF NATURAL TRITIUM MEASUREMENTS.
TELLUS 18 PAGES 191-196 1966

MEASUREMENT • INSTRUMENTS, MISC.

[illegible]
[illegible]
THE NATIONAL BUREAU OF STANDARDS VERIFIED WITH STANDARDS.
INTERNATIONAL JOURNAL OF APPLIED RADIATION AND ISOTOPES 19 PAGES 629-639 1968

CHARTS AND STANDARDS • WATER

[illegible]
[illegible]
A SENSITIVE POSITRON MONITOR,
[illegible] P.

MONITOR • INSTRUMENTS, MISC.

[illegible]
[illegible]
ASSAY OF TRITIUM AND [illegible] IN HUMAN TISSUES BY LIQUID SCINTILLATION.
ELSEVIER [illegible] 8 PAGES [illegible] 1967

[illegible] • CHEMICAL ANALYSIS • LIQUID • HUMAN • MEANS • INSTRUMENTS, MISC.

[illegible]
[illegible] • [illegible] • [illegible] • [illegible]
THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS
19 PAGES, 7 TABLES, 7 REFERENCES, NUCLEAR SAFETY, 13(3), PP. 285-295 (MAY-JUNE 1972)

A TRITIUM SYMPOSIUM SPONSORED BY THE NEVADA ENVIRONMENTAL RESEARCH LABORATORY OF THE ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA AT LAS VEGAS WAS HELD IN LAS VEGAS AUG. 30 TO SEPT. 2, 1971. NINETY TWO PAPERS WERE PRESENTED COVERING A BROAD RANGE OF TOPICS, INCLUDING TRITIUM PRODUCTION, ITS IMPORTANCE IN THE ENVIRONMENT, ENVIRONMENTAL RELEASE AND MONITORING, DETECTION AND MEASUREMENT, BIOLOGICAL EFFECTS, DOSIMETRY, APPLICATIONS TO BIOLOGY AND MEDICINE, AND HEALTH PHYSICS. THIS REPORT TREATS ON ALL ASPECTS OF THE MEETING, BUT PAPERS OF PARTICULAR INTEREST IN THE FIELD OF NUCLEAR SAFETY ARE EMPHASIZED.

ENVIRONMENTAL RELEASE • COMMERCIAL • MONITORS, LIQUID • REPORTING, ETC • ANALYTICAL TECHNIQUE • MONITORING SYSTEM, RADIATION

[illegible]
[illegible], [illegible] • [illegible], [illegible] • [illegible], [illegible]
RESEARCH ON [illegible] TYPE SEMICONDUCTOR RADIATION DETECTORS
GENERAL ELECTRIC COMPANY, [illegible], PENNSYLVANIA
[illegible] 171 PAGES, JANUARY 1972

IN THIS REPORTING PERIOD, SPECIAL EMPHASIS WAS PLACED ON THE CONTINUED DEVELOPMENT OF USES OF COMPOUND SILICON [illegible] DIODES AS RADIATION DETECTORS AND IN UNDERSTANDING RESISTIVITY STABILIZATIONS IN SILICON IN ORDER TO [illegible] SILICON AS HIGH [illegible] AND HIGHER GAIN. [illegible] CRYSTALLOGRAPHY AND CRYSTAL GROWTH [illegible] AND PARAMETRIC PROPERTIES UNDER STUDY. THE APPLICATION OF [illegible] TECHNOLOGY TO THE PRACTICAL SOLUTION OF PROBLEMS IN [illegible] DETECTION CONDITIONS TO GAMMA. [illegible] DETECTORS WITH ACTIVE DETECTION AREAS OF UP TO 9 CM2 HAVE BEEN FABRICATED AND INCLUDE COMPUTING EFFICIENCIES FOR E-16 MV UP TO 60 PERCENT AND WITH LOW BACKGROUND RATES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] STATE DEVICE • [illegible] DEVELOPMENT, EXPERIMENTAL • INSTRUMENT, COMPONENT • U AND W PROGRAM • RADIATION DETECTORS

[illegible]
[illegible] S • [illegible] V
PROGRESS IN OCCUPATIONAL HEALTH PHYSICS AND DEVELOPMENT OF MONITORING TECHNIQUE IN JAPAN
JAPAN ATOMIC ENERGY RESEARCH INSTITUTE
[illegible] • [illegible]-[illegible] 29 PAGES, 8 FIGURES, 6 TABLES, 17 REFERENCES, FROM THE FOURTH ANNUAL NATIONAL INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, SEPTEMBER 6-16, 1971

IN THIS PAPER, PROGRESS OF OCCUPATIONAL HEALTH PHYSICS IN THE NUCLEAR FACILITIES OF THE JAPAN ARE DESCRIBED. THIS PAPER ALSO DESCRIBES THE DEVELOPMENT OF MONITORING TECHNIQUE FOR ATMOSPHERE CONTAMINATION MATERIALS SUCH AS RADIONUCLIDE AND THE METHOD USING PORTABLE INSTRUMENTS FOR EVALUATING [illegible] TYPE EQUIPMENT, AND THE DEVELOPMENT OF LONG MONITORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] • [illegible] TECHNIQUE • [illegible], [illegible] • [illegible] DEVELOPMENT, EXPERIMENTAL • DOSE CALCULATION, [illegible] • FISSION PRODUCT, [illegible] • [illegible] • [illegible] EXPOSURE, RADIATION • RADIATION SAFETY AND [illegible] • [illegible] EXPOSURE, [illegible] DEVICE • [illegible] • [illegible] EXPOSURE • LONG • BODY BURDEN

[illegible]
[illegible] PD • [illegible] RF
ANALYSIS OF [illegible] GASES
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
7 PAGES, 2 REFERENCES. PAPER PRESENTED AT THE [illegible] AIHC AND CLEARING CONFERENCE, [illegible], [illegible].
AUGUST 31-SEPTEMBER 3, 1970

THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY COLLECTS AND ANALYZES RADIOACTIVE [illegible] WHICH OCCUR IN THE GASEOUS STATE IN THE ENVIRONMENT. A VARIETY OF SAMPLERS ARE USED DEPENDING UPON THE TYPE OF GAS BEING SAMPLED. THE MIXTURES OF GASES ARE SEPARATED IN THE LABORATORY USING LOW TEMPERATURE ADSORPTION AND GAS CHROMATOGRAPHY TECHNIQUES. AFTER SEPARATION, THE QUANTITY OF RADIOACTIVITY IS DETERMINED BY COUNTING. THE GASES COMMONLY SAMPLED AND ANALYZED ARE [illegible], [illegible], [illegible], [illegible], CARBON DIOXIDE AND RADON.

RADIOGENIC RELEASE • [illegible] • [illegible] • [illegible] GAS • [illegible] • SAMPLING • [illegible] TECHNIQUE • [illegible] SYSTEM, RADIATION • CALIBRATION • [illegible]

[illegible]
[illegible] • [illegible] JC • [illegible] JJ
A TECHNIQUE FOR DEMONSTRATING C-[illegible] AT A PLANT USING TRITIATED METHANE
NEW YORK STATE DEPARTMENT OF HEALTH, ALBANY
7 PAGES, NUCLEAR APPLICATIONS AND TECHNOLOGY. VOL. 7, PP. 109-112 JULY 1969

A SILICA GEL SAMPLER FOR TRITIATED METHANE WAS DEVELOPED TO TRACE THE EFFLUENT FROM A NUCLEAR FUEL REPROCESSING PLANT. AN ESTIMATE STUDY OF THE AREA SURROUNDING NUCLEAR FUEL SERVICES, INC., TO DETERMINE EXPERIMENTALLY THE MAXIMUM CONCENTRATION OF THE STACK EFFLUENT. BASED ON EXPERIMENTAL MAXIMUM CONCENTRATION VALUES, AN ESTIMATE OF THE EMISSION RATE WAS MADE UNDER VARIOUS METEOROLOGICAL CONDITIONS.

[illegible], MAXIMUM • ATMOSPHERIC DIFFUSION EQUIPMENT • [illegible], RADIOACTIVE [illegible] • SAMPLING • SAMPLE, [illegible]

[illegible]
[illegible] JR • SMITH FG • [illegible] PJ • [illegible] R
AN INVESTIGATION OF ATMOSPHERE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT
PUBLIC HEALTH SERVICE, BUREAU OF RADIOLOGICAL HEALTH, ROCKVILLE
BRH/DEPHE-70-3 0. 9. PAGES, 11 FIGURES, 14 TABLES, 12 REFERENCES, JULY 1970

DESCRIBES STUDIES CARRIED OUT AT AN OPERATING NUCLEAR FUEL REPROCESSING PLANT AND THE PURPOSES TO CHARACTERIZING THE STACK EFFLUENT, MEASURING THE ENVIRONMENTAL LEVELS OF ACTIVITY DUE TO COMPONENTS OF STACK RELEASE, AND EVALUATING INSTRUMENTATION AND METHODOLOGY USED TO SAMPLE AIR AT THE STACK AND IN THE ENVIRONMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT • IODINE • [illegible] • MEASUREMENT • SAMPLING • STACK • [illegible], ENVIRONMENTAL • [illegible] FIRESIDE • METEOROLOGY • FUEL REPROCESSING • INSTRUMENTS, MISC.

[illegible]
[illegible] PW
ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT 11, MAY - JULY 1970
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-10217 0. 57 PAGES, AUGUST 1970

PROGRESS REPORT ON STUDY OF PERFORMANCE OF SA-1 FUEL RODS (ZIRCALOY-2 CLADDING, UO2 FUEL). DISCUSSES FABRICATIONS AND ANALYSES OF THE RODS (GAMMA SCANNING, DIMENSIONAL MEASUREMENTS, EXAMINATIONS OF DE-CLADDED RODS, METALLOGRAPHY OF RODS, GAS COLLECTION, AND ANALYSES OF CLADDING FOR TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING • FISSION GAS RELEASE • FUEL DAMAGE • FLAW • CRUD • ZIRCALOY • DEMONSTRATION • SURFACE FILM TRIBOSET • EXPANSION • FUEL ROD

[illegible]
[illegible] HW • [illegible] RF
[illegible] SAFETY PRACTICES - OPERATION MANUAL
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-[illegible] 0. 34 PAGES, APRIL 1970

DURING 1967 AN EXPERIMENT WAS CONDUCTED AT THE NEVADA TEST SITE USING A HIGH-YIELD-OPERATION GENERATOR SUPPORTED AT SEVERAL ELEVATIONS ON A 1577-FT STEEL TOWER. MANPOWER PERSONNEL RADIATION HAZARDS WERE ASSOCIATED WITH THE POWERED OPERATION OF THIS GENERATOR, AND SPECIALIZED EQUIPMENT AND PROCEDURES WERE REQUIRED. THE MOST HAZARDOUS TASKS RESULTED FROM HANDLING TARGETS FOR THE GENERATOR, EACH OF WHICH CONTAINED 1500 TO 2000 CI OF TRITIUM. HANDLING WAS REQUIRED FOR TARGET FABRICATION, PACKING AND SHIPPING, MOUNTING INTO GENERATOR, REMOVAL AND TRANSFER TO STORAGE, AND DISPOSAL OF WASTES. THIS REPORT INCLUDES AREA MONITORING AND DIP-SAMPLING TECHNIQUES, INTERNAL-DOSE ESTIMATION, AND SPECIFIC PROCEDURES FOR LIMITING PERSONNEL EXPOSURE.

[illegible]
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible], [illegible] • [illegible] • TRANSPORTATION AND HANDLING • WASTE DISPOSAL • WASTE STORAGE • SAMPLING • [illegible] CALCULATION, [illegible] • [illegible] TEST SITE • [illegible] [illegible], [illegible] • RADIATION SAFETY AND CONTROL • [illegible], [illegible]

[illegible]
[illegible] • [illegible] • [illegible]
THE CURRENT TRITIUM CONTENTS OF NATURAL WATERS
INSTITUTE OF GEOCHEMISTRY AND ANALYTICAL CHEMISTRY, MOSCOW
[illegible] PAGES, [illegible], VOL. [illegible], [illegible]

TRITIUM ANALYSES WERE MADE ON A NUMBER OF WATER AND PLANT SAMPLES COLLECTED [illegible] DURING [illegible] TO [illegible] IN THE [illegible] USSR. THE ANALYSES WERE MADE BY GAS-[illegible] COUNTING. THE COUNTERS WERE [illegible] IN [illegible] STEEL SHIELDS WITH A RING OF [illegible] GUARD COUNTERS IN ANTICOINCIDENCE WITH THE MAIN COUNTER. RESULTS ARE GIVEN.

WATER • ANALYTICAL TECHNIQUE • USSR • MONITORING PROGRAM, ENVIRONMENTAL • [illegible]

[illegible]
[illegible] • [illegible]
CALIBRATION OF AIRBORNE AND GASEOUS ACTIVITY MONITORS USED IN THE [illegible] REACTOR OF [illegible] AND [illegible]
[illegible] ATOMIC ENERGY COMMISSION, RESEARCH ESTABLISHMENT, HEALTH PHYSICS DEPARTMENT, [illegible], [illegible]
[illegible] • [illegible], [illegible] PAGES, [illegible] FIGURES, TABLES, [illegible] REFERENCES, [illegible] 1970

RADIATION-MEASURING INSTRUMENTS USED IN THE [illegible] REACTOR HAVE BEEN CALIBRATED FOR GASEOUS AND AIRBORNE PARTICULATE ACTIVITY. THE MONITORS CONCERNED ARE - [illegible] INSTRUMENTS INSTALLED IN THE [illegible] PLANT (FISSION GAS STATION MONITOR, [illegible] AND DUST MONITORS, THE STACK MONITOR), [illegible] HEALTH-PHYSICS AIR MONITORS AVAILABLE IN THE PLANT. CALIBRATION METHODS AND THE CALIBRATION CURVES AGAINST [illegible] AND [illegible] AS WELL AS THE ENERGY RESPONSE CURVES ARE DESCRIBED AND SHOWN.

FISSION PRODUCT, [illegible] • [illegible] • [illegible] • MONITOR, AIR • MONITOR, GAS • ANALYTICAL TECHNIQUE • [illegible] • MONITORING SYSTEM, RADIATION • CALIBRATION • RADIATION MONITORS

[illegible]
[illegible]
LOW LEVEL TRITIUM MEASURING SYSTEM
TECHNION-ISRAEL INST. OF TECH., HAIFA
[illegible], 50 PAGES, [illegible] 1967 (IN HEBREW AND ENGLISH)

THE SYSTEM DESCRIBED IN THIS WORK IS USED IN TRACER MEASUREMENTS OF BIOLOGICAL PROCESSES. THE ACTIVITY OF THE RADIOACTIVE TRACERS IS MEASURED BY A LIQUID SCINTILLATOR. THE MAIN LIMITING FACTORS IN SUCH MEASUREMENTS ARE THE PULSES DUE TO THE THERMIONIC EMISSION FROM THE PHOTOCATHODE OF THE PHOTOMULTIPLIER WHICH ARE IN THE ENERGY RANGE OF THE GAMMA RADIATION TO BE MEASURED. THE NUMBER OF THESE NOISE PULSES IS VERY LARGE IN COMPARISON TO SOURCE PULSES. THE SYSTEM DEVELOPED REDUCES THE THERMIONIC NOISE TO LEVEL WHICH ENABLES MEASUREMENT OF TRACER ACTIVITIES TO BE CARRIED OUT IN A SHORT TIME.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MONITOR, GAS • SYSTEM DESCRIPTION • EQUIPMENT DESIGN • MONITORING SYSTEM, RADIATION • BIOLOGICAL CONTROL • RADIATION MONITORS

[illegible]
[illegible]
A RAPID FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN
MIAMI UNIVERSITY, FLORIDA
[illegible], [illegible] PAGES, (JUNE 1970)

A SAMPLING SYSTEM FOR HT IN THE ATMOSPHERE WAS DESIGNED AND BUILT. IT UTILIZES TRITIUM-FREE HYDROGEN AS A CARRIER, ADDED TO THE AIR, AND CATALYTIC COMBUSTION AT HIGH FLOW RATES. THE RESULTING WATER IS ABSORBED IN THE SAME CATALYST. SAMPLING TIMES ARE AS SHORT AS TEN MINUTES. THE CATALYST-ABSORBER WITH THE DESIRED PROPERTIES WAS DEVELOPED, CONSISTING OF [illegible] METAL CARRIED ON MOLECULAR SIEVE. THE SAMPLING SYSTEM WAS DESIGNED FOR USE IN AN AUTOMOBILE OR IN AN AIRCRAFT. THE ATMOSPHERIC HT CONTENT SHOWS A CONTINUED SLOW INCREASE OVER THE PAST FEW YEARS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

INSTRUMENT, AIR SAMPLING • CATALYST • ABSORPTION • CONCENTRATION

[illegible]
[illegible] • [illegible] • [illegible]
ON-LINE MONITOR OF NATURAL GAS LINES FOR HYDROGEN-3 AND KRYPTON-85
[illegible] CORPORATION, LAS VEGAS, NEVADA, CONTINENTAL OIL COMPANY, PONCA CITY, OKLAHOMA
[illegible] PAGES, [illegible] FIGURES, [illegible] REFERENCES, NUCLEAR TECHNOLOGY, [illegible], PG. [illegible], (FEB. 1971)

[illegible]

A SYSTEM HAS BEEN DEVELOPED AND TESTED FOR CONTINUOUSLY MONITORING A GAMMA GAS STREAM FOR THE DATA ACTIVITY OF FROM TRITIUM AND [illegible]. THE SYSTEM USES A PROPORTIONAL COUNTER UNDER SPECIFIED VOLUME IS LIMITED TO ABOUT [illegible] OF THE TOTAL VOLUME BY A SET OF PLATE TUBULAR CATHODE [illegible]. THIS STATUS AVOIDS A BUILDUP OF BACKGROUND ACTIVITY DUE TO THE [illegible] PROPERTY OF [illegible], WHICH TEND TO PLATE OUT IN PROPORTION TO DEPTH OF THE COUNTER. [illegible], TEMPERATURE, AND FLOW CONTROLS ARE PROVIDED TO OPERATE THE SYSTEM DIRECT IN THE STATIC OR FLOWING MODE. IN THE LATTER, THE [illegible] TIME OF THE COUNTING GAS IS ABOUT TWO MINUTES.

[illegible] • TRITIUM CONTROL • MONITORS • DATA SYSTEMS • [illegible], GAS • [illegible] CALIBRATION • [illegible], FLOW • FLOW • GAS • CONCENTRATION

[illegible]
[illegible] • [illegible]
CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT
S.L. DU PONT DE NEMOURS & COMPANY, • SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA
7 PAGES, 13 REFERENCES, 4 TABLES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24, PAGE 270-280, 1963.
[illegible]

OF MORE NO. DATA. TRITIUM IS PRODUCED AS AN [illegible] PRODUCT FROM NEUTRON BOMBARDMENT OF [illegible] IN THE REACTORS, AND FROM LI [illegible]. [illegible] AS REPORTS TO ACCOMPLISH 1 MCI OF [illegible] VS AND ACTIVITY IN MCI OF [illegible] COVER FOR DIFFERENT TYPES OF [illegible] AND THEY [illegible]. [illegible] CONDITIONS EXCEED OF [illegible] CONTROL. TRITIUM [illegible] EXCEED AT SAVANNAH AS FOLLOWS - [illegible], [illegible] OF [illegible], AS [illegible] BETWEEN 0.97 AND 1.0 MCI. [illegible] GREATER THAN 1.0 MCI - 1950, 2900, -, 0 - 1950, 2900, -, 2 - 1950, 3950, -, 10 - 1957, 4000, -, 40 - 1960, 3000, 101, 39 - 1964, 3900, 1[illegible], 37 - 1966, 3920, 4[illegible], 70 - 1969, 2000, 4[illegible], 75. AS [illegible] AS [illegible] EXCEED [illegible] TO 10 MCI/L IN 70 CASES THE [illegible] HALF-LIFE [illegible] TO [illegible]. [illegible] ACTIVITY [illegible] AT [illegible] IN [illegible] FROM 9 LOCAL [illegible] AND 7 [illegible] [illegible] 7 X 10 TO [illegible] -[illegible] MCI/CC. [illegible] ACTIVITY [illegible] IN [illegible] WAS [illegible] OF LIMIT SUGGESTED BY [illegible] FOR LARGE [illegible]. [illegible] AIR [illegible] WAS 0.4 MCI/CC X 10 [illegible] -[illegible]. WITH [illegible] FOR OF 0.0. AND [illegible] [illegible] 10 X 10 [illegible] -[illegible] WITH [illegible] MAX OF 100. OF NEW [illegible]. [illegible], [illegible], [illegible] FOR [illegible] SAVANNAH RIVER [illegible] ON TRITIUM.

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible], ENVIRONMENTAL • SAVANNAH RIVER PLANT • [illegible] • [illegible] • [illegible], [illegible] • [illegible] • [illegible] • [illegible] • [illegible], [illegible] • [illegible], [illegible] • [illegible] • [illegible] • [illegible], [illegible] • [illegible], [illegible] • [illegible] • [illegible] • [illegible], BACKGROUND

[illegible]
[illegible] • [illegible]
MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT
2 PAGES, AMERICAN NUCLEAR SOCIETY TRANSACTIONS, 14(1), PAGE 162-163, JUNE 1971

DETAILS THE VARIOUS METHODS OF MONITORING FOR TRITIUM IN ITS VARIOUS FORMS. POINTS OUT THE DIFFICULTIES OF CONTINUOUS MONITORING FOR LOW TRITIUM BLOOD CONCENTRATIONS. THE SAVANNAH RIVER PLANT IS A PRODUCER OF TRITIUM, AND CONSEQUENTLY THE MONITORING OF TRITIUM IN GASES, LIQUIDS, AND OTHER ENVIRONMENTAL MEDIA HAS BEEN OF PRIME IMPORTANCE SINCE STARTUP IN THE 1950S.

[illegible]TER, LIQUID • MONITOR, STACK • [illegible]TER, AIR • [illegible]TER, GAS • [illegible]TER, ENVIRONMENTAL • SAVANNAH RIVER PLANT • RADIATION MONITORS

[illegible]
[illegible] • [illegible]
THE DETERMINATION OF ACCURACY AND PRECISION LIMITS FOR TRITIUM IN WATER
ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, PUBLICATION [illegible]-[illegible], WASHINGTON, D.C.
6 PAGES, RADIOLOGICAL HEALTH DATA AND REPORTS, 12(8), PAGE 485-[illegible], AUGUST 1971

DESCRIBES THE PROCEDURE FOR ESTABLISHING A STANDARD DEVIATION (SD) VALUE FOR ANALYSIS OF TRITIUM IN WATER AND DISCUSSES THE RESULTS OF A TECHNICAL EXPERIMENT TO TEST THE VALIDITY OF THIS VALUE. SINCE MANY STATE, FEDERAL AND LOCAL LABORATORIES ARE ANALYZING THIS RADIONUCLIDE ON A ROUTINE BASIS, A PROCEDURE OF QUALITY CONTROL TO ASSIST IN PRODUCING COMPARABLE AND ACCURATE DATA IS NECESSARY. AS MORE NUCLEAR POWER REACTORS AND NUCLEAR FUEL REPROCESSING PLANTS BECOME OPERATIVE, WITHIN WELL OF ENVIRONMENTAL DATA THE ENVIRONMENT IN OPERATION QUANTITIES. THEREFORE, OTHER ASPECTS ARE PERTINENT FOR TRITIUM ANALYSIS CAPABILITY AND WELL OF REPRESENTING WHEN THIS QUALITY CONTROL PROGRAM TO ASSESS EQUIPMENT AND SAMPLE PREPARATION CAPABILITIES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

WATER • ANALYTICAL TECHNIQUE • RADIATION SAFETY AND CONTROL • CONCENTRATION

[illegible]
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO DEC. 31
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-3901 •, 69 PAGES, 1971

INCLUDES A 600-WORD TOPICAL SUMMARY ON GENETIC EFFECTS OF LOW DOSES. 200-300 WORD SUMMARIES ON PROJECTS IN THE SECTIONS, BIOLOGY (BIOCHEMISTRY AND MOLECULAR BIOLOGY, GENETICS AND POPULATIONS), AND POPULATION RESEARCH (INVESTIGATE CHANGES IN VERTEBRATES, SOMATIC, AND GENETIC HARM IN HUMAN POPULATIONS). 50-150 WORD SUMMARIES IN THE SECTIONS, ENVIRONMENTAL RESEARCH (DOSE-SITE AND EFFLUENT MONITORING, RADIOECOLOGY, PRODUCTIVITY STUDIES BY THE C-14 TECHNIQUE,

[illegible]
[illegible] [illegible]

[illegible]

[illegible]
[illegible]
[illegible] TRITIUM STACK MONITOR WITH A [illegible] DIGITAL OUTPUT
UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-[illegible] • CONF-[illegible] •, 17 PAGES, 1971

[illegible]

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. [illegible]

[illegible]

[illegible]
[illegible]
MONITORING REACTOR EFFLUENTS FOR TRITIUM - PROBLEMS AND POSSIBILITIES
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, ONTARIO
AECL-[illegible] •, 11 PAGES, PRESENTED AT THE TRITIUM SYMPOSIUM, LAS VEGAS, NEVADA, AUGUST 30-SEPTEMBER 2, 1971

FOR MONITORING WATER EFFLUENTS, A PLASTIC SCINTILLATOR IS SENSITIVE TO 1 [illegible] WITH ABOUT [illegible] RESPONSE TIME. [illegible] THE PLASTIC SCINTILLATOR HAS THE ADVANTAGE OF [illegible] DISCRIMINATION TO [illegible] INTERFERENCE FROM [illegible] AND SOMEWHAT HIGHER SENSITIVITY (LESS THAN 1 PCI/CC) AS COMPARED WITH IONIZATION METHODS (THOUGH THE LATTER HAVE THE ADVANTAGE OF SIMPLICITY). [illegible] CONDENSATION, EXCHANGE WITH WATER OR COLLECTION IN LIQUID SCINTILLATOR ENABLE MONITORING OF LESS THAN 0.1 PCI/CC IN AIR, WITH RESPONSE TIMES OF FROM SEVERAL MINUTES TO HOURS. CHOICE OF SYSTEM DEPENDS UPON THE NEEDED SENSITIVITY AND RESPONSE TIME, LIKELY CONTAMINANTS AND RUNNING COSTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. [illegible]

[illegible] • SYSTEM CAPABILITY • [illegible] • SYSTEM ANALYSIS • SENSITIVITY ANALYSIS • COST, OPERATING • [illegible]

[illegible]
PROJECT GASBUGGY - ON-SITE RADIOLOGICAL SAFETY DURING PRODUCTION TESTING, [illegible]
EBERLINE INSTRUMENT CORPORATION, SANTA FE, NEW MEXICO
PNE-1009 • [illegible] •, 44 PAGES, AUGUST 20, 1971

EBERLINE INSTRUMENT CORPORATION PROVIDED ON-SITE RADIOLOGICAL SAFETY SUPPORT SERVICES FOR PROJECT GASBUGGY DURING PRODUCTION TESTING. GAS RELEASED BY FLARING WAS MONITORED BY A SYSTEM THAT MEASURED THE TRITIUM AND KRYPTON (KR-85) CONCENTRATIONS. TRITIATED LIQUID WASTES REMOVED BY BULK LIQUID SEPARATORS WERE ANALYZED FOR TRITIUM AND THEN RELEASED AS VAPOR TO THE GAS FLARE. THE TOTAL AMOUNT OF TRITIUM AND KR-85 RELEASED AS VAPOR OR GAS DURING PRODUCTION TESTING THROUGH DECEMBER 31, 1969, WAS 2632 AND 346 CURIES, RESPECTIVELY. PERSONNEL WORKING ON-SITE DURING PRODUCTION TESTING DID NOT RECEIVE ANY SIGNIFICANT RADIATION EXPOSURE FROM THE TRITIUM OR KR-85.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

[illegible] • [illegible] • INSTRUMENT, SURVEILLANCE • PERSONNEL EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL • ON SITE • GAS • CONCENTRATION • RADIATION MONITORS

[illegible]
[illegible]
FACILITY FOR THE DETERMINATION OF LOW-LEVEL TRITIUM IN BIOLOGICAL AND ENVIRONMENTAL SAMPLES
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-[illegible] •, 10 PAGES, JULY 27, 1971

SAMPLES HAVING LEVELS AS LOW AS 1 TU ARE COUNTED ROUTINELY. WATER SAMPLES ARE DISTILLED AFTER SEDIMENT IS REMOVED. THESE OPERATIONS ARE CONDUCTED UNDER AN INERT ATMOSPHERE TO AVOID CONTAMINATION WITH AMBIENT TRITIUM. VEGETABLE AND ANIMAL MATTER SAMPLES ARE FREEZE DRIED AND THE RESIDUE COMBUSTED TO WATER IN A SPECIAL APPARATUS CAPABLE OF HANDLING SMALL SAMPLES. CONTAMINATION OF THE LOW LEVEL FACILITY IS AVOIDED BY PRIOR SCREENING BY LIQUID SCINTILLATION COUNTING. SAMPLES LESS THAN [illegible] TU ARE CONVERTED TO HYDROGEN GAS BY PASSAGE OVER MAGNESIUM TURNINGS AND ARE COUNTED IN AN INTERNAL GAS PROPORTIONAL COUNTER. IF THERE IS SUFFICIENT SAMPLE, ELECTROLYTIC ENRICHMENT INCREASE THE SENSITIVITY 70 TIMES.

[illegible]
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

[illegible] • [illegible] • WATER, ENVIRONMENT • SURFACE WATER, NUCLIDE OCCURRENCE • ANALYTICAL TECHNIQUE • MONITORING, ENVIRONMENTAL • [illegible] • [illegible] • RADIONUCLIDE UPTAKE • VEGETATION • RADIONUCLIDE TRANSFER • INSTRUMENTS, MISC.

[illegible]
[illegible] • [illegible]
ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS
WOODS HOLE OCEANOGRAPHIC INSTITUTION, MASS.
[illegible] PAGES, FIGURES, TABLES, REFERENCES, CRC CRIT. REV. SOLID STATE SCI., [illegible] SEPTEMBER [illegible]

THE ANALYTICAL CHEMISTRY INVOLVED IN THE DETERMINATION OF THE MAJOR IONS, TRACE ELEMENTS, NUTRIENTS, DISSOLVED GASES, AND RADIONUCLIDES PRESENT IN SEAWATER IS DISCUSSED. PARTICULAR ATTENTION IS PAID TO RECENT DEVELOPMENTS AND TO THE TECHNIQUES THAT ARE ACTUALLY IN USE IN OCEANOGRAPHIC LABORATORIES. SEAWATER SAMPLING AND STORAGE METHODS ARE REVIEWED, AND TABLES OF THE TRACE ELEMENTS AND RADIONUCLIDES THAT HAVE BEEN DETERMINED IN THE OCEAN ARE GIVEN.

[illegible] • CESIUM • ELEMENTS AND ISOTOPES • [illegible] • [illegible] • STRONTIUM • TRITIUM • URANIUM • SURFACE WATER, NUCLIDE OCCURRENCE • ANALYTICAL TECHNIQUE • RADIOCHEMICAL ANALYSIS • CONCENTRATION • INORGANIC

[illegible]
[illegible] • [illegible]
RAPID EVALUATION OF RADIOACTIVE SAMPLES BY GAMMA-RAY SPECTROMETRY
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, DIDCOT, BERKS., UNITED KINGDOM
STI/PUB-290 • CONF-710701 • IAEA-SM-148-[illegible] P., 17 PAGES, 10 FIGURES, 7 REFERENCES, PP. [illegible], DECEMBER 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT NEUHERBERG, GERMANY, JULY 5-9, 1971

GAMMA-RAY SPECTROMETRY PROVIDES A CONVENIENT AND RELATIVELY RAPID MEANS OF PERFORMING [illegible] RADIOCHEMICAL ANALYSES. THE TECHNIQUE IS USED REGULARLY AT HARWELL TO ESTIMATE VARIOUS [illegible] ANY INCIDENT [illegible] THE ESCAPE OF RADIOACTIVITY. SPECTROMETRY MAY ALSO BE USED FOR [illegible] OF RADIOACTIVITY NOT ONLY IN THE NEIGHBOURHOOD OF NUCLEAR ESTABLISHMENTS BUT OF THE ENVIRONMENT IN GENERAL. VARIOUS FORMS OF GAMMA-RAY SPECTROMETRY ARE DESCRIBED BRIEFLY WITH EXAMPLES OF APPLICATIONS TO LOCAL ENVIRONMENTAL MONITORING. SOME NUMERICAL METHODS OF ANALYSIS ARE [illegible] THE APPROPRIATE DATA HANDLING PROBLEMS ARE DISCUSSED.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

FALLOUT • FISSION PRODUCT RELEASE • IAEA • IODINE • MONITORS, EMERGENCY • [illegible] • [illegible] • UNITED KINGDOM • DATA PROCESSING • MONITOR, ENVIRONMENTAL • [illegible] • RADIOCHEMICAL ANALYSIS • RADIOACTIVITY RELEASE • SPECTROMETRY, GAMMA • [illegible] • [illegible] • GAS • RADIATION MONITORS • FILTERS

[illegible]
[illegible] • [illegible]
APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA ASSAY
U. S. ATOMIC ENERGY COMMISSION, NEW YORK, N.Y.
STI/PUB-290 • CONF-710701 • IAEA-SM-148-[illegible] P., 7 PAGES, [illegible] TABLES, 2 FIGURES, 4 REFERENCES, PP. [illegible], DECEMBER 13, 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT NEUHERBERG, GERMANY, JULY 5-9, 1971

TOTAL BETA AND ALPHA MEASUREMENTS HAVE BEEN PERFORMED, SIMULTANEOUSLY, BY LIQUID SCINTILLATION SPECTROMETRY. THE BETA MEASUREMENT CLASSIFIES THE EMITTERS BY ENERGY DISCRIMINATION INTO TWO CATEGORIES - LOW ENERGY (H-3, ETC.) AND FISSION PRODUCTS OR ACTIVATION PRODUCTS OF MEDIUM-TO-HIGH ENERGY. THE ALPHA MEASUREMENT IS PERFORMED BY RATIO TECHNIQUES SINCE THE ALPHA SPECTRUM IS LOCATED IN THE MEDIUM TO HIGH ENERGY BETA SPECTRAL REGION. THEREFORE, ONE MEASUREMENT PROVIDES THE FOLLOWING INFORMATION FOR AN ENVIRONMENTAL SAMPLE - (1) RELATIVE CONTRIBUTION OF TRITIUM AND OTHER LOW ENERGY EMITTERS TO THE TOTAL BETA SPECTRUM; (2) CONTRIBUTION OF FISSION AND ACTIVATION PRODUCTS TO THE TOTAL BETA SPECTRUM; AND (3) TOTAL ALPHA ENERGY [illegible]. A DESCRIPTION OF THE EXPERIMENTAL RESULTS, DATA PROCESSING, APPLICATION TO ENVIRONMENTAL MONITORING AND COMPARISON OF THIS TECHNIQUE TO EXISTING METHODS IS GIVEN.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

IAEA • MONITORING, [illegible] • DATA PROCESSING • ANALYTICAL TECHNIQUE • MONITORING, ENVIRONMENTAL • SPECTROMETRY, ALPHA • SPECTROMETRY, BETA • ENERGY LEVEL • COMPARISON • RADIATION MONITORS

[illegible]
[illegible] JJ • PHELPS PL • ANSPAUGH LR • HOLLADAY G
SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
STI/PUB-290 • CONF-710701 • IAEA-SM-148-[illegible] P., [illegible] PAGES, 19 FIGURES, 7 TABLES, 16 REFERENCES, PP. [illegible], DECEMBER 13, 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT NEUHERBERG, GERMANY, JULY 5-9, 1971

RAPID METHODS OF SAMPLING AND QUANTITATING AIRBORNE TRITIATED WATER, RADIOACTIVE PARTICULATES AND A WIDE RANGE OF ENVIRONMENTAL SAMPLES HAVE BEEN DEVELOPED TO DOCUMENT THE RELEASES OF RADIOACTIVITY ASSOCIATED WITH USES OF NUCLEAR EXPLOSIVES, REACTOR OPERATION AND BASIC

[illegible]

[illegible] STUDIES. [illegible] WERE USED IN [illegible] STUDIES CONDUCTED ON [illegible] FIELD [illegible]. A [illegible] SAMPLER OF [illegible] DESIGNS [illegible] WAS DEVELOPED AND USED IN LABORATORY STUDIES AND FIELD STUDIES. A NEW [illegible] SAMPLER WHICH HAS POTENTIALLY BE [illegible] DESIGN A [illegible] OF [illegible] SAMPLER [illegible] HAS BEEN [illegible]. A SIMPLE AND INEXPENSIVE SYSTEM FOR DETERMINING AND [illegible] OF PARTICULATE PARTICULATES HAS BEEN USED SUCCESSFULLY IN SEVERAL TYPES OF [illegible] STUDIES [illegible] WITH VARIOUS CHEMICAL [illegible], [illegible] OF [illegible] AND CLOSE-IN FALL-OUT DEPOSITION, AND OTHER STUDIES. DETAILS ARE GIVEN FOR THE SAMPLING PROGRAM AND THE ANALYTICAL [illegible].

AVAILABILITY - NATIONAL BUREAU FOR INTERNATIONAL RESEARCHING, INC., 317 EAST 34TH STREET, NEW YORK, N. Y. 10016

[illegible] • [illegible] • [illegible] • [illegible], [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible], [illegible] • [illegible] • [illegible], [illegible] • [illegible], [illegible] • [illegible],

[illegible]

A PRACTICAL, [illegible], TRITIUM FOOD AND SAMPLES FOR SAMPLING. [illegible] SAMPLING OF THE [illegible] FOR TRITIUM [illegible] AND TRITIUM [illegible] IN [illegible]. THE [illegible] TRITIUM [illegible] ENVIRONMENT'S [illegible] TRITIUM [illegible] LEVELS. [illegible] WITH THE [illegible] OF [illegible] FOR [illegible] THE COLLECTION AND [illegible] TRITIUM IS PROPOSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • DESIGN CRITERIA • [illegible] • [illegible] • [illegible], AND SAMPLING • [illegible], [illegible]

[illegible]
[illegible] VI
TRITIUM [illegible]
[illegible] 1976 [illegible] PAGES, FIGURES, REFERENCES, [illegible]

A [illegible] SUMMARIZING PRESENT [illegible] AND PHYSIOLOGICAL [illegible] ON THE [illegible], [illegible] OF [illegible], AND [illegible] ACTION OF TRITIUM [illegible]. THE [illegible] DATA ON THE PHYSICAL [illegible] OF [illegible] AND TRITIUM, THE [illegible] OF [illegible], THE [illegible] OF [illegible] [illegible]. [illegible] FOR [illegible] TRITIUM IN [illegible] WORK. THE [illegible] OF [illegible] [illegible] THE [illegible] AND [illegible] [illegible], [illegible] AND PATHS OF [illegible] OF TRITIUM [illegible] THROUGH THE [illegible] TRACT, [illegible], AND [illegible], AND THE [illegible] OF THE [illegible] OF TRITIUM [illegible] FROM THE [illegible] AND [illegible] [illegible] ARE [illegible].

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[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible], PHYSICS • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] TRACT • [illegible] • [illegible] • [illegible] • [illegible] COMPOUNDS • [illegible] [illegible]

[illegible]
[illegible] LA • [illegible] W
TRITIUM [illegible] OF THE [illegible]
[illegible] SAFETY AND [illegible] [illegible], [illegible], [illegible] AND SECURITY
[illegible] PAGES, [illegible] FIGURES, [illegible] REFERENCES. [illegible] AT THE [illegible] OF THE TRITIUM [illegible]'S [illegible] [illegible] ON [illegible] TO THE PROTECTION OF MAN AND HIS ENVIRONMENT. [illegible], SEPTEMBER 1975

[illegible] METHOD TO [illegible] CONTAMINATION IS [illegible] AND DESIGNED [illegible] [illegible]-OFF [illegible], [illegible] SCINTILLANT. SINCE TRITIUM IN AIR IS LARGELY IN THE FORM OF TRITIATED WATER, TO THIS [illegible] SAMPLING OF COLLECTED AIR A [illegible] PERIOD IS [illegible]. THE [illegible] [illegible] FOR [illegible]-, [illegible]-, AND [illegible] ARE [illegible] WITH THOSE OF OTHERS. [illegible] RANGED FROM 0.4-1.4 [illegible], AND THE [illegible] DUE TO MAN WAS [illegible] 0.1 [illegible]. [illegible] THE AIR [illegible] IN [illegible] [illegible] [illegible] RANGED [illegible] THAN 1 [illegible], THE [illegible] [illegible] FROM THIS [illegible] WAS [illegible] 0.01 [illegible]. [illegible] OF THE [illegible] IS [illegible] [illegible] [illegible] [illegible] TRITIUM.]

AVAILABILITY - OFFICE FOR [illegible] PUBLICATIONS OF THE [illegible] COMMUNITIES, P.O.B. 1003, LUXEMBOURG 1

[illegible] • [illegible], LIQUID • [illegible], [illegible] • [illegible], [illegible] • SAMPLING • [illegible] [illegible], NUCLEAR [illegible] • [illegible] • [illegible] • [illegible] • [illegible], [illegible] • [illegible] • [illegible], NUCLEAR [illegible] • NUCLEAR [illegible] • [illegible], [illegible] • [illegible] NUCLEAR [illegible] • [illegible] • [illegible] • [illegible] [illegible] • [illegible] • [illegible] • [illegible], [illegible]

[illegible]
[illegible] DJ • [illegible] CJ
BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM [illegible], 1969-JAN. 1977
[illegible] LABORATORY, OHIO
[illegible]-1040 P. 44 PAGES. SEPTEMBER 5, 1977

AN ANNOTATED BIBLIOGRAPHY PREPARED TO PROVIDE A SOURCE OF INFORMATION ON RECENT LITERATURE ON SUBJECTS RELATING TO THE CONTROL, MONITORING, AND HANDLING OF TRITIUM. PARTICULAR EMPHASIS HAS PLACED ON LITERATURE THAT RELATES TO THE TRITIUM HANDLING AND CONTROL NEEDS OF THE DIVISION OF MILITARY APPLICATIONS/USAEC. THE PERIOD COVERED BY THIS BIBLIOGRAPHY EXTENDS FROM 1969 TO JANUARY 31, 1977, AND INCLUDES BOTH JOURNAL AND REPORT LITERATURE. REVIEWS AND REPORT [illegible] ARE [illegible] AND A SPECIAL SUBJECT-GROUPING [illegible] PRELUDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

•BIBLIOGRAPHY • TRANSPORTATION AND HANDLING • [illegible] • RADIATION SAFETY AND CONTROL • MILITARY CONSIDERATIONS • [illegible], AEC

[illegible]
[illegible] JR • [illegible] CR • [illegible] CJ
CHARACTERIZATION OF [illegible] FROM NUCLEAR FACILITIES
NEW YORK STATE DEPARTMENT OF HEALTH
PAPER NO. 27 P. PAPER PRESENTED AT THE 10TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1975 ISPP CONF-750609--1

THE [illegible] SCIENCES LABORATORY OF THE NEW YORK STATE DEPARTMENT OF HEALTH IS CONDUCTING A STUDY TO CHARACTERIZE THE GASEOUS RADIOACTIVE EFFLUENTS FROM NUCLEAR FACILITIES. AT THIS TIME,

[illegible]

[illegible]

[illegible]

[illegible]
[illegible] AA • CARTER [illegible]
TRITIUM
[illegible] PAPERS. PUBLISHED BY [illegible] [illegible], PHOENIX, ARIZONA, MAY [illegible]

"TRITIUM" IS BASED ON A SYMPOSIUM HELD FROM AUGUST [illegible] THROUGH SEPTEMBER 2, 1971, IN LAS VEGAS, NEVADA, AND SPONSORED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA, LAS VEGAS. THE SYMPOSIUM ATTENDED TO CHAIR THE PAPERS PRESENT. ALTHOUGH OTHERS [illegible] PLACED ON THE ENVIRONMENTAL ASPECTS OF TRITIUM. THE BOOK IS DIVIDED INTO TEN CHAPTERS COVERING THE HISTORY, PRODUCTION, MANAGEMENT, BIOLOGICAL EFFECTS AND [illegible], ENVIRONMENTAL ASPECTS, APPLICATIONS AND HEALTH PHYSICS OF TRITIUM.

CONTAMINANT • TRITIUM • MANAGEMENT • [illegible] • [illegible], RELATIVE • [illegible] • [illegible], [illegible] • [illegible], [illegible] • [illegible], ENVIRONMENTAL • [illegible] INFORMATION • [illegible] • [illegible] • DATA CHARACTERIZATION • PRODUCTION • [illegible] • BIOLOGICAL EFFECTS • [illegible]

[illegible]
[illegible]
DETECTION AND MEASUREMENT [illegible]
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.
[illegible] PAGES. PP. [illegible] OF "TRITIUM". PUBLISHED BY [illegible] [illegible], PHOENIX, ARIZONA, MAY [illegible]

CHAPTER THREE OF "TRITIUM" DEALS WITH DETECTION AND MEASUREMENT THROUGH DEVELOPMENT OF STANDARDS, ANALYTICAL PROCEDURES, GAS COUNTING, PREPARATION AND ANALYSIS OF LOW-LEVEL SAMPLES, MONITORING DEVICES, MEASUREMENT EFFECTS, LIMITS OF DETERMINATION, CONTINUOUS MONITORING, AND DETECTING OF PULSESONE IN COUNTING, AND NEW PROCEDURES FOR LIQUID SCINTILLATION COUNTING.

EVENTS AND STANDARDS • COUNTING • MEASUREMENT • ANALYTICAL TECHNIQUE • MONITOR • DEVICE • [illegible] • LIQUID • CONCENTRATION • [illegible] • SCINTILLATION

[illegible]
[illegible] CA • CHAPTER 6
[illegible] SURVEY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972
[illegible] SURVEY OF CANADA, LTD., CHALK RIVER
APRIL-1972 P. 32 PAGES. • REPORTS, SEPTEMBER 1972

EFFLUENTS AND REMOTE [illegible], [illegible] [illegible] MONITORING AND [illegible]. A METHOD FOR DETERMINATION OF LOW LEVELS OF STRONTIUM COMPLETE HAS DEVELOPED. STUDIES HAVE INVESTIGATED THE RADIOACTIVE AND STABLE SR IN LAKE SEDIMENT, ON THE TRITIUM DUMP TO A LAKE FOR GROUND WATER, AND OF THE FATE OF TRITIUM DEPOSITED BY SPUT ON THE TRANSPORTATION OF [illegible] WATER FROM PRODUCTION. [illegible] OF PLUTONIUM AND PERMIC DONE BY AEROSTIC PLANTS OCCURRED THROUGH THE [illegible]. [illegible] IN PLANTING SPECIES WITH [illegible] ADVERTENT LEVELS. MONITORING METHODS WERE DEVELOPED FOR T AND I IN AIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM • COBALT • [illegible] • MONITOR, LIQUID • STRONTIUM • TRACER, RADIOACTIVE • SURFACE WATER, NUCLEAR OCCURRENCE • GROUND WATER, NUCLEAR OCCURRENCE • [illegible] • PHOSPHORUS • SODIUM, NUCLEAR OCCURRENCE • CONTROL NUCLEAR PRODUCT • [illegible] DRIVE • [illegible] • WATER POLLUTION • [illegible] PROGRAM, PROCEDURE • LAKE • [illegible] EFFECT • [illegible], AEROSTIC • [illegible] TRANSPORT • SEDIMENT • POLICY • RADIATION MONITORS • INSTRUMENTS, ETC.

[illegible]
[illegible] 7 • [illegible] P
TRITIUM IN THE ENVIRONMENT IN JAPAN
AGRICULTURAL [illegible] RESEARCH STATION, [illegible], JAPAN
7 PAGES. [illegible] TO [illegible]. [illegible], PP. 299-307 [illegible] 1977

THE FOLLOWING METHODS FOR MEASURING TRITIUM ARE DISCUSSED - MEASUREMENTS BY LIQUID SCINTILLATION OF WATER SAMPLES; MEASUREMENT OF GAS SAMPLES BY A GAS PROPORTIONAL COUNTER; AND MEASUREMENT OF GAS SAMPLES BY AN IONIZATION CHAMBER. THE MERITS AND DEMERITS OF THE METHODS ARE DISCUSSED.

[illegible] WATER • MEASUREMENT • [illegible] • SAMPLING • [illegible] WATER, NUCLEAR OCCURRENCE • GAS • [illegible]

[illegible]
[illegible] [illegible] • [illegible] D • [illegible] P, ET AL.
A PORTABLE ULTRASENSITIVE FIELD AIR SAMPLER FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE
[illegible] LABORATORY, [illegible], OHIO
[illegible]-2019 P. 22 PAGES. 10 FIGURES. 7 REFERENCES. APRIL 6, 1973

THE INSTRUMENT DESCRIBED IN THIS INTERIM DEVELOPMENT REPORT IS AN OPERATIONAL, PRACTICAL, PORTABLE, ULTRASENSITIVE, TRITIUM FIELD AIR SAMPLER DESIGNED FOR THE SIMULTANEOUS, DIFFERENTIAL SAMPLING OF THE ENVIRONMENTAL AIR FOR TRITIUM OXIDE AND ELEMENTAL TRITIUM. THE DETECTION SENSITIVITY APPROACHES TRITIUM BACKGROUND LEVELS. THIS SENSITIVITY IS ACHIEVED BY HIGH VOLUME SAMPLING, EFFICIENT REMOVAL OF TRITIUM OXIDE AND ELEMENTAL TRITIUM, AND COUNTING THE PRODUCED PRODUCTS BY LIQUID SCINTILLATION SPECTROMETRY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ATMOSPHERIC POLLUTION • INSTRUMENT, AIR SAMPLING • DATA • [illegible] LABORATORY • MONITORING SYSTEM, RADIATION • *CONCENTRATION • SPECTROMETRY - RADIATION MONITORS

[illegible]
[illegible] OF [illegible] ON
A DETECTOR DEVELOPMENT FOR LOW LEVEL TRITIUM COUNTING
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
[illegible] PAGES, [illegible] TABLES, [illegible] REFERENCES, [illegible] TRANSACTIONS ON NUCLEAR SCIENCE, NS-[illegible], NO. [illegible], [illegible] 1973

DESCRIBES THE DESIGN OF A DETECTOR DEVELOPMENT PROJECT, WITH ASSOCIATED [illegible] LOGIC AND ITS APPLICATION TO THE COUNTING OF LOW-ACTIVITY TRITIUM SAMPLES IN GAS PROPORTIONAL COUNTER SYSTEMS. THE CIRCUITRY, PACKAGED IN A SINGLE-WIDTH NIM, PROVIDES SIGNAL DISCRIMINATION WHICH IS USED IN CONJUNCTION WITH THE [illegible] OF AN ANALOG COUNTER COUPLED TO PERIPHERALLY MOUNTED [illegible] CHARGE PARTICLES [illegible] AND COMMON-MODE REJECTION.

KEYWORDS • [illegible] STUDY • INSTRUMENT, [illegible] • EQUIPMENT DEVELOPMENT • [illegible] MONITORS

[illegible]
[illegible] DIVISION, ENVIRONMENTAL AND ANALYTICAL CHEMISTRY, OCT. 30-31, 1973, PROGRAM AND ABSTRACTS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-[illegible] P., 30 PAGES, 1973

[illegible] ON THE CONCEPTS ANALYSIS OF [illegible] IN HUMANS OR ANIMALS, THE ABSTRACTS CONCERN ANALYSIS OF WATER, SOIL, OR VEGETATION AND VARIOUS ENERGY [illegible]; AND ONE ABSTRACT CONCERNS THE PREPARATION OF ENVIRONMENTAL IMPACT STATEMENTS. THE RATIO OF THE TRITIUM SPECIFIC ACTIVITY IN THE ORGANIC TO OXIDIZED FRACTION IS THAT IN FOOD WHICH WAS 6-10 FOR SOIL AND 1-1.7 FOR PLANTS. [illegible] OF [illegible] FROM [illegible] DISCHARGES WERE LOCATED USING A SCINTILLATION [illegible]. IN ENVIRONMENTAL SAMPLES, [illegible]-CORRECTED AND [illegible]-COOLED [illegible] WERE DISTINGUISHED BY MEANS CONCENTRATION [illegible] OF THE [illegible]. [illegible], FOR [illegible] IN LARGE SOIL SAMPLES [illegible], A TECHNIQUE USING LOW-ENERGY A [illegible] WAS [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] • SAFETY, ENVIRONMENT • [illegible] WATER, NUCLEAR [illegible] • ANALYTICAL TECHNIQUES • [illegible], ENVIRONMENTAL • SOIL, NUCLEAR [illegible] • [illegible] WATER, DISPOSAL [illegible] • BIOCHEMICAL ANALYSIS • [illegible], CARBON • BIOCHEMICAL • COMMUNITY, [illegible] • [illegible], [illegible] • [illegible] • [illegible] MONITORS

[illegible]
[illegible] ON A MEANS FOR TRITIATED WATER [illegible] IN THE [illegible] OF [illegible] CASES
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-[illegible] P., 10 PAGES, 2 TABLES, 8 FIGURES, [illegible] 1973

FISSION-PRODUCT WASTE GASES AND [illegible] TRITIATED WATER [illegible] FROM REACTOR SYSTEMS. [illegible] THE CONCENTRATIONS OF GASES ARE [illegible] THAN THE [illegible] THAT OF THE TRITIATED WATER VAPOR, GAS-[illegible] MONITORS (E.G., [illegible] CHAMBERS) ARE INSENSITIVE. THE PRINCIPLES OF A MEANS FOR [illegible] IN THESE CONDITIONS [illegible] OPERATE. AN [illegible] PROCEDURE IS [illegible] WITH PLASTIC OR LIQUID SCINTILLATOR AS [illegible] AND TRITIATED WATER IN A SINGLE SAMPLE TYPE LIQUID SCINTILLATION COUNTER. WASTE GASES ARE [illegible], RELATIVE TO AND [illegible], IN THE WATER.

AVAILABILITY - SCIENTIFIC DOCUMENT DISTRIBUTION OFFICE, ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO, CANADA

FISSION PRODUCT [illegible] • [illegible] GAS • [illegible] RIVER • [illegible] • [illegible]

[illegible]
[illegible] ON
ENVIRONMENTAL MONITORING TECHNIQUES
PUBLIC RIVER NUCLEAR LABORATORIES, ONTARIO, CANADA
[illegible] P., [illegible] OF [illegible], PUBLISHED IN [illegible] CHEMICAL, [illegible], ARIZONA, MAY [illegible] 1973

DISCUSSES [illegible] AS MONITORING [illegible] FOLLOWING, ANALYTICAL TECHNIQUES, MONITORING [illegible] AQUATIC ENVIRONMENT AND SUBSURFACE ANALYSIS OF TRITIUM IN WATER, A [illegible] AND [illegible] AND GAS COUNTING, STACK MONITORING, AND A MONITOR FOR NATURAL GAS FROM NUCLEAR STIMULATION.

MONITORING, STACK • [illegible] • WATER • MONITORING, GAS • [illegible] • [illegible] • ANALYTICAL TECHNIQUE • [illegible], ENVIRONMENTAL • MONITORING, [illegible] • GAS • STIMULATION • [illegible]

[illegible]
[illegible] I • [illegible] B • [illegible] ON
[illegible] FOR TRITIUM CONCENTRATION AT NATURAL [illegible]
[illegible] INSTITUTE, [illegible]
7 PAGES, [illegible], [illegible], PP. [illegible] DECEMBER 1973

[illegible]

The [illegible] and distribution [illegible] of [illegible] samples are discussed. Activity measurements by means of scintillation spectrometry are [illegible].

[illegible] • [illegible] • Sampling • [illegible] • [illegible] • Spectrometry

[illegible]

[illegible]
[illegible] • [illegible] • [illegible]
Tritium measurements with a new liquid scintillation counter
University of Georgia, Athens
[illegible] pages, [illegible] tables, [illegible] figures, [illegible] references, Nuclear Instruments and Methods, [illegible], pp. 177-187 [illegible] 19, 1970

A new concept in liquid scintillation counting has been developed in anticipation of instrument for the purpose of quantitatively measuring low specific activity tritium samples. The instrument system differs from previous commercial [illegible] operations in that it utilizes electronic [illegible] post-pulse type thresholds rather than [illegible] pulse height analysis. Direct counting of aqueous [illegible] can be accomplished to sensitivity levels below 10 T.U. Tritiated [illegible] samples of 20 ml volume have been counted at 51% counting efficiency with background count rates corresponding less than 1.19 cpm.

Counter • Measurement • Tritium oxide • Instrument, pulse • Instrument, optical • Laboratory

[illegible]
[illegible] • [illegible] • [illegible]
The stack monitor system of the [illegible] chemical processing plant
Allied Chemical, Nuclear Fuelcycle Services
[illegible] p., 30 pages, 7 tables, 6 figures, 0 references, September 1977

The [illegible] monitoring system used to measure airborne particulate emissions from the [illegible] chemical processing plant is described in detail. The efficiency of the system was [illegible] evaluated through studies of particle [illegible] as a function of size, particulate [illegible], particle size distribution, type of filter paper, flow rates, and the [illegible] of the gaseous [illegible]. Several deficiencies of the system have been identified and [illegible] are important to [illegible] and [illegible] collection [illegible] and [illegible].

Availability - National Technical Information Service, U. S. Department of Commerce, Springfield, Va. 22161

Radioactive • Aerosol • Monitor, stack • Waste • Particle size • Outdoor • Chemical, air • Nuclear fuelcycle • Particle size distribution • Radiochemical processing • Monitoring system, radioactive • Monitoring program, environmental • Jacobs

[illegible]
[illegible] C • [illegible] • [illegible]
A [illegible]-[illegible], [illegible] scintillation system for low-level tritium detection
Lawrence Livermore Laboratory, California
[illegible] pages, 9 tables, 13 figures, 16 references, Nuclear Instruments & Methods, [illegible], pp. 273-280 [illegible] 1970

An on-line detector and electronic system for low-level tritium detection have been built and tested. Tritium decay and detected with a [illegible] [illegible] scintillation [illegible] conditions. An integrator, fully transistorized circuit, analyzing pulse analyzer, was designed and built for detecting low-level signals in the presence of the noise and cosmic ray [illegible]. The analyzing pulse shape analyzer performs signal post-amplification and -shaping, pulse shape discrimination, and single channel [illegible] analysis. The system is readily suited for computer monitoring and controlling of tritium-contaminated gas streams. A detailed description is presented.

Design study • Instrument, [illegible] • Instrument, surveillance • Purpose • Commercial description

[illegible]
[illegible] B • [illegible] • [illegible]
Continuous monitors for tritium in sodium coolant and cover gas of an [illegible]
Argonne National Laboratory, Illinois
ANL-[illegible] p., 30 pages, 9 tables, 16 figures, 12 references, March 1976

Continuous monitors for tritium in the sodium coolant and the cover gas of a fast breeder reactor have been developed. The sensor for the monitors consists of a thin nickel membrane which permits the diffusion of tritium into an argon swept gas containing 1 ppm H_2 as [illegible]. The tritium content of the swept gas leaving the sensor is determined by [illegible] counting in an [illegible] chamber. The monitors for sodium are sensitive to 0.04 uCi of tritium/g of sodium [illegible] = 2.06 x 10^[illegible] atoms of tritium; for the cover gas monitors, the sensitivity level is 0.6 x 10^[illegible] atoms of tritium/cm^3 of gas. For comparison, the typical tritium content of the primary sodium in FFTF is 40 uCi/g, and in the primary cover gas it is 3 x 10^[illegible] atoms/cm^3.

Availability - Limitations on distribution; some requests to [illegible] Technical Information Center, P.O. Box 62, Oak Ridge, Tenn. 37830

000070 MONITORING
HYDROGEN • TRITIUM • MONITOR. GAS • REACTOR COOLANT • CRUDE GAS • COOLANT CONTROL • MONITOR • REACTOR, LIQUID

000500
CAMPBELL DG • BOEHNKE J
METHOD FOR DETERMINING REACTOR COOLANT SYSTEM LEAKAGE
U.S. PATENT 3,717,040 .. 6 PAGES. JANUARY 23, 1973

INDIRECT AND DIRECT METHODS ARE DESCRIBED FOR DETERMINING LEAKAGE FROM A REACTOR COOLANT SYSTEM INSIDE THE REACTOR CONTAINMENT. THE INDIRECT METHOD RELIES ON THE COMPARISON OF QUANTITATIVE MEASUREMENTS OF A TRACER, SUCH AS TRITIUM, IN THE REACTOR COOLANT TO THE TRACER IN THE CONDENSATE COLLECTED BY THE CONTAINMENT COOLING COILS TO DETERMINE WHAT PART OF THE TOTAL COLLECTION, CORRESPONDING TO LEAKAGE, IS DERIVED FROM THE REACTOR COOLANT SYSTEM. THE DIRECT METHOD RELIES ON MEASUREMENTS OF RADIOACTIVITY PRODUCED BY SHORT HALF-LIVED NOBLE GAS ISOTOPES.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

MEASUREMENT • REACTOR COOLANT • TRACER. GAS • TRACER • UNITED STATES • PATENT • REACTOR COOLING SYSTEM • LEAKAGE
DATE

000637
RADEISKOVSKY P • MACELWEE S • DOW-DEBROW DJ
THERMAL GAS CONDUCTIVITY METHOD FOR ADEQUATE MEASUREMENTS OF THE SPECIFIC RADIOACTIVITY OF TRITIATED WATER
ARGONNE NATIONAL INSTITUTE, ARGONNE, TENNESSEE
9 PAGES. 9 FIGURES. 9 REFERENCES. NUCLEAR INSTRUMENTS & METHODS. 112(1-2). PP. 69-72 SEPTEMBER-OCTOBER 1973

THIS PAPER DESCRIBES THE RESULTS OF ADEQUATE DETERMINATION OF THE SPECIFIC RADIOACTIVITY OF TRITIATED WATER, ON THE BASIS OF THE MEASURED DISTINTEGRATION RATE OF TRITIUM BY THE THERMAL GAS CONDUCTIVE METHOD. THE SPECIFIC RADIOACTIVITY OF WATER IS FOUND IN TWO WAYS, DEPENDING ON THE MEANS OF DETERMINING THE MASS OF THE RADIOACTIVE HYDROGEN WHICH GIVE THE SAME RESULT WITHIN THE LIMITS OF 0.5%. THE TOTAL ERROR IN THE DETERMINATION OF SPECIFIC RADIOACTIVITY IS PLUS OR MINUS 1%.

HYDROGEN • GAS • RADIOACTIVE MONITORS

000614
SHEPHERD WF • CURTIS RW
NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION
MONSANTO LABORATORY, MIAMISBURG, OHIO
6 PAGES. 3 FIGURES. IEEE TRANS. ON NUCLEAR SCIENCE. NS-21(1). PP. 922-929 FEBRUARY 1974

A METHOD FOR DETERMINING LEAK RATES FOR THE ORDER OF 1 X 10E-1TO CM3/1/SEC AND HIGHER FROM CONTAINERS OF TRITIUM WASTE IS DESCRIBED. EACH CONTAINER IS SEALED IN A DISPOSABLE CAN. AFTER SEVERAL DAYS, THE ACCUMULATED TRITIUM IS FLUSHED FROM THE CAN WITH COMPRESSED AIR THROUGH AN ETHYLENE-GLYCOL BUBBLER WHERE THE HTO, BUT NOT THE HT, IS TRAPPED. THE OUTPUT OF THE BUBBLER IS CHANNELED THROUGH A HEATED PALLADIUM CATALYST WHERE THE HT IS OXIDIZED. THE OXIDIZED HT IS COLLECTED IN A SECOND ETHYLENE-GLYCOL BUBBLER. THE TRITIUM COLLECTED IN BOTH BUBBLERS IS MEASURED BY LIQUID SCINTILLATION COUNTING.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

MEASUREMENT • LEAK RATE

000612
OKTAVEC MC
A SAMPLING SYSTEM FOR ATMOSPHERIC HT AND HTO
UNIVERSITY OF UTAH, SLC UTAH
3 PAGES. 3 FIGURES. IEEE TRANS. ON NUCLEAR SCIENCE, NS-21(1), PP. 510-512 FEBRUARY 1974

A SYSTEM IS BRIEFLY DESCRIBED, WHICH IS DESIGNED FOR THE SAMPLING OF TRITIUM GAS (HT AND T SUB 2) AND TRITIATED WATER VAPOR (HTO) IN THE AIR AT LEVELS FOR WHICH HPC AND DOSE TO PERSONS-DAY ATMOSPHERIC BACKGROUND LEVELS. THE TRITIUM GAS IS EXTRACTED FROM THE AIR BY CATALYTIC COMBUSTION ON PD AT AMBIENT TEMPERATURE. THE RESULTANT WATER IS ADSORBED ON MOLECULAR SIEVE CONTAINING THE PD. THE SYSTEM IS BEST SUITED FOR FIELD WORK. PRESENT-DAY WORLD-WIDE HT LEVELS ARE ABOUT 2.4 PCI/MG AIR, AND THE HTO LEVELS ABOUT THE SAME IN THE TROPOSPHERE.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

DISTRIBUTION, AIR SAMPLING • MONITOR, SAMPLING

000660
STREAM DA • KABUSHI MC
A SENSITIVE DETECTOR SYSTEM FOR THE CONTINUOUS MONITORING OF TRITIUM IN THE AIR.
BROOKHAVEN ATOMIC RESEARCH CENTER, UPTON, NEW YORK
6 PAGES. 8 FIGURES. IEEE TRANS. ON NUCLEAR SCIENCE, NS-21(1), PP. 100-105 FEBRUARY 1974

[illegible] ACCEPTANCE

A NEW DESIGN OF A FLOW CELL TYPE OF SCINTILLATION DETECTOR SYSTEM SUITABLE FOR CONTINUOUS MONITORING OF TRITIUM IN THE AMBIENT AIR HAS BEEN DEVELOPED. THE DETECTOR RECORDS 7000 COUNTS PER SECOND WITH A SINGLE PHOTOMULTIPLIER TUBE FOR 1 MRC LEVEL OF TRITIUM ACTIVITY RELEASE AT 30 COUNTS PER SECOND BACKGROUND AND 2.5% COUNTING EFFICIENCY. POSSIBILITY OF DESIGNING DETECTORS WITH AN EFFICIENCY, COMPARABLE TO THAT OF LIQUID SCINTILLATORS, HAS BEEN DISCUSSED. THE PERFORMANCE OF THE DETECTOR HAS BEEN STUDIED IN DETAIL AND A COMPLETE TRITIUM MONITORING SETUP HAS BEEN DESCRIBED.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

COUNTER • ENVIRONMENT, COMPONENT • MONITOR • MONITORING SYSTEM, RADIATION • SCINTILLATION

[illegible]
[illegible] TO • LANDRIGAN PH
TRITIUM CONTROL TECHNOLOGY
MOUND LABORATORY, MIAMISBURG, OHIO
MLM-1890 •. 590 PAGES, FIGURES, DECEMBER 1971

THE PURPOSE OF THIS REPORT IS TO ASSEMBLE IN AN UNCLASSIFIED COMPREHENSIVE REFERENCE DOCUMENT THE CONTRACTOR AND PRIVATE INDUSTRY OPERATING EXPERIENCE WITH TRITIUM CONTAINMENT AND HANDLING, MONITORING, TRAPPING AND RECOVERY, AND STORAGE AND DISPOSAL SYSTEMS. THIS REPORT EMPHASIZES THE CAPABILITIES AND LIMITATIONS OF EXISTING TECHNOLOGY AND OPERATING TRITIUM CONTROL SYSTEMS AND DOES NOT DISCUSS CURRENT OR PROPOSED RESEARCH AND DEVELOPMENT PROGRAMS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

WASTE HANDLING • WASTE STORAGE • WASTE DISPOSAL, GAS • MONITORING SYSTEM, RADIATION • OPERATING PROCEDURE • [illegible]

[illegible]
SHEPHERD WE • CURTIS RL
NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION
MOUND LAB., MIAMISBURG, OHIO
MLM-2007(OP) • CONF-721112-0 •. 10 PAGES, PRESENTED AT THE NUCLEAR SCIENCE SYMPOSIUM, HELD IN SAN FRANCISCO, CALIFORNIA, NOV. 10, 1972

A METHOD FOR DETERMINING LEAK RATES FOR THE ORDER OF 1 X 10(-8) CUBIC CM/SEC AND HIGHER FROM CONTAINERS OF TRITIUM WASTE IS DESCRIBED. EACH CONTAINER IS SEALED IN A DISPOSABLE CAN. AFTER SEVERAL DAYS, THE ACCUMULATED TRITIUM IS PLUCKED FROM THE CAN WITH COMPRESSED AIR THROUGH AN ETHYLENE-GLYCOL BUBBLER UNDER THE HOOD, BUT NOT THE HT, IS TRAPPED. THE REMAINDER OF THE BUBBLER IS CHANNELED THROUGH A HEATED PALLADIUM CATALYST WHERE THE HT IS OXIDIZED. THE REMAINING HT IS COLLECTED IN A SECOND ETHYLENE-GLYCOL BUBBLER. THE TRITIUM COLLECTED IN BOTH BUBBLERS IS MEASURED BY LIQUID SCINTILLATION COUNTING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COUNTER • MEASUREMENT • WASTE HANDLING • MONITOR • LEAK RATE • SCINTILLATION

[illegible]
[illegible] GW • HUNT J
CONSTRUCTION OF A SIMPLE TRITIUM MONITOR AND A TRITIUM ANNULE LEAK TESTER USING VB-J-15/15A TYPE B-GAM GAMMA-RAY DOSIMETERS
9 PAGES, 3 FIGURES, NEWNEWPORT, 1971, PP. 50-61 (PROCEEDINGS TOPO)

A SIMPLE TRITIUM MONITOR AND A DEVICE FOR TESTING LEAK RATES OF GLASS AMPULES HAVE BEEN CONSTRUCTED FOR MEASURING RADIATION PROTECTION IN AREAS WITH GASEOUS TRITIUM, IN PARTICULAR IN MANIPULATING TRITIUM-FILLED GLASS AMPULES. AN OPEN-END IONIZATION CHAMBER FOR THE MONITOR AND A HEMISPHERICALLY SEALABLE IONIZATION CHAMBER FOR THE LEAK TESTER HAVE BEEN USED AS THE DETECTORS. MEASUREMENTS OF THE IONIZATION CURRENT ARE MADE BY MEANS OF A SIMPLE MODIFIED B-GAM GAMMA-RAY DOSIMETER VB-J-15/15A. THE MINIMUM DETECTABLE ACTIVITY CONCENTRATION RELATIVE TO FOND-FIELD BACKGROUND IS 10(-8) CI/L., AND THE MINIMUM DETECTABLE LEAKAGE RATE IS 10(-8) CI/MO. AT A PERIOD OF 24 HR. FOR ONE TEST.

[illegible], JOH • INSTRUMENT, NUCLEAR • TESTING • MONITOR • LEAK RATE • [illegible] DEVELOPMENT • RADIATION MONITORS

A [illegible] OF [illegible] IS USED TO [illegible] THE [illegible] [illegible] [illegible] [illegible] [illegible] EACH [illegible]. THE [illegible] INDEX IS AN [illegible] LISTING OF THE [illegible] [illegible] [illegible] [illegible] [illegible] EACH [illegible] [illegible] [illegible] [illegible].

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THE THICKNESS OF THE LAMINAR SUBLAYER.

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DISTRIBUTION IN GROUNDWATER OF RADIONUCLIDES FROM UNDERGROUND NUCLEAR EXPLOSIONS
U. S. GEOLOGICAL SURVEY, DENVER, COLORADO
11 PAGES, 2 TABLES, 1 FIGURE, 22 REFERENCES- TYP-[illegible]. PROCEEDINGS OF THE THIRD PLOWSHARE SYMPOSIUM,
ENGINEERING WITH NUCLEAR EXPLOSIVES, APRIL 27, 28, 29, 1966, PAGES 127-[illegible]- CFSTI

RADIONUCLIDES RELEASED FROM UNDERGROUND NUCLEAR EXPLOSIONS IN THE PLOWSHARE PROGRAM WILL BE
INITIALLY DISTRIBUTED IN THE REGION BY DIRECT FUNCTIONS OF [illegible]- [illegible] AND DIFFUSIVITY
SIGNIFICANT CONTAMINATIONS MAY LATER ENTER INTO AND MOVE WITH GROUNDWATER FLOW. WHERE ADEQUATE
PRECAUTIONS HAVE BEEN TAKEN, NO SIGNIFICANT POST-EXPLOSION MOVEMENT OF RADIONUCLIDES FAR AS WET
OR DEMONSTRATED- HOWEVER, RADIOACTIVE WASTE DISPOSAL EXPERIMENTS CLEARLY INDICATE THAT
RADIONUCLIDES CAN BE TRANSPORTED CONSIDERABLE DISTANCES BY GROUNDWATER FLOW. PROTECTION OF THE
PATENT OF RADIONUCLIDE CONTAMINATION BY GROUNDWATER IS PROVIDED BY PHYSIOGRAPHICAL SETTINGS- EACH
PROPOSED SITE IN A PLOWSHARE NUCLEAR EXPLOSIVE APPLICATION MUST BE EVALUATED, TO DETERMINE IF
GEOLOGIC AND HYDROLOGIC CONDITIONS ARE PRESENT WHICH WILL DEFINITELY DELAYED AND PROLONGED
MIGRATION OF RADIONUCLIDES.

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • SOIL, RADIONUCLIDE [illegible] THROUGH • [illegible] •
[illegible] • [illegible] WATER, [illegible] • [illegible] • [illegible] • [illegible], NUCLEAR [illegible] •
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CLEMENT, A • LIEBERMAN JA
THE POSSIBILITY OF GROUND WATER CONTAMINATION BY FALLOUT
U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C., • U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
11 PAGES- [illegible], 1967, VOL 2, PAGES [illegible] OF PROCEEDINGS OF A CONFERENCE ON RADIOACTIVE FALLOUT
FROM NUCLEAR WEAPONS TESTS, HELD IN GERMANTOWN, MARYLAND, NOVEMBER 15-17, 1967- CFSTI, 0.75

IN CONSIDERING WATER-SUPPLY SOURCES THAT COULD ARISE FROM CONTAMINATION BY STRONTIUM AND RESPONSES
BY OTHER REPORTS IN THE EVENT OF A NUCLEAR ATTACK, THE IDEA HAS BEEN GENERALLY ACCEPTED THAT WATER
SUPPLIES OBTAINED FROM GROUND-WATER SOURCES CAN BE EXPECTED TO BE FREE OF CONTAMINATION. AS WITH
MOST GENERALIZATIONS, THERE ARE POSSIBLE EXCEPTIONS. IT IS THE PURPOSE OF THESE REPORTS TO
DESCRIBE BRIEFLY THE KINDS OF GROUNDWATER TRACERS THAT BY DRAWING ON TRITIO GEOLOGIC STRUCTURE
AND HYDROLOGIC CHARACTERISTICS SUPPORT THE HIGHEST DEGREES OF SAFETY FROM FALLOUT CONTAMINATION,
AND WISH TO INDICATE THE TYPE OF GROUND-WATER OBSERVATIONS THAT ARE SUSCEPTIBLE TO CONTAMINATION AS
A RESULT OF MASSIVE DEPOSITION OF BOMB REPORTS.

[illegible] • [illegible] • SOIL, RADIONUCLIDE [illegible] THROUGH • [illegible] WATER, NUCLEAR [illegible] • [illegible]
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SEEPAGE [illegible] CONTAMINANTS FROM RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS
[illegible] NATIONAL LABORATORY • U. S. [illegible] [illegible], [illegible]
7 PAGES, 10 REFERENCES- [illegible] CONFERENCE [illegible]- [illegible] [illegible] [illegible]

[illegible] (CONTINUED)

THE SECOND DOE CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, SPONSORED BY THE DOE DIVISION OF BIOLOGY AND MEDICINE, WAS HELD AT DOE HEADQUARTERS, GERMANTOWN, MD., NOVEMBER 5-6, 1964. THE CONFERENCE ADDRESS INCLUDED DISCUSSIONS OF THE PHYSICAL, CHEMICAL, AND RADIOLOGICAL CHARACTERISTICS OF ATMOSPHERIC RADIOACTIVITY AND FALLOUT- PARTICLE GENERATION- ATMOSPHERIC TRANSPORT- AND DISTRIBUTION AND CYCLING OF RADIONUCLIDES.

CARBON • ATMOSPHERIC CIRCULATION, GLOBAL • ATMOSPHERIC DIFFUSION, GLOBAL • FALLOUT • PARTICLE SIZE • [illegible] • SAMPLING, HIGH ALTITUDE • STRATOSPHERE • STRONTIUM • TRACER, RADIOACTIVE • TROPOSPHERE, AIR SAMPLING • SAMPLING • NUCLEAR DETONATION • WARFARE • FIRE

[illegible]
NEVADA DOE • TRANSFER OF
[illegible] OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963

U. S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY, TRUCKEE, CALIF.
[illegible]-27040 P., 270 PAGES, FIGURES, TABLES, REFERENCES- MAY 1964- CFSTI, $4.00 CY

U. S. GEOLOGICAL SURVEY INVESTIGATIONS FOR 1963 OF THE WATS AND DISCUSSION AND INCLUDE REGIONAL GEOMORPHOLOGY OF WATS AND ADJACENT AREAS, SPECIAL STUDIES RELATED TO WASTE DISPOSAL, HYDROLOGY OF WASTE DISPOSAL, COLLECTION OF BASIC RECORDS AND THE FUTURE SCOPE OF THE PROGRAM.

CESIUM • GEOLOGY • GROUND WATER • WATS • SITING • STRONTIUM • WASTE DISPOSAL • GROUND WATER, NUCLIDE OCCURRENCE • GROUND WATER, PROPERTY • SOIL, NUCLIDE OCCURRENCE • HYDROLOGY • GEOLOGY, STRATIGRAPHICAL • GEOLOGY, GEOPHYSICAL

[illegible]
POST-SHOT HYDROLOGIC SAFETY, PROJECT SHORE, FINAL REPORT
HAZLETON-NUCLEAR SCIENCE CORPORATION, PALO ALTO, CALIFORNIA
[illegible]-1014 P., 40 PAGES, 5 FIGURES, 2 TABLES, 16 REFERENCES- FEBRUARY 11, 1964- CFSTI, $3.00

AN INVESTIGATION OF GROUND-WATER CONTAMINATION RESULTING FROM THE SHORE SHOT WHICH RECURRED IN THE SATURATED GRANITE OF THE SAND SPRINGS RANGE, NEVADA, SHOWED THAT THE TRANSPORT OF RADIONUCLIDES BY GROUND WATER WELL OF QUITE SLOW AND RADIOACTIVE DECAY AND ADSORB FACTORS WELL LOWER CONCENTRATION OF NUCLIDES TO NON-HAZARDOUS LEVELS BEFORE THE WATER TRAVELS MORE THAN 1000 METERS FROM THE DETONATION POINT.

CESIUM • GEOLOGY • STRONTIUM • ACTIVATION PRODUCT • GROUND WATER, NUCLIDE OCCURRENCE • NUCLEAR DETONATION • HYDROLOGY • HYDROLOGY, RATE OF MOVEMENT

[illegible]
LYNCH FJ • DAVIS SN • PERTLE GL
TRANSPORT OF RADIONUCLIDES BY GROUND WATER- SOME THEORETICAL ASPECTS
HAZLETON-NUCLEAR SCIENCE CORPORATION, PALO ALTO, CALIFORNIA • BRADBURY (GORDON F.) AND ASSOCIATES, LOS ALTOS, CALIF.
NVO-1229-01 P., 46 PAGES- NOVEMBER 19, 1964- CFSTI, $3.00 CY, $0.75 MF

RADIONUCLIDES MAY BE TRANSPORTED BY FLOWING GROUNDWATER FROM THE SITE OF A NUCLEAR DETONATION TO POINTS OF POTENTIAL WATER USE. IN AID IN FORMULATING THE HAZARD FROM THIS CONDITION, AN ANALYSIS OF WATER TRANSPORT AND CONTAMINANT MOVEMENT IS HERE REPORTED. EQUATIONS ARE DERIVED FOR PREDICTING TRANSPORT TIME AND DISPERSION IN UNIFORM SYSTEMS. THE EQUATIONS INDICATE THAT DISPERSION SHOULD HAVE A NEGLIGIBLE EFFECT ON TRANSPORT TIME. EXPERT FOR FLOW THROUGH A SINGLE SET OF PARALLEL FRACTURES. THIS IS AT VARIANCE WITH RESEARCH RESULTS ON DISPERSION IN GROUND ON TRACKS, AND SUGGESTS THAT GEOLOGIC INHOMOGENEITIES MAY PLAY AN IMPORTANT ROLE. METHODS FOR DETERMINING ANISOTROPY OF AQUIFER BEDS AND FOR MEASURING THE DISTRIBUTION FACTOR TO PLACE HERE TO BE DEVELOPED.

ADSORPTION • GEOLOGY • FISSION PRODUCT TRANSPORT • GROUND WATER, NUCLIDE OCCURRENCE • GROUND WATER, PROPERTY • GROUND WATER, TRACER • NUCLEAR DETONATION • HYDROLOGY • DISPERSION • HYDROLOGY, RATE OF MOVEMENT

[illegible]
HASKELL EE • LEVENTHAL JS • BEACHEY WC
THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD INDICATING WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA
U. S. DEPARTMENT OF AGRICULTURE, FRESNO • UNIVERSITY OF CALIFORNIA, LOS ANGELES
11 PAGES, 5 FIGURES, 3 TABLES, 21 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH VOLUME PAGES 3849-49 AUGUST 19, 1964

THE TRITIUM CONTENT OF WATER FROM INDICATING WELLS ALONG TWO EAST-WEST TRANSECT LINES WAS USED IN ESTIMATING GROUNDWATER VELOCITIES IN THE SAN JOAQUIN VALLEY. TRITIUM PEAKS DUE TO NUCLEAR WEAPONS TESTS WERE IDENTIFIED WITHIN THE GROUNDWATER BODY. THE ESTIMATED VELOCITIES WERE COMPARABLE WITH VELOCITIES EXPECTED IN THE COARSE PARTS OF THE AQUIFERS. THE RATIO OF TRITIUM IN THE WELL WATER TO THAT IN THE RAIN WAS INCONSISTENT WITH PRECIPITATION RECHARGE, INDICATING THAT RECHARGE WAS INFILTRATION AND THAT WATER FLOWED TO THE SAMPLED WELLS THROUGH THE COARSE AQUIFERS.

RAINFALL • GROUND WATER, TRACER • NUCLEAR DETONATION • HYDROLOGY, RATE OF MOVEMENT • GEOLOGY, STRATIGRAPHICAL

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[illegible] RELATE TO DISTRIBUTION OF THE POSE IN NEW YIRSUP.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

[illegible] QUESTION * ECOLOGY * [illegible], PUB * [illegible] FRANCHISE * [illegible] CLIMATE 1 [illegible] * [illegible] CLIMATE 2
(PUB)

[illegible]
[illegible] JJ
RESIDUAL TRITIUM AT SPEAR CRATER
LAWRENCE RADIATION LABORATORY
CONF-670509 --, 13 PAGES, 19 FIGURES, REFERENCES, PG [illegible], MAY 19, 1967

RESIDUAL TRITIUM FROM THE SPEAR THERMONUCLEAR EXPLOSION, 6 JULY 196., WAS SEARCHED BY THE [illegible] BY THE 5-6 MILLION YEARS OF EARTH MATERIALS MADE BY THE EXPLOSION. AS A RESULT, THE SPEAR POST-SHOT ENVIRONMENT CONTAINED A MORE SIGNIFICANT RADIOGENIC TRACER IN THE SPEAR CRATER. RESIDUAL TRITIUM STUDY IS FOCUSED ON SPECIFIC/SPE CONTAMINATIONS IN THE INTERSTITIAL WATER OF THE SPEAR THERMONUCLEAR SITE, AND IN THE LARGE TRITIUM WATER OF DEEPEST WATER WHICH RE-INVADED THE NEW SUBSTRATUM OF POSITION ON THE LAWRENCE ORIGINAL ON THE CRATER. TRITIUM IS CONTAINED IN LARGE TRITIUM WATER OF VARIOUS TRITIUM-BEARING MINERALS. MEASUREMENTS, AS SO MANY TRITIUM CONTAMINATIONS IN THREE GROUP WATER ACTUALLY 1 AND 3 DEPENDING. 3 DEPENDING.

AVAILABILITY - [illegible] FOR OFFICIAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22161 $3.00
COPY, $0.65 MICROFICHE

ECOLOGY * FALLOUT * [illegible] * NATURAL, ARTIFICIAL * CONTAMINATION FACTOR

[illegible]
[illegible]
LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL, ENGLAND
CONF-[illegible] --, 8 PAGES, PP. 19-27 IN [illegible] INSTRUMENTATION, [illegible], INSTITUTE OF ELECTRICAL ENGINEERS,
1969, [illegible] CONFERENCE ON NUCLEAR INSTRUMENTATION, [illegible], ENGLAND

TRITIUM MEASUREMENTS CAN HAVE A SIGNIFICANT CONTRIBUTION TO MANY STANDARD GEOLOGICAL INVESTIGATIONS ON CONTAMINATED DRINKING, [illegible] AND [illegible]. A LABORATORY HAS BEEN SET UP AT U.K.A.E. FOR TRITIUM MEASUREMENTS IN SAMPLES OF NATURAL WATER. THE PRINCIPLES AND TECHNIQUES EMPLOYED WERE AT U.K.A.E. FOR THESE MEASUREMENTS ARE DESCRIBED.

AVAILABILITY - U.K. [illegible], UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL, ENGLAND

GEOLOGY * [illegible] WATER * MEASUREMENT * [illegible] TECHNIQUE * [illegible]

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[illegible]
TRITIUM GEOCHEMISTRY AS AN INTERNATIONAL RESEARCH PROJECT
UNIVERSITY OF CALIFORNIA, SAN DIEGO, LA JOLLA
8 PAGES, SCIENCE, VOL. 163, PAGES 1669-70 (APRIL 20, 1969)

THE PRESENCE OF ARTIFICIAL TRITIUM ON THE SURFACE OF THE EARTH PROVIDES AN OPPORTUNITY FOR THE STUDY OF A NUMBER OF PROBLEMS IN ENVIRONMENTAL SCIENCES. THE ENVIRONMENTAL TRITIUM CAN BE USED AS A TRACER FOR WATER VAPOR IN THE ATMOSPHERE, [illegible], [illegible], AND [illegible] ON LAND, AND FOR THE VARIOUS WATER MASSES OF THE OCEANS. THE [illegible] FOR A WORLDWIDE [illegible] PROGRAM IS DISCUSSED.

GEOLOGY * [illegible] * [illegible] SUPPORT * [illegible]

[illegible]
LEFFORD P * [illegible] *
[illegible] ON THE TRITIUM ACTIVITY MEASUREMENT OF SOME WATERS ON THE SOUTHWEST
[illegible] SCIENCES, [illegible]
8 PAGES, [illegible], VOL. 241, PAGES [illegible] (NOVEMBER 19, 1969)

MEASUREMENTS OF THE TRITIUM ACTIVITY OF RAIN WATER, LAKE WATER, [illegible] LEVELS, AND [illegible] WATER FLOWING, THANKS TO THE DISTRIBUTION OF THIS ISOTOPE, INFORMATION ON THE SEASONAL STRATIFICATION OF LAKES, THE [illegible] OF [illegible] LEVELS, AND THE EFFECT OF THE WATER LEVEL ON THE TRITIUM DISTRIBUTION IN SEVERAL [illegible] [illegible]. [illegible] THE [illegible] FOUND ON WATER LEVELS [illegible] INFLUENCED BY [illegible] SEASON ACTIVITY INFLUENCED BY THE TRITIUM

FALLOUT * WATER * LAKE * [illegible] * DISTRIBUTION * [illegible]

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[illegible] JJ
PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND I-129 IN THE PACIFIC [illegible]
UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-[illegible]-T --, 13 PAGES, HEALTH PHYSICS, VOL. 11, PAGES 1665-67 (DECEMBER 1965)

[illegible] [illegible]
THE RESULTS OF A PRELIMINARY SURVEY OF DETONATION ENVIRONMENTS IN THE PACIFIC PROVING GROUNDS INDICATE THAT RESIDUAL TRITIUM AND C14 ARE PRESENT IN RELATIVELY HIGH CONCENTRATIONS IN SOIL MOISTURE OF THE DETONATION SITES AT TIMES UP TO 12 YEARS AFTER THE EVENT. EXCHANGE OF SOIL-BOUND TRITIUM WITH THE AVAILABLE SOIL WATER TAKES PLACE AT A SLOW BUT SIGNIFICANT RATE AND TRITIUM IS DETECTABLE IN PLANTS GROWING IN THE DETONATION ENVIRONMENTS. CARBON-14 IS ALSO ELEVATED IN THE TERRESTRIAL PLANTS. TRITIUM AND C14 ARE ALSO PRESENT IN ELEVATED CONCENTRATIONS IN MARINE ORGANISMS.

WEAPONS * NUCLEAR DETONATIONS * SOIL * ENVIRONMENT * CONCENTRATION * ANIMAL, AQUATIC

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ODUM HT
ECOLOGY - STUDIES OF A TROPICAL RAIN FOREST
PUERTO RICO NUCLEAR CENTER
[illegible], [illegible] PAGES, [illegible], SECTION I, DECEMBER [illegible], [illegible]

REPORTS ECOLOGICAL STUDIES OF A TROPICAL RAIN FOREST LOCATED AT AN ELEVATION OF 1500 FT ON THE SIDE OF EL VERDE MOUNTAIN IN EASTERN PUERTO RICO. CONTENTS OF CA, CU, FE, K, MG, MN, NA, AND P IN VARIOUS COMPONENTS OF THE ECOSYSTEM WERE DETERMINED FROM CONTENTS IN LEAVES, BARK, ROOTS, LITTER, ORGANIC MATTER IN THE FOREST AND BIOMASS OF THE SOIL. RATES OF MOVEMENT OF EACH ELEMENT WERE RELATED TO RAINFALL AND STORMS. FALLOUT DISTRIBUTION IN TROPICAL RAIN FOREST SYSTEMS WAS STUDIED IN TERMS OF SPECIES, SITE, CANOPY, AND PRESENCE OF EPIPHYLLS ON LEAVES. THE MOVEMENTS OF INJECTED CS-137, MN-54, NA-22, AND SR-85 THROUGH SELECTED SPECIES OF TREES WERE ALSO MEASURED AT VARIOUS TIMES, AND ACTIVITY IN THE SURROUNDING SOIL WAS DETERMINED. TRITIUM TRANSPORT WAS STUDIED IN A PLOT TO WHICH TRITIATED WATER WAS APPLIED BY SIMULATED RAINFALL.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

ELEMENTS AND ISOTOPES * FALLOUT * TRACER, RADIOACTIVE * [illegible], NUCLIDE OCCURRENCE * EVAPORATION * PRECIPITATION * PUERTO RICO * BIOMASS * RESPIRATION * CONCENTRATION * RADIONUCLIDE TRANSFER * DISTRIBUTION * ECOSYSTEM, FOREST * ECOSYSTEM, TROPICAL * RADIATION PROFILE * TRANSPORT * CYCLING

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MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM
[illegible], [illegible] PAGES, DECEMBER 1967

DISCUSSES THE PROBLEMS POSED BY TRITIUM - ITS DETECTION, APPARATUS USED, PROTECTION OF PERSONNEL IN AN ATMOSPHERE CONTAMINATED WITH TRITIUM, THE DIFFUSION OF TRITIUM IN THE ATMOSPHERE, DECONTAMINATION, ETC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DECONTAMINATION * ATMOSPHERIC DIFFUSION * ATMOSPHERIC POLLUTION * CONTAMINATION * PERSONNEL EXPOSURE, RADIATION * RADIATION SAFETY AND CONTROL * RADIATION MONITORS

[illegible]
CARLSTON CW
TRITIUM-HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY RESEARCH PROGRAM
GEOLOGICAL SURVEY, WASHINGTON, D. C.
[illegible] PAGES, SCIENCE, VOL. 143, PAGES [illegible] (FEBRUARY 21, 1964)

TRITIUM IS OF LIMITED USEFULNESS AS A TOOL IN HYDROLOGIC STUDIES BECAUSE THE TRITIUM CONTENT OF GROUND WATER, AS A RESULT OF RADIOACTIVE DECAY, BECOMES TOO LOW TO BE DETECTABLE AFTER ABOUT 50 YEARS. A STUDY WAS MADE OF THE HYDROLOGIC CYCLE OF SMALL STREAM BASINS IN WISCONSIN AND NEW JERSEY ON THE BASIS OF MEASUREMENTS RELATIVE TO THE PEAK OF TRITIUM FALLOUT IN THE SPRING OF 1963. THE CONTINENTAL AND THE COASTAL BASINS RECEIVED APPROXIMATELY THE SAME TRITIUM FALLOUT. ABOUT [illegible] PERCENT WENT INTO GROUND-WATER STORAGE, THE REMAINDER BEING EXPORTED AS RUNOFF AND EVAPOTRANSPIRATION.

FALLOUT * MEASUREMENT * GROUND WATER, NUCLIDE OCCURRENCE * EVAPORATION * HYDROLOGY * R AND D PROGRAM * CONCENTRATION * TURNOVER RATE

[illegible]
REICHERT SO
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES
E. I. DUPONT DE NEMOURS AND COMPANY, AIKEN, S.C.

DISPOSAL OF RADIOACTIVITY TO THE GROUND HAS BEEN LIMITED TO THE BURIAL OF SOLID WASTE AND THE DISCHARGE OF VERY-LOW-LEVEL WASTE TO OPEN SEEPAGE BASINS. NO RADIONUCLIDES HAVE BEEN DETECTED IN GROUNDWATER FROM THIS SOURCE. SEEPAGE BASIN RETENTION OF RADIONUCLIDES HAS BEEN LESS SATISFACTORY. ALL OF THE RADIONUCLIDES RELEASED TO THE SEEPAGE BASINS, EXCEPT PLUTONIUM, HAVE BEEN DETECTED IN THE SURROUNDING GROUNDWATER. TRITIUM IS NOT ABSORBED AND THUS SERVES AS A USEFUL GROUNDWATER TRACER. STRONTIUM-90 IS POORLY ABSORBED ON LOCAL SOIL AND IS DETECTABLE IN SAND LAYERS, AT CONCENTRATIONS LESS THAN THE RADIOACTIVITY CONCENTRATION GUIDE, AS FAR AS [illegible] FEET FROM THE BASINS. THE PATH OF RADIONUCLIDE MIGRATION FROM SEEPAGE BASINS IS DETERMINED BY THE GEOLOGY AND HYDROLOGY OF EACH AREA.

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CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.
BALTIMORE GAS AND ELECTRIC COMPANY
1 PAGE, THE WASHINGTON POST, [illegible]

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FISSION PRODUCT RELEASE • RADIATION IN PERSPECTIVE • REACTOR POWER • RADIOACTIVITY RELEASE • CALVERT CLIFFS [illegible]

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FISSION PRODUCT RELEASE [illegible] PUBLIC RELATIONS [illegible]

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ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS [illegible] CONGRESS OF THE U.S. - 91ST CONGRESS
U.S. ATOMIC ENERGY COMMISSION
[illegible] PAGES, [illegible] OF THE HEARINGS BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, NINETY-FIRST CONGRESS, FIRST SESSION, [illegible]

[illegible] AEC COMMISSIONER ON ENVIRONMENTAL EFFECTS. RADIATION EFFECTS ARE [illegible] GIVES DETAILS OF TYPES AND EFFECTS OF STUDIES ON ENVIRONMENTAL EFFECTS. [illegible] THERMAL EFFECTS.

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TRITIATED WATER AS A TRACE FOR ATMOSPHERIC FIELD STUDIES.
SCIENCE 147 PAGES 1448-1449 1965

WATER • PRECIPITATION • DESCRIPTION • DEVELOPMENT • FIELD EXPERIMENT

051171
[illegible]
ACCURACY IN THE MEASUREMENT OF THE TRITIUM CONTENT OF NATURAL WATERS IN THE SOUTH PACIFIC OCEAN AREA, 1970-
71, BY THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LAURA BAY, NEW ZEALAND.
DSR-R-77 P.

OCEAN AND SEA • WATER • NEW ZEALAND • MEASUREMENT • PACIFIC • INSTRUMENTS, MISC.

051272
[illegible]
CONTENTS OF ISOTOPES.
SCIENCE 147 PAGES 607-677 1965

ISOTOPES AND ISOTOPES • CHEMICAL INDUSTRY

051277
[illegible]
TRITIUM CONCENTRATIONS IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1
[illegible] P.

OCEAN AND SEA • RIVER • WATER • SAMPLING • MONITORING • CONCENTRATION

051278
[illegible]
OCEANIC TRITIUM DISPERSAL IN CONTAMINATED WATER BY FOUR DIMENSIONAL ANALYSIS.
[illegible] P.

WATER • CONTAMINATION, OCEANIC

051280
[illegible]
AN ACCOUNT FOR THE WORLD PROJECT ON TRITIUM AND RADIO CARBON IN THE ATMOSPHERE.
TELLUS 17 PAGES 118-130 1965

OCEAN AND SEA • ATMOSPHERIC POLLUTION • PARTICIPATION • REPORT

051487
[illegible]
MEASUREMENT OF TRITIATED WATER VAPOUR BY RAIN.
[illegible] • CHEM-67-71 P. INTERNATIONAL JOURNAL OF AIR AND WATER POLLUTION 9 PAGES 115-120 1964

RAINWATER • WATER • PARTICIPATION • MEASURE

051962
[illegible]
DIFFUSION OF TRITIATED WATER IN SOILS.
SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 27 PAGES 255-258 1963

DIFFUSION • WATER • SOIL

051969
[illegible]
THE MOVEMENT OF TRITIUM FROM THE CHALK RIVER LIQUID DISPOSAL AREA.
AECL-2730 • PAPR-1164 P.

DIFFUSION • RIVER • WASTE DISPOSAL • DESERTED • LIQUID

051970
[illegible]
TRITIUM DISTRIBUTION IN CANADIAN WATER DURING LARGE UNDERGROUND NUCLEAR EXPLOSION.
PNE-[illegible] P. SCIENCE 147 PAGES 1143-1145 1965

[illegible]
[illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
[illegible] [illegible] [illegible] [

[illegible]
[illegible]
TRITIUM AND OTHER ENVIRONMENTAL TRACERS IN THE HYDROLOGIC CYCLE. PART I. STUDIES OF THE ENVIRONMENTAL
TRACERS AND THEIR USE IN THE INVESTIGATION OF THE HYDROSPHERE.
[illegible] p.

ISOTOPES AND TRACERS • ENVIRONMENT • STUDIES

[illegible]
[illegible]
TRITIUM IN HYDROSPHERE OF CANADIAN STATE [illegible].
[illegible] p.

CANADA • SAMPLING • PARTICIPATION

[illegible]
[illegible]
TRITIUM IN [illegible] HYDROSPHERE PARTICIPATION [illegible].
[illegible] p.

PARTICIPATION

[illegible]
[illegible] • [illegible] • [illegible] • [illegible]
[illegible] TRITIUM PARTS PER PARTS CONTROL [illegible]
[illegible] ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA
[illegible] p., 19 PAGES, NOVEMBER 20, 1971

FIRST MEASURE OF A NUCLEAR-EXPLOSION-STIMULATED GAS WELL [illegible] IN [illegible] [illegible] CONTROL
[illegible] TRITIUM CONCENTRATION [illegible] OBSERVATIONS. [illegible] CONCENTRATIONS [illegible] AT [illegible] 7
[illegible] FROM THE SOURCE, AS [illegible] BY [illegible]. THE SCINTILLATION [illegible] DATA [illegible] A
[illegible] THE [illegible]. [illegible] [illegible] IN [illegible], [illegible] THIS [illegible]
[illegible] BY [illegible] AS AN [illegible] THROUGH THESE [illegible] AT [illegible]. [illegible] THIS [illegible]
IS SPECULATIVE AT [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]
[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible] [illegible] • [illegible] • [illegible] • [illegible]
THE [illegible] TRITIUM SYMPOSIUM AT LAS VEGAS
[illegible] PAGES, 1 TABLE, 7 REFERENCES, NUCLEAR SAFETY, [illegible], PP. [illegible] [illegible]-JUNE 1971

A TRITIUM SYMPOSIUM SPONSORED BY THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY OF THE
ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA AT LAS VEGAS WAS HELD IN LAS VEGAS
AUG. 30 TO SEPT. 2, 1970. NEARLY 100 PAPERS WERE PRESENTED COVERING A BROAD RANGE OF TOPICS,
INCLUDING TRITIUM PRODUCTION, ITS REPORTED IN THE ENVIRONMENT, PHOTOSYNTHETIC RELEASE AND
MONITORING, REACTOR DATA AND MEASUREMENT, GEOCHEMICAL EFFECTS, DIAGNOSTICS, APPLICATIONS TO BIOLOGY
AND MEDICINE, AND HEALTH PHYSICS. THIS ARTICLE TRACES THE ALL ASPECTS OF THE MEETING, AND REPORTS
ON PARTICULAR INTEREST IN THE FIELD OF NUCLEAR SAFETY AND FORMULATION.

[illegible] RELEASE • [illegible] • [illegible], [illegible] • [illegible], [illegible] • [illegible] • [illegible]
[illegible]

[illegible]
[illegible] [illegible] • [illegible] [illegible]
[illegible] TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1969-DEC. 1969
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA • [illegible] [illegible] [illegible] LABORATORY
[illegible] PAGES, [illegible] FIGURES, 1 TABLE, [illegible] REFERENCES, [illegible] DATA AND [illegible], 1971, PP. [illegible]-67 [illegible]
1972

TO ESTABLISH A BASELINE FOR ENVIRONMENTAL TRITIUM A STUDY WAS CONDUCTED TO MEASURE CURRENT LEVELS
OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES. DATA ARE REPORTED FOR
TRITIUM CONCENTRATIONS IN SURFACE AND GROUND WATERS DURING APRIL 1969-DECEMBER 1969. THE
CONCENTRATION OF TRITIUM WAS UNDETECTABLE IN MOST GROUND-WATER SAMPLES, WHILE OTHER SAMPLES
CONTAINED AS MUCH AS 7.8 PICOCURIES. SURFACE WATER SAMPLES RANGED FROM UNDETECTABLE TO 9.0
PICOCURIES. POSSIBLE REASONS FOR THE RANGE OF RESULTS, SUCH AS ALTITUDE AND LATITUDE EFFECTS, ARE
DISCUSSED.

SAMPLING, HIGH ALTITUDE • ANALYTICAL TECHNIQUE • [illegible], ENVIRONMENTAL • [illegible] WATER, [illegible] [illegible]
• [illegible], GROUND SURFACE • UNITED STATES • [illegible] • [illegible]

[illegible]

[illegible]

[illegible]

[illegible]
[illegible] BY THE USE OF COMPUTERIZED [illegible] TECHNIQUES AS [illegible] AS [illegible] AND
[illegible] COMPARED WITH THE [illegible] OBTAINED BY [illegible] [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] • [illegible], [illegible] • [illegible] TECHNIQUE • [illegible] • [illegible] •
[illegible] [illegible] • [illegible]

[illegible]
[illegible] CD
A [illegible] OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN HEMISPHERE
[illegible] [illegible], [illegible]
[illegible] PAGES, [illegible], VOL. [illegible], PP. [illegible]

THE [illegible] OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN HEMISPHERE [illegible] [illegible] FROM THE YEAR
[illegible] TO [illegible] 1966. THE [illegible] [illegible] [illegible] TO [illegible] AND TRITIUM TO [illegible]-
[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] TO [illegible], [illegible] [illegible] TO LOST
[illegible] TO [illegible]. THE [illegible] [illegible] WITH THE [illegible] OF THE [illegible] [illegible] OF THE FALLOUT
[illegible], SUGGESTING THAT THE STRATOSPHERE-TROPOSPHERE [illegible] OF THE [illegible] OF SOUTHERN
[illegible] TRITIUM FALLOUT [illegible] [illegible] THE [illegible] [illegible] SR-90 TO [illegible]-[illegible]
[illegible]. THE [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] TO [illegible] [illegible]
[illegible] A [illegible] [illegible] [illegible] [illegible].

[illegible] CIRCULATION, [illegible] • [illegible] • [illegible]

[illegible]
[illegible] PH • [illegible] B
[illegible] [illegible] OF [illegible] AND [illegible]
[illegible] AND SAFETY LABORATORY, U.S. ATOMIC ENERGY COMMISSION, NEW YORK
[illegible]-[illegible] U. 15 PAGES, DE [illegible] IN THE PROCEEDINGS OF A SYMPOSIUM ON PARTICIPATING SCAVENGING, [illegible],
[illegible], JUNE [illegible], 1970

[illegible] INVENTORIES OF TRITIUM AS HTO AND [illegible] FOR THE YEARS 1960, 1966, AND 1969 WITH
DATA SHOWN THE PARTICIPATION OF THE [illegible] [illegible] PROBE [illegible]. THE [illegible]
[illegible] RESIDENCE TIME OF 30 DAYS FOR SR-90 WAS [illegible], AND A [illegible] [illegible]
HOLD RESIDENCE TIME OF 10 DAYS WAS FOUND FOR HTO. THIS [illegible] 70-DAY VALUE IS THE [illegible] OF
TRITIUM [illegible] BY PARTICIPATION AND BY [illegible] EXCHANGE WITH THE OCEAN. THE HOLD RESIDENCE TIME
FOR HTO [illegible] BY PARTICIPATION IS 70 DAYS BUT ONLY 30 DAYS BY [illegible] EXCHANGE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] • [illegible], [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible] H • [illegible] LG • [illegible] H
STUDY OF [illegible] OF [illegible] [illegible] WITH THE AIR OF TRITIUM
7 PAGES, [illegible], 1970, PP. 713-719 [illegible] 1970

[illegible] WITH TRITIATED WATER VAPOR) IN THE ATMOSPHERE. THE [illegible] [illegible]
COMPARED WITH THE [illegible] GAUSSIAN [illegible], AND THE [illegible] WAS WITHIN A FACTOR OF 2.

ATMOSPHERIC DIFFUSION [illegible] • [illegible] PATH, [illegible], [illegible] • [illegible], [illegible] • [illegible],
[illegible]

[illegible]
[illegible] JR • [illegible] D • [illegible] CH • [illegible]
[illegible] FALLOUT FROM SOUTH AFRICA AND ITS [illegible] [illegible]
11 PAGES, SOUTH AFRICAN JOURNAL OF SCIENCE, 66(7), PP. 714-775

[illegible] SINCE 1951 WITH SPECIAL ATTENTION TO 1966-67 SHOWS THE [illegible] [illegible] AND NOT
[illegible] A [illegible] INCREASE. ANALYSES OF [illegible] FALLOUT, SR-90 IN MILK, [illegible] IN [illegible],
TRANSIT TIME AND DEP ANALYSIS, THE [illegible] OF [illegible] [illegible] FALLOUT AGE, AND [illegible]
FALLOUT TRENDS THE END OF 1966. [illegible] IN [illegible] SR-90 [illegible] AND [illegible] IN [illegible]
ATTRIBUTABLE TO [illegible]. THE AVERAGE [illegible] DATE FOR THE [illegible] WAS [illegible], TO
BE [illegible] [illegible] TO CANADA AND [illegible] IN THE [illegible] [illegible], ICA [illegible]

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] CALCULATION, [illegible] • [illegible] • [illegible] •
[illegible] • [illegible] • [illegible] • [illegible] • [illegible], [illegible] • [illegible]

[illegible]
[illegible] W • [illegible] JF • [illegible] JJ
A TECHNIQUE FOR [illegible] C-[illegible] OF A PLUME USING TRITIATED [illegible]
NEW YORK STATE DEPARTMENT OF HEALTH, ALBANY
7 PAGES, NUCLEAR APPLICATIONS AND TECHNOLOGY, VOL. 7, PG. [illegible]-[illegible] JULY 1969

A SILICA GEL SAMPLER FOR TRITIATED [illegible] WAS [illegible] TO TRACE THE FOLLOWUP FROM A NUCLEAR

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

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AUTHOR(S) [illegible]
CORPORATE AUTHOR(S) [illegible]

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AVAILABILITY - [illegible]

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AUTHOR(S) [illegible]
CORPORATE AUTHOR(S) [illegible]

[illegible]

AVAILABILITY - PRINTING AND PUBLISHING OFFICE, NATIONAL ACADEMY OF SCIENCES, WASHINGTON, D.C.

[illegible]

[illegible]
[illegible] • [illegible] J • [illegible] C
A SYSTEM FOR PREDICTING TRITIUM FLOW TRANSPORT IN VEGETATION WITH METEOROLOGICAL VARIABLES
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-[illegible] • CONF-[illegible]-70 p., 8 PAGES, 8 FIGURES, 7 REFERENCES. PAPER PRESENTED AT THE 1970 1972 NUCLEAR SCIENCE SYMPOSIUM, SAN FRANCISCO, CALIFORNIA, NOVEMBER 1-5, 1972

LIMITED INCREASES OF ATMOSPHERE TRITIUM CONCENTRATIONS WILL RESULT IN DECREASES OF MORE TRITIUM FLOW TO THE ENVIRONMENT. THIS LOW ENERGY BETA EMITTER HAVING A HALF-LIFE OF 12.4 YEARS IS AN IMPORTANT PHYSIOLOGICAL HAZARD. IN THE WEST CENTRAL DESERT AREA OF TRITIUM WATER STUDY, TRITIUM WORKS THROUGH THE ENVIRONMENT ESSENTIALLY ALONG WATER PATHWAYS. KNOWLEDGE OF THESE PATHWAYS IN THE DESERT AREA OF ENVIRONMENTAL CONDITIONS IS REQUIRED FOR CALCULATING THE BIOLOGICAL HAZARD TO MAN. THE STUDY OF TRITIUM IN THE BIOSPHERE IS HERE ACTUALLY THE STUDY OF THE PROPERTIES OF WATER TRANSPORT THROUGH THE BIO-WATER, SOIL, PLANT INTERFACES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible], RELATIVE • TRACER, ENVIRONMENTAL • ENVIRONMENTAL POLLUTION • WATER • DATA FLOWER • [illegible] CALCULATION, [illegible] • [illegible] SAFETY AND CONTROL • [illegible] • ENVIRONMENTAL DEFENSE • [illegible] • [illegible] • [illegible], TEMPERATE • [illegible] • BIOMEDICAL CONTROL • TRANSPORTATION

[illegible]
[illegible] J • [illegible] JR
[illegible] OF TRITIUM IN ECOLOGICAL SYSTEMS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-[illegible] P., [illegible] PAGES, [illegible] FIGURES, 4 TABLES, [illegible] REFERENCES, AUGUST 24, 1972

THE WORLD-WIDE EXPOSURE FROM ELECTRONS-PRODUCED TRITIUM BY THE YEAR 2000 (0.009 MILLIRADS) WILL BE SMALL. LOCAL EXPOSURES MAY BE SUBSTANTIALLY HIGHER, DEPENDING ON HOLDUP IN ECOSYSTEMS. TRANSFER OF TRITIATED WATER IN PLANTS, ANIMALS, AND ECOSYSTEMS IS REVIEWED. INVESTIGATIONS INCLUDE DATES OF TRANSFER OF TRITI WATER, MAKE TIMES OF ARRIVAL OF TRITIUM WATER INTERFACES-WORKS IN PLANTS, I-[illegible] MAKE IN ANIMALS, AND RATES OF MAXIMUM ELEVATION OF TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

POLLUTION • [illegible] • [illegible] ELECTRONICS, INTERNAL • [illegible] WATER, [illegible] ACCIDENT • [illegible], [illegible] SECURITY • SURFACE WATER, DISPOSAL WASTE • WASTE DISPOSAL, LIQUID • CRITICAL [illegible] PATHWAY • [illegible] • [illegible] SYSTEM MODELS • PARTICIPATING [illegible] • [illegible] • PHOTOSYNTHESIS/TRANSPORT • ECOSYSTEM, [illegible] • OBSERVATION • [illegible] TRANSFER • [illegible] • [illegible]

[illegible]
[illegible] JR • [illegible] JJ • [illegible] DE • [illegible] JR
[illegible] TO USE VIA [illegible] TRANSFER [illegible] FROM EXPOSURE TO TRITIATED WATER VAPOR
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-[illegible] • CONF-[illegible] P., 11 PAGES, FROM THE TRITIUM SYMPOSIUM HELD IN LAS VEGAS, NEVADA, AUGUST 30, 1972

[illegible] ESTIMATE THE DOSE TO MAN AS A FUNCTION OF PRESENT [illegible] CONTAMINATION FOLLOWING THE RELEASE OF THE WORLD WIDE DATA BASED UPON MODELS HAVE APPROPRIATE FOR THE RELEASE OF [illegible] WITH RESPECT SIGNIFICANCE FROM THE IN THE PATHWAYS AND PATHWAYS OF BIOLOGICAL TRANSFORMATION. FIELD STUDIES IN CONJUNCTION WITH [illegible] RELEASE AND COMPARISON EXPERIMENTS INDICATE THAT THESE MODELS [illegible] THE DOSE TO MAN BY MEANS OF [illegible]. DATA FROM THESE AND OTHER [illegible] EXPERIMENTS ARE USED TO DEVELOP A MORE REALISTIC, SIMPLE MODEL WHICH MAY BE USED TO ESTIMATE THE DOSE TO MAN VIA TRANSFERRING PLANT ENVIRONMENT AND VIA THE INGESTION OF VEGETABLES, MILK, AND MEAT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECOLOGY • DOSE • [illegible] • [illegible] • MODEL • CRITICAL [illegible] • [illegible] • [illegible] PATHWAY • WATER VAPOR • ABSORPTION • [illegible] • [illegible] • [illegible] CHAIN • [illegible] EXPOSURE, ACUTE • [illegible] EXPOSURE, CHRONIC • [illegible]

[illegible]
[illegible] CB
[illegible] - [illegible]
ATOMIC ENERGY COMMISSION, [illegible] LABORATORIES
ARCL-[illegible] • [illegible] P., [illegible], MARCH 1972

THE SPECIFIC ACTIVITY OF [illegible] IN THE WORLD IN [illegible] LAKE SEDIMENTS INVESTIGATED INCORPORATE EXCHANGE WITH THE WATER OVER 14 YEARS OF [illegible]. ABOUT [illegible] OF THE [illegible] OXIDIZING THE LAKE GAS OPERATION IN THE UPPER [illegible] OF THE SEDIMENTS. TO CONSOLIDATE SEDIMENTATION RATES WITH [illegible] PROFILES, ANALYTIC [illegible] WERE DETERMINED AND [illegible], [illegible], AND [illegible]; OUT WHICH WHICH IS DEPOSITED AND [illegible], [illegible] OF [illegible] OR [illegible] WAS RELATIVELY LOW FOR MOST AND [illegible]-[illegible] [illegible] [illegible] WITH [illegible] WITHIN. [illegible] BY ACOUSTIC [illegible] WAS DETERMINED BY [illegible], WATER [illegible], AND [illegible] FISH [illegible] WEIGHTS. [illegible] DISCRIMINATION WAS [illegible] BETWEEN [illegible] SPECIES, WAS SLIGHTLY [illegible] BY ENVIRONMENTAL [illegible], AND WAS [illegible] FOR WEIGHT VIA THE GAT THAN VIA THE GILLS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVATION • [illegible] • SOIL, [illegible] [illegible] • [illegible] • [illegible], ENVIRONMENT • [illegible], OTTAWA •

072235 *CONTINUED*
ANALYTICAL TECHNIQUE * [illegible] * SOIL PROPERTY * [illegible] * LAKE * [illegible] UPTAKE * [illegible],
FISH * BIOACCUMULATION/[illegible] * ECOSYSTEM, AQUATIC * PHYSIOLOGY/METABOLISM * VEGETATION * AQUATIC ORGANISM
* [illegible] * FIELD EXPERIMENT * SPECIFIC ACTIVITY * CONCENTRATION FACTOR

072306
[illegible] E * [illegible] P * [illegible] P * [illegible] E * [illegible] A
TRITIUM IN INVESTIGATION OF SURFACE HYDROLOGY. EXPERIMENTAL DETERMINATION OF COEFFICIENT OF RUNOFF
CENTRE OF [illegible] RESEARCH, [illegible], HAUTE SAVOIE, FRANCE * BUREAU OF GEOLOGICAL RESEARCH AND
MINING, ORLEANS, FRANCE
CSIRO-TRANS-10757 ., [illegible] PAGES. TRANSLATED FROM JOURNAL OF HYDROLOGY, VOL. 11, PP. 217-229 (1970)

MEASUREMENT OF TRITIUM CONTENTS IN RAIN AND RIVER ALLOWS FOR THE DETERMINATION OF ACTUAL PARTICIPATION OF RAINWATER IN RIVER FLOW DURING A FLOOD. WHEN THE DURATION OF THE FLOOD IS SHORTER THAN THE TRANSIT TIME OF THE GROUND WATER, THE TRITIUM CONTENT AFTER THE FLOOD BECOMES RE-ESTABLISHED AT THAT VALUE BEFORE THE FLOOD AND IT IS THEN NOT NECESSARY TO MEASURE THE TRITIUM IN THE [illegible] WATERS. WHEN THE DURATION OF THE FLOOD DOES NOT EXCEED ONE WEEK, THIS SIMPLIFICATION IS VALID. IN THE [illegible] STUDIES, THE MEAN TRANSIT TIME OF THE SHALLOW GROUND WATER IS ABOUT A MONTH. THE INCREASE IN FLOW-RATE OF THE SUBTERRANEAN WATERS NOTED DURING FLOODS IS NOT ACCOMPANIED BY A VARIATION OF THEIR TRITIUM CONTENT. ONLY A [illegible] IN [illegible] OF THESE WATERS IS INVOLVED AND NOT A MIXING OF THE INFILTRATING RAIN AND THE GROUND WATER. IT IS AS IF THE [illegible] OF INFILTRATING WATER DRIVES THE WATER OF THE PREVIOUS RAINY PERIODS IN FRONT OF ITSELF. THUS ACTUAL DETERMINATION BY THIS METHOD OF THE PROPORTION OF THE RAIN WATER REMOVED DIRECTLY BY RUNOFF DURING FLOODS ALLOWS FOR ESTABLISHMENT OF A MORE SATISFACTORY HYDROLOGICAL BALANCE OF CATCHMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GROUND WATER * MEASUREMENT * [illegible] * [illegible] * [illegible] WATER, [illegible] * [illegible] * [illegible] COEFFICIENT *
[illegible] * FLOOD * ACCUMULATION * [illegible] BALANCE

072960
[illegible] JJ * HIGGINS GW
SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY
UCRL-73187 (REV. 1) * CONF-710809-15 ., 19 PAGES. FROM THE TRITIUM SYMPOSIUM, LAS VEGAS, NEVADA, AUGUST 30,
1971

IN ACCORDANCE WITH CURRENT GUIDANCE, TRITIUM RELEASES MUST BE KEPT BELOW QUANTITIES WHERE MPC LEVELS ARE EXCEEDED, AND SHOULD BE KEPT AS LOW AS PRACTICABLE. DETERMINATION OF PRACTICABILITY REQUIRES AN ANALYSIS OF BENEFIT-VERSUS-RISK CONSIDERATIONS. SUCH AN ANALYSIS WAS PERFORMED FOR CERTAIN GENERAL CASES. IT IS BASED ON A [illegible] VALUE OF [illegible] [illegible] IS THE AMOUNT OF BENEFIT REQUIRED TO JUSTIFY A RADIATION EXPOSURE OF ONE MAN-REM AND CONSIDERS THE NATURE OF TRITIUM DISTRIBUTION IN THE BIOSPHERE AS WELL AS CERTAIN DEMOGRAPHIC FACTORS. IT ALSO ASSUMES THAT CONSTRAINTS IMPOSED BY EXPOSURE GUIDES ARE OBSERVED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] * KRYPTON * MPC * REGULATION * HAZARDS ANALYSIS * RADIOACTIVITY RELEASE * DISTRIBUTION * BENEFIT VS
RISK * SOCIO/PHILOSOPHICAL CONSIDERATION

072991
[illegible] LA
ENVIRONMENTAL BURDENING BY TRITIUM
KERNFORSCHUNGSZENTRUM, KARLSRUHE, GERMANY
KFK-1900 ., 76 PAGES, [illegible] FIGURES, [illegible] REFERENCES, FEBRUARY 1972

REVIEWS PRESENT KNOWLEDGE WITH RESPECT TO THE TRITIUM BURDEN ON THE ENVIRONMENT. FOLLOWING A COMPILATION OF THE MOST IMPORTANT CHARACTERISTICS THE THEORETICAL RELATIONSHIP BETWEEN TRITIUM INCORPORATION AND RADIATION BURDEN IS DEALT WITH. SOURCES OF ENVIRONMENTAL TRITIUM CONTAMINATION ARE THE TRITIUM PRODUCED BY NATURE AND IN NUCLEAR FISSION REACTORS, THE USE OF TRITIUM-CONTAINING LUMINOUS [illegible], AND, ABOVE ALL, THE NUCLEAR WEAPON TESTS. THE TRITIUM RELEASED UNDERGOES A WORLDWIDE SPREAD BY THE CIRCULATING WATER. THE RADIATION BURDEN DUE TO THIS TRITIUM CONTAMINATION AND EVALUATED BY CONCENTRATION MEASUREMENTS AMOUNTS PRESENTLY TO [illegible] MREM/A.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT * FISSION PRODUCT RELEASE * MEASUREMENT * SOURCE, RADIATION * [illegible], WEAPONS * FISSION PRODUCT
TRANSPORT * REACTOR, POWER * CONTAMINATION * ENVIRONMENT * SAFETY EVALUATION * CONCENTRATION

073005
OESTLUND HG
STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT
MIAMI UNIVERSITY, ROSENSTIEL SCHOOL OF MARINE AND ATMOSPHERIC SCIENCES, FLORIDA
UM-RSMAS-72071 ., 14 PAGES, APRIL 19, 1972

IN ADDITION TO THE EXISTING GROUND-LEVEL STATIONS FOR ATMOSPHERIC HT AND HTO IN MIAMI AND FAIRBANKS, A THIRD STATION WAS ESTABLISHED AT THE MAUNA LOA OBSERVATORY, ISLAND OF HAWAII. ROUTINE SAMPLING AND ANALYSIS OF THE SAMPLES FROM ALL THREE GROUND STATIONS ON A TWICE-WEEKLY

[illegible] (CONTINUED)
[illegible] HAVE BEEN CONTINUED. DATA UP TO THE END OF 1971 ARE AVAILABLE. A LONGITUDINAL PROFILE FROM THE U.S. [illegible] WAS COLLECTED. A SECOND [illegible], AIRCRAFT SAMPLER, WAS BUILT AND SIX VERTICAL PROFILES ON THE [illegible] WERE SAMPLED. A SAMPLING SYSTEM FOR THE [illegible] AIRCRAFT IS PRESENTLY UNDER CONSTRUCTION.

[illegible], AIR • SAMPLING • AIRCRAFT • ANALYTICAL TECHNIQUE • MONITORING, ENVIRONMENTAL • MONITOR, GROUND SURFACE • MONITORING SYSTEM, RADIATION • RADIATION PROFILE

[illegible]
[illegible]
WASHOUT OF GASEOUS TRITIUM COMPOUNDS BY RAIN
BATTELLE NORTHWEST LABORATORY, RICHLAND, WASHINGTON
[illegible] PAGES, [illegible] FIGURES, [illegible] TABLES, [illegible] REFERENCES, APRIL 1972

WASHOUT OF GASEOUS TRITIUM COMPOUNDS FROM THE ATMOSPHERE HAS BEEN INVESTIGATED THEORETICALLY. THIS ANALYSIS IS BASED UPON REVERSIBLE GAS-WASHOUT THEORY, AND ACCOUNTS FOR SUCH FACTORS AS RESORPTION AND THE INFLUENCE OF LIQUID-PHASE TRANSPORT. GENERAL EQUATIONS ARE PRESENTED WHICH DESCRIBE POLLUTANT CONCENTRATIONS IN SINGLE DROPS AS THEY FALL THROUGH THE ATMOSPHERE. RESULTS FROM THESE EQUATIONS MAY BE COMBINED TO PROVIDE TOTAL WASHOUT CHARACTERISTICS FOR NATURAL RAIN BY SIMPLE DISTRIBUTION OVER THE DROP-SIZE SPECTRA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

RAINOUT • [illegible] • PRECIPITATION • WASHOUT • GAS • CONCENTRATION • TRANSPORT

[illegible]
[illegible]
GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER
GESELLSCHAFT FUR KERNFORSCHUNG M.B.H., KARLSRUHE
[illegible] PAGES, [illegible] TABLES, [illegible] FIGURES, [illegible] REFERENCES, NOVEMBER 1972

DISCUSSES DISPERSION EXPERIMENTS WITH TRITIATED WATER VAPOR AS THE TRACER CONDUCTED SO FAR AT THE KARLSRUHE NUCLEAR RESEARCH CENTER. THE HEIGHT OF THE SOURCE WAS [illegible]. TO EVALUATE THE [illegible], AIR HUMIDITY SAMPLES WERE [illegible] SURFACES AT [illegible] POINTS IN THE FIELD OF DISPERSION. THE RESULTS SHOW CONSIDERABLE DEVIATIONS FROM THEORETICAL VALUES BOTH WITH RESPECT TO THE AMOUNTS AND THE SOURCE DISTANCES OF THE [illegible] OF CONCENTRATION. (IN GERMAN)

AVAILABILITY - GESELLSCHAFT FUER KERNFORSCHUNG MBH, [illegible] KARLSRUHE, POSTFACH [illegible], GERMANY

ATMOSPHERIC DIFFUSION EXPERIMENT • COMPARISON, THEORY AND EXPERIMENT • INSTRUMENT, AIR SAMPLING

[illegible]
[illegible]
TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN
CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE, MOL, BELGIUM
[illegible] PAGES, [illegible] PP. [illegible] (1972)

TRITIUM IN THE ENVIRONMENT ORIGINATES FROM NATURAL AND ARTIFICIAL SOURCES: THE NATURAL PRODUCTION [illegible] COSMIC RAYS ON NITROGEN AND OXYGEN IN THE AIR) AND THE ARTIFICIAL PRODUCTION [illegible] EXPLOSIONS, [illegible] ARE INDICATED. DATA ON THE [illegible] OF TRITIUM IN THE ENVIRONMENT AND ESTIMATES OF TRITIUM PRODUCTION AND RELEASE BY NUCLEAR INSTALLATIONS ARE GIVEN AND [illegible]. THE WAYS IN WHICH [illegible] IS CONTAMINATED ARE [illegible] ABSORPTION [illegible] LEAF, VAPOR EXCHANGE AND THE MECHANISM RESPONSIBLE FOR TRITIUM INCORPORATION IN PLANT ORGANIC MATTER IS THAT OF PHOTOSYNTHESIS.

[illegible] EXPOSURE • CONTAMINATION • RADIOACTIVITY RELEASE • ABSORPTION • RADIONUCLIDE UPTAKE • CONCENTRATION • FOOD CHAIN • RADIONUCLIDE TRANSFER • VAPOR EXCHANGE

[illegible]
[illegible]
SCREENING EFFECT OF CONTINENTS WHICH DETERMINE THE ISOTOPIC COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM SPACE-TIME DISTRIBUTION IN THE ATMOSPHERIC PRECIPITATION OF THE NORTHERN HEMISPHERE)
INSTITUTE OF WATER PROBLEMS, MOSCOW
[illegible] PAGES, [illegible] AKAD. NAUK SSSR, [illegible], PP. [illegible] (NOVEMBER 1, 1971) (IN RUSSIAN)

THE AVERAGE YEARLY FALLOUT OF TRITIUM IN THE NORTHERN HEMISPHERE WAS ESTIMATED FROM MEASUREMENTS IN JUNE, AUGUST, SEPTEMBER, AND NOVEMBER IN A NUMBER OF RUSSIAN CITIES. AND GEOPHYSICAL INTERPRETATION OF THE RESULTS OF TRITIUM IN CONCENTRATION, THE AVERAGE CONCENTRATION OF TRITIUM IN A [illegible] OF ATMOSPHERIC MOISTURE WAS TAKEN TO BE EQUAL TO THE TRITIUM CONCENTRATION IN THE AVERAGE MONTHLY PRECIPITATION FROM IT. THE DATA ARE DISCUSSED IN TERMS OF A SCREENING EFFECT OF THE CONTINENTAL SURFACE, IN CONTRAST TO TRITIUM IN THE ATMOSPHERIC MOISTURE ABOVE THE OCEANS.

ATMOSPHERIC CIRCULATION, GLOBAL • FALLOUT • MEASUREMENT • OCEAN AND SEA • SURFACE CONTAMINATION • ATMOSPHERIC POLLUTION • MONITOR • PRECIPITATION • USSR • ENVIRONMENT • METEOROLOGY • SEASONAL • COMPARISON

[illegible]

[illegible] - [illegible] - [illegible]

[illegible]

[illegible]

[

[illegible]
[illegible]
SYMPOSIUM ON RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT
COMMISSION OF THE EUROPEAN COMMUNITIES, LUXEMBOURG [illegible]
[illegible] PAGES, 1 TABLE, NUCLEAR SAFETY, [illegible] (SEPTEMBER-OCTOBER 1972)

THE SYMPOSIA PAPERS (SEPARATE ABSTRACTS APPEAR IN NSIC ABSTRACTS [illegible]) ARE LISTED AND CHARACTERIZED BRIEFLY. SOME OF THE QUESTIONS RAISED AT A 2.5-HOUR PANEL DISCUSSION ARE PRESENTED - EFFECTS FROM TRITIUM PRODUCED BY FAST REACTORS, ACCOUNTING FOR PARAMETERS WHICH AFFECT RADIONUCLIDE UPTAKE, THE TERM [illegible] RADIOLOGICAL CAPACITY INCLUDES NO SAFETY FACTORS, THE TERM CRITICAL POPULATIONS DOES NOT ACCOUNT FOR MULTIPLE SOURCES AND EFFECTS FROM OTHER POLLUTANTS, AND EXTENSION OF THE [illegible] TO NONRADIOACTIVE POLLUTANTS. ANSWERS TO MANY OF THESE QUESTIONS REQUIRE FURTHER WORK IN RADIOECOLOGICAL FORECASTING ON A [illegible] BASIS, ALSO IN ANALYSIS OF HAZARDS IN CONNECTION WITH BOTH RADIOACTIVE WASTE DISPOSAL AND ENVIRONMENTAL CONTAMINATION BY TRITIUM AND THE NOBLE-GAS RADIONUCLIDES.

ECOLOGY • [illegible] • NOBLE GAS • ATMOSPHERIC POLLUTION • WASTE DISPOSAL • CRITICAL NUCLIDE PATHWAY • ENVIRONMENT • WATER POLLUTION • FORECAST • RADIONUCLIDE UPTAKE • BIOACCUMULATION/TRANSFER • ECOSYSTEM, AQUATIC • FOOD CHAIN • POLLUTION • ECOSYSTEM, MARINE • ECOSYSTEM, MODEL • SYSTEM ANALYSIS • MODEL, DETERMINISTIC • ECOSYSTEM, ESTUARINE • ORGANIZATION, INTERNATIONAL

[illegible]
[illegible]
RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA
TELEDYNE ISOTOPES, INC.
NVO-1229-175 [illegible], 86 PAGES, 8 TABLES, [illegible] FIGURES, [illegible] REFERENCES, SEPTEMBER 1971

A FOUR-YEAR SURVEILLANCE PROGRAM OF TRANSPORT OF RADIOACTIVITY THROUGH GROUND WATER FROM THE SITES OF UNDERGROUND NUCLEAR DETONATIONS IS DESCRIBED, AND IT IS RECOMMENDED THAT ONCE-A-YEAR SAMPLING CONTINUE. IN A RELATED STUDY, DISTRIBUTION COEFFICIENTS [illegible] RADIONUCLIDES IN [illegible] OF ASSOCIATED GROUND WATERS WERE DETERMINED BY ADDING RADIONUCLIDES TO ENVIRONMENTAL SAMPLES. DISTRIBUTION COEFFICIENTS RANGED FROM 30 TO 2000 FOR CA-45; [illegible] TO 2500 FOR SR-85; AND 70 TO 5000 FOR CS-137.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SOIL, RADIONUCLIDE MOVEMENT THROUGH • GROUND WATER, NUCLIDE OCCURRENCE • GROUND WATER, PATHWAY • GROUND WATER, TRACER • NEVADA TEST SITE • MONITOR, BACKGROUND • CRITICAL NUCLIDE PATHWAY • ION EXCHANGE • RADIOCHEMICAL ANALYSIS • SORPTION • HYDROLOGY, RATE OF MOVEMENT • SOIL PROPERTY, IN SITU • SURVEILLANCE PROGRAM • RADIONUCLIDE UPTAKE • RADIONUCLIDE TRANSFER • SEDIMENT • DISTRIBUTION

078706
KINCAID CO JR
CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE
TEXAS A&M UNIVERSITY
267 PAGES, 15 TABLES, 10 FIGURES, AUGUST 1971

SEA WATER FROM THE YUCATAN STRAIT IS THE MAJOR SOURCE OF TRITIUM FOR THE WESTERN GULF. SEA WATER FIRST CARRIES THE H-3 OF THE YUCATAN STRAIT, AND THEN TO THE WESTERN GULF. THE PHYSICAL PROPERTIES OF THE WATER MASS THAT EXTENDS FROM THE SURFACE TO THE DEPTH OF THE SUBTROPICAL UNDERWATER, AND THE H-3 CONTENT, ARE MODIFIED BY MIXING PROCESSES AS THE WATER MOVES WESTWARD. THE INTEGRATED H-3 CONTENT OF THE WATER COLUMNS, TO A DEPTH OF 150 M, IS HIGHER IN THE WESTERN GULF THAN IN THE YUCATAN STRAIT. THIS EXCESS IS DUE TO THE INPUT OF H-3 FROM RUNOFF AND RAINFALL. A 2-BOX MODEL WAS DEVELOPED FOR THE MIXING AND EXCHANGE OF WATER MASSES IN THE UPPER LAYERS OF THE GULF OF MEXICO.

COUNTER • COMPOSITION • OCEAN AND SEA • REACTOR, RESEARCH • RESAMPLING • MIXING DEPTH • CROSS SECTION • CONCENTRATION • DISTRIBUTION • MODEL, DETERMINISTIC • RETENTION • SPECTROMETRY

078706
KINCAID CO JR
CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE
TEXAS A&M UNIVERSITY
267 PAGES, 15 TABLES, 10 FIGURES, AUGUST 1971

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COUNTER • COMPOSITION • OCEAN AND SEA • REACTOR, RESEARCH • RESAMPLING • MIXING DEPTH • CROSS SECTION • CONCENTRATION • DISTRIBUTION • MODEL, DETERMINISTIC • RETENTION • SPECTROMETRY

077004
[illegible] F
ON DECAY OF THE MAJOR PHASES OF TRITIUM AND TRACE GASES IN THE ATMOSPHERE
[illegible] INSTITUTE, SWEDEN
19 PAGES, 7 TABLES, 10 FIGURES, BIBLIOGRAPHY, [illegible], PP. [illegible]

[illegible] TRITIUM PRODUCED SINCE 1954 FROM [illegible] TESTS WAS BY FAR LARGER THAN EXPECTED FROM THE STRATOSPHERE. THE FIRST [illegible] ARE NOT [illegible] ESTIMATES BEFORE [illegible] WELL. THE FATE OF THE BOMB PRODUCED TRITIUM IS DISCUSSED IN SOME DETAIL AND IT APPEARS THAT [illegible] AND [illegible] PROPERTIES FOR WITHDRAWING STRATOSPHERIC TRITIUM. [illegible] DATA ON [illegible] CONCENTRATIONS ARE ALSO PRESENTED AS WELL AS SIMPLIFIED MODELS BUT STILL TO EXPLAIN THE TRANSPORT OF TRITIUM TO [illegible].

[illegible] SEA • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

077007
[illegible] FS
ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS [illegible] IN ATMOSPHERIC [illegible]
[illegible] CENTER AND STOCKHOLM [illegible]
11 PAGES, 7 TABLES, 4 FIGURES, [illegible], 3. [illegible], PP. [illegible]

[illegible] OF THE BOMB-PRODUCED TRITIUM INVENTORY AND FEATURES OF THE [illegible] AND DISTRIBUTION OF TRITIUM IN ATMOSPHERIC WATER VAPOR, [illegible], AND [illegible] PARAMETERS & BASIC FOR [illegible] PROPERTIES FOR THE INCORPORATION OF ARTIFICIAL TRITIUM INTO ATMOSPHERIC [illegible]. IT IS CONCLUDED THAT TRITIUM [illegible] IS PROMOTED IN THUNDERSTORM CLOUDS BY [illegible] DISSOCIATION TO WATER VAPOR [illegible] CONDITIONS. THE [illegible] OF TRITIATED [illegible] IS [illegible] BY THUNDERSTORM [illegible] OF [illegible] WITH TRITIATED [illegible] WHICH HAS BEEN [illegible] FROM THE STRATOSPHERE. [illegible] AND [illegible] TRITIUM FROM THE [illegible] OF [illegible] AND [illegible] IN THE [illegible] ATMOSPHERE ARE DISCUSSED. [illegible] TRITIUM [illegible] FROM [illegible] PAINT IS [illegible].

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

077101
[illegible] GS • [illegible] MS
TRITIUM
[illegible] PAGES, PUBLISHED BY [illegible], [illegible], [illegible], [illegible]

TRITIUM IS [illegible] IN A SYMPOSIUM HELD [illegible] AUGUST 31 THROUGH SEPTEMBER 2, 1971, IN LAS VEGAS, NEVADA. [illegible] CONFERENCE BY THE U.S. ENVIRONMENTAL [illegible] AND THE UNIVERSITY OF NEVADA, LAS VEGAS. THE [illegible] ATTEMPTED TO COVER THE ENTIRE SUBJECT, BY INCLUDE [illegible] WAS [illegible] ON THE ENVIRONMENTAL ASPECTS OF TRITIUM. THE [illegible] IS DIVIDED INTO TEN CHAPTERS CONCERNING THE HISTORY, [illegible], [illegible], [illegible] EFFECTS AND [illegible], ENVIRONMENTAL ASPECTS, [illegible] AND WATER PHYSICS OF TRITIUM.

[illegible] • [illegible] • [illegible] • [illegible], [illegible] • [illegible]

077104
[illegible] J
[illegible] OF KR-85 AND TRITIUM RELEASED FROM A NUCLEAR FUEL [illegible] PLANT
[illegible] NUCLEAR RESEARCH CENTER, ISRAEL • THE [illegible] UNIVERSITY
6 PAGES, 29 REFERENCES, [illegible] PHYSICS, [illegible], PP. [illegible] JANUARY 1979

THE ATMOSPHERIC DEPOSITION PARAMETERS FOR KR-85 AND H-3 FROM [illegible] CONTINUOUS RELEASED FROM A NUCLEAR FUEL REPROCESSING PLANT ARE ESTIMATED. THESE INCLUDE WASHOUT AND DRY DEPOSITION AND DEPOSITION THROUGH [illegible] ON PARTICULATE WATER. THEORETICAL CONSIDERATIONS SUGGEST THAT THE DEPOSITION COEFFICIENTS AT STEADY STATE CONDITIONS, FOR A CONTINUOUS PARTICULATE SOURCE AND LONG TIME PERIOD COMPARED FROM THE GENERAL DEPOSITION RELATIONS PREVIOUS TO DATE, DEPENDS ON THE INTERDEPENDENCE OF THE CONSTANTS OF THE STABLE ELEMENTS IN THE ATMOSPHERE, AND BECAUSE OF THE TEMPORARY STAR CHARACTERISTICS OF THE STABLE SPECIES.

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

077045
[illegible] CB • [illegible] G
ATOMIC ENERGY OF CANADA LIMITED, [illegible] AND HEALTH PHYSICS [illegible] PROGRESS REPORT, APRIL 1 TO JUNE 30, 1977
ATOMIC ENERGY OF CANADA, LTD., [illegible] OFFICE
AECL-6777 0, 17 PAGES, 1 FIGURES, SEPTEMBER 1977

[illegible] AND [illegible] NATURAL WATERS WERE [illegible] FOR [illegible]. A METHOD FOR DETERMINATION OF LOW LEVELS OF STABLE [illegible] WAS [illegible]. STUDIES WERE INITIATED ON [illegible] AND STABLE SR IN LAKE SEDIMENT, ON THE TRITIUM INPUT TO A LAKE WITH [illegible] WATER, AND ON THE [illegible] OF TRITIUM DETENTION BY SOIL ON THE EVAPORATION OF TRITIATED WATER FROM [illegible], [illegible] OF [illegible] AND [illegible] BY AQUATIC PLANTS RECEIVED THROUGH THE [illegible], [illegible] IN [illegible] SPECIES WITH [illegible]

[illegible]

[illegible] 1 [illegible]

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

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AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

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[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DATA • DESCRIPTION • PARTICIPATION • DEPENDENCY • THERMODYNAMICS INVESTIGATION • DEPENDENT • GAS

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

070400 [illegible]

[illegible] TEST WELLS AND WATER ANALYSES WERE USED TO LOCATE THE FRESHWATER-SALTWATER INTERFACE. THE HYDRAULIC CONDUCTIVITY WAS ESTIMATED FROM THE RESPONSE TO TEST WELLS TO BAROMETRIC AND TIDAL FLUCTUATIONS. ELECTRICAL ANALOGUE SIMULATIONS OF THE HYDRAULIC CONDUCTIVITY OF FRACTURE [illegible] GAVE A RESIDENCE TIME OF 14,000 YEARS FOR THE HYPOTHETICAL SALINE AQUIFER. THE TRACERS TIME THROUGH THE FRESHWATER LENS TO THE SEA IS ABOUT 3000-4000 YEARS - SUCH THAT TRITIUM IS ELIMINATED BY RADIOACTIVE DECAY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] ANALYSIS • DILUTION • [illegible] AND SEA • SOIL, [illegible] • OCEANIC WATER, [illegible] DEPARTURE • POLITICAL [illegible] PATHWAY • [illegible] SIMULATION • [illegible] • [illegible] MOVEMENT • WATER POLLUTION • SOIL PROPERTY, IN SITU • [illegible]

000011
[illegible] • [illegible] TO
IN-SITU PRECIPITATION SCAVENGING OF TRITIATED WATER VAPOR
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-51293 •, 7 PAGES, 7 TABLES, 1 FIGURE, 17 REFERENCES, SEPTEMBER 22, 1972

A METHOD FOR CALCULATING THE DEPOSITION OF TRITIUM POLLUTANTS A NUCLEAR ROAST CONSIDERS THE INTERACTION OF TRITIATED WATER VAPOR WITH PRECIPITATION. IT CALCULATES THE LONG-RANGE WET DEPOSITION OF TRITIUM FROM THE CALCULATED PRODUCTS-FLUXES CONCENTRATIONS AND THE MEASURED TOTAL RAINFALL, TEMPERATURE, AND RELATIVE HUMIDITY. THE METHOD IS TESTED ON HISTORIC DATA FROM A DIESTION NUCLEAR FACILITY FUNCTIONING. THE CALCULATED VALUES ARE FROM [illegible] TIMES THE MEASURED VALUES. THE DIFFERENCES MAY REFLECT THE LIMITED METEOROLOGICAL AND DEPOSITION MEASUREMENTS, THE INITIAL VARIABLE TOPOGRAPHY, AND UNCERTAINTIES IN WIND VELOCITY AND DIRECTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEPOSITION • MEASUREMENT • RAINFALL • [illegible] CALCULATION, [illegible] • PRECIPITATION • [illegible] • TEMPERATURE • WATER VAPOR • CONCENTRATION • TIME

001100
MECHERSKI PA • CHARLES JF
DEMONSTRATION OF RADIOACTIVE GAS CONTAMINATIONS OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS
U.S. PATENT 3,707,780 •, NOVEMBER 21, 1972

THIS PATENT RELATES TO MONITORING DEVICES WHICH ARE DISPOSED EXPERIMENTALLY TO A NUCLEAR DEVICE DETONATED IN A GEOLOGICAL FORMATION, GENERALLY A FOREMOREFRONT, AND DURING DEPOSIT EXPLORATION, TO PROVIDE A WAY MONITORING EQUIPMENT THEREBEFORE. SOME DETONATIONS OF THE NUCLEAR DETONATORS PRESENT IN THE FORMATION AS WELL AS IN FOREMOREFRONT COMPONENTS ARE TRITIATED. CONSEQUENTLY TRITIUM PRODUCED BY THE DETONATION TOGETHER WITH ANY HYDROGEN GAS PRESENT TENDS TO BE MONITORED TO FORM A TRITIATED WATER PRODUCT. THE WATER COMBINES WITH INORGANIC MATERIALS IN THE VICINITY OF THE DETONATION AND IS TRANSPORTED TO PARTS BY THE ACTION OF THE DETONATION PRODUCTS CAUSING SUCH AS TO MINIMIZE THE TRITIUM CONTENT OF INORGANIC MATERIALS EXPOSED BY THE FORMATION.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (75 CENTS/COPY)

DETONATION • WASTE TREATMENT • [illegible] • WASTE MANAGEMENT • [illegible] STATES • PATENT

001405
REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1968 THROUGH MAY 1969
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5296-MS •, 8 PAGES, 7 TABLES, 5 FIGURES, 9 REFERENCES, APRIL 1973

SURFACE AND GROUND WATER SAMPLES WERE ANALYZED FOR TRITIUM FROM 113 SAMPLING STATIONS DURING THE PERIOD AUGUST 1968 THROUGH MAY 1969. TRITIUM WAS DETECTED ONLY IN SURFACE AND GROUND WATER IN THE STREAM-CHANNEL ACTIVITIES IN THE BELLEMONT MA AND, LOS ALAMOS, AND WHITEROCK CANYONS WITHIN AND CONTIGUOUS AREAS. THESE CANYONS RECEIVE TREATED LOW-LEVEL RADIOACTIVE EFFLUENTS. THE TRITIUM IN AND AND LOS ALAMOS CANYON IS FROM OLD SURFACE PITS THAT CONTAINED TRITIUM. THE TRITIUM CONCENTRATIONS DECREASE DOWNSTREAM IN THE CANYONS THAT DO DILUTION WITH OTHER WASTE WATER, SURFACE SEEPAGE, AND STREAM RUNOFF.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION • DILUTION • GROUND WATER • SURFACE WATER • [illegible], [illegible] • [illegible] • [illegible], [illegible] • DECONTAMINATION

002301
OSTLUND HG
CERTAIN ENVIRONMENTAL ASPECTS OF TRITIUM
UNIVERSITY OF MIAMI, FLORIDA
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LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LOWER HUTT, NEW ZEALAND.-SOUTH PACIFIC OCEAN AREA, (1959-63), AT THE TRITIUM 051171 P 22

VI Biological Behavior

VI - BIOLOGICAL DYNAMICS

012090
ELWOOD JW
TRITIUM DYNAMICS IN FISH FROM A CHRONICALLY CONTAMINATED LAKE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-710401-A9 p. 11 PAGES, FROM THE 3RD NATIONAL SYMPOSIUM ON RADIOECOLOGY, OAK RIDGE, TENNESSEE, MAY 10, 1971

AFTER EXPOSURE OF FISH TO CONTAMINATED LAKE WATER FOR ABOUT 2 YEARS, THE BIOLOGICAL HALF-LIVES OF TRITIUM WERE 3.7 AND 900 DF TRIT IN BODY WATER, 0.4 AND FOR THE REMAINING 48 IN BODY WATER, AND 0.7 DAYS FOR ALL BUT A VERY SMALL FRACTION OF THAT WHICH WAS ORGANICALLY BOUND IN TISSUE. IT APPEARED THAT UNDER EQUILIBRIUM CONDITIONS THE CONCENTRATION FACTOR WAS LESS THAN 1.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ANIMAL + LAKE + BIOCHEMICAL UPTAKE + ANIMAL, FISH + SPECIFIC ACTIVITY + RADIATION EXPOSURE, CHRONIC + CONCENTRATION FACTOR

013050
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM
SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE
CONF-660413 p. 139 PAGES, TABLES, SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM, [illegible], FRANCE, APRIL 15-18, 1966, IN FRENCH

THE 29 PAPERS, TOGETHER WITH THE DISCUSSIONS FOLLOWING THEIR PRESENTATION, PRESENT [illegible] SEMINAR AT IT WISHES ON PROTECTION AGAINST THE DANGERS OF TRITIUM [illegible].

AVAILABILITY - SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, [illegible], FRANCE.

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013015
BIOMEDICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965
ARGONNE NATIONAL LABORATORY
ANL-7155 p. 367 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 1965

PROGRESS IS REPORTED FOR THE YEAR 1965 FOR RESEARCH IN THE AREAS OF RADIATION BIOLOGY. A LIST OF PUBLICATIONS BY MEMBERS OF THE RESEARCH STAFF OF THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION IS GIVEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $7.00 CY, $1.75 MF

BIOMEDICAL + CESIUM + ECOLOGY + MAMMALS + RADIATION DAMAGE + RADIATION SAFETY [illegible] + X-RAY + GAMMA + NEUTRON + SPECTROMETRY, GAMMA + RADIATION PROTECTION, CHEMICAL + RADIATION EFFECT

010070
LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
STI-PUB-18/[illegible] p. 194 PAGES, 67 FIGURES, 10 TABLES, 4 REFERENCES, TECHNICAL REPORTS SERIES NO. 49, AUGUST 1966

THIS MANUAL CONTAINS LECTURE MATERIAL AND LABORATORY EXPERIMENTS APPLICABLE TO A BASIC COURSE ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH. BASIC CONCEPTS OF NUCLEAR PHYSICS, RADIATION DETECTION, AND HEALTH PHYSICS ARE DISCUSSED, AND APPLICATIONS OF THE BASIC PRINCIPLES ARE DISCUSSED. EIGHTEEN LABORATORY EXPERIMENTS ARE GIVEN TO ILLUSTRATE THE USE OF VARIOUS RADIATION DETECTION INSTRUMENTS. 19 MINERS CARRY TRACER STUDIES IN RATS, DOGS, AND FROGS. ONE SHOWS THE ACUTE EFFECTS OF RADIATION ON RATS. THE MATERIAL IS WELL ORGANIZED, AND EACH SECTION IS FOLLOWED BY A BIBLIOGRAPHY. THE APPENDICES PROVIDE INFORMATION PERTINENT TO THE STUDIES.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, NEW YORK OR GENEVA, $4.00 COPY

BIOMEDICAL + ECOLOGY + COUNTER + DECONTAMINATION + HEALTH PHYSICS TRAINING + TRACER, RADIOACTIVE + ANIMAL + DECONCENTRATION + RADIATION EFFECT + RADIATION [illegible]

010079
NELSON, V
COLUMBIA RIVER STUDIES 1969-1970, APPENDIX, EFFECTS OF TEMPERATURE AND RADIATION ON LARVAE OF A PACIFIC OYSTER
UNIVERSITY OF WASHINGTON, SEATTLE
BLO-2279-TL-2 p. 7 PAGES, JUNE 27, 1970

SIGNIFICANT INCREASES IN LARVAL ABNORMALITIES OCCUR AT 29 C, AND DOSE EFFECTS OCCUR FROM 60TH TO 69 AND H-3 UPTAKE. CONCES. OF 10(-4)-10(-3) CI/LITER OF H-3 OR OF 10(-6)TH CI/LITER OF ZN-65 GAVE A DOSE OF ABOUT 0.3-0.4 RAD/DAY WHICH CAUSED THE ABNORMALITIES. SURVIVAL LESSENED AS THE RESULTING TEMPERATURE INCREASED FROM 20-28 C, BUT SURVIVAL WAS NOT AFFECTED BY DOSE.

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010775 [illegible]
FINE • [illegible] • [illegible] • BIOACCUMULATION/TUNGSTEN • AQUATIC MAMMALS •
[illegible]

021912
TOWER WT
[illegible] SPACE AND [illegible] IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF
TRITIUM [illegible]
[illegible] NUCLEAR CENTER, [illegible]
[illegible]-171-007 •, 34 PAGES, TABLES, REFERENCES, JUNE 1, 1967

[illegible] THE NATURAL, THROUGHFALL, STEMFLOW, EVAPORATION, TRANSPIRATION, PRECIPITATION, [illegible]. AND DESORPTION FROM THE [illegible] FOREST AT EL VERDE, PUERTO RICO. A [illegible] COMPARTMENTAL MODEL WITH FLOW RATES AND COMPARTMENTAL STORAGES WAS PREPARED. THE DIAGRAM [illegible] COMPUTATION OF TRANSIENT [illegible] FOR THE FLOW OF TRITIUM IN A TROPICAL FOREST, ASSUMING A [illegible] ON THE SYSTEM AND THE [illegible] OF THE TRACER [illegible]. A [illegible] MODEL FOR TRITIUM TRANSFER, BASED UPON THIS DIAGRAM, IS GIVEN IN THE APPENDIX. THE STEMS OF EL VERDE IS FOUND TO BE OF SIGNIFICANT [illegible] TO THAT OF PINUS DURING ITS WET SEASON BECAUSE THEIR [illegible] AND SATURATION DEFICITS ARE SIMILAR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA., $1.00 COPY, $0.65 MICROFICHE

[illegible] • [illegible] • [illegible], NUCLEAR

021154
[illegible] JJ
DESIGNED TRITIUM AT SEMAN CRATER
CALIFORNIA UNIV., LIVERMORE. LAWRENCE RADIATION LAB.
UCRL-70202 • CONF-670401-9 •, 14 PAGES, APRIL 2, 1967, PRESENTED AT 2ND NATIONAL SYMPOSIUM ON RADIOECOLOGY, ANN ARBOR, MICHIGAN

DESIGNED TRITIUM FROM THE SEDAN THERMONUCLEAR DETONATION, 6 JULY 1962, WAS SCAVENGED BY AN [illegible] IN THE 4-6 MILLION TONS OF EARTH MATERIALS MOVED BY THE DETONATION. AS A RESULT, THE SEDAN POST-SHOT ENVIRONMENT CONTAINED A MOST SIGNIFICANT RADIOLOGICAL TRACER IN THE FORM OF THE DESIGNED TRITIUM ITSELF IS FOUND IN MICROCLIMATE CONCENTRATIONS IN THE INTERSTITIAL WATER OF THE SEDAN THROUGHOUT SPILL. AND IN THE LARGE TISSUE WATER OF PLANTS WHICH HAVE RE-INVADED THE NEW SUBSTRATUM DEPOSITED IN THE LANDSCAPE ADJACENT TO THE CRATER. TRITIUM IS PRESENT NOT ONLY IN THE LARGE TISSUE WATER OF VASCULAR PLANTS GROWING ON THE SEDAN THEMSELVES, BUT A COMPARABLE LEVEL IS ALSO FOUND IN THE TISSUE-BOUND HYDROGEN OF THESE PLANTS. HYDROTROPES, [illegible] HYDROXYLIC COMPOUNDS, WHICH HAVE RE-INVADED THE SEDAN POST-SHOT ENVIRONMENT AND DESIGNED TRITIUM, ALSO HAVE TRITIUM CONCENTRATIONS IN THEIR BODY WATER BETWEEN 1 AND 3 MICROCURIES/ML. THESE BODY-WATER TRITIUM CONCENTRATIONS ARE CLOSELY RELATED TO THE LEVELS OF TRITIUM IN THE PLANT TISSUE-BOUND HYDROGEN. THE INTERNAL DOSE TO THE RESIDENT MAMMAL BY SEDAN CRATER FROM RESIDUAL TRITIUM IS ESTIMATED TO BE BETWEEN 10 AND 200 RAD, OR ABOUT 10 TIMES THAT FROM EXTERNAL RADIATION SOURCES RESULTING FROM THE DETONATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $1.00 COPY, $0.65 MICROFICHE

CRUSTACEAN • [illegible] • [illegible] • HYDROGEN • [illegible] • NUCLEAR DETONATION

070066
[illegible] DC
THE EFFECTS OF CHRONIC IRRADIATION BY TRITIATED WATER ON [illegible], THE [illegible]
UNIVERSITY OF WASHINGTON, SEATTLE
NVO-700-15 • CONF-710401-10 •, PAPER PRESENTED AT A SYMPOSIUM, MAY 10, 1970

GUPPIES WERE FEDDED [illegible] TRITIATED WATER [illegible]. THE OBJECTIVES WERE TO CHARACTERIZE SUBLETHAL EFFECTS OF CHRONIC IRRADIATION AND TO EVALUATE THE EFFECTS OF A RANGE OF [illegible] CONCENTRATIONS ON [illegible] AND [illegible]. SIGNIFICANT EFFECTS WERE [illegible] INCREASED [illegible] OF [illegible] AND AN [illegible] DECREASE OF [illegible] SEX CHROMOSOMES IN FISH FEDDED TO THE LOWEST [illegible] CONCENTRATION USED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible], FISH • [illegible] • CONCENTRATION • [illegible] EFFECT, SUPPLIES • [illegible], CHRONIC • [illegible], DOSE • [illegible], SEX

070077
CADDY JF
CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S. C.
DP-MS-67-94 •, 23 PAGES, 7 FIGURES, 2 TABLES, 16 REFERENCES, PRESENTED AT THE SYMPOSIUM ON ENVIRONMENTAL SIGNIFICANCE IN THE VICINITY OF NUCLEAR FACILITIES, JANUARY 24-25, 1968, [illegible], GEORGIA

TRITIATED WATER DEPOSITED ON THE SOIL SURFACE DIRECTLY TO THE ATMOSPHERE BY EVAPORATION FROM THE SOIL SURFACE AND BY TRANSPIRATION BY PLANTS. THE TIME FOR TRITIATED WATER TO EVAPORATE FROM A [illegible] SAND WAS MEASURED WHEN TRITIATED WATER WAS PLACED @ TO 16, 16 TO 30, AND 30 TO 67 CM BELOW THE SURFACE AND THE SOIL WATER CONTENTS OF 0.04 AND 0.10 G/G OF OVEN-DRY SOIL. THE EVAPORATION

070029 [illegible]
TIME INCREASED WITH THE DEPTH OF PLACEMENT AND WITH A DECREASE IN WATER CONTENT. TRITIATED WATER 14 TO 20 CM BELOW THE SOIL SURFACE DID NOT EVAPORATE BEFORE 48 HR. TRITIATED WATER 20 TO 47 CM BELOW THE SOIL SURFACE DID NOT EVAPORATE BEFORE 200 HR FROM SOIL WET TO 0.10 G/G OF OVEN-DRY SOIL, AND NOT BEFORE 500 HR FROM SOIL WET TO 0.05 G/G OF OVEN-DRY SOIL.

AVAILABILITY - J.C. CAREY, SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S.C. 29801

ECOLOGY • DEPOSITION • EVAPORATION • SOIL

070030
BLANE JR • JOHNSON CF
TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST
PUERTO RICO NUCLEAR CENTER, CARAMBA HEIGHTS STATION, SAN JUAN
2 PAGES, 2 FIGURES, 6 REFERENCES, SCIENCE, 160, PAGES 990-91 (MAY 3, 1968)

TRITIATED WATER APPLIED TO THE SURFACE OF SOIL IN A TROPICAL RAIN FOREST WAS FOUND IN FREE WATER OF THE LITTER AND TOP 10 CENTIMETERS OF SOIL AS LONG AS 7 MONTHS AFTER THE APPLICATION. PLANT ROOTS, EVEN IN THE HIGH-RAINFALL ENVIRONMENT OF A TROPICAL RAIN FOREST, THEREFORE ARE EXPOSED TO TRITIATED WATER FOR CONSIDERABLE PERIODS OF TIME AFTER RELEASE.

ECOLOGY • SOIL, RADIONUCLIDE MOVEMENT THROUGH • RADIATION MODEL • RADIONUCLIDE, TRACER • VEGETATION • CONCENTRATION

070037
[illegible] JJ • ANDERSON LD • MORTON JP
THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
19 PAGES, 8 FIGURES, 4 TABLES, 26 REFERENCES, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, 19(1), PP. 77-90 (FEBRUARY 1972)

TRITIUM IS PRODUCED NATURALLY AND WAS PRESENT IN LOW CONCENTRATIONS IN PRECIPITATION AND NATURAL BODIES OF WATER BEFORE ATMOSPHERIC TESTING OF NUCLEAR WEAPONS. OTHER SOURCES OF TRITIUM AND HOW PRESENT FORM WHICH TRITIUM IS RELEASED TO THE ENVIRONMENT. NUCLEAR REACTOR TRITIUM PRODUCTION, ACCORDING TO RECENT ESTIMATES, WILL EXCEED NATURAL TRITIUM PRODUCTION BEFORE THE YEAR 2000. PREDICTED INCREASES OF TRITIUM IN THE ENVIRONMENT WILL TAKE PLACE FIRST ON A LOCAL ECOLOGICAL LEVEL AND THEN OFTEN ON A BIOSPHERIC LEVEL. ITS BEHAVIOR IN THE ENVIRONMENT IS DISCUSSED.

ECOLOGY • WATER • EVAPORATION • HYDROLOGY • PRECIPITATION • RADIOACTIVITY RELEASE • ENVIRONMENT • WATER VAPOR • BEHAVIOR • TRANSPIRATION • WATER EXCHANGE

070041
AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS
CONGRESS OF THE UNITED STATES
6 PAGES, PG 505-510 OF JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, 1969

AT THESE HEARINGS CONCERN WAS EXPRESSED BY INTERESTED CITIZENS AS TO THE POSSIBLE ENVIRONMENTAL EFFECTS THAT MIGHT RESULT FROM ROUTINE RELEASES OF LOW LEVELS OF RADIOACTIVE HYDROGEN (TRITIUM) INTO THE BAY. THE BIOLOGICAL EFFECTS, IF ANY, OF EXPOSURES TO SUCH A LOW LEVEL WOULD BE TOO SMALL TO BE DETECTED, EVEN IF VERY LARGE POPULATIONS WERE EXPOSED, AND WOULD HAVE NO ECOLOGICAL SIGNIFICANCE. IN DEFINING LIMITS FOR TRITIUM APPLICABLE TO MEMBERS OF THE GENERAL PUBLIC, THESE EXPERT GROUPS HAVE TAKEN INTO ACCOUNT THE UNIQUE ENERGY AND ABSORPTION PROPERTIES OF TRITIUM AS THEY RELATE TO DISTRIBUTION OF THE DOSE IN BODY TISSUE.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

AEC QUESTION • ECOLOGY • REACTOR, PWR • POPULATION EXPOSURE • CALVERT CLIFFS 1 (PWR) • CALVERT CLIFFS 2 (PWR)

070064
[illegible] PT • [illegible] JB • [illegible] CG • [illegible] JJ • [illegible] JL
STUDIES ON LIVER AND IN TRITIATED KANGAROO RAT LIVING AT SEZANO CRATER
CALIFORNIA UNIVERSITY, LIVERMORE, LAWRENCE RADIATION LABORATORY
UCRL-50461 V., 20 PAGES, JULY 30, 1968

KANGAROO RATS LIVING NEAR THE CRATER OF AN OLD NUCLEAR EXPLOSION WERE FOUND TO BE UNIFORMLY TRITIATED. THE LIFETIME CHRONIC DOSE TO ADULT ANIMALS WAS ESTIMATED TO BE 10 RAD FROM INTERNAL H-3 AND 10 RAD FROM PRESISTENT EXTERNAL BETA- AND GAMMA-EMITTING RADIONUCLIDES. LIVER DNA WAS ISOLATED FROM THESE ANIMALS AND FROM CONTROL ANIMALS TRAPPED IN AREAS NOT AFFECTED BY RADIONUCLIDES. DNA FROM THE CRATER ANIMALS CONTAINED 6,000,000 BASE/G NUCLEOTIDES, IN COMPARISON WITH CONTROL DNA. THE CRATER DNA EXHIBITED THE FOLLOWING - HIGHER PROTEIN AND HISTONE, LOWER HELF FORCTION OF A + T NUCLEOTIDES, INCREASED TEMPLATE ACTIVITY DNA AND T DNA POLYMERASE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

NUCLEAR EXPLOSION • ANIMAL, VERTEBRATE • RADIATION EXPOSURE, CHRONIC • DNA • DEXRO ACID • MAMMAL, RAT • OLIVER • PROTEIN • RNA

[illegible]
[illegible] DE
RADIATION EFFECTS UPON WATER ABSORPTION AND SECRETION IN THE RAT
UNIVERSITY OF ROCHESTER, N. Y.
[illegible] PAGES, THESIS, 1967

WHOLE BODY X-IRRADIATION HAS A SIGNIFICANT EFFECT ON GASTROINTESTINAL ABSORPTION OF TRITIATED WATER IN THE RAT. THE IMPAIRMENT INCREASED STEADILY WITH MINIMAL ABSORPTION OCCURRING ON DAY 3. THE EARLY POST-IRRADIATION DAY WAS CHARACTERIZED BY AN ABRUPT RECOVERY WITH TRITIATED WATER ABSORPTION RETURNING TO CONTROL LEVELS. NO ALTERATION IN TRITIATED WATER ABSORPTION WAS OBSERVED BEYOND DAY 3 IN THE 21 DAY POST-IRRADIATION PERIOD STUDIED. FOLLOWING A 1500 R EXPOSURE, THE ABSORPTION OF TRITIATED WATER WAS EVEN LESS THAN THAT SEEN IN RATS IRRADIATED WITH 750 R. WITH THE SUBLETHAL EXPOSURE, THIS IMPAIRMENT INCREASED STEADILY UNTIL DEATH OF THE ANIMALS ENSUED.

ABSORPTION • BIOLOGICAL HALF-LIFE • LETHAL DOSE • RECOVERY • RADIATION EFFECT • MAMMAL, RAT • GI TRACT

[illegible]
PACHER PE
EVIDENCE AGAINST THE ALTERNATION OF SYNTHESIS OF IDENTICAL CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW RATES
INDIANA UNIVERSITY, BLOOMINGTON
7 PAGES, JOURNAL OF MOLECULAR BIOLOGY, VOLUME 20, PAGES [illegible] (SEPTEMBER 20, 1967)

SLOWLY GROWING CELLS IN MEDIUM CONTAINING SUCCINATE AS A CARBON SOURCE WERE LABELED FOR ABOUT HALF A GENERATION AND ABOUT TWO GENERATIONS WITH HEAT-THYMINE, AND THE SURVIVAL ON STORAGE AT LIQUID-NITROGEN TEMPERATURE WAS FOLLOWED. CELLS IN BOTH SAMPLES WERE INACTIVATED IN A FIRST-ORDER WAY. THE SURVIVAL CURVES SHOWED NO TENDENCY TO LEVEL OFF, EVEN WHEN SURVIVAL WAS FOLLOWED INTO THE FOURTH DECADE. THIS IS EVIDENCE AGAINST ALTERNATE SYNTHESIS OF IDENTICAL CHROMOSOMES IN THESE CELLS, A CONCLUSION SUPPORTED BY THE FACT THAT THE FINAL SLOPE OF THE SURVIVAL CURVE WAS PROPORTIONAL TO THE AMOUNT OF SELF-IRRADIATION OF THE RADIATION-SENSITIVE TARGET.

BACTERIA • CHROMOSOME EFFECT • CELL • CULTURE • DURATION, GENERATION

[illegible]
[illegible] V • [illegible] M • [illegible] G
THE STAGE OF CHROMOSOME REPLICATION IN THE CELL CYCLE AS REVEALED BY X-RAY BREAKAGE AND TH-THYMIDINE LABELING
CENTRO STUDI NUCLEARI, CASACCIA, ITALY
[illegible] PAGES, CHROMOSOMA, VOLUME 21, PAGES [illegible] (1967)

EXPERIMENTS WITH X IRRADIATION AND HEAT-THYMIDINE LABELING OF THE CHROMOSOMES IN THE DNA SYNTHESIS PHASE, AND SUBSEQUENT ANALYSIS AT METAPHASE OF THE AUTORADIOGRAPHS OF THE CHROMOSOMAL DAMAGE INDUCED DURING INTERPHASE, ARE REPORTED. IT WAS SHOWN THAT IN SOMATIC CELLS FROM A DIPLOID CHINESE HAMSTER LINE CULTURED IN VITRO THE CHROMOSOMES CHANGED THEIR RESPONSE TO RADIATION FROM SINGLE TO DOUBLE IN LATE G-SUB-1. THESE RESULTS INDICATED THAT THE CHROMOSOME DIVIDED INTO TWO CHROMATIDS IN G-SUB-1, BEFORE THE REPLICATION. BY EXTENDING THE OBSERVATIONS TO THE SECOND METAPHASE AFTER IRRADIATION, IT WAS SHOWN THAT CELLS IRRADIATED WHILE IN G-SUB-2, OR LATE S, STILL EXHIBITED MANY CHROMATID EXCHANGES; SOME OF WHICH WERE LABELED.

RADIOGRAPHY • GAMMA CHEMICAL • CHROMOSOME EFFECT • EFFECT, SYNTHETIC • DNA • CELL • CULTURE • MITOSIS • MUTATION

[illegible]
PILGRIM C • LEHNERT HJ • WESSER KJ • MOLLUNG T • WAGNER W
AUTORADIOGRAPHIC INVESTIGATION OF DIURNAL FLUCTUATIONS IN THE TH-INDEX AND THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, RAT RATUSES, ASCITES TUMOR CELLS
[illegible] PAGES, TRANSLATED FROM ZEITSCHRIFT FUER ZELLFORSCHUNG UND MIKROSKOPISCHE ANATOMIE, VOLUME [illegible], PAGES [illegible] (1967)

DIURNAL FLUCTUATIONS IN THE UPTAKE OF INJECTED TRITIUM, USED AS A LABEL FOR THYMIDINE, AND THE MITOTIC INDEX WERE INVESTIGATED IN 10 DIFFERENT CELL TYPES OF NORMAL MICE, IN FIVE FETAL CELL TYPES AND IN THREE ASCITES TUMORS. THE ANIMALS WERE SACRIFICED 60 MINUTES AFTER INJECTION OF HEAT-THYMIDINE. AUTORADIOGRAPHS WERE PREPARED FROM VARIOUS ORGANS. DIURNAL FLUCTUATIONS OF DNA SYNTHESIS, AS INDICATED BY THE UPTAKE OF TRITIUM-LABELED THYMIDINE, WERE OBSERVED IN A NUMBER OF CELL TYPES OF THE ADULT ANIMAL, ASIDE FROM THE DIURNAL FLUCTUATIONS IN THE MITOTIC INDEX. THESE HEAT-INDEX FLUCTUATIONS WERE FOUND WITHOUT EXCEPTION IN ALL CELL TYPES IN WHICH DIURNAL FLUCTUATIONS OF THE MITOTIC INDEX WERE OBSERVED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

RADIOGRAPHY • CELL • MAMMAL, RAT • FETUS • MITOSIS • TUMOR

[illegible]
BELL GD • APPLETON TC
DISTRIBUTION OF TRITIATED THYMIDINE IN ANIMALS AS SHOWN BY WHOLE-CELLULAR AUTORADIOGRAPHY
MEDICAL RESEARCH COUNCIL, LONDON (ENGLAND)
[illegible] PAGES, PP. 79-[illegible]

A NEW TECHNIQUE IS DESCRIBED FOR STUDYING THE INCORPORATION OF LABELED SOLUBLE COMPOUNDS IN WHICH

[illegible] ABSTRACT

THE LABELED MATERIAL IS UNMODIFIED. NO MATERIALS THAT MIGHT LEACH OUT SOLUBLE COMPOUNDS ARE USED UNTIL AFTER THE COMPLETION OF AUTORADIOGRAPHIC EXPOSURE. THE TECHNIQUE IS BOTH SIMPLE AND RELIABLE. FROZEN SECTIONS OF THE LABELED TISSUE ARE CUT ON A MEASE CRYOSTAT MOUNTED IN THE DARKROOM AND PICKED UP ON COLD COVER-SLIPS COATED WITH KODAK AR.10 STRIPPING FILM. THE COVER SLIPS ARE STORED, EXPOSED, PROCESSED, AND STAINED IN PERSPEX RACKS TO AVOID BREAKAGE. THE SECTIONS ARE KEPT FROZEN UNTIL COMPLETION OF THE EXPOSURE.

AVAILABILITY - USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D. C. 20545

ANALYTICAL TECHNIQUE • RADIOGRAPHY • SOLID • RADIONUCLIDE UPTAKE • ANIMAL

[illegible]
GALAND P • WINDEBEY P • ANDRIEUX A • CHEVEREM J • DOUMELS M
IN VITRO AUTORADIOGRAPHIC STUDIES OF CELL PROLIFERATION IN THE GASTROINTESTINAL TRACT OF MAN
FREE UNIVERSITY, BRUSSELS
3 PAGES, JOURNAL OF NUCLEAR MEDICINE, VOLUME 9, PAGES 37-9 (JANUARY 1968)

THE S PHASE (PHASE OF DESOXYRIBONUCLEIC ACID SYNTHESIS) AND CELL CYCLE DURATION WAS MEASURED IN HUMAN RECTAL MUCOSAL EPITHELIUM INCUBATED IN VITRO WITH H3-THYMIDINE. THE RESULTS OBTAINED ON AUTORADIOGRAMS WAS QUITE REPRODUCIBLE AND SEEMS COMPATIBLE WITH THE AVAILABLE DATA IN THE LITERATURE CONCERNING ESTIMATES MADE AFTER IN VIVO LABELING OF THIS TISSUE. THEREFORE THE PROCEDURE SEEMS TO CONSTITUTE A WAY OF AVOIDING THE BIOLOGICAL HAZARDS IN USING H3-THYMIDINE WHEN STUDYING THE PROLIFERATION OF HUMAN TISSUES.

RADIOGRAPHY • DNA • CELL, NUCLEUS • CULTURE • GI TRACT • MITOSIS

[illegible]
BRAUSE RD
TRITIATED THYMIDINE EFFECTS ON DNA, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L-CELLS
UNIVERSITY OF TORONTO, CANADA
14 PAGES, JOURNAL OF CELLULAR AND COMPARATIVE PHYSIOLOGY, VOLUME 70, PAGES 141-54 (OCTOBER 1967)

EXPONENTIALLY GROWING L CELLS WERE SYNCHRONIZED BY THE DOUBLE THYMIDINE-BLOCK METHOD AND EXPOSED TO HIGH SPECIFIC ACTIVITIES OF TRITIATED THYMIDINE. DNA, RNA, AND PROTEIN SYNTHETIC RATES WERE MEASURED THROUGH ONE CELL CYCLE WITH 1-HOUR PULSES OF THE APPROPRIATE C14(1)-LABELED PRECURSORS. EQUIVALENT DOSES OF TRITIATED WATER WERE SUBSTITUTED FOR TRITIATED THYMIDINE IN SOME EXPERIMENTS. TOTAL AMOUNTS OF DNA AND HISTONES PER NUCLEUS WERE DETERMINED SPECTROPHOTOMETRICALLY IN FEULGEN AND FAST-GREEN STAINED CELLS. IT WAS NOTICED THAT INCORPORATED TRITIATED THYMIDINE HAS AN EFFECT DISTINCT FROM THAT OF TRITIATED WATER AND THAT IT ENHANCES THE INCORPORATION OF THE PRECURSORS AT SPECIFIC STAGES OF THE CELL CYCLE, TO A DEGREE DIRECTLY PROPORTIONAL TO THE DOSE.

CARBON • SPECIFIC ACTIVITY • DNA • CULTURE • PROTEIN • RNA

[illegible]
HOLLE S • HEYDLE RD
SOME CHROMOSOME STUDIES WITH TRITIATED THYMIDINE
CALIFORNIA UNIVERSITY, SAN FRANCISCO
UCSF-1097-56 • CONF-670022-7 • , 10 PAGES, FROM INTERNATIONAL CONFERENCE ON REPLICATION AND RECONSTITUTION OF GENETIC MATERIAL, CANBERRA, AUSTRALIA, SEPTEMBER 1967

IT APPEARS THAT ABERRATIONS AS WELL AS SISTER STRAND EXCHANGES ARE INDEPENDENT OF THE DOSE OF TRITIATED THYMIDINE WITHIN THE RANGE OF DOSES ORDINARILY USED. THIS QUALITATIVE SIMILARITY GIVES GOOD SUPPORT TO THE NOTION THAT THE SISTER STRAND EXCHANGES COULD BE INDUCED BY THE PHOTOGENIC RADIATION RATHER THAN REPRESENT THE GENETIC PHENOMENON OF SPONTANEOUS SISTER STRAND CROSSING OVER. THE NOTION THAT THERE IS A COMPLETE NONRANDOMNESS IN THE DISTRIBUTION OF CHROMATIDS AFTER LABELING WAS NOT CONFIRMED. ON THE CONTRARY, RESULTS INDICATE THAT CHROMATIDS PROCEED TO THE POLES RANDOMLY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

CHROMOSOMAL EFFECT • EFFECT, GENETIC • RADIATION EFFECT, SPECIES

[illegible]
JAJDELA F
NUCLEAR RADIOLESIONS CAUSED BY THE USE OF RADIOACTIVE PRECURSORS OF NUCLEIC ACID
10 PAGES, PP. 899-908 OF RADIOBIOLOGIE APPLIQUEE, TOME II, PARIS, GAUTHIER-VILLARS, 1964 (IN FRENCH)

DATA ARE GIVEN ON NUCLEAR RADIOLESIONS FOLLOWING THE INCORPORATION OF TRITIUM-LABELED THYMIDINE BY DESOXYRIBONUCLEIC ACID. THE RADIOLESIONS OBSERVED IN ANIMAL AND VEGETABLE TISSUES ARE DESCRIBED AND THE RADIOLESIONS AT THE CELLULAR LEVEL ARE DISCUSSED. THE PRINCIPAL EXPERIMENTAL FACTORS IN THE PRODUCTION OF RADIOLESIONS BY INTRANUCLEAR IRRADIATION ARE SUMMARIZED. THE METHODS FOR DOSIMETRY ARE GIVEN. THE PRACTICAL CONSEQUENCES OF AUTORADIOGRAPHIC EXPERIMENTS ARE CONSIDERED.

DOSIMETRY • RADIOLESION • ANIMAL • ANIMAL, ANATOMY • DNA • CULTURE • LARGE MAMMAL

[illegible]
[illegible] HL • [illegible] DD • [illegible] FD • SCHEFFER LM • STOCKMANS PA
TRITIATED THYMIDINE AS A CYTOTOXIC AGENT IN HUMAN LEUKEMIA
[illegible] NATIONAL LABORATORY • MOUNT SINAI HOSPITAL, N. Y.
4 PAGES, BLOOD, VOLUME 28, PAGES 851-9 DECEMBER 1966

TWO PATIENTS WITH ACUTE LEUKEMIA HAD CONSIDERABLE DECREASES IN LEUKEMIC CELLS IN THE PERIPHERAL BLOOD AS WELL AS REDUCTIONS IN SIZE OF SPLEEN AND LEUKEMIC MASSES AFTER 19 INJECTIONS OF METH-TDR GIVEN OVER A 4-DAY PERIOD. EACH INJECTION WAS 1.75 MICROCURIES/GM BODY WEIGHT. THE PERTINENT ASPECTS OF CYTOTOXIC EFFECTS OF METH-TDR ARE REVIEWED. THE RADIATION DOSES DELIVERED TO THE NUCLEUS ARE ESTIMATED FROM AUTORADIOGRAPHIC DATA. EVIDENCE IS PRESENTED FOR THE CONTROLLED EFFECTS BEING DUE TO METH-TDR.

DOSE CALCULATION, INTERNAL • RADIOGRAPHY • TOXICITY • BLOOD • RADIATION EFFECT • LEUKEMIA

[illegible]
[illegible] OF • [illegible] • [illegible] AE
TOXICITY OF TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO INTRAPERITONEAL INJECTION
6 PAGES, RADIOBIOLOGICAL, VOLUME 6, PAGES 90-96 [illegible] 1966 [illegible]

TRITIUM OXIDE AT DOSES OF 2.4 AND 1.2 MC/G INTRAPERITONEAL INJECTIONS CAUSED A CLINICAL PICTURE OF ACUTE RADIATION SICKNESS IN RATS AND MICE WHILE THE INJECTION OF 1.0, 0.8, AND 0.6 MC/G CAUSED ONE OF ONLY MODERATE GRAVITY. THE LD50/30D WAS 1.09 MC/G FOR RATS AND 0.34 MC/G FOR MICE. RATS RECEIVED THE MINIMUM DOSE OF TISSUE IRRADIATION TWO WEEKS AFTER THE INTRAPERITONEAL INJECTION OF THE ISOTOPE STAT.

TOXICITY • RADIATION EFFECT, SPECIES • MAMMAL, RAT • EXPOSURE, IP

[illegible]
PHYSICS OF CELLULAR SYNTHESIS, GROWTH, AND DIVISION
[illegible] STATE UNIVERSITY
NASA-CR-70921 • N67-11891 •, 21 PAGES, NOVEMBER 7, 1966

SUMMARIES ARE PRESENTED OF THE FOLLOWING RESEARCH - CELL DENSITY GRADIENT CENTRIFUGATION OF INFANT BACTERIAL CELLS - HYDROSTATIC PRESSURE EFFECTS ON MACROMOLECULAR SYNTHESIS - CENTRIFUGAL EFFECT ON MACROMOLECULAR SYNTHESIS OF E. COLI - DIVISION OF NUCLEONS - HYDROGEN ATOM-ASSISTED DETO INTERACTION - DOSE SATURATION IN GAMMA-IRRADIATED INORGANIC SOLIDS - RADIATION EFFECTS ON PHENOLIC AND RELATED PURINE DERIVATIVES - DOSE BANDAL PARAMETRICS BY DECAY OF TRITIUM IN NUCLEIC ACID PYRIMIDINES - PHOTOCHEMIC ACTION AT THE MOLECULAR LEVEL - [illegible] IN DNA - BACTERIAL GROWTH IN HIGH SUGAR CONCENTRATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

GAMMA EMITTER • BACTERIA • GROWTH/DEVELOPMENT • DNA • AMINO ACID • CELL • MITOSIS • MUTATION • DNA

[illegible]
LEE WD
A QUANTITATIVE STUDY OF THE MUTAGENIC EFFECT OF TRANSMUTATION IN DROSOPHILA AND THE MEMORY OFF
LOUISIANA STATE UNIVERSITY, BATON ROUGE
NYO-3270-2 •, 7 PAGES, JUNE 30, 1969

PROGRESS IS REPORTED ON EXPERIMENTS DESIGNED TO DETERMINE THE GENETIC CONSEQUENCES OF CARBON-14 INCORPORATED INTO DNA OF DROSOPHILA MELANOGASTER. PRELIMINARY RESULTS ARE DESCRIBED ON FEEDING LARVAE WITH THYMIDINE LABELED WITH TRITIUM OR CARBON-14. THE RESULTS OF EXPERIMENTS ON ETHYL METHANESULFONATE-TREATED MOSAICS ARE SUMMARIZED AND THEIR SIGNIFICANCE FOR TRANSMUTATION STUDIES ARE DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

CARBON • INSECT • RADIATION EFFECT • DNA • MUTATION

[illegible]
BRYANT JG • [illegible] WJ
EFFECT OF TRITIATED THYMIDINE ON SISTER-CHROMATID EXCHANGE IN A RING CHROMOSOME
NEW MEXICO NATIONAL LABORATORY, ALBUQUERQUE
4 PAGES, MUTATION RESEARCH, VOLUME 7, PAGES 433-40 (MAY-JUNE 1969)

PERIPHERAL LYMPHOCYTES FROM A HUMAN MALE HETEROZYGOUS FOR A RING CHROMOSOME WERE CULTURED BOTH IN THE PRESENCE AND ABSENCE OF TRITIATED THYMIDINE. ANALYSIS OF COLCHICINE-ARRESTED CELLS SHOWED THAT INCORPORATED TRITIATED THYMIDINE INDUCED A SUBSTANTIAL INCREASE IN THE FREQUENCY OF RECIPROCAL RING CHROMOSOMES. CONSIDERABLE LEVELS OF RECIPROCALS IN THE FIRST AND SECOND CELL CYCLE FOLLOWING ISOTOPE INCORPORATION INDICATED THAT RECIPROCAL INDUCTION IS A TYPE STRITIUM-INDEPENDENT PROCESS.

CHROMOSOMAL EFFECT • BRAIN • MAMMAL, DOMESTIC • CELL • LYMPHATIC SYSTEM • MITOSIS

040002
PHILLIPS DL
THE CHARACTERIZATION OF REVERTANTS OF THE LACI IN E. COLI K-12 - A STUDY OF RADIATION ACTION ON THE GENE
PENNSYLVANIA STATE UNIVERSITY
67 PAGES, THESIS, 1968

THE MUTAGENIC PROPERTIES OF TRITIUM DECAY, ULTRAVIOLET LIGHT AND CO60 GAMMA-RAYS WERE STUDIED USING E. COLI. THESE AGENTS WERE USED TO REVERT THE LACI, THE REGULATOR LOCUS AND THE THIOGALACTOSIDE SYNTHETASE GENE WHICH BOTH CONTAIN NONSENSE TRIPLETS. REVERTANTS WERE SEPARATED INTO EIGHT CLASSES WHICH CONSISTED OF SEVEN CLASSES OF CELLS WHICH CONTAINED NONSENSE SUPPRESSORS AND ONE CLASS OF STRUCTURAL GENE REVERTANTS. REVERTANTS PRODUCED BY TRITIUM DECAY AND COBALT RADIATION WERE EXAMINED. THEY APPEARED TO BE NO LARGER MOLECULAR REARRANGEMENT AT THE SITE OF THYMIDINE-METHYL-HYD DECAY. TRITIUM DECAY IN THYMIDINE-METHYL-HYD, URACIL-6 HYD AND HISTIDINE-HYD APPEARED TO CAUSE MUTATIONS BY BETA PARTICLE IONIZATION.

BACTERIA • DNA • AMINO ACID • MUTATION • PROTEIN • ULTRAVIOLET

040003
PUHL FD
LETHALITY AND MUTATIONS PRODUCED BY TRITIUM DECAY IN BACTERIOPHAGES
PENNSYLVANIA STATE UNIVERSITY
84 PAGES, THESIS, 1967

THE VALUES OF THE KILLING EFFICIENCY FROM DECAYS OF HYD-TRIPHOSPHATE OF HYD-6-HYDROXYMETHYLCYTOSINE IN T4 BACTERIOPHAGE DNA, 0.126, AND DECAYS OF FIVE TRITIATED AMINO ACIDS IN T4 PROTEIN, 0.066, WERE DETERMINED. THE RATIO OF THE KILLING EFFICIENCIES OBTAINED FROM DNA PRECURSOR TO PROTEIN PRECURSOR, 2.7, WAS COMPARED TO A THEORETICAL RATIO, 2.3, WHICH WAS CALCULATED ASSUMING THAT INACTIVATION OCCURS SOLELY BY BETA PARTICLE IONIZATIONS IN THE PHAGE DNA. FROM THIS COMPARISON IT WAS CONCLUDED THAT NO SIGNIFICANT MOLECULAR REARRANGEMENT OF THE PARENT MOLECULE INVOLVING IN THE INACTIVATION OF T4 ACCURRED FROM DECAYS OF THESE DNA PRECURSORS, AND THAT THE PRIMARY MEANS OF INACTIVATION WAS BY BETA PARTICLE IONIZATIONS IN THE PHAGE DNA.

BETA EMITTER • LETHAL DOSE • DNA • AMINO ACID • MUTATION • PROTEIN • VIRUS

040775
BRYANT RJ
INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE
BROOKHAVEN NATIONAL LABORATORY • NAVAL RADIOLOGICAL DEFENSE LABORATORY
BNL-10327 P. 8 PAGES, JOURNAL OF CELL BIOLOGY, VOLUME 29, PAGES 29-36 (APRIL 1966)

TRITIUM FROM METHYL-H3-THYMIDINE WAS FOUND TO BE INCORPORATED INTO PROTEINS IN MICE. THIS INCORPORATION IN THE MOUSE AS A WHOLE APPROXIMATED DILUTION I AND TO PURITY OF THE INJECTED TRITIUM. TRITIATED WATER WAS NOT AN INTERMEDIATE. TRANSMETHYLATION REACTIONS ARE PROPOSED AS A MEANS WHEREBY CERTAIN AMINO ACIDS MIGHT HAVE ACQUIRED THE TRITIUM FROM THYMIDINE AT SOME STAGE OF ITS CATABOLISM. THE INITIAL 17 MIN RATIOS OF DNA TO PROTEIN TRITIUM ACTIVITIES PER MILLIGRAM OF DRY TISSUE RANGED FROM 4 IN THE TISSUES OF LOW DNA SYNTHETIC ACTIVITY TO 14 TO 40 IN THE TISSUES OF HIGH DNA SYNTHETIC ACTIVITY . LABELED NUCLEAR PROTEIN WAS CONSISTENT WITH LABELED DNA IN NUCLEI, WHERE IT CONSTITUTED LESS THAN 2.5 PERCENT OF THE TOTAL TRITIUM.

PHYSIOLOGY/METABOLISM • MAMMAL, MOUSE • EXPOSURE, IP • PROTEIN

040776
BOND VP • FEINENDEGEN LE
INTRANUCLEAR TH THYMIDINE - DOSIMETRIC, RADIOLOGICAL AND RADIATION PROTECTION ASPECTS
BROOKHAVEN NATIONAL LABORATORY
BNL-9699 P. HEALTH PHYSICS, VOL. 12, PAGES 1007-20 (AUGUST 1966)

TRANSMUTATION EFFECTS OF THE DISINTEGRATING H-3 NUCLIDE IN DNA APPEAR TO HAVE BEEN DEMONSTRATED TO PRODUCE GENETIC MUTATIONS IN MICROORGANISMS, AND DATA SUGGESTIVE OF THIS MECHANISM IN DROSOPHILA HAVE BEEN REPORTED. FROM AVAILABLE DATA, IT APPEARS THAT THE DEGREE OF GENETIC EFFECT IN MAMMALIAN CELLS CAN BE APPROXIMATED CLOSELY FROM THE DOSAGE ASSUMED DUE TO THE NUCLIDE. THE EFFICIENCY FOR H-3 BETA PARTICLES APPEARS TO BE 1.0 RATHER THAN THE VALUE OF 1.7 CURRENTLY USED FOR RADIATION PROTECTION.

DOSIMETRY • MOUSE CALCULATION, INTERNAL • RADIOBIOLOGY • RADIATION SOURCE, INTERNAL • RADIATION EFFECT • MUTATION • TRP

040779
NEUTGENS RJ
INDUCTION OF LEUKEMIA IN THE CAT BY MEANS OF TRITIATED THYMIDINE
UNIVERSITY, BRUSSELS
9 PAGES, COMPTES RENDUS DES SEANCES DE LA SOCIETE DE BIOLOGIE, VOL. 190, PAGES 1009-7 (1964)(FR FRENCH)

TWO GROUPS OF CAT OF MALE AND FEMALE SEXES WERE INSTALLED AFTER THE ANIMALS OF THE FIRST GROUP WERE INJECTED AT BIRTH WITH TRITIATED THYMIDINE AT A DOSE OF 0.9 MICROCURIE PER BODY WEIGHT. THE ANIMALS OF THE CONTROL GROUP RECEIVED A PHYSIOLOGICAL SERUM. IN THE ANIMALS INJECTED WITH TRITIATED THYMIDINE, 4 DEATHS COLLOWING THE APPEARANCE OF A LYMPHOID LEUKEMIA OCCUR A LATENCY PERIOD FROM 315 TO 526 DAYS WERE OBSERVED. NO LYMPHOMA OR OTHER MALIGNANCY FOUND WAS OBSERVED IN

040770 [illegible]
THE CONTROL GROUP.

MORTALITY • RADIATION SOURCE, INTERNAL • RADIATION EFFECT • MAMMAL, MOUSE • LEUKEMIA • TUMOR

040779
PERSON S • BECKMAN RC
EVIDENCE FOR A MUTAGENIC LOCAL EFFECT ACCOMPANYING THE DECAY OF INCORPORATED TRITIUM IN ESCHERICHIA COLI
PENNSYLVANIA STATE UNIVERSITY
7 PAGES, JOURNAL OF MOLECULAR BIOLOGY, VOL. 13, PAGES 400-2 SEPTEMBER 1965

THE DECAY OF INCORPORATED TRITIUM COMPOUNDS PRODUCES LOSS OF COLONY-FORMING CAPACITY IN BACTERIA. THE LOSS OF COLONY-FORMING CAPACITY SEEMS EXPLICABLE DIRECTLY ON THE BASIS OF MUTATION DUE TO THE NUCLEAR DECAY OF THE BACTERIUM. THUS THE EXISTENCE OF A LOCAL EFFECT, E.G., A MOLECULAR REARRANGEMENT AT THE SITE OF DECAY, HAS NEVER BEEN SUBSTANTIATED. THE MUTAGENIC EFFECTIVENESS OF THE DECAYSONS FOR DNA (WEAK-BINDING), RNA, HIGH-THYMIDINE, OR PROTEIN (HIGH-LABELED BOTHO ACIDS) HAVE RELATIVE VALUES OF 0.4, 7.4 AND 1.0, RESPECTIVELY.

BACTERIA • RADIATION SOURCE, INTERNAL • RADIATION EFFECT • DNA • AMINO ACID • MUTATION • PROTEIN • DNA

040780
GLIVENKO E • GLIVENKO A
THE MUTAGENIC EFFECT OF TRITIATED URIDINE IN DROSOPHILA SPERMATOCYTES
STATE UNIVERSITY, LEIDEN
4 PAGES, MUTATION RESEARCH, VOL. 2, PAGES 301-4 AUGUST 1965

THE MUTAGENIC EFFECTS OF B PARTICLES FROM INCORPORATED HIGH-THYMIDINE OR HIGH-URIDINE IN DROSOPHILA SPERMATOCYTES WERE STUDIED. SINCE DETHYMIDINE B DIMINISHES THE INCORPORATION OF URIDINE, BUT NOT THAT OF THYMIDINE, A COMPARISON OF MUTAGENIC EFFECTIVENESS OF THE TWO TRITIATED NUCLEOSIDES WAS MADE WITH AND WITHOUT DETHYMIDINE B CO-TREATMENT. HIGH-URIDINE WAS FOUND TO BE A MORE EFFECTIVE MUTAGENIC AGENT THAN HIGH-THYMIDINE, IN SPITE OF THE EFFECT THAT THE SPECIFIC ACTIVITY OF THE THYMIDINE WAS GREATER THAN THAT OF THE URIDINE.

RADIONUCLIDE, INGESTED • RADIATION SOURCE, INTERNAL • SPECIFIC ACTIVITY • DOSE • CELL, NUCLEOLUS • CELL, NUCLEUS • MUTATION • DEFINITION

040781
[illegible] JJ
PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND
UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-12783-T 0, 13 PAGES, HEALTH PHYSICS, VOL. 11, PAGES 1465-47 DECEMBER 1965

THE RESULTS OF A PRELIMINARY SURVEY OF DETONATION SITE SAMPLES IN THE PACIFIC PROVING GROUNDS INDICATE THAT DETONATED TRITIUM AND C14 ARE PRESENT IN RELATIVELY HIGH CONCENTRATIONS IN SOIL MATERIALS OF THE DETONATION SITES AT TIMES UP TO 12 YEARS AFTER THE BURST. EXCHANGE OF SOIL-BOUND TRITIUM WITH THE AVAILABLE SOIL WATER TAKES PLACE AT A SLOW BUT SIGNIFICANT RATE AND TRITIUM IS DETECTABLE IN PLANTS GROWING IN THE DETONATION ENVIRONMENTS. CARBON-14 IS ALSO ELEVATED IN THE TERRESTRIAL PLANTS. TRITIUM AND C14 ARE ALSO PRESENT IN ELEVATED CONCENTRATIONS IN MARINE ORGANISMS.

OCEANS • NUCLEAR DETONATION • SOIL • PHOTOSYNTHESIS • CONCENTRATION • ANIMAL, ARTHROPOD

040782
STEIN RL
PROGRESS REPORT ON USE OF TRITIATED THYMIDINE AS INTERNAL SOURCE OF RADIATION IN STUDY OF LATENT BODY INFLAMMATION, 1964-1966
MASSACHUSETTS UNIVERSITY, AMHERST
NYO-9941-7 0, 10 PAGES, 1966

FROG AND RAT SPLEENS WERE GROWN IN COLD THYMIDINE AT 0.6% AND 0.0005% (THE LATTER IS 1000 TIMES THE CONCENTRATION AVAILABLE TO THE PLANTS TREATED WITH TRITIATED THYMIDINE). NO EFFECT ON SOMATIC BODY LENGTH WAS FOUND IN FITTED STATES. IN CONN A POSSIBLE DISTURBANCE OF LATENT BODY PATTERN WAS NOTICED. DEPART RUNS WITH BETTER EXPERIMENTAL CONTROLS WILL MODIFY PRESENT CONCLUSIONS. IN RAT BODIES GROWN IN .04 AND 04 PPM THYMIDINE NO PROBING OF THE MITOTIC CYCLE WAS ANSWERED.

OPLANT, SPECIMENTOMATE • RADIATION SOURCE, INTERNAL • CELL • INHERITANCE • MITOSIS

040787
[illegible] PW
THE EFFECT OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE MORTALITY OF THE ADULT DROSOPHILA MELANOGASTER LARVAE (PART III)
CERMACE NUCLEAR RESEARCH CENTER, ATOMIC ENERGY COMMISSION, INTERNAL STUDIES
CNAEN-37 0, 13 PAGES, NOVEMBER 1964

THE APPLICATION OF TRITIATED THYMIDINE AND CO-60 GAMMA IRRADIATION AT DIFFERENT TIMES TO THE SAME ADULT DROSOPHILIC LARVAE CAUSED A HIGH RATE AN ADDITIVE MORTALITY EFFECT. THE APPLICATION OF ABOU

04070 (CONTINUED)

IRRADIATING AGENTS TO THE LARVAE SIMULTANEOUSLY CAUSED A HIGHER MORTALITY RATE WHICH WAS EVEN MORE THAN AN ADDITIVE ONE. SEVERAL FACTORS THAT MIGHT AFFECT THE INCREASE IN MORTALITY RATE OF DROSOPHILA LARVAE WHEN EXPOSED TO RADIATIONS WERE ALSO STUDIED. HOWEVER IT WAS FOUND THAT IRRADIATED TRITIATED THYMIDINE WAS ALMOST THE MOST IMPORTANT FACTOR FOR INCREASED MORTALITY IN THE LARVAE.

CHEMLT • GAMMA EMITTER • MORTALITY • RADIATION SOURCE, INTERNAL • INSECT • IMMATURE

04070A
FEINENDEGEN LE
RADIATION DECOMPOSITION OF TRITIUM-LABELED COMPOUNDS
10 PAGES. PP. 56-71 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

THE PRINCIPAL CHARACTERISTICS OF TRITIUM-LABELED ORGANIC MOLECULES ARE SURVEYED WITH EMPHASIS ON THE STABILITY OF THE LABEL IN BIOLOGICAL SYSTEMS AND PRIMARY REACTIONS. AMONG THE LABELED COMPOUNDS DISCUSSED ARE - THYMIDINE, AMINO ACIDS, STEROIDS, AND COMPOUNDS OF EXTREMELY HIGH SPECIFIC ACTIVITY. METHODS FOR THE DETERMINATION OF RADIOCHEMICAL PURITY OF THE SPECIFIC COMPOUNDS AND A DISCUSSION OF THE RADIATION DECOMPOSITION OF TRITIUM-LABELED MOLECULES AND THE STORAGE CONDITIONS THAT SHOULD BE ADHERED FOR THEM ARE ALSO INCLUDED.

RADIOCHEMICAL ANALYSIS • SPECIFIC ACTIVITY • DECOMPOSITION • AMINO ACID • PROTEIN

04070B
FEINENDEGEN LE
TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS
6 PAGES. PP. 550-61 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

TRITIUM-LABELED LEUCINE, PROLINE, AND HISTIDINE WERE LESS TOXIC IN ESCHERICHIA COLI THAN H3-NUCLEOSIDES AND LED TO A KILLING EFFICIENCY OF APPROXIMATELY ONE-HALF THE VALUE OBTAINED FOR H3-URIDINE AND H3-THYMIDINE. STUDIES ON RELATIVE TOXICITY OF H3-CYTIDINE AND H3-THYMIDINE IN HELA CELLS IN CULTURE SHOWED THAT UP TO 0.1 MICROCURIE OF H3-CYTIDINE PER MILLILITER TO MEDIUM HAD NO SIGNIFICANT EFFECT ON VIABILITY, WHILE THE SAME DOSE OF H3-THYMIDINE REPRESSED SURVIVAL TO 19.0 PERCENT.

BACTERIA • TOXICITY • AMINO ACID • CELL, NUCLEUS • CULTURE • PROTEIN

04070C
FEINENDEGEN LE
TOXICITY OF TRITIUM-LABELED THYMIDINE
10 PAGES. PP. 570-79 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

EFFECTS OF TRITIUM-LABELED THYMIDINE ON DNA IN THE NUCLEUS AND GENETIC MATERIAL OF MULTIPLYING CELLS ARE EMPHASIZED. WITHIN THE GROUP OF RADIATION EFFECTS, DESIGNS MITOTIC DELAY AND LETHALITY, CHROMOSOME CHANGES AND DELAYED MANIFESTATIONS SUCH AS NEOPLASMS AND TUMOR INDUCTIONS ARE OF PREVAILING INTEREST. DATA ARE PRESENTED FOR EFFECTS ON MICROORGANISMS, INSECTS, PLANTS, AND ANIMALS. RELATED INFORMATION CONTRASTING WITH H-3 THYMIDINE TOXICITY OR DEALING ON THE PROBLEM OF GENETIC DAMAGE CAUSED BY OTHER TRITIUM-LABELED AMINO ACIDS IS ALSO CITED

TOXICITY • EFFECT, GENETIC • DNA • CELL, NUCLEUS • MUTATION • PROTEIN

04070D
FEINENDEGEN LE
TRANSMUTATION EFFECT
2 PAGES. PP. 581-7 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

WHEN THE CHROMOSOME OF ESCHERICHIA COLI WAS LABELED WITH H-3 THYMIDINE, VIABILITY LOSSES CORRESPONDED TO AN INCREASING NUMBER OF TRITIUM DISINTEGRATIONS, ALTHOUGH THE TRANSMUTATION WAS NOT AFFECTED. THE EFFECT OF TRITIUM ON THE EXPRESSION OF ANTIBIOTIC RESISTANCE FOR E. COLI WAS INVESTIGATED. TRITIUM BOUND MORE TO DNA WAS SIGNIFICANTLY MORE EFFECTIVE IN YIELDING DEVOTED MUTANTS AMONG THE SURVIVORS THAN WAS TRITIUM BOUND TO DNA OR PROTEIN. TRANSMUTATION EFFECTS ARE CONSIDERED EXPRESSIONS OF INCREASED MOLECULAR REACTIONS INSUFFICIENT FOR CAUSING DEATH BUT CAPABLE OF INDUCING MUTATIONS - THEREFORE THEY SHOULD BECOME OPPORTUNISTIC IN CELLS OF HIGHER ORGANISMS WITH IMPROVED GENETIC TECHNIQUES.

BACTERIA • EFFECT, GENETIC • RADIATION EFFECT • DNA • PHENOTYPE • MUTATION • PROTEIN • RNA

04070E
FEINENDEGEN LE
TOXICITY OF TRITIUM-LABELED WATER
6 PAGES. PP. 517-70 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

040798 [illegible]

THE DOSE OF TRITIUM REQUIRED TO PRODUCE TOXIC EFFECTS IN PARAMECIUM WAS VERY LARGE COMPARED WITH THAT FOR MAMMALS. THE DETERMINANT ROLE OF THE NUCLEUS IN RADIOSENSITIVITY OF MAMMALIAN CELLS WAS SHOWN BY EXPERIMENTS ON RELATIVE TOXICITY OF TRITIUM-LABELED WATER AND THYMIDINE INCORPORATED INTO DNA OF HELA TISSUE CULTURE CELLS.

BACTERIA • RADIOSENSITIVITY • TOXICITY • MORTALITY • MAMMAL • DNA • CELL, NUCLEUS • CULTURE

040799

HAPLOS WD • PETERSON P

GENETIC EFFECTS OF TRITIATED THYMIDINE AND EVIDENCE FOR ITS INCORPORATION INTO A CYTOPLASMIC COMPONENT OF THE EARLY TESTIS OF DROSOPHILA MELANOGASTER

CITY OF HOPE MEDICAL CENTER, DUARTE, CALIF. • NORSK HYDRO INSTITUTE FOR CANCER RESEARCH, OSLO

17 PAGES, MUTATION RESEARCH, VOL. 8, PAGES 177-90 (JULY-AUGUST 1969)

SEX-LINKED RECESSIVE LETHALS WERE INDUCED BY THE INJECTION OF H-3 THYMIDINE INTO MALE EMBRYOS OF DROSOPHILA MELANOGASTER. ELEVEN MUTATION RATES WERE OBSERVED EARLIER THAN THE TERM DAY POST-INJECTION WHEN THE FIRST LABELED SPERM CELLS ARE EXPECTED TO BE AVAILABLE FOR FERTILIZATION. AUTORADIOGRAPHIC PROOFREAD FROM TESTES OF MALES TAKEN FROM SUCCESSIVE BROODS DISCLOSED A CYTOPLASMIC LABEL THAT WAS REMOVABLE BY DNASE. IT IS SUGGESTED THAT RADIATIONS FROM THE LABELED CYTOPLASMIC DNA WERE RESPONSIBLE FOR THE MUTATIONS PRODUCED IN THE EARLY BROODS. THE NATURE OF THE CYTOPLASMIC DNA WHICH HAS INCORPORATED THE H-3 THYMIDINE IS NOT KNOWN.

DISINFECTANT, MUTAGENIC • EFFECT, GENETIC • RADIATION SOURCE, INTERNAL • RADIATION EFFECT, SPECIES • INSECT • DNA • TESTIS

040800

BERGER JE • OLIVIERI G

THE KINETICS OF CHROMATID ABERRATIONS INDUCED IN CHINESE HAMSTER CELLS BY TRITIUM-LABELED THYMIDINE

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

[illegible] 9. 14 PAGES, RADIATION RESEARCH, VOL. 29, PAGES 779-92 (AUGUST 1966)

DOSE CURVES WERE OBTAINED FOR THE INDUCTION OF THE VARIOUS TYPES OF CHROMATID ABERRATIONS BY TRITIATED THYMIDINE. WHEN THE YIELDS OF ABERRATIONS WERE PLOTTED AGAINST THE NUMBER OF GRAINS IN THE AUTORADIOGRAMS, TERMINAL DELETIONS AND CHROMATID EXCHANGES EXHIBITED ONE-HIT AND TWO-HIT COMPONENTS IN THEIR DOSE CURVES, AND ISOCHROMATID DELETIONS EXHIBITED LINEAR KINETICS. SINCE THE NUMBERS OF SILVER GRAINS OBTAINED FOR A GIVEN FILM EXPOSURE TIME WERE MEASURES OF RELATIVE DOSE RATES, IT WAS ASSUMED THAT THEY WERE ALSO AN ACCURATE ESTIMATION OF THE TOTAL RELATIVE DOSES.

CHROMOSOMAL EFFECT • EFFECT, GENETIC • RADIATION SOURCE, INTERNAL • EFFECT, SOMATIC • RADIATION EFFECT • CELL, NUCLEUS • CULTURE

040801

SCHEUERMANN W • TASCHNER K

UPTAKE OF TRITIATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA FABA (L)

TECHNISCHE UNIVERSITY, HANNOVER

10 PAGES, RADIATION RESEARCH, VOL. 30, PAGES 483-97 (DECEMBER 1967)

A QUICK AND ACCURATE METHOD FOR DETERMINATION OF TRITIUM-LABELED THYMIDINE IN TISSUE WAS DISCUSSED. AFTER H3-TDR INCORPORATION INTO THE ROOT TIP MERISTEM OF VICIA FABA, TOTAL H3 ACTIVITY AS WELL AS H3-DNA ACTIVITY WAS MEASURED BY LIQUID SCINTILLATION COUNTING. THE INCORPORATION RATE OF H3-TDR USING VARIOUS PARAMETERS WAS EXAMINED - FOR EXAMPLE, THE AMOUNT OF INCORPORATED H3-TDR AS A FUNCTION OF DURATION OF TREATMENT AND AS A FUNCTION OF THYMIDINE CONCENTRATION IN THE NUTRIENT SOLUTION. THE EXPERIMENTAL RESULTS TOGETHER WITH OTHER DATA METHOD THE CALCULATION OF THE AVERAGE NUMBER OF INCORPORATED THYMIDINE MOLECULES PER LABELED CELL NUCLEUS.

COUNTING • ANALYTICAL TECHNIQUE • LIQUID • DEOXYRIBONUCLEIC UPTAKE • CONCENTRATION • PLANT • CELL, NUCLEUS

040802

LEARNING BY

LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS

UNIVERSITY OF CALIFORNIA, LOS ANGELES

3 PAGES, ANALYTICAL BIOCHEMISTRY, VOL. 26, PAGES 445-7 (DECEMBER 1968)

A METHOD IS DESCRIBED FOR DETERMINING RADIOACTIVITY IN TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS. THE PROTEIN IS FIRST LIBERATED FROM THE GEL BY DISSOLVING THE GEL WITH NO DEGREE HYDROGEN PEROXIDE. THE FREE PROTEIN IS THEN BROUGHT INTO INTIMATE CONTACT WITH THE SCINTILLATION SOLVENT BY MEANS OF A NEW SOLUBILIZING AGENT. LIQUID SCINTILLATION SPECTROMETRY IS USED TO COUNT THE SAMPLES AND ALL STEPS ARE DONE IN SCINTILLATION VIALS UNDER CONDITIONS CONSIDERED OPTIMAL FOR NO LOSS OF TRITIUM RADIOACTIVITY. THE RESULTS OF DETERMINING RADIOACTIVITY IN INCREASING AMOUNTS OF BLOOD-DRY ARE TABULATED. IT WAS FOUND THAT AS THE AMOUNT OF SERUM IS INCREASED THERE IS A CORRESPONDING INCREASE IN THE NET ACTIVITY OF THE SERUM ALBUMIN

ANALYTICAL TECHNIQUE • SPECTROMETRY, DATA • POLYACRYLAMIDE GELS • LIQUID • PROTEIN

041974
CLEAVER JE
THYMIDINE METABOLISM AND HT THYMIDINE SUICIDE IN MAMMALIAN CELLS
UNIVERSITY OF CALIFORNIA, SAN FRANCISCO
UCSF-TID7-33 • CONF-671076-1 •. 21 PAGES. SEPTEMBER 2, 1967. FROM MEETING ON BIOMEDICAL EFFECTS OF TRANSMUTATION AND DECAY OF INCORPORATED ISOTOPES. VIENNA, AUSTRIA

SUICIDE EXPERIMENTS WITH MOUSE LYMPHOMA CELLS DEMONSTRATE THAT THE KILLING EFFICIENCY PER H-3 DECAY DEPENDS ON THE LOCATION OF THE H-3 ATOMS. SURVIVAL CURVES FOR CELL KILLING FROM DECAYS IN THE DNA STRAND, NUCLEAR DNA, WHOLE CELL DNA, AND WHOLE CELL DNA PLUS PROTEIN ARE ALL EXPONENTIAL WITH NO SHOULDER. THE SURVIVAL CURVE FOR H-3 DECAYS IN BOTH DNA STRANDS IS SIMILAR TO THAT FOR SINGLE STRAND LABEL AT LOW NUMBERS OF DECAYS BUT IS STEEPER ABOVE 400 DECAYS PER CELL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

BETA EMITTER • MAMMAL • DNA • CELL. STEM • DNA

041006
INFLUENCE OF DRUGS ON INTESTINAL CIRCULATION AND THE ABSORPTION OF TRITIUM-LABELED WATER IN THE SMALL INTESTINE OF RATS
UNIVERSITY OF TUEBINGEN, GERMANY
20 PAGES. ARCHIV FUER EXPERIMENTALE PATHOLOGIE UND PHARMAKOLOGIE, NAUNYN-SCHMIEDEBERG'S. VOL. 244. PAGES 199-224 (1962) (IN GERMAN)

IN URETHAN-ANESTHETIZED RATS, TRITIATED WATER (HTO) IN ISOTONIC SALINE WAS INJECTED INTO AN CONTINUOUSLY PERFUSED THROUGH THE LUMEN OF A JEJUNAL LOOP. THE VENOUS OUTFLOW OF THE LOOP, ITS BLOOD CONCENTRATION, AND AMOUNT OF HTO (ABSORPTION RATE) WERE DETERMINED. THE LOSS OF BLOOD WAS SUBSTITUTED BY AN APPROPRIATE INFUSION OF BLOOD. WHEN HTO WAS INJECTED INTO THE JEJUNAL LOOP, THE HTO BLOOD CONCENTRATION AND ABSORPTION RATE DECREASED EXPONENTIALLY. THE DECREASE WAS PROPORTIONAL TO THE BLOOD FLOW. WHEN THE HTO WAS PERFUSED THROUGH THE LUMEN OF A LOOP, THE HTO BLOOD CONCENTRATION AND ABSORPTION RATE WERE CONSTANT IN RELATION TO TIME. WITH INCREASED BLOOD FLOW THE HTO BLOOD CONCENTRATION DECREASED AND THE HTO ABSORPTION RATE INCREASED.

ABSORPTION • ACCUMULATION • BLOOD • MAMMAL, SMALL • BLOOD, SERUM • BLOOD, VASCULAR SYSTEM • INTESTINE, SMALL

041007
BAKER HF • BLACK AL • BRAND RS • RISK RA
BODY WATER TURNOVER IN CATTLE WITH PARASITIC GASTROENTERITIS
UNIVERSITY OF CALIFORNIA, DAVIS
6 PAGES. EXPERIMENTAL PARASITOLOGY. VOL. 27. PAGES 271-6 (DECEMBER 1969)

CATTLE WERE INJECTED WITH HT2O TO STUDY TOTAL-BODY WATER TURNOVER AND VOLUME IN NORMAL AND SEVERELY PARASITIZED ANIMALS. THE PARASITIZED CATTLE WERE HEREFORD HEIFERS WHICH HAD ACQUIRED INFECTIONS WITH OSTERTAGIA OSTERTAGI, TRICHOSTRONGYLUS AXEI, AND COOPERIA SPP WHILE ON PERMANENT PASTURE. DURING THE HT2O TURNOVER STUDIES ALL ANIMALS HAD FREE ACCESS TO FEED AND WATER. THE MEAN TOTAL-BODY WATER VOLUME IN PARASITIZED ANIMALS WAS 70 PERCENT OF THE BODY WEIGHT. THIS REPRESENTS AN INCREASE OF 8 TO 15 PERCENT OVER THAT FOUND IN NORMAL ANIMALS OF SIMILAR AGE. THE MEAN TURNOVER RATE OF BODY WATER IN NORMAL ANIMALS WAS 0.273, WHILE THAT OF PARASITIZED CATTLE WAS 0.110.

WATER, DRINKING • PARASITISM • MAMMAL, LARGE

041020
MARSYNOVICH P • NEW IN RC • BLUM PE • WEINER ES
TH THYMIDINE INCORPORATION INTO NUCLEAR DNA OF LEAF CELLS
VILLANOVA UNIVERSITY, PA.
4 PAGES. PLANT PHYSIOLOGY. VOL. 42. PAGES 814-18 (JUNE 1967)

THE INCORPORATION OF HT3-THYMIDINE INTO NUCLEAR DNA OF LEAF CELLS OF IPOMOEA PENNSYLVANICUM WAS STUDIED AS A FUNCTION OF CONCENTRATION AND SPECIFIC ACTIVITY OF THE RADIOISOTOPE. FROM THE ASSESSMENT OF THE AVERAGE NUMBER OF GRAINS PER NUCLEUS AND THE PERCENT OF LABELED NUCLEI, IT WAS CONCLUDED THAT THE INCORPORATION WAS A LINEAR FUNCTION OF CONCENTRATION OF THE EXOGENOUS RADIOISOTOPIC SOLUTION AND A LOGARITHMIC FUNCTION OF THE INCUBATION TIME.

ABSORPTION • ACCUMULATION • PLANT, SPERMATOPHYTE • DNA • CELL, NUCLEUS

041009
ROCH AL
ON THE DIFFERENCE BETWEEN THE LETHAL EFFECTS OF H3 AND P32 IN BACTERIA
UNIVERSITY OF FLORIDA, GAINESVILLE
15 PAGES. RADIATION RESEARCH. VOL. 29. PAGES 18-32 (SEPTEMBER 1966)

THE LETHAL EFFECTS OF INCORPORATED RADIOISOTOPES INTO BACTERIAL POPULATIONS LABELED DURING LOGARITHMIC GROWTH ARE ANALYZED. A MODEL IS PRESENTED. IT IS SHOWN THAT THE DNA PER CELL IS DISTRIBUTED ACCORDING TO THE SAME INVERSE-SQUARE DISTRIBUTION LAW THAT APPLIES TO CELL SIZE. THE ANALYSIS TAKES INTO ACCOUNT THE FACT THAT NUCLEAR BODY SEPARATION IS MISSED BETWEEN CELL DIVISIONS. A HIT AND PLACE IN THE GENOME INACTIVATES THAT GENOME. THE CALCULATED CURVES HAVE LOWER EXTRAPOLATION NUMBERS THAN THE POPULATION AVERAGE NUMBER OF NUCLEAR BODIES. THIS MODEL

041099 [illegible]

[illegible] ADEQUATELY ACCOUNTS FOR RESULTS WITH H-3. A HIT IN ONLY ONE OF THE PARTIALLY REPLICATED REGIONS [illegible] A CHROMOSOME JOINS NOT REMOVE [illegible] THE GROUP RESULTING FROM THE FURTHER REPLICATION AND SEPARATION OF THE OTHER DAUGHTER STRAND - NAMELY RECORD EXTRAPOLATION NUMBERS ARE CALCULATED. THIS MODEL ACCOUNTS FOR THE MULTIHIT KINETICS OBSERVED FOR X-RAY INJECTION, AND THIS IS COMPATIBLE WITH THE REPORTED EXTRAPOLATION NUMBERS WHICH ARE LARGER THAN OUR CYTOLOGICAL OBSERVATION OF THE AVERAGE NUMBER OF NUCLEI PER CELL.

CHROMOSOMES • [illegible] • MODEL • [illegible] DOSE • DNA • MITOSIS

041090
[illegible] • [illegible] • [illegible] • [illegible] • [illegible]
RADIOAUTOGRAPHIC PROCESSING SEQUENCE FOR CHORIOALLANTOIC MEMBRANE TISSUE CULTURES LABELED WITH TRITIATED THYMIDINE
MATERIAL SCIENCE, BRISTOL, ENGLAND
11 PAGES. LABORATORY PRACTICE, VOL. 16, PAGES 69-79 (JANUARY 1967)

STUDIES ARE IN PROGRESS ON THE NUCLEAR DAMAGE TO CELLS FOLLOWING IRRADIATION WITH ULTRAVIOLET LIGHT OF 2537-A WAVELENGTH. THE DAMAGE IS IN PART MEASURED BY THE ABILITY OF THE IRRADIATED CELLS TO INCORPORATE TRITIATED THYMIDINE INTO THE NUCLEI, AND IN PART BY THE INTENSITY OF THE SUPERIMPOSED FEULGEN STAINING REACTION. CHORIOALLANTOIC MEMBRANE CULTURES OF THE CELLS PROVEN TO BE FRIENDLY SUITABLE FOR THESE STUDIES BECAUSE NUMBERS OF REPLICATE CULTURES WERE EASILY AND QUICKLY PROCESSED AT ONE TIME, AND BECAUSE PERMANENT PREPARATIONS WERE READILY MADE OF THE FINISHED AUTORADIOGRAMS FOR MICROSCOPIC AND REFERENCE PURPOSES.

ANALYTICAL TECHNIQUE • AUTORADIOGRAPHY • DNA • CELL, NUCLEUS • MEMBRANE

041091
[illegible] [illegible]
A PAGES. IMMUNOLOGY, VOL. 16, PAGES 83-90 (JANUARY 1969)
TRUDEAU RESEARCH INST., SARANAC LAKE, N.Y.
A PAGES. IMMUNOLOGY, VOL. 16, PAGES 83-90 (JANUARY 1969)

RESULTS OF EXPERIMENTS IN X-IRRADIATED RECIPIENT RATS SUGGESTED THAT DEVIDING CELLS IN BONE MARROW CAN GENERATE LYMPHOCYTES CAPABLE OF INITIATING A SYSTEMATIC GRAFT-VS-HOST REACTION. CONCENTRATIONS OF NEXT-THYMIDINE AND BUDR THAT INHIBITED THE DEVELOPMENT OF PUTATIVE LYMPHOCYTE PRECURSORS IN BONE MARROW HAD NO OBVIOUS EFFECT ON THE IMMUNOLOGICAL PERFORMANCE OF THORACIC DUCT LYMPHOCYTES. THE RESULTS STRENGTHEN THE VIEW THAT [illegible]-THYMIDINE AND BUDR EXERT THEIR INHIBITORY EFFECT ON REPLICATING LYMPHOCYTE PRECURSORS AND NOT ON LONG-LIVED MEMBERS OF THE CIRCULATING LYMPHOCYTE POOL.

GROWTH/DEVELOPMENT • BONE, MARROW • IMMUNOLOGY • LYMPHOID SYSTEM

041092
KING V
A STUDY OF THE MECHANISM OF WATER ACROSS FROG SKIN BY A COMPARISON OF THE PERMEABILITY OF THE SKIN TO DEUTERATED AND TRITIATED WATER
CHELSEA COLLEGE, LONDON
10 PAGES. JOURNAL OF PHYSIOLOGY (LONDON), VOL. 200, PAGES 573-10 (FEBRUARY 1969)

THE POSSIBILITY OF EXISTENCE OF AN ISOTOPE EFFECT WAS EVALUATED IN A STUDY OF THE MOVEMENT OF D2O AND T2O IN THE FROG. THE RATE OF EQUILIBRATION OF DEUTERATED AND TRITIATED WATER ACROSS THE SKIN WAS FOLLOWED AT PH 5.0, 6.9, AND 8.0 WITH RINGER SOLUTION BATHING BOTH SURFACES OF THE SKIN - AND AT PH 7.0 WITH SIMPLETS-RINGER SOLUTION BATHING BOTH SURFACES OF THE SKIN. THE RATIO OF THE PERMEABILITY COEFFICIENTS AND THE INFLUX OF DEUTERATED AND TRITIATED WATER HAD A MEAN VALUE OVER ALL THE EXPERIMENTS OF 0.9986 +-0.0707, INDICATING THAT NO ISOTOPE EFFECT WAS OBSERVABLE WITHIN THE LIMITS OF ACCURACY OF THE METHOD USED.

MEMBRANE • WATER • COMPARISON • TRANSPORT • SKIN

041097
[illegible] [illegible] • [illegible] JR
STRUCTURAL AND FUNCTIONAL PROPERTIES OF POLYTENE NUCLEI ISOLATED FROM SALIVARY GLANDS OF DROSOPHILA HYDEI
[illegible]-PASTEUR INSTITUT PARIS BIOLOGIE, TUBINGEN, GERMANY
9 PAGES. JOURNAL OF CELLULAR BIOLOGY, VOL. 47, PAGES 591-9 (MAY 1969)

SALIVARY GLAND NUCLEI OF DROSOPHILA HYDEI, ISOLATED BY A MODIFICATION OF THE PROCEDURE DESCRIBED BY [illegible] ET AL. DETAIL THEIR NORMAL MORPHOLOGY DURING THE ISOLATION AND SUBSEQUENT INCUBATION PROCEDURE. DNA SYNTHESIS WAS STUDIED IN ISOLATED NUCLEI BY BIOCHEMICAL AND CYTOLOGICAL TECHNIQUES. IN AUTORADIOGRAPHS TO REPORT ON THE NUCLEI DISPLAYED A DISTRIBUTION OF LABELED DNA OVER THE NUCLEAR CONSTITUENTS SIMILAR TO THE DISTRIBUTION OBTAINED BEFORE IN VIVO INCORPORATION OF RADIOACTIVE PRECURSORS. CHROMOSOME BODIES AND THE NUCLEOLI WERE SPECIFICALLY LABELED. THE DEVIATING 10 PERCENT OF THE NUCLEI SHOWED A WEAK TO VERY WEAK INCORPORATION OF RADIOACTIVE PRECURSORS.

AUTORADIOGRAPHY • CHROMOSOMAL EFFECT • DNA • CELL, NUCLEUS

041994
WEBB GL
THE FATE OF ISOTOPE-LABELLED UTERINE SPERMATOZOA IN THE HOUSE MOUSE(MUS MUSCULUS)
UNIVERSITY OF SYDNEY, AUSTRALIA
7 PAGES, AUSTRALIAN JOURNAL OF ZOOLOGY, VOL. 13, PAGES 575-81 (OCTOBER 1965)

TECHNICS ARE DESCRIBED FOR PRODUCING ISOTOPICALLY LABELED SPERM IN TWO WAYS. BOTH TYPES OF ISOTOPICALLY LABELED SPERM WERE USED TO INVESTIGATE THE FATE OF THE UTERINE SPERM RESERVE. A PORTION OF THE SPERM PRESENT IN THE UTERUS FOLLOWING A COPULATION PLUG WAS REMOVED AND REPLACED BY INTRAUTERINE INJECTION OF LABELED SPERM. SEVERTEEN HOURS AFTER INJECTION, LABEL WAS PRESENT IN SPERM IN THE LUMEN, IN NUCLEI ASSOCIATED WITH PERIVITELLINE CRANNICHEVES AND NONEVVES IN THE LUMEN, IN THE EPITHELIAL AND SUBEPITHELIAL CELLS OF THE MUCOSA, AND IN PHAGOCYTIC CELLS OF THE LAMIA PROPRIA. LYMPH NODES AND SPLEEN

TRANSFER FUNCTION + DISTRIBUTION + MAMMAL, SMALL + TESTIS + UTERUS

041995
MARTINAS JA + MARCH FT + BISHOP CC + GILL JF
RADIATION EFFECTS POLY-DAT FROM INTRANUCLEOLAR TRITIUM
CALIFORNIA UNIVERSITY, LAWRENCE RADIATION LABORATORY
UCRL-16559 +. 10 PAGES, DECEMBER 6, 1965

POLY-DAT WAS BIOSYNTHESIZED. AQUEOUS SOLUTIONS WERE STORED AT -20 C AND THAWED AT INTERVALS FOR COMPARISON OF TEMPLATE ACTIVITY, ULTRAVIOLET ABSORBANCE AND THERMAL TRANSITION WITH THAT OF UNLABELED POL-DAT. THE H-3 CONTENT OF THE TWO SAMPLES WAS 1.9 X 10(4TH) AND 6.4 X 10(4TH) DPM/MG. RADIATION DOSES WERE ESTIMATED TO BE 2.9 AND 8.4 RAD/DAY (100 AND 1000 RAD OVER 3 MONTHS), RESPECTIVELY, ASSUMING UNIFORM DISTRIBUTION OF ABSORBED ENERGY IN THE SPECIMEN. THE NORMALLY EXCELLENT TEMPLATE ACTIVITY OF POLY-DAT FOR DNA AND DNA POLYMERASES FROM CELL PROGRESSIVELY DECREASED. THE IMPAIRMENT BECAME MEASURABLE AFTER A DOSE OF ONLY 20-10 RAD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

MORTALITY + RADIATION EFFECT + DNA + RNA

041996
MARTIN C +
LETHALITY FROM TH-NUCLEOSIDES INCORPORATED IN MAMMALIAN CELLS
INTERNATIONAL LAB. OF GENETICS AND BIOPHYSICS, NAPLES (ITALY)
EUR-3240F-3 +. 4 PAGES, PP. 73-7, MAY 10, 1966

PRELIMINARY RESULTS ARE REPORTED FOR A SERIES OF EXPERIMENTS DESIGNED TO DETERMINE THE EFFECTIVENESS OF TRITIUM-LABELED THYMIDINE INFORMATION AS OPPOSED TO TRITIUM-LABELED URIDINE INCORPORATED IN CAUSING CELL DEATH, AND THE EFFECTS OF TIME OF INCUBATION AT 20 C ON THE SURVIVAL OF CELLS EXPOSED TO CONSTANT DOSES OF TRITIUM-LABELED THYMIDINE OR TRITIUM-LABELED URIDINE. IT WAS SHOWN THAT THYMIDINE-INCORPORATED TRITIUM WAS MORE EFFECTIVE THAN URIDINE-INCORPORATED TRITIUM IN CAUSING THE DEATH OF CULTURED HAMSTER FIBROBLAST CELLS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MORTALITY + CHEMICAL + DNA + AMINO ACID + CELL + RNA

041997
CERFF CH
CHROMATID ABERRATIONS RESULTING FROM TH-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS
CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE, MANCHESTER, ENG.
6 PAGES, INTERNATIONAL JOURNAL OF RADIATION BIOLOGY, VOL. 17, PAGES 479-84 (1967)

CHROMATID ABERRATIONS WERE INDUCED BY HIGH-THYMIDINE INCORPORATION IN EARLY AND LATE S PERIODS OF HUMAN EV, HEV, AND XX CELLS. AT SIMILAR TOTAL H-3 DISINTEGRATIONS, LATE S CELLS WERE FOUR TIMES (EV) OR SEVEN TIMES (HEV) MORE SENSITIVE THAN EARLY S CELLS. THIS DIFFERENCE IS PARTLY ATTRIBUTABLE TO DOSE-RATE DIFFERENCES BETWEEN SAMPLES. LOCALIZATION DIFFERENCES ON INTRANUCLEAR DOSE-RATE EFFECT DEMONSTRATED BY THE CONCENTRATION OF ABERRATIONS TO LATE-LABELLING CHROMOSOMES, PARTICULARLY THE LATE X. ANY ATTEMPT AT COMPARING STAGE SENSITIVITY MUST BE CARRIED OUT AT AN INTRACHROMOSOMAL LEVEL.

CHROMOSOMAL EFFECT + RADIATION EFFECT + CELL, STEM + MAN

041998
MCCARTHY C + WESTED FV
INACTIVATION OF TRANSFORMING DNA BY TRITIUM DISINTEGRATIONS IN VIVO
UNIVERSITY OF WASHINGTON, SEATTLE
7 PAGES, BIOCHEMICA ET BIOPHYSICA ACTA, VOL. 160, PAGES 289-90 (AUGUST 27, 1968)

TO DETERMINE WHETHER THE RADIATION RESULTING FROM TRITIUM IN POSITION NUMBER ONE AND WHETHER AMINO ACID-INCORPORATED TRITIUM KILLS LESS EFFICIENTLY THAN THYMIDINE-INCORPORATED TRITIUM BY DIRECT ASSAY OF THE BIOLOGICAL ACTIVITY OF TRANSFORMING DNA ISOLATED FROM BACILLUS SUBTILIS THAT HAD INCORPORATED TRITIUM-LABELED THYMIDINE OR AMINO ACIDS. IT WAS CONCLUDED THAT THE BASIC CAUSE OF

[illegible]

047701 [illegible]
DEATH WAS INDEPENDENT OF THE MACROMOLECULE THAT CONTAINED THE TRITIUM AND THAT DEATH FROM TRITIUM RESULTS IN ALTERATIONS OF THE GENOME BY IONIZING RADIATION.

[illegible] • RADIATION EFFECT • RNA • AMINO ACID • CELL • PROTEIN

047745
[illegible] • [illegible] • [illegible]
ANESTHETIC GASES AND WATER STRUCTURE. THE EFFECT OF XENON ON TRITIATED WATER FLUX ACROSS THE GUT
NEW YORK UNIVERSITY, NEW YORK
11 PAGES, JOURNAL OF GENERAL PHYSIOLOGY, VOL. 52, PAGES [illegible] (DECEMBER 1968)

THE FLUX OF THO ACROSS THE MUCOSAL SURFACE OF RAT CECUM AS AFFECTED BY XE, AS AN ANESTHETIC GAS, WAS STUDIED. TO EVALUATE THE EFFECT OF EXPOSURE TO XE ON TRITIATED WATER FLUX, EACH CECUM SERVED AS ITS OWN CONTROL. WHEN XE COMPRISED [illegible] PERCENT OF THE TOTAL GAS FLOW, TRITIATED WATER FLUX ACROSS THE CECUM SLOWED BY 7.0 +- 2.7 PERCENT (MEAN +- STANDARD ERROR). WHEN XE COMPRISED 80 PERCENT OF TOTAL GAS FLOW, WATER FLUX SLOWED BY 17.0 +- 3.7 PERCENT. THESE FINDINGS ARE CONSISTENT WITH THE THEORY THAT THE PRESENCE OF AN ANESTHETIC GAS IN TISSUE INDUCES A CAGE-LIKE ARRANGEMENT OF HYDROGEN-BONDED WATER MOLECULES.

[illegible] • [illegible] • [illegible] EFFECT • MOLECULAR EFFECT • MAMMAL, SMALL • CECUM

047746
[illegible] • [illegible]
EFFECT OF TRITIUM OXIDE ON THE FERTILITY OF MALES
AEC-TR-[illegible], 10 PAGES, PAGES [illegible]. TRANSLATED FROM PP. [illegible] OF [illegible]
[illegible], 1964

THE ADMINISTRATION OF TRITIUM OXIDE IN THE DOSES OF 0.5 AND 0.[illegible] MICROCURIES/G TO RATS PRODUCED A STERILIZING EFFECT ON MALES. THIS EFFECT DEPENDS ON THE DOSE SIZE AND IS EXPRESSED IN (A) DECREASE IN THE MATING ABILITY OF THE MALES, (B) DECREASE IN THE NUMBER OF OFFSPRING IN LITTERS PRODUCED BY MATING THE MALES WITH INTACT FEMALES, (C) FREQUENT DEATHS OF FETUSES AND A HIGH PROPORTION OF STILLBIRTHS, (D) CHANGE IN THE WEIGHT OF TESTES. TRITIUM OXIDE ADMINISTERED TO RATS IN THE DOSE OF 0.[illegible] MICROCURIES/G DID NOT PRODUCE MARKED CHANGES IN THE BLOOD SYSTEM. THE ADMINISTRATION OF TRITIUM OXIDE IN THE DOSE OF 0.5 MICROCURIES/G PRODUCED MARKED CHANGES IN THE BLOOD SYSTEM AS EXPRESSED IN THE DECREASE IN ERYTHROCYTE AND LYMPHOCYTE COUNTS AND SHARP FLUCTUATIONS IN THE NEUTROPHIL COUNT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DOSE • [illegible] • [illegible], GENETIC • BLOOD • RADIATION EFFECT • MAMMAL, SMALL • FETUS • [illegible] • TESTIS

047747
[illegible] • [illegible] • COSTES C
STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. II. CRITICAL STUDY OF TECHNIQUES FOR ANALYSES AND MEASUREMENT OF RADIOACTIVITY OF WATER AND TRITIATED LEAF METABOLITES.
CENTRE NATIONAL DE RECHERCHES AGRONOMIQUES, FRANCE
[illegible] PAGES, ANNALES DE PHYSIOLOGIE VEGETALE, VOL. 7, PP. 171-[illegible] (1965)(IN FRENCH)

DESCRIBES EXPERIMENTAL TECHNIQUES NECESSARY FOR THE STUDY OF WATER METABOLISM IN WHEAT LEAVES WITH TRITIATED WATER. TWO MAJOR PROBLEMS OCCUR WITH THIS ISOTOPE - DETERMINATION OF RADIOACTIVITY IN VARIOUS TRITIATED COMPOUNDS BY LIQUID SCINTILLATION, AND ISOTOPIC EFFECTS. [illegible] ISOTOPIC EXCHANGE. [illegible] SCINTILLATION TECHNIQUES FOR COUNTING RADIOACTIVITY OF [illegible] ARE COMPARED FOR VARIOUS SCINTILLATORS - THEIR CHARACTERISTICS ARE SUMMARIZED IN A TABLE.

COUNTER • [illegible] • ANALYTICAL TECHNIQUE • PHYSIOLOGY/METABOLISM • TURNOVER RATE • BIOLOGICAL CONTROL

047748
COSTES C • [illegible] • [illegible] • [illegible]
STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY
CENTRE NATIONAL DE RECHERCHES AGRONOMIQUES, FRANCE
[illegible] PAGES, ANNALES DE PHYSIOLOGIE VEGETALE, VOL. [illegible], PP. [illegible] (1964)(IN FRENCH)

REVIEWS THE USE OF H-3 AND [illegible]-LABELED WATER FOR STUDY OF PLANT METABOLISM. IN ADDITION TO A SURVEY OF EXPERIMENTAL RESULTS, TECHNIQUES FOR COUNTING TRITIUM IN BIOLOGICAL SYSTEMS ARE DESCRIBED, INCLUDING USE OF GAS COUNTERS AND SCINTILLATION COUNTERS, CHARACTERISTICS OF VARIOUS SCINTILLATORS, MEASUREMENT PROCEDURES FOR H-3, SIMULTANEOUS COUNTING OF H-3 AND C-14, AND THE EFFECT OF EXTINCTION.

BIBLIOGRAPHY • COUNTER • MEASUREMENT • WATER • REVIEW • RESPIRATION • PHYSIOLOGY/METABOLISM • VEGETATION • CONCENTRATION • TRANSPORT

047749
[illegible] • RASSMAN [illegible]
GLYCOLIC ACID LABELING DURING PHOTOSYNTHESIS WITH [illegible] AND TRITIATED WATER

[illegible]
UNIVERSITY OF CALIFORNIA, BERKELEY
UCRL-10490 v. 4 PAGES, PLANT PHYSIOLOGY. VOL. 14, PP. 1272-5 (DECEMBER 1964)

FAILED ATTEMPTS TO DEMONSTRATE PHOTOSYNTHESIS FROM [illegible] IN THE [illegible] OF [illegible] AND [illegible] GROW [illegible] AND [illegible] DESERTS. THE [illegible] WAS IN MAINTAINING ACCURATE [illegible] DESERTS FROM [illegible] TOXICITY AND [illegible]. TO ROTATE DESERTS CONTAINING DESERTS IT WAS NECESSARY TO MAINTAIN THE RATIO OF TRITIUM TO C-14 IN THE [illegible] DESERTS AT A HIGH LEVEL. IT IS [illegible] THAT FORMATION OF LABELED GLYCOLIC ACID AS A [illegible] PRODUCT OF ITS [illegible] TRANSPORT [illegible] IN PHOTOSYNTHESIS IS QUANTITATIVELY OF LIMITED IMPORTANCE COMPARED TO THE [illegible] STRUCTURES OF GLYCOLIC ACID FROM CO2.

DESERTS • TRITIUM • WATER • TRANSPORT LEVEL • RADIOMETRIC [illegible] • [illegible] • PLANT, [illegible] • TRANSPORT • [illegible]

[illegible]
[illegible] • [illegible] • [illegible] • [illegible]
ESTIMATION OF WATER CONTENT BY TRITIUM DILUTION OF [illegible] SUBJECTED TO RAPID LIVE-WEIGHT CHANGES
UNIVERSITY OF NEW SOUTH WALES, AUSTRALIA
9 PAGES, JOURNAL OF AGRICULTURAL SCIENCE, VOL. 77, PP. 77-80 (JANUARY 1971)

RESEARCH VARIOUS [illegible] IN THE USE OF TRITIATED WATER [illegible] TO ESTIMATE TOTAL BODY WATER [illegible] OF ANIMALS EXPERIENCING RECENTLY FROM MANIPULATION.

RABBITS • EFFECT, GENETIC • [illegible] • [illegible] EFFECT • [illegible], SMALL • CONCENTRATION • LIVER

[illegible]
MORRIS TH • WOODIN V
UPTAKE AND TRANSFERRED OF RADIOCHEMICALLY AND TRITIATED WATER BY VARIOUS [illegible] OF [illegible] OF DIFFERENT GROWTH STATUS
UNIVERSITY OF CALIFORNIA, DAVIS
9 PAGES, PLANT PHYSIOLOGY, VOL. 39, PP. 104-108 (JANUARY 1964)

THE UPTAKE AND TRANSFERRED OF RADIOCHEMICALLY AND TRITIATED WATER BY DIFFERENT [illegible] OF INDIVIDUAL [illegible] FROM [illegible] OF DIFFERENT GROWTH STATUS WAS DETERMINED. THE [illegible] OF THE [illegible] WAS [illegible] TO CLEAR DECOMPOSITION AND TRANSFERRED TO THE [illegible]. THE [illegible] RATE OF CLEAR DECOMPOSITION BY THE [illegible] TISSUE INITIALLY INCREASED WITH [illegible], WHEREAS THE RATE OF CLEAR TRANSFERRED TO THE [illegible] REMAINED CONSTANT OVER A 17 HOUR PERIOD. IT WAS SUGGESTED THAT THE TRANSFERRED OF THIS [illegible] VARIABLES ALSO RECORD AT A CONSTANT RATE WHICH IS RECOMPENSED BY PROGRESSIVELY INCREASING RATES OF [illegible] FROM [illegible].

HEAVY WATER • TRANSFERRED THERAPY • [illegible] • [illegible] • [illegible] • DECOMPOSITION • CONCENTRATION • PLANT, [illegible]

[illegible]
[illegible]
THE EFFECTS OF TRITIUM [illegible] ON AQUATIC ORGANISMS
UNIVERSITY OF CONNECTICUT
TID-[illegible] v. 11 PAGES, APRIL 4, 1967

A LARGE [illegible] OF [illegible] WAS PASSED UNDER [illegible] CONTROLLED CONDITIONS. [illegible] WERE KEPT ON THE VITAL STATISTICS OF EACH [illegible] RECORD. A [illegible] OF INFORMATION ABOUT [illegible] WHICH WILL SERVE AS COMPARATIVE DATA FOR FUTURE STUDIES ON FISH [illegible] IN A TRIT[illegible]. RESULTS OF A PILOT STUDY USING 5 [illegible] SHOWED THAT [illegible] OF THE TISSUE SAMPLES [illegible]. THIS MAY INDICATE LACK OF [illegible] OF T FOR H OR LACK OF ASSIMILATION OF TISSUE [illegible].

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

[illegible] • [illegible], BACKGROUND • [illegible] • [illegible] • DATA COLLECTION • [illegible] • AQUATIC ORGANISM

[illegible]
[illegible] P • [illegible] CH
RADIAL [illegible] OF LABELED WATER IN [illegible]
UNIVERSITY OF EAST ANGLIA, NORWICH, ENGLAND
12 PAGES, JOURNAL OF EXPERIMENTAL BIOLOGY, VOL. 39, PP. 695-704 (DECEMBER 1962)

THE EFFLUX KINETICS OF WATER WAS STUDIED IN [illegible] MAIZE PLANTS TO IDENTIFY THE RATE-LIMITING STEP IN THIS RADIAL EXCHANGE PROCESS. BETWEEN THE EFFLUX CURVE OF WATER CLEARED AND MATHEMATICALLY DESCRIBED BY THE SOLUTION FOR AN APPROPRIATE CYLINDRICAL DIFFUSION PROBLEM, AFTER EXPERIMENTAL PERIODS WAS INCORPORATED WITH THIS MODEL. IT WAS CONSIDERED THAT THE EFFLUX KINETICS OF WATER-LABELED WATER DESCRIBED BOTH THE CHARACTERISTICS OF [illegible] IN A METABOLISMING MULTICELLULAR ORGANIZATION LIKE THE PLANT.

DIFFUSION • HEAVY WATER • [illegible] • CHEMICAL KINETICS • MATHEMATICAL TREATMENT • MODEL TESTING • [illegible] • [illegible] • [illegible] • PLANT, [illegible] • PLANT, [illegible] • [illegible] EFFECT

[illegible]
[illegible] • [illegible]
QUANTITATIVE [illegible] OF TRITIUM IN [illegible] AND [illegible]
[illegible] RESEARCH COUNCIL, LONDON
3 PAGES. NATURE (LONDON), VOL. 210, NO. 210, PP [illegible] DECEMBER 2, 1966

CALCULATIONS ARE PRESENTED FOR THE BETA-PARTICLE ABSORPTION WITHIN A LAYER INCORPORATING TRITIUM, AND IN A SUBSTITUTION LAYER OF ORGANIC MATERIAL. FOR A BIOLOGICAL SPECIMEN THE ABSORPTION CAN BE TAKEN AS PROPORTIONAL TO DENSITY. THE EMISSION SPECTRUM OF TRITIUM HAS BEEN COMPUTED USING A NUCLEAR CHARGE FACTOR FURNISHED FROM NBS TABLES, AND THE AVERAGE KINETIC ENERGY WAS CALCULATED AS 5.7 KEV. WITH A RANGE OF 2.3 MEV. THE PROCEDURE FOR PARTICLES TRAVERSING A GIVEN THICKNESS OF MATERIAL, AND THEIR EFFECTIVE CHARGES, WERE ESTIMATED, AND A SERIES OF CALCULATIONS WERE RAN ON FOURTY LAYERED LAYER PROVIDED BY AN UNSUPPLIED LAYER. THE COMPUTED RESULTS FOR THE PROCEDURE OF INTRODUCING BETA-PARTICLES DEPTH WELL WITH EXPERIMENTAL RESULTS.

FLUID DISTRIBUTION • PARTICLE • BETA EMITTER • DOSE CALCULATION, EXTERNAL • MATHEMATICAL TREATMENT • MODEL TISSUE • ABSORPTION • DETERMINATION • DISTRIBUTION • COMPARISON

[illegible]
[illegible]
THE INSUFFICIENCY OF DIETARY FAT ON THE INCORPORATION OF TRIT IN BRAIN TISSUES
UNIVERSITY OF [illegible], CANADA
9 PAGES. [illegible] PUBLICATIONS, VOL. 12, PAGES 644-652 [illegible] 1964; [illegible]

PREPARATIONS FOR [illegible] OF AN AND ITS USE AS TRITIATED [illegible] IN EXPERIMENTAL STUDIES ON CHAIN LENGTHENING OF MEDIUM LENGTH FATTY ACIDS IN ANIMALS AND [illegible]. TO DETERMINE THEIR [illegible] OF THE TISSUE [illegible], THE SAMPLES WERE COMBUSTED AND THE CONDUCTION [illegible] MEASURED BY LIQUID SCINTILLATION. DETERMINATION OF THE SP. ACT. OF THE INDIVIDUAL FATTY ACIDS WAS CARRIED OUT BY A COMBINATION OF GAS CHROMATOGRAPHY AND LIQUID SCINTILLATION MEASUREMENTS. THE VALUES FOR INDIVIDUAL AMINO ACIDS WERE DETERMINED AFTER THEIR SEPARATION ON ANTIMATE CHROMATOGRAPHIC COLUMNS IN AN ANTIMATE CELL THAT WERE [illegible] OF [illegible] BY SCINTILLATION METHODS.

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • GAS • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
NATURAL [illegible] OF [illegible], [illegible], AND TRITIUM IN RECENT YEARS
[illegible] UNIVERSITY, [illegible]
[illegible] 0, 6 PAGES, AUGUST 1961

NO [illegible] WAS COLLECTED AT [illegible] FROM LIQUID NITROGEN OBTAINED FROM A SMALL-SCALE DISTILLATION. A DISCREPANCY INCREASE IN THE CONCENTRATION OF ATMOSPHERIC [illegible] AFTER THE [illegible] OF 1963 IS SHOWN. ATMOSPHERIC CO2 WAS COLLECTED AT [illegible] BY ABSORPTION IN [illegible] COLLECTION, AND THE RADIOACTIVITY WAS MEASURED. TEST RESULTS WERE ANALYZED FOR C-14 AND TRITIUM CONCENTRATIONS. THE CONCENTRATION OF C-14 AND CO2 TRITIUM IN THE TEST SITE AND DECREASED AS AN ANNUAL MEAN VALUE OF THE C-14 CONCENTRATION IN THE ATMOSPHERE AND OF THE TRITIUM CONCENTRATION IN RAIN WATER. THE CONCENTRATION OF ATMOSPHERIC C-14 HAS A MAXIMUM VALUE AT THE BEGINNING OF 1963, AND THE CONCENTRATION OF TRITIUM DECREASED AFTER 1964 WITH A HALF LIFE OF ABOUT ONE YEAR. THE DATA ARE TABULATED.

AVAILABILITY - [illegible] RADIOACTIVITY LITERATURE IN THE U.S. AND [illegible]

CONCENTRATION • DECAYED • [illegible] • [illegible] • ATMOSPHERIC POLLUTION • SAMPLING • PRECIPITATION • BIOLOGICAL HALF-LIFE • [illegible] • [illegible]

[illegible]
[illegible] • [illegible] J
TRITIUM [illegible] IN BIOLOGICAL SYSTEMS
UNIVERSITY OF CALIFORNIA, [illegible]
10 PAGES, PAGES [illegible] OF TRITIUM IN THE PHYSICAL AND BIOLOGICAL SCIENCES, VOL. II, VIENNA, IAEA, 1962

[illegible] TRITIUM-LABELED WATER IS PRESENTED AS A TEST SOURCE OF TRACER IN BIOLOGICAL SYSTEMS, AND [illegible] TRITIUM AND [illegible] ATOMS DECAYS THAT PROPERLY DEFECTS THE NATURE AND INTERPRETATION OF EXPERIMENTAL RESULTS. THE STUDIES [illegible] AND CONCERNED WITH THE PROPERTIES OF THE [illegible] THAT TRITIUM EXCHANGES INTERMEDIATES FROM [illegible] OF TOTAL BODY WATER AND WATER METABOLISM IN ANIMALS AND HUMANS.

[illegible] WATER • TRACER, [illegible] • [illegible] • [illegible] • [illegible] • CONCENTRATION • BLOOD • [illegible] [illegible] • [illegible] • [illegible], SMALL • [illegible], [illegible] • [illegible] • [illegible]

[illegible]
[illegible] J • [illegible] J • [illegible] A
BIOLOGICAL STUDY [illegible] A TRITIATED LYSOZYME [illegible]
[illegible] [illegible], [illegible], [illegible]
[illegible] 0, 17 PAGES, [illegible]

[illegible]
A POWDERED MIXTURE OF ZINC SULFIDE AND A TRITIATED POLYESTER WAS ADMINISTERED TO RATS BY MEANS OF THE ESOPHAGEAL PROBE. THE DISTRIBUTION OF TRITIUM IN THE [illegible], AND ITS ELIMINATION, WERE STUDIED. FROM 75 TO 80 PERCENT OF THE POLYESTER UNDERWENT SUBTILE DEGRADATION IN THE INTESTINAL MEDIUM TO BE ABSORBED BY THE DIGESTIVE MUCOUS MEMBRANE AND TO BE SUBJECTED TO METABOLIC REACTIONS.

AVAILABILITY - USAEC REPOSITORY LIBRARIES IN THE U.S. AND TERRITORIES

DEPOSITION • DIGESTION • ZINC • SULFIDE • PLASTICS • ABSORPTION • [illegible] • LIVESTOCK • STOMACH • [illegible], [illegible]

[illegible]
[illegible] • [illegible]
USE OF TRITIATED WATER STUDY FOR CONTINUOUS REGISTRATION OF INSECT TRANSPIRATION
UNIVERSITY WÜRZBURG, GERMANY • UNIVERSITY OF BONN, GERMANY
6 PAGES, ARCHIVES, VOL. 19, PP. 269-274 (JUNE 1961)(IN GERMAN)

A CONTINUOUS REGISTRATION OF THE INSECT TRANSPIRATION COULD NOW BE REALIZED WITH HELP. APPLIED THE MEANS WITH THE NORMAL BODY WATER AND THEREFORE IS RELEASED SIMULTANEOUSLY BY THE INSECT WHILE TRANSPIRING. IT CAN BE CONTINUOUSLY MEASURED AND REGISTERED BY MEANS OF AN IONIZATION CHAMBER OF 100 CC CAPACITY AND A VIBRATING-REED ELECTROMETER WITH [illegible] ATTACHED. TO REDUCE THE MEMORY-EFFECT THE INTERNAL SURFACE OF THE CHAMBER IS PLATED WITH GOLD. ALL ENVIRONMENTAL FACTORS INFLUENCING THE TRANSPIRATION OF INSECTS SUCH AS TEMPERATURE, AIR HUMIDITY AND WIND VELOCITY CAN BE VARIED IN THE DESCRIBED APPARATUS. THIS METHOD OFFERS THE OPPORTUNITY TO FOLLOW THE COURSE OF TRANSPIRATION QUALITATIVELY OVER A LONG PERIOD AS WELL AS TO REPORT SPONTANEOUS OSCILLATING EFFECTS.

COUNTED • CHAMBER, ION • HEAVY WATER • [illegible] • [illegible] • [illegible], [illegible] • [illegible]

[illegible]
[illegible] [illegible] • [illegible]
TRITIUM AND CARBON-14 IN THE TREE RINGS
[illegible] UNIVERSITY, TOKYO
2 PAGES, BULLETIN OF THE CHEMICAL SOCIETY OF JAPAN, VOL. 34, PAGES 1738-9 (NOVEMBER 1961) (IN ENGLISH)

MEASUREMENTS [illegible] OF THE CONCENTRATION OF C-14 AND TRITIUM IN THE TREE RINGS OF RECENT YEARS IN ORDER TO [illegible] THE ANNUAL MEAN CONCENTRATION OF THE ATMOSPHERIC C-14 AND OF THE TRITIUM IN THE RAIN WATER. THE DATA ON C-14 SHOWED A TENDENCY OF THE CONCENTRATION TO INCREASE AFTER 1960, AND IT SEEMED TO HAVE A MAXIMUM VALUE AT THE BEGINNING OF 1963. THE SAME WAS TRUE FOR THE TRITIUM CONCENTRATIONS. THE DATA SUGGESTED A STRATOSPHERIC RESIDENCE TIME OF 1 TO 2 YEARS.

RESEARCH • [illegible] • RAINWATER • STRATOSPHERE • ATMOSPHERIC POLLUTION • RADIONUCLIDE [illegible] • CONCENTRATION • [illegible], SPECTROSCOPY

[illegible]
LEMBERGER F. • SEWING OF • WINKLER D
THE INFLUENCE OF 5-HYDROXYTRYPTAMINE ON THE ABSORPTION OF TRITIATED WATER FROM THE INTESTINE OF THE RAT
UNIVERSITAET, [illegible], GERMANY
10 PAGES, ARCHIV FUER EXPERIMENTELLE PATHOLOGIE UND PHARMAKOLOGIE, NAUNYN-SCHMIEDEBERG, VOL. 247, PG 188-199 (1964)(IN GERMAN)

ADDITIONALITIES OF WATER ABSORPTION IN RATTERS WITH THE CARCINOID SYNDROME, IN WHICH THE SECRETION OF 5-HYDROXYTRYPTAMINE (SEROTONIN) IS HEMMERT INCREASED, PROMOTED A STUDY OF THE INFLUENCE OF SEROTONIN ON THE ABSORPTION OF TRITIATED WATER INTO FROM THE SMALL INTESTINE OF RATS IN SITU. SEROTONIN, GIVEN INTRAVENOUSLY (2.5 MG) OR BY INTRAVENOUS INJECTION (5 MICROGRAMS/KG), REDUCED THE RATE OF WATER ABSORPTION ABOUT 50 PERCENT. THIS EFFECT MAY BE CAUSED BY A CHANGE IN INTESTINAL CAPILLARY BLOOD FLOW OR AN INHIBITION OF ACTIVE WATER TRANSPORT.

HEAVY WATER • ABSORPTION • CONCENTRATION • BIOLOGY, CLINICAL • THERAPY • HUMAN • MAMMAL, RAT • [illegible], IV

[illegible]
[illegible] FR • [illegible] D
TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES
DUKE UNIVERSITY, N.C.
7 PAGES, SCIENCE, VOL. 147, PP. 140-40 (JANUARY 8, 1965)

TRITIUM WAS USED TO INVESTIGATE THE WITHDRAWAL BY SMALL TYPES OF WATER FROM SOIL AT THREE DEPTHS, WITHIN A HOURS OF PLACEMENT AT EACH DEPTH. TRITIUM WAS DETECTED IN THE TRANSPIRED WATER OVER MEADOW TOPES. ON THE 5TH DAY AFTER APPLICATION, 70 TIMES MORE TRITIUM (PER UNIT VOLUME) WAS PRESENT IN TRANSPIRED WATER COMING FROM SOIL AT A DEPTH OF 0 TO 30.5 CENTIMETERS THAN IN WATER COMING FROM THE 61- TO 91.5-CENTIMETER LEVEL.

HEAVY WATER • SOIL • EXPERIMENT • RADIONUCLIDE INVENTORY • [illegible] • VEGETATION • [illegible] • RADIATION PROFILE • [illegible] • PLANT

[illegible]
THE FREQUENCY OF SYSTEM CHROMATID EXCHANGES FOLLOWING EXPOSURE TO DRYING DOSES OF N-9 -THYMIDINE OR B-RAYS
[illegible] NATIONAL LABORATORY, TENNESSEE
4 PAGES, SPONSOR OF CELL BIOLOGY, VOL. 71, PG 190-197 (1964)

IN THE CHINESE HAMSTER CELL LINE CHOS-1[illegible] IN VITRO CULTURES, SISTER CHROMATID EXCHANGES OCCURRED AT A RATE OF A LITTLE MORE THAN ONE PER CELL CYCLE. THE EXCHANGES WERE REPRESENTED BY LABELING WITH N-9 -THYMIDINE AND AUTORADIOGRAPHY ANALYSIS OF CHROMOSOMES AT THE SECOND AND SUBSEQUENT METAPHASES AFTER LABELING WAS REMOVED. IT WAS CONCLUDED THAT SISTER CHROMATID EXCHANGES ARE NOT CAUSED BY TRITIUM RADIATION AND THEREFORE ARE SPONTANEOUS EVENTS. CHINESE HAMSTER CELLS WERE IRRADIATED WITH BETA RAYS OF B-RAYS UP TO 700 R AND SCORED FOR SISTER CHROMATID EXCHANGES. BETWEEN ZERO AND 40 R THERE WAS A STATISTICALLY SIGNIFICANT INCREASE IN THE RATE OF EXCHANGES.

[illegible]

[illegible]
SPONSOR BY
THE EFFECTS OF TRITIUM BETA ON AQUATIC ORGANISMS. FINAL REPORT, JUNE 1, 1962 - JULY 31, 1964
UNIVERSITY OF [illegible]
NYO-[illegible]-1 0, 17 PAGES, NOVEMBER 12, 1964

AN ENVIRONMENT OF TRITIATED WATER MIN NOT HAVE AN OBSERVED TOXIC EFFECT ON THE [illegible] COPEPOD. SOME FISH LIVED AS LONG AS [illegible] IN THE TRITIATED WATER, AND LONG-TERM EFFECTS DUE TO THE BUILD UP OF TRITIUM IN THE FISH WERE NOT APPARENT. THERE WERE NO GENETIC CHANGES IN THE THREE GENERATIONS OF FISH LIVING IN THE TRITIATED WATER. IT WAS APPARENT THAT THE AMOUNT OF TRITIUM IN THE FISH APPEARED PROPORTIONAL WITH THAT IN THE SURROUNDING WATER. ABOUT 40 PERCENT OF THE TRITIUM PRESENT IN THE FISH WAS IN THE BODY WATER, AND ONLY 10 PERCENT WAS ACTUALLY INCORPORATED IN THE BODY TISSUES. THE TURNOVER OF TRITIUM IN THE FISH MAY HAVE BEEN RAPID.

AVAILABILITY - USAEC PROPRIETARY LIBRARIES IN THE U.S. AND PROPOSED

BODY WATER • BETA • ENVIRONMENT • ORGANIC, FISH • BIOACCUMULATION/TURNOVER • CONCENTRATION • AQUATIC ORGANISM • TOXICITY • EFFECT, GENETIC • OBSERVATION EFFECT • TURNOVER RATE • WORK ENERGY

[illegible]
FIRST BY
THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER TROPICAL CONDITIONS AND THE EFFECT OF ELEVATED AND SALINE DRINKING ON THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE RAT
[illegible] COLLEGE OF TECHNOLOGY, IBADAN, NIGERIA
4 PAGES, SPONSOR OF [illegible] AND COMPARATIVE PHYSIOLOGY, VOL. 64, PAGES 270-97 (SEPTEMBER 1964)

BODY WATER TURNOVER (THE BIOLOGICAL HALF LIFE OF TRITIUM) WAS DETERMINED IN THE RABBIT, GUINEA-PIG, RAT AND MOUSE UNDER TROPICAL CONDITIONS. THE VALUE INCREASED PROGRESSIVELY (EXCEPT FOR THE RABBIT) WITH BODY SIZE. THE VALUE FOR THE RAT SHOWED LITTLE VARIATION WITH CHANGES IN CLIMATIC CONDITIONS, FOR INSTANCE TROPICAL SUMMER, AIR-CONDITIONED ROOM AND COLD-ROOM. SIGNIFICANT DIFFERENCES WERE ONLY RECORDED BETWEEN THE AIR-CONDITIONED AND THE COLD-ROOM. IN ALL CONDITIONS ASTHMA, [illegible] 0.9 PERCENT SALINE SOLUTIONS HAD A QUICKER WATER TURNOVER.

BODY WATER • BETA • ORGANOGRAMMATIC/TURNOVER • BIOLOGICAL HALF-LIFE • TEMPERATURE • TURNOVER RATE • HUMAN, SMALL • CELL • LIVESTOCK • WORK ENERGY

[illegible]
[illegible] • [illegible] • [illegible]
TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS
UNIVERSITY OF [illegible]
4 PAGES, SURGERY, GYNECOLOGY AND OBSTETRICS, VOL. 119, PG 900-904 (NOV 1964)

THE TRANSFER OF TRITIUM, NA-22, AND CL-36 ACROSS BURNED SKIN WAS STUDIED IN 10 PATIENTS. SOLUTIONS OF THE RADIOISOTOPES WERE APPLIED DIRECTLY TO THE SKIN AND LOCAL LOSS OF RADIOACTIVITY WAS MEASURED. ABSORPTION OF ALL THREE ISOTOPES FROM THE SOLUTIONS EXPOSED TO THE BURN GRANULATION TISSUE WAS RAPID. BEGINNING FROM 11 TO 14 DAYSAFT IN 30 MIN. OBSERVE INDICATION THAT WATER WAS TRANSFERRED FROM THE GRANULATING TISSUE SURFACE AT NEARLY THE SAME RATE AT WHICH IT WAS ABSORBED. DATA SHOW LARGE TRANSFERS OF WATER AND ELECTROLYTES ACROSS BURNED TISSUE. THAT ABSORPTION IS CONCENTRATION DEPENDENT AND SUGGEST THAT A MORE PHYSIOLOGIC SOLUTION SHOULD HAVE ELECTROLYTE CONCENTRATIONS APPROXIMATING THOSE OF THE EXTRACELLULAR FLUID.

SKIN • BETA • CHLORINE • ABSORPTION • CONCENTRATION • ORGANOGRAMMATIC TRANSFER • RADIATION EXPOSURE, ACUTE • MEASUREMENT, CLINICAL

[illegible]
WESTERN G
CHROMOSOMAL EFFECTS OF TRITIATED WATER (THWO) ON SHORT-TIP WORKERS AT BEIJING [illegible]
LABORATORY OF GENETICS BELJ/SIBUTH SPECIALTY TOBACCO, OTHER
CONF-767-3 0, 17 PAGES, FROM 11 INTERNATIONAL CONGRESS OF GENETICS, THE HAGUE, SEPTEMBER 1963

[illegible] OF MAIZE ROOTS WERE GROWN IN TRITIATED WATER HAVING SPECIFIC ACTIVITY OF 2.4 MC/ML. THE DOSE ABSORBED BY ROOTS WAS CALCULATED TO BE ABOUT 10 RADIAN. MANY NEW SUPER CHROMOSOME

043274 UNCLASSIFIED
DEUTERIUM EFFECT. A DISCRIMINATORY ONE, WAS FOUND. THE RESULTS ARE DISCUSSED IN COMPARISON WITH AN ANALOGOUS ONE.

ABSORPTION • HEAVY WATER • RADIONUCLIDE UPTAKE • ISOTOPIC EFFECT • COMPARISON • LETHAL DOSE • EXPOSURE, ACUTE

043284
BARTY P • VANDIA Y
MOVEMENT OF TRITIATED WATER IN THE ADULT SYSTEM OF HELIANTHUS ANNUUS IN THE PRESENCE AND ABSENCE OF TRANSPIRATION
INSTITUTE OF ARID ZONE RESEARCH, BEERSHEBA, ISRAEL
4 PAGES, PLANT PHYSIOLOGY, VOL. 40, PP. 370-382 (MARCH 1965)

MOVEMENT OF TRITIATED WATER WAS FOLLOWED IN 2- TO 3-WEEK-OLD ADULT SYSTEMS OF HELIANTHUS PLANTS GROWN IN NUTRIENT SOLUTION CONTAINING TRITIATED WATER (TWO) AT 20 DEG C. SUNFLOWER PLANTS GROWN 2 WEEKS IN NUTRIENT SOLUTION CONTAINING ONLY HOD WERE DETOPPED AT THE CYTOKINOKINY NODE, AND THE ROOT SYSTEM WAS SUBMERGED IN A LARGE VOLUME OF TWO. AT VARIOUS TIMES, ROOT SYSTEMS WERE REMOVED FROM THE SOLUTION, BLOTTED, AND ANALYZED FOR TRITIUM.

FLOW DISTRIBUTION • HEAVY WATER • DEUTERATION • FOUNTAIN • RADIONUCLIDE UPTAKE • BIOLOGICAL HALF-LIFE • CONCENTRATION • PLANT, SPERMATOPHYTE • DEHYDRATION • TRANSPORT

043290
BECKERMANN PW • HAMEL TM • FRANKLE DG
TOTAL BODY WATER ESTIMATIONS IN DAIRY CATTLE USING TRITIATED WATER
STATE UNIVERSITY, STATION FARGO, N.D.
4 PAGES, JOURNAL OF ANIMAL SCIENCE, VOL. 24, PP. 430-433 (MAY 1965)

TRITIATED WATER (TWO) WAS USED WITH LIQUID SCINTILLATION DETECTION AS A METHOD TO ESTIMATING TOTAL BODY WATER AND BLOOD-PLASMA FOLLOWING DILUTION OF WATER IN DAIRY COWS. FOUR HOLSTEIN COWS WERE GIVEN INTRAVENOUSLY WITH 10 MC OF TWO PER 1000 LB BODY WEIGHT. AND THE MILK AND MILK SAMPLES WERE TAKEN. A SECOND EXPERIMENT WAS CONDUCTED USING TWO HOLSTEINS, COMPARATIVE DRY COWS, GIVEN INTRAVENOUSLY WITH 7.5 MC OF TWO PER 1000 LB BODY WEIGHT. SAMPLES WERE COUNTED IN A PICKMAN 7 UTILIZING SPECTROMETER AT -19 C. THE LOG OF T ACTIVITY IN BLOOD PLASMA, URINE, OR MILK PLOTTED AGAINST COMPARATIVE WATER INTAKE OBSERVED IN A LINEAR RELATION FOR ABOUT 4 DAYS AFTER DOSING.

COUNTING • HEAVY WATER • INGESTION • WATER • SAMPLING • MILK • FOUNTAIN • BIOLOGICAL HALF-LIFE • BLOOD • CHANNEL, LARGE • EXPERIMENTAL, URINE • EXPERIMENT, IN • COUNTER BODY

043290
WORLEY JT
RADIUM EXCHANGE OF LANDFILL WATER IN INTACT MAIZE ROOTS
UNIVERSITY OF ILLINOIS, URBANA
7 PAGES, PLANT PHYSIOLOGY, VOL. 40, PAGES 711-17 (JULY 1965)

EQUILIBRATION OF MAIZE (ZEA MAYS) ROOTS WITH TRITIATED WATER WAS COMPARED WITH THEORETICAL CURVES FOR THE SINGLE CELL, SHEET, CYLINDER, AND SPHERE. DATA WAS FOUND TO FOLLOW THE CYLINDER CURVE. THIS WAS INTERPRETED TO INDICATE THAT THE PRINCIPALS ROOTS DO NOT CONSTITUTE A BARRIER TO THE EXCHANGE OF WATER. THE STELE WAS SEPARATED FROM ROOTS AFTER TREATMENT WITH TRITIATED WATER, AND THE EQUILIBRATION OF THE STELE WAS COMPARED WITH THAT OF THE CORTEX.

HEAVY WATER • RADIOISOTOPE • DIFFUSION COEFFICIENT • EQUILIBRATION • RADIONUCLIDE UPTAKE • PHYSIOLOGY/PHYSIOLOGY • COMPARISON • TEMPERATURE • CELL • CORN

043294
LYAGINSKAYA AN • ISTOMINA AG
TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND SPECIALITIES OF DEVELOPMENT OF THE REPRODUCING ORGANS IN THE PERIODS OF PRENATAL AND POSTNATAL LIFE
INSTITUTE OF BIOPHYSICS, MOSCOW
4 PAGES, RADIOBIOLOGIYA, VOL. 4, PAGES 890-92 (1964) (IN RUSSIAN)

TRITIUM OXIDE IN A DOSE OF 0.5 MICROCURIE/G, ADMINISTERED TO FEMALE RATS IN THE EIGHT DAY OF PREGNANCY, PRODUCES A SUBNORMAL TISSUE DOSE IN THE BODY OF THE FEMALE RATS TO 404 RAD DURING THE PERIOD OF PREGNANCY. THIS DOSE IS NOT SUFFICIENTLY STEREOTYPIC, ALTHOUGH IN SOME OF THE FEMALE RATS PREGNANCY WAS TERMINATED AS A RESULT OF DEATH OF ALL THE EMBRYOS. THE COMMON TISSUE DOSE OF 417 RAD, RECEIVED BY THE FETUS, DEPENDS TO DO IN PREGNANT WOMEN THAN THAT RECEIVED BY THE MOTHER. THE TRITIUM OXIDE CONTENT IN THE WATER EXTRACTED FROM THE FETUS, PLACENTA, AND UTERUS PROVED TO BE THE SAME AS IN THE WATER OF THE OTHER ORGANS.

RADIUM • WATER • FEMALE • LIVESTOCK • FETUS • PLACENTA • UTERUS • WHOLE BODY

043299
CATHOUD FH • BUTANDILOV GG
DYNAMICS OF THE ACCUMULATION OF HEAVY HYDROGEN IN THE ADDITIVE PHASE OF THE RABBIT ORGANISM AFTER PROLONGED ADMINISTRATION OF TRITIUM OXIDE

[illegible]
[illegible]
[illegible]

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[illegible]

[illegible]
[illegible]
[illegible] AS STUDIED BY THE USE OF [illegible]
[illegible] LABORATORY
[illegible] PAGES. [illegible] TECHNICAL REPORT, [illegible], PP. [illegible] [illegible] 1969

THE CONCEPT OF THE USE OF ISOTOPES IS RELATED TO THE USE OF DEUTERIUM AND TRITIUM IS PROPOSED IN THE LIGHT OF BIOLOGICAL STUDIES ALREADY MADE WITH THESE HEAVY ISOTOPES OF HYDROGEN. [illegible] IT WAS [illegible] POSSIBLE TO COMPARE THE RATES OF DIFFUSION [illegible] WITH THE RATES WITH WHICH THEY ENTER BODIES OF GREAT DIFFERENCE WAS [illegible] IN THE RATES WITH WHICH THEY ENTER [illegible] BODIES.

[illegible] • DIFFUSION • [illegible] • TRITIUM, RADIOACTIVE • WATER • THERMOTRICAL TRANSVISCOSITY • [illegible] • BLOOD • [illegible] • [illegible] • LIVER • [illegible] • [illegible] • [illegible]

[illegible]
PROCEEDINGS FROM [illegible] MEETING
[illegible] INDUSTRIAL FORUM, INC.
[illegible] PAGES. [illegible] NO. [illegible] 1970, PG 7

ARC WAS ENGAGED [illegible] OF HISTORIC [illegible] PUBLIC HEARING. [illegible] CONTAINS (1) PRESENTATIONS [illegible] ARC COMMISSIONERS AND SECRETARIES. (2) [illegible] DISCUSSION [illegible] ARC AND [illegible] PROPRIETARY [illegible], (3) [illegible] COMPONENTS WITH ARC [illegible] AND CONTRACTORS, (4) [illegible] TO WRITTEN QUESTIONS SUBMITTED BY [illegible] AND ARC [illegible]. CONTAINS INFORMATION ON OPERATION SAFETY OF LIGHT-WATER AND [illegible] REACTORS. [illegible] STUDIES, DECONTAMINATION OF [illegible], AND ARC [illegible] ACTIVITIES.

[illegible] PRODUCT [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] SAFETY OF • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
LARSON CE
[illegible] EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS [illegible] CONGRESS OF THE U.S. - 91ST CONGRESS
U.S. ATOMIC ENERGY COMMISSION
[illegible] PAGES, PG [illegible] OF THE HEARINGS BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, NINETY-[illegible] CONGRESS, FIRST SESSION, [illegible] [illegible]-[illegible], WASHINGTON D.C. 1969

STATEMENT BY C. F. LARSON, ARC COMMISSIONER ON ENVIRONMENTAL EFFECTS. RADIATION EFFECTS ARE [illegible] TO [illegible] PLANT [illegible] A YEAR. [illegible] STUDIES [illegible] AT [illegible] LEVELS [illegible] VERY SMALL EFFECTS. EFFECTS AT ALLOWABLE LEVELS SO SMALL AS TO BE [illegible] BY PRESENT TECHNIQUES. GIVES REVIEWS OF TYPES AND REPORTS OF STUDIES ON ENVIRONMENTAL EFFECTS, INCLUDES RADIONUCLIDE CYCLING, SOMATIC AND GENETIC EFFECTS, TRITIUM, [illegible], THERMAL EFFECTS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

[illegible] • [illegible] • [illegible] • [illegible] • THERMAL POLLUTION • [illegible] • [illegible] CHAIN

[illegible]
MERRIMOLT PC
PROGRESS REPORT ON [illegible] OF [illegible] ONE IN VIVO
STANFORD UNIVERSITY, CALIFORNIA. [illegible] LAB.
[illegible] PAGES, WASHINGTON 1969

A [illegible] SAMPLE TO BE DETECTED IN THE F. COLI AND [illegible] IN [illegible] WAS [illegible] BY US TO STILL [illegible] DEPOSIT [illegible] IN VIVO [illegible] AND TRANSPORTATION. HOWEVER, THE [illegible] OF NORMAL [illegible] WITH THE [illegible] IS RELEASED [illegible] COMPARED TO THE [illegible]. ALSO, THE [illegible] WEIGHT OF [illegible] AND [illegible] BY ALLOWING [illegible] METHOD [illegible] NOT [illegible] TO [illegible] AS [illegible] IN THE [illegible] AS IN THE [illegible].

AVAILABILITY - NTIS, DIVISION OF TECHNICAL INFORMATION EXTENSION, P.O. BOX 62, OAK RIDGE, TENNESSEE 37830

CHROMATOGRAPHY • [illegible] • RESEARCH CONTRACT • [illegible] • [illegible] • [illegible] • [illegible] • IN VIVO

[illegible]
[illegible] PL • [illegible] JJ
[illegible] OF [illegible] ANIMALS IN AN [illegible] FORESHORTED [illegible]
LAWRENCE [illegible] LABORATORY, LIVERMORE, CALIFORNIA
UCRL-[illegible] P. [illegible] PAGES, AUGUST 3, 1971

[illegible] ANIMALS [illegible], [illegible], AND [illegible] AND ALGAE [illegible] HALF TIMES OF LESS THAN A DAY [illegible] TISSUE WATER TO THE SPECIFIC ACTIVITY OF [illegible] WATER. THE SPECIFIC ACTIVITY OF THE TISSUE WATER AS A [illegible] [illegible] [illegible] TYPE OF THAT OF THE [illegible] WATER STUDY THERE WAS [illegible] WITH ATMOSPHERIC WATER THROUGH THE LEAVES. RATIOS OF THE SPECIFIC ACTIVITY OF THE [illegible] TRITIUM TO THE SPECIFIC ACTIVITY OF TISSUE WATER [illegible] 1.0 FOR ALGAE, 0.65-0.90 FOR [illegible], 0.90 FOR THE [illegible] TISSUE, AND 0.90 FOR THE MUSCLE TISSUE. [illegible] OF 1 KILOGRAM OF THE ANIMAL TISSUE WHICH GIVE A WHOLE BODY DOSE OF ABOUT A [illegible], WHEN THE RADIOACTIVITY OF THE [illegible] WATER WAS ABOUT 0.[illegible] MICROCURIES/ML.

[illegible]
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

[illegible]
[illegible]
TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST
PUBLIC HEALTH SERVICE, LAS VEGAS, NEVADA
[illegible] PROCEEDINGS OF THE SYMPOSIUM ON AGRICULTURAL AND PUBLIC HEALTH ASPECTS OF ENVIRONMENTAL CONTAMINATION BY RADIOACTIVE MATERIALS, VIENNA, AUSTRIA, 1969

[illegible] ... AS WAS BEEN SUGGESTED.

[illegible]

[illegible]
[illegible]
[illegible] BY RATS OF TRITIUM FROM A LUMINOUS COMPOUND
[illegible]
6 PAGES, [illegible] FIGURES, [illegible] TABLES, [illegible] REFERENCES, HEALTH PHYSICS, [illegible] (JANUARY 1972)

[illegible] ... HALF-LIFE WAS [illegible].

[illegible] BIOLOGICAL HALF-LIFE [illegible] LUMINARY [illegible], RAT

[illegible]
[illegible]
COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS
EASTERN ENVIRONMENTAL RADIATION LABORATORY, [illegible]
6 PAGES, [illegible] FIGURES, [illegible] TABLE, [illegible] REFERENCES, HEALTH PHYSICS, [illegible] (JANUARY 1972)

A SINGLE [illegible] DOSE OF A T-TITRATED LUMINOUS COMPOUND IN COMMON USAGE BY THE LUMINOUS DIAL PAINTING INDUSTRY WAS GIVEN TO RATS AND CATS, AND THE TRITIUM CONCENTRATION [illegible] IN THE URINE, FECES AND VARIOUS BODY TISSUES. A MAJOR PORTION OF THE ABSORBED TRITIUM WAS ELIMINATED WITH A BIOLOGICAL HALF-LIFE ESSENTIALLY THE SAME AS THAT OF TRITIATED WATER.

[illegible] BIOLOGICAL HALF-LIFE [illegible] COMPARISON [illegible], SMALL [illegible] LUMINARY [illegible], RAT [illegible], FECAL [illegible] EXCRETION, URINE

[illegible]
[illegible]
EFFECTS OF TRITIUM [illegible] ON THE LARVAE OF THE PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL HALF-LIFE [illegible] IN THE OYSTER
UNIVERSITY OF WASHINGTON, SEATTLE
[illegible]

[illegible] ... DECAY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

049222
FOY JM • SCHNIEDEN [illegible]
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

050577
JOHNSON BC
USE OF ADMINISTRATORS IN RESEARCH IN ANIMAL NUTRITION.
TIM-1974 P.

ADMINISTRATOR • ANIMAL • FOCUS

041773
DIMMOCK C
AN ANALYSIS OF TRANSLOCATION IN THE PHLOEM OF THE BEAN PLANT USING TMO, P-32, AND C-14.
PLANT PHYSIOLOGY 37 PAGES 600-610 1962

CARBON • PHOSPHORUS • FOOD CHAIN • DISTRIBUTION • PLANT

041774
GAGE RS
BIOAUTOMATOGRAPHY OF TRITIATED PHOTOSYNTHATE ADDITIONS FROM WOD.
PLANT PHYSIOLOGY 34 PAGES 64-68 1959

BIOAUTOMATOGRAPHY • PLANT

041776
BAMBY RC
MOVEMENT AND DISTRIBUTION OF TRITIATED WATER IN PLANTS.
COLLEGE U THESIS P.

DEPOSITION • WATER • FOUNDATION • VEGETATION • DISTRIBUTION

041778
CLINE JF
ADSORPTION AND METABOLISM OF TRITIUM OXIDE AND TRITIUM GAS BY BEAN PLANTS.
PLANT PHYSIOLOGY 38 PAGES 717-723 1963

OXIDE • GAS • ADSORPTION • VEGETATION • FOOD CHAIN • DISTRIBUTION

041780
MORGAN TH
UPTAKE AND TRANSPORT OF RADIOACTIVE AND TRITIATED WATER BY VARIOUS ZONES OF BEAN PLANTS OF DIFFERENT
FLOWERING STATUS.
PLANT PHYSIOLOGY 39 PAGES 104-109 1964

WATER • FLOWERING • RADIOACTIVE UPTAKE • VEGETATION • TRANSPORT

041717
MORIN L
DEPOSITION OF TRITIATED WATER INTO PLANTS AS INFLUENCED BY WATER STATUS OF TISSUE.
PLANT PHYSIOLOGY 19 PAGES 771-779 1967

DEPOSITION • WATER • VEGETATION • DISTRIBUTION

041714
SPRINGER JF
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN PLANT (VICIA FABA) AS A
TEST SYSTEM.
RADIATION RESEARCH 4 PAGES 771-777 1966

TESTING • EFFECT • BIOCHEMICAL • VEGETATION • FOOD CHAIN • BETA RAY

041407
TRIFILLIN TT
BIOLOGICAL EFFECTS OF IRRADIATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.
LA-1994 P.

IRRADIATION • GAS • EFFECT • HIGH • BIOCHEMICAL • CONCENTRATION • HAMMOND, INDIANA

041479
BIRKHOLZ CG
ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIONUCLIDES IN WATER INGESTION FROM INTERSPECIES
EXTRAPOLATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.
LAMS-2924 P.

[illegible]
[illegible] • WATER • [illegible] • [illegible] • [illegible] • CONCENTRATION • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
STUDIES ON [illegible] TREATED WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.
JOURNAL OF [illegible] CHEMISTRY 9(4) PAGES 181-187 1954

[illegible] • TRACER • COMPARISON • TURNOVER RATE • [illegible], RAT

[illegible]
[illegible]
THE TRITIUM RATE EFFECT IN TRANSFERASE-CATALYZED [illegible].
[illegible] OF BIOCHEMISTRY AND BIOPHYSICS 88 PAGES 479-484 1960

ELEMENTS AND ISOTOPES • RATE • EFFECT

[illegible]
[illegible]
[illegible] OF TRITIUM [illegible].
[illegible] JOURNAL OF [illegible], RADIOP THERAPY AND NUCLEAR MEDICINE 71 PAGES 1040-1045 1954

[illegible] • ABSORPTION • [illegible], RAT • SKIN

[illegible]
[illegible]
THE [illegible] AND [illegible] OF TRITIUM [illegible] IN THE [illegible].
[illegible] 0.

[illegible] • [illegible], [illegible] • [illegible]

[illegible]
[illegible]
[illegible] WITH TRITIUM.
INTERNATIONAL JOURNAL OF APPLIED RADIATION AND ISOTOPES 16 PAGES 479-479 1965

[illegible] • [illegible] • [illegible], RAT

[illegible]
[illegible]
[illegible] OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.
LABORATORY INVESTIGATION 11 PAGES 5[illegible]-[illegible] 1962

[illegible] UPTAKE • [illegible] • TUMOR • THYMIDINE

[illegible]
[illegible]
[illegible] INGESTED IN THE [illegible] WITH TRITIATED THYMIDINE.
[illegible] 1[illegible] PAGES 7[illegible]-7[illegible] 1962

EFFECT, [illegible] • [illegible], [illegible] • THYMIDINE

[illegible]
[illegible]
INCORPORATION OF TRITIATED THYMIDINE INTO DEOXYRIBONUCLEIC ACID BY ISOLATED NUCLEI.
BIOCHIMICA ET BIOPHYSICA ACTA 44 PAGES 36-44 1961

ACID • [illegible], RAT • BIOCHEMISTRY • THYMIDINE

[illegible]
[illegible]
EFFECT OF TRITIATED THYMIDINE ON THE CLONAL GROWTH OF MAMMALIAN CELLS.
RADIATION RESEARCH 11 PAGES 4[illegible]-4[illegible] 1960

EFFECT • [illegible] • [illegible] • GROWTH/DEVELOPMENT • CELL • THYMIDINE

[illegible]
CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF [illegible] DAMAGE, RECOVERY, AND
RADIORESISTANCE USING TRITIATED THYMIDINE.
RADIATION RESEARCH 19 PAGES 46-57 1963

SDSF • DAMAGE • HIGH • RECOVERY • RADIATION EXPOSURE • MAMMAL, RAT • THYMIDINE

052900
SELGMAN AM
THE KINETICS OF BIOLOGICAL PROCESSES. SPECIAL PROBLEMS CONNECTED WITH THE USE OF TRACERS.
ADVANCES IN BIOLOGICAL AND MEDICAL PHYSICS 3 PAGES 69-97 1953

TRACER • BIOCHEMICAL • RADIONUCLIDE TRANSFER • MAN

059130
WEBER DE
EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.
BNL-7040 •, ADVANCES IN RADIATION BIOLOGY 1 PAGES 95-115 1964

EFFECT • INTERNAL • RADIATION EXPOSURE

059417
SHAPIRO BM
TRITIUM IN ECOLOGY. A REVIEW.
HEALTHPHYSICS 4 PAGES 409-420 1963

ECOLOGY • REVIEW

059599
BACHMELER H
THE EFFECTS OF TRITIUM DECAY ON DNA. PROGRESS REPORT, JULY 1, 1964 TO DECEMBER 31, 1964.
COO-1609-1 •.

BACTERIA • EFFECT • CHROMOSOMAL EFFECT • DECOMPOSITION

064673
GOLDSTEIN A
BIOLOGICAL PROPERTIES AND RADIOSENSITIVITY OF TUMORS. REPRODUCTION IN THE CELL-CYCLE AND TIME OF SYNTHESIS
OF DEOXYRIBONUCLEIC ACID USING TRITIATED THYMIDINE AND AUTORADIOGRAPHY.
NATURE 207 PAGES 612-614 1964

AUTORADIOGRAPHY • BIOCHEMICAL • RADIOSENSITIVITY • ACID • TUMOR • THYMIDINE

064770
LORD BI
CELLULAR PROLIFERATION IN NORMAL AND CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING
WITH TRITIATED THYMIDINE.
BRITISH JOURNAL OF HAEMATOLOGY 11 PAGES 130-143 1965

RADIATION EXPOSURE • MAN • BONE, MARROW • CELL • MAMMAL, RAT • THYMIDINE

064879
CHERNEY W
RADIATION EFFECTS ON CARBON-14 AND TRITIUM ON GROWTH OF SYNCHRONY.
RADIATION BOTANY 5 PAGES 297-303 1965

CARBON • EFFECT • GROWTH/DEVELOPMENT • RADIATION EFFECT

064897
WEBER PCV
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.
LA-1641 •.

BIOCHEMICAL • MAMMAL, MOUSE • BETA RAY • THYMUS

064916
PUSCHNER J
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IODINE UPTAKE IN RATS.

[illegible]
[illegible]

[illegible]

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AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT • DECONTAMINATION • DECONTAMINATION, PROFIT • DECONTAMINATION, TOPICAL

[illegible]

[illegible]
[illegible]
[illegible]
[illegible]

CONTENTS - OBJECTIVE OF THIS REPORT. NUCLEAR CHARACTERISTICS. FORMATION AND ASSOCIATED HAZARDS. [illegible] NITROGEN, WATER AND VOLATILE ORGANICS OF STRATEGIC IMPORTANCE. BIBLIOGRAPHY. EXCHANGE REACTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY • DEBRIS AND SPA • DEGRADATION IN ENVIRONMENT • HAZARD, RELATIVE • STUDY • WEAR • ORGANOMETALLIC COMPOUND • DECONTAMINATION/TOXICOLOGY

[illegible]

[illegible]
[illegible]
[illegible]

[illegible] ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED TOPOTECAN
UNIVERSITY OF KANSAS, LAWRENCE
[illegible] PAGES, [illegible] FIGURES, [illegible] TABLES, 22 REFERENCES, RADIATION RESEARCH, VOL. 43, PP. 617-619 (1970) (1970)

[illegible] ESTIMATING HAZARD TO MAN OF INGESTED TRITIATED TOPOTECAN, ASSUMPTIONS MADE WERE (1) THAT MAN IS A SINGLE COMPARTMENT, (2) THAT ALL THE NONEXCHANGEABLE TRITIUM [illegible] IS LOCATED IN THE NUCLEUS, (3) THAT THE VOLATILE TRITIUM IS WATER AND UNIFORMLY DISTRIBUTED, (4) THAT ACTIVITY IN EACH TISSUE DECREASES EXPONENTIALLY WITH TIME, (5) THAT TISSUE ACTIVITY REMAINS CONSTANT DURING THE 24 HOURS BEFORE STANDARD-TYPE ADMINISTRATION. NUCLEAR DENSITY OF DIFFERENT MAMMALIAN CELLS [illegible] TO 4.0 DIFFERENT AND CELL [illegible] WERE DETERMINED FROM [illegible] IN AN ATLAS OF ULTRASTRUCTURE, BY DUNCIN, SAUNDERS (1969). [illegible] WERE [illegible] TO DETERMINE ESP. ACT. [illegible] EXPERIMENTALLY BY STANDARD TIME TO EP. [illegible] TRITIUM IN DIFFERENT TIMES (FROM -71 DPM WE NOT TISSUE AT 1,2,4,8,16,30,60 HOURS. [illegible] IN MANNER OF REFERENCE ORGANS LISTED BELOW AS [illegible] AND TO DETERMINE INGESTION - 21, 14, [illegible] 7 - 27, 19, [illegible] - 100, 70, 30, 14, 5, 1.0, 1.3. [illegible] DIFFERENCE IN WHICH DATA THE INGESTED DETERMINING [illegible] OF TRITIUM. [illegible] AT 15 HOURS IN [illegible].

INGESTION • HAZARD, RELATIVE • DOSE CALCULATION, INTERNAL • ENVIRONMENTAL DAMAGE • ANIMAL, [illegible] • [illegible] • TOXICITY • DISTRIBUTION • DOSE • [illegible], [illegible] • [illegible], [illegible], SC • [illegible] • LIVER • MATTER • [illegible] • INGESTION, SMALL • [illegible] • TESTIS • [illegible] • [illegible] • [illegible] • DISTRIBUTION, MICRO • [illegible], [illegible] • [illegible] • [illegible]

[illegible]

[illegible]
[illegible]
[illegible]

[illegible] AND [illegible] STRUCTURE OF [illegible] DATE LIVING IN A TRITIATED ENVIRONMENT
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
11 PAGES, RADIATION RESEARCH, [illegible], PP. 97-107 (1970)

[illegible] DATE LIVING WERE THE CHAMBER RESULTING FROM A NUCLEAR [illegible] WERE TRITIATED. THE [illegible] ACTIVITY IN BONE WATER AND TISSUES [illegible] FROM [illegible] TO 0.6 MICRONCI. PER G. [illegible] [illegible] WERE [illegible] THE SAME SP. ACTIVITY AS BONE WATER [illegible] X IRRADIATED [illegible] AT. THE ANIMALS WERE IN FOOD. WITH TRITIUM FROM SUPPLY, IN TERMS OF [illegible] CHAMBER. THE [illegible] MOST TO ADULT ANIMALS WAS ABOUT 10 PARTS FROM INTERNAL [illegible]. ABOUT 10 PARTS WAS ALSO RECEIVED FROM PERSISTENT EXTERNAL [illegible] IN THE SOIL.

[illegible] • [illegible] • [illegible] • [illegible] • RADIATION SPORES, INTERNAL • [illegible], [illegible] • [illegible]

[illegible]

[illegible]
[illegible]
[illegible]

[illegible] TRITIUM INCORPORATION IN ALGAE AND TRANSFER IN SIMPLE AQUATIC FOOD CHAINS
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS • CHICAGO UNIVERSITY, CHICAGO, ILLINOIS
[illegible]-71[illegible]-70 [illegible], 19 PAGES, MAY 1971

UPTAKE OF TRITIUM FROM TRITIATED WATER [illegible] BY ALGAE, WATER FLEAS, FATHEAD MINNOW, SNAILS, AND TOADS-DONG TADPOLES TRACERED A 24-HOUR DISCRIMINATION AGAINST UPTAKE FROM TRITIATED WATER INTO THE ORGANIC MOLECULES OF ALGAL CELL MATTER AND A 5-10-FOLD DISCRIMINATION AGAINST UPTAKE TO ANIMAL TRITIUM BY THE ANIMALS. THE ANIMAL TRITIUM CONTENT OF ANIMALS FEEDING ON TRITIATED ALGAE WAS OF THE SAME MAGNITUDE AS THAT OF THE ALGAE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]
WATER • AIR • [illegible] UPTAKE • ANIMAL • [illegible] • PHYSIOLOGY/METABOLISM • FOOD CHAIN • AQUATIC ORGANISM • LABORATORY EXPERIMENT • INSECT • PLANT, [illegible] • CONCENTRATION FACTOR • POND

[illegible]
[illegible]
INTERNAL CONTAMINATION WITH TRITIUM
[illegible]
5 PAGES, STRAHLENTHERAPIE, VOL. 137, PP. 700-704 [illegible] (IN GERMAN)

REPEATED AND LONG LASTING INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS IN AIR LED TO VERY SERIOUS CONTAMINATION EFFECTS WITH FATAL CONSEQUENCES IN ONE CASE. STUDIES OF TRITIUM CONTENT IN URINE [illegible] WITH RADIOACTIVE MATERIAL SHOWED AT LEAST TWO [illegible] BIOLOGICAL HALF LIFE OF MORE THAN FOUR MONTHS, THE OTHER [illegible] OF WEEKS. DEFINITE FIGURES [illegible] STRONGLY INFLUENCED BY THE MODE OF CALCULATION. IN ALL INVESTIGATED ORGANS, TRITIUM WAS FOUND IN A FORM COMPLETELY INSOLUBLE IN WATER.

[illegible], EXPOSURE • INHALATION • DOSE CALCULATION, INTERNAL • INCIDENT, FATALITY • BIOLOGICAL HALF-LIFE • CONCENTRATION • EXCRETION, URINE • ORGANS

[illegible]
[illegible]
RADIOACTIVE FALLOUT [illegible] SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE
[illegible] PAGES, SOUTH AFRICAN JOURNAL OF SCIENCE, [illegible], PP. [illegible]

MEASUREMENTS [illegible] WITH SPECIAL ATTENTION TO [illegible] SHOWED THE FRENCH NUCLEAR TESTS DID NOT [illegible] INCREASE. ANALYSES OF AIRBORNE FALLOUT, SR-90 IN MILK, CS-137 IN [illegible]. [illegible] AGE ANALYSIS. THE RATIO OF [illegible] INDICATED FALLOUT AGE, AND SHOWED FALLOUT [illegible] THE END OF [illegible]. INCREASES IN CUMULATIVE SR-90 DEPOSITION AND [illegible] IN RAIN WERE ATTRIBUTABLE TO [illegible] MIXING. THE AVERAGE DOSE RATE FOR THE POPULATION WAS CALCULATED TO BE [illegible] TO [illegible] AND [illegible] TO THE [illegible]. [illegible]

CERIUM • CESIUM • FALLOUT • STRONTIUM • DOSE CALCULATION, INTERNAL • [illegible] EXPOSURE • SOUTH AFRICA • RADIONUCLIDE UPTAKE • [illegible] • [illegible] • TESTIS

[illegible]
[illegible]
HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER
CEA, FONTENAY-AUX-ROSES, FRANCE
[illegible] PAGES, HEALTH PHYSICS, VOL. [illegible], PP. 100-107 [illegible]

CONTAMINATION MECHANISMS ARE (1) INHALATION AND SKIN ABSORPTION AND (2) INGESTION OF CONTAMINATED [illegible]. THE DOSE TO POPULATIONS WAS ESTIMATED BY CONSIDERING DISPERSION IN THE AIR AS A FUNCTION OF METEOROLOGICAL CONDITIONS, CONTAMINATION OF RAIN BY WASHOUT FROM THE ATMOSPHERE, CONTAMINATION OF THE WATER TABLE, CONTAMINATION OF VEGETABLE PRODUCTS TAKING INTO ACCOUNT THE EXCHANGE OF WATER IN THE VAPOR PHASE BETWEEN THE ATMOSPHERE AND THE EXPOSED PARTS OF PLANTS, OF THE FOLIAR ABSORPTION OF TRITIATED WATER, AND OF UPTAKE THROUGH THE ROOTS, CONTAMINATION OF MILK AND MEAT FROM PASTURE AND FROM THE WATERING OF [illegible] LIVESTOCK.

[illegible] • [illegible] • WASTE DISPOSAL, ATMOSPHERIC • MILK • WATER, DRINKING • ABSORPTION • RADIONUCLIDE UPTAKE • [illegible] • LIVESTOCK • MAN • SKIN

[illegible]
[illegible]
INCORPORATION OF TRITIUM IN [illegible]
INSTITUTE OF NUCLEAR RESEARCH, [illegible]
[illegible] PAGES, INTERNATIONAL JOURNAL OF RADIATION BIOLOGY, VOL. [illegible], PP. [illegible]

IT WAS [illegible] FROM EXPERIMENTS WITH RABBITS THAT THE LOWEST DETECTABLE AMOUNT OF TRITIUM ENTERING A [illegible] COLLECTING A [illegible] URINE SAMPLE IS [illegible], WHICH IS [illegible] TIMES LOWER THAN THE MAXIMUM PERMISSIBLE BODY BURDEN, AND THAT URINE MAY BE USED FOR DETECTING INTERNAL CONTAMINATION BY TRITIUM.

[illegible] • ANALYTICAL TECHNIQUE • [illegible] UPTAKE • [illegible] • [illegible], SMALL • [illegible] • [illegible]

[illegible]
[illegible]
RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED [illegible] ACID AND TRITIATED WATER IN THE RAT
RADIOLOGICAL PROTECTION SERVICE, [illegible], SUTTON, SURREY, ENGLAND
[illegible] PAGES, BRITISH JOURNAL OF RADIOLOGY, VOL. [illegible], PP. [illegible]

FROM RAT ORGAN RETENTION DATA AND [illegible] DOSE LIMITS TO ORGANS, PRESENT AUTHORS CONCLUDE THAT TRITIATED [illegible] ACID [illegible] IS [illegible] AS TOXIC AS TRITIATED WATER [illegible]. [illegible] WERE AS FOLLOWS, [illegible] RESPECTIVELY - LIVER [illegible] - KIDNEY [illegible] - [illegible] - BLOOD [illegible] - WHOLE BODY [illegible]. GROUPS OF [illegible] RATS WERE SACRIFICED FROM [illegible] AFTER INJECTING [illegible]

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064757 CONTINUED
EFFECT, DOSE • EFFECT, SEX • GROWTH • THYMIDINE

064758
CARDON RW • DEVIN P
STUDIES ON INCORP OF TRITIATED THYMIDINE IN DNA OF MOUSE TISSUES AND ON ITS RADIATION EFFECTS (TT2707)
HEALTH PHYSICS DEPARTMENT, INSTITUTE FOR ATOMENERGIE, KJELLER PH, KJELLSTADLI, NORWAY, • NUCLEAR SECTION, STATENS
RADIOBIOLOGISK-FYSISKE LABORATORIUM, MONTEBELLO, CALIF, NORWAY
15 .ABS. 27 REFERENCES, 7 FIGURES, 5 TABLES, INT. J. RAD. BIOL., 6 PAGE 157-177, 1963 (TT2707)

BASERGA, NSIC NO. 04759, FOUND SUBSTANTIAL OF MOUSE LIFE SPAN AT 10 AND 5 RAD WHT 0.1 UCI OF HT-THYMIDINE (3) PER GM OF BODY WT, BUT TUMOR VS DOSE RELATION WAS FAVORABLE. FRANKLIN, NSIC NO. 04759, SUGGESTED THAT (A) IN ANY SUFFICIENT FOR GROSS AUTORADIOGRAPHY, 0.05 TO 0.1 UCI/GM, GAVE NO OBVIOUS EVIDENCE OF RADIATION INJURY, BUT DID NOT RULE OUT MORE SUBTLE EFFECTS. CORTELLA, NSIC NO. 04757, FOUND NO APPARENT EFFECT IN MICE FROM 2 UCI/ML IN DRINKING WATER THE 1ST MATING, BUT SUBSEQUENT MATINGS PRODUCED STILLBIRTHS, FETAL DESTRUCTION, MALE STERILITY. PRESENT AUTHORS RAN A 120-DAY EXPT, USING 200, 20, 5 UCI OF (3) PER MOUSE AND 4 UCI OF (14)-THYMIDINE, SP ACT 6.5 CI/MM AND 0.0193 CI/MM RESPECTIVELY, 44 MICE WEIGHING ABOUT 27 GM, WITH AUTORADIOGRAPHY AND DNA EXTRACTION OF 7 TISSUES. PLOTS OF USING TISSUE VS TIME FROM 0 TO 120 DAYS SHOWN TO WHICH DESIRED FUNCTIONS CAN BE FITTED, AND GRAIN DENSITY/CELL NUCLEUS TABULATED, 120 DAYS TOO SHORT FOR DETERMINING MALIGNANCY. AUTHORS INTERPRET THEIR RESULTS TO MEAN THAT CELLULAR DEATH FROM RADIATION OCCURRED AT 200 UCI, AND POSSIBLY AT 20 UCI OR 1 UCI/GM OF BODY WT. (A) INCORP WAS NOT PROP TO MASS, SUGGESTING A THYMIDINE POOL. NOT OF LIVER, KIDNEY ACTIVITY FOUND IN THE DNA, NONE IN RNA. CF NSIC NO. 04726.

CARDON • DOSE CALCULATION, INTERNAL • AUTORADIOGRAPHY • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • CONCENTRATION • TOXICITY • DISTRIBUTION • COMPARTMENT • DNA • MAMMAL, MOUSE • RADIOSUPP, IP • KIDNEY • LIVER • NATURE • MITOSIS • MUSCLE • DNA • SKIN • SPLEEN • TESTIS • MALE • MASS • ORGAN • REPRODUCTION FUNCTION • DEFFECT, DOSE • EFFECT, MASS • GROWTH • THYMIDINE

064759
COCHRANE EP • FLEISCHER TM • KILLMANN SA • MURINI JR
TRITIUM-LABELED THYMIDINE - ITS SEMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (TT2707)
BROOKHAVEN NATIONAL LABORATORY, UPTON, LONG ISLAND, NEW YORK
20 PAGES, 44 REFERENCES, 7 FIGURES, 4 TABLES, TRITIUM IN PHYSICAL AND BIOL SCIENCES, 2, PAGE 189-208, 1961, (TT2707)

WITH REGARD TO DOSIMETRY, METABOLISM, AND TOXICITY OF H3-THYMIDINE (A) THIS REVIEW LEADS SOMETHING TO BE DESIRED, A REFLECTION OF THE STATE OF THE ART. INTERPRETATION OF SPECIAL AUTORADIOGRAPHIC DATA FOLLOWING FLASH LABELING AT (A) USUALLY ASSUMES (1) HT LABEL ON (A) DOES NOT EXCHANGE, (2) THYMINE BASE DOES NOT EXCHANGE AFTER INCORP INTO DNA, (3) DNA TURNOVER IS SLOWLY RESULT OF MITOSIS AND CELL DEATH, (4) REPUTILIZ OF (3) FROM DNA DEGRADATION IS TRIVIAL, (5) REUTILIZ OF LARGE CHUNKS OF DNA IS UNLIKELY IN MOST CELL REPAIRING SYSTEMS, (6) DNA SYNTHESIS IN NORMAL CELLS DESTINES A CELL TO DIVIDE ONCE AGAIN, (7) INITIALLY (A) IS UNIFORMLY DISTRIBUTED THROUGHOUT THE BODY AND IS EITHER PROMPTLY INCORPD INTO DNA OR DEGRADED TO NON-LABELING MATERIALS. (8) EFFECTIVE AVAILABILITY TIME OF (A) FOR DNA SYNTHESIS IS SHORT, (9) RADIATION FROM (A) IN DNA DOES NOT PERTURB NORMAL STEADY STATE CELL PARTIS, (10) IN-VITRO LABELING OFFERS THE PROFILE PERTURBATION OF NORMAL CELLS, (11) IN-VIVO LABELING AFTER SINGLE I.V. DOSES GIVES PROFILE STUDY POSSIBLE BY DILUTING DNA RADIOACTIVITY THROUGH SUCCESSIVE MITOSES, ETC. TOXICITY PAPERS REVIEWED, AS WELL AS CYTOLOGY, HEPATOLOGY, HISTOPATHOLOGY. CF NSIC NOS. 04758, 04747, 04766 FOR TOXICITY AND 04758, 04757, 04760, 04765, 04769, 04770, 04730, 04716, 04987, 04984 FOR DOSIMETRY.

IAEA • DOSE CALCULATION, INTERNAL • POPULATION EXPOSURE • AUTORADIOGRAPHY • REVIEW • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • CHROMOSOMAL EFFECT • PHYSIOLOGY/METABOLISM • TOXICITY • BRAIN • BONE, MARROW • CELL • NUCLEUS, BIOLOGICAL • MAMMAL, MOUSE • MITOSIS • THYMIDINE

064760
BIANCHI PA • CRATHORN AR • SHOTTON KY
USE OF TRITIUM-LABELED THYMIDINE IN STUDIES ON SYNTHESIS OF DNA
CHESTER BEATTY RESEARCH INSTITUTE, INSTITUTE OF CANCER RESEARCH, LONDON, UNITED KINGDOM
7 PAGES, 10 REFERENCES, 2 FIGURES, 2 TABLES, TRITIUM IN PHYSICAL AND BIOL SCIENCES, 2, PAGE 249-278, 1961 (TT2707)

POSTULATE (1) OF NSIC NO. 04759 ASSUMES THAT ANY H3-THYMIDINE (A) NOT PROMPTLY INCORPD INTO DNA IS DEGRADED TO NON-LABELING MATERIALS. SEVERAL AUTHORS HAVE SUGGESTED EXISTENCE OF A THYMIDINE POOL, SIZE AND KINETICS UNSPECIFIED (NSIC NOS. 04759, 04758, 04759, 04760, 04767, 04769, 04766, 04767, 04987). CARDON, NSIC NO. 04758, FOUND NO H3 FROM (A) IN DNA BUT HEAVY, NSIC NO. 04770, FOUND UP TO 2% AND ABVART, NSIC NO. 04726, FOUND UP TO 10% OF INJECTED (A) ACTIVITY IN PROTEIN BUT PERHAPS TO TRANSPEPTIDASE OR TO SELF-RADIOLYSIS OR SMALL-STORED (A). LACK OF DNA SPECIFICITY BY (A) ALSO SUGGESTED BY FOX, NSIC NO. 04726. SINCE THYMINE CAN REPLACE FOLIC ACID AND THYMIDINE VITAMIN B12, THESE AND OTHER REACTIONS CAN EITHER DILUTE OR CONCENTRATE THE TRITIUM LABEL FROM INGESTED (A) AND TO SOME UNKNOWN DEGREE AFTER DOSIMETRY. NOT OF LIVER AND KIDNEY ACTIVITY WAS FOUND IN DNA, NSIC NO. 04758. NOT OF DNA LABEL IS LOST IN 2 MONTHS FROM ACTIVE CELLS, NSIC NO. 04769, RENEWAL BY UNSTEADY THYMIDINE RANGES FROM 40 TO 200 UG/DAY, NSIC NO. 04767. BIANCHI ET AL CAUTION THAT THYMIDINE PHOSPHATES ARE NOT REMOVED FROM INTACT CELLS BY USUAL AUTORADIOGRAPHIC WASHPIX TECHNIQUE, WHICH CAN GIVE VALUES TOO HIGH FOR DNA H3 ACTIVITY.

ANALYTICAL TECHNIQUE • PHOSPHATE • REVIEW • RADIOMUTAGEN • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOCHEMICAL • PHYSIOLOGY/METABOLISM • DNA • CELL • NUCLEUS, BIOLOGICAL • MAMMAL, RAT • MICROSTUDIES • IN VITRO • THYMIDINE

004741
WEBER DW • RAN S
INCORPORATION OF RADIOACTIVE LABEL FROM PHOSPHATES INTO LIVER LIPIDS (TPS901)
BIOLOGY & MEDICINE DIVISION, ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
2 PAGES, 1974, J. PHYSIOL. PHARMACOL., 47, PG. 731-732, 1969

PHOSPHATE (P) OF WHICH APP. 44794 ASSUMES THAT NO LABEL ON NON-THYMIDINE (P) DOES NOT EXCHANGE. PRESENT AUTHORS + MORE 3 TIMES AS MUCH TRITIUM IN LIPID FRACTION OF RAT LIVER AS IN NUCLEIC ACID FRACTION, EMPHASIZING NEED FOR COMPARING LIPID EXTRACTIVITY IN AUTORADIOGRAPHY INCORPORATIONS OF NUCLEIC SYNTHESIS. HIGHEST LIPID INCORP IN LIVER, WHICH HAS A LOW RATE OF DNA SYNTHESIS AND HIGH RATE OF THYMIDINE INCORPORATION. MORSON, HOWEVER NOT NT, E NO IN NUCLEIC ACIDS, E NO IN LIPIDS, E NO IN ACID-SOLUBLE MATERIALS AS FOLLOWS - LIVER 0.17, 6, 17, 46 - KIDNEY 0.17, 7, 5, 98 - THYMUS 0.15, 63, 7, 44 - SPLEEN 0.21, 70, 1, 99. PROVIDING RESIDUE SHOWED 0.1 TO 0.5% NO IN ORGANS (SEE NUCL NO. 44794). THE 149-151 CM DATS DECEIVED EITHER 2M UCI OF (3) OR 6 MCI OF C14-LABELED THYMINE (D), URACIL (E) OR CYTOSINE (D). THE C14 LABEL FITTED THE 5-CH3 OR ONE C-2 OF PYRIMIDINE RING OF (B) WITH PARTIALLY INCORPORATED INTO LIVER LIPIDS (ONLY NOT SPECIFIC), AS WELL AS NO ONE C14 METHYL-LABELED (B), 2-C14-LABELED (B), NO ONE C14 METHYL-LABELED (B), AND 5,6-H3-LABELED (E) AND (D). ONLY OF LIPID EXCLUSIVELY INCORPORATED INTO NUCLEIC ACIDS AT 1 HR PRETREATMENT. THE LABEL BEING WIDELY DISTRIBUTED IN TISSUE CONSTITUENTS INDEPENDENT AS DESIRED FOR CONVENIENT INFORMATION OF PYRIMIDINE RING IN LIPID.

CHROMA • ANALYTICAL TECHNIQUE • AUTORADIOGRAPHY • BACTERIOLITIC UPTAKE • ANIMAL, VERTEBRATE • BIOCHEMICAL • CHEMISTRY/CHEMICAL • CONCENTRATION • DISTRIBUTION • DNA • NORMAL, RAT • EXPOSURE, IV • HEAT • KIDNEY • LIVER • MARROW • MUSCULOSKELETAL • PROTEIN • SURVIVAL • FEMALE • WOMAN • PHYSIOCHEMICAL FORM • THYMIDINE • THYMUS

004707
GRIFFITH A • PHAROAHMARCH N • FOTTLER M • CROMBIE FP • SCHNEIDER M
SPECIFICITY OF TRITIATED THYMIDINE AS A PRECURSOR OF DNA UNDER CONDITIONS OF OPTIMIZED BRONCHOSTATION (TPS901)
QUEEN ELIZABETH FOR FUNDAMENTAL CANCER RESEARCH, TORONTO LAUSANNE, SWITZERLAND, DEPARTMENT OF PATHOLOGY, UNIVERSITY OF BERN, BERN BERN, SWITZERLAND • MEDICAL DEPARTMENT, BONNEVEAUX NATIONAL LABORATORY, UPTON, NEW YORK
9 PAGES, 13 REFERENCES, 1 TABLE, 1 FIGURE, PROC OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE, PAGE 1070-1079, 1970

IN VIVO NO. 44741. PRESENT AUTHORS SUGGESTED TO FIND HIGH ACTIVITY IN DNA OF RAT TISSUE. ACTIVITY IN DIFFERENT BIOCHEMICAL FRACTIONS OF VARIOUS ORGANS AFTER INJECTION 6 MCI OF UNSPECIFIED ACT WITH 90 INJECTIONS AT 8-HR INTERVALS (0.97% DETECH ARMY WT) FOR TOTAL OF 90 UCI/GM, SP ACT 1.0 CI/MM FROM SCHWARTZ. GAVE FOLLOWING VALUES IN UCI/MG OF WET OF TISSUE FOR DNA, RNA, PROTEIN, LIPIDS, ACID-SOLUBLE MATERIALS RESPECTIVELY - LIVER 991, 70, 130, 140, 1900 - KIDNEY 630, 67, 25, 73, 1400 - SPLEEN 3665, 57, 49, 67, 1900 - BRAIN 94, 32, 14, 48, 1670 - SKELETAL MUSCLE 90, 31, 16, 70, 1270 - HEART 101, 31, 12, 70, 1190 - RAT TISSUE 1397, 55, 20, 101, 1030 - SKIN 135, 74, 14, 84, 700 - GI TRACT 2655, 61, 115, 49, 974. THYMIDINE WAS TRITIATED IN THE METHYL POSITION. FRACTIONATION BY METHOD OF SCHMIDT AND THANNHAUSER, JBC 161, 83 (1945) AS MODIFIED BY SCHNEIDER, JBC 164, 747 (1946). RADIOKNOW PURITY CHECK SHOWED SINGLE ARM OF THYMINE, 1 HR AFTER BOTH INJECTIONS NO FREE NT-THYMIDINE DETECTED IN ORGANS. TOTAL OF LABEL IN ACID-SOLUBLE FRACTION WAS IN VARIATED WATER. SPECIFICITY WAS SPECIFICITY IN ORGANS WITH HIGHEST FREE PROLIFERATION. 2TH OF TOTAL FROM PRE-SOLUBLE RADIOACTIVITY DID NOT EXCHANGE WITH WATER. DIFFERENT LABELING INCREASES WITH TIME. SEE ALSO NOS. 44740, 44744.

CHROMATOGRAPHY • ANALYTICAL TECHNIQUE • SEQUENCE EXTRACTION PROCESS • BACTERIOLITIC UPTAKE • ANIMAL, VERTEBRATE • BIOCHEMICAL • CHEMISTRY/CHEMICAL • CONCENTRATION • DISTRIBUTION • DNA • NORMAL, MOUSE • OTHERWISE, CHEMICAL • EXPOSURE, IV • HEAT • GI TRACT • KIDNEY • LIVER • MUSCLE • PROTEIN • RNA • SKIN • SPLEEN • FEMALE • MOUSE • MARROW • THYMIDINE • WOMAN

004741
WEBER D • RAN D
NT-3-DEUTERIUM AS TRACER IN THERAPEUTIC STUDIES (TPS901)
DEPARTMENT OF PHYSIOLOGY, UNIVERSITY OF TORONTO, TORONTO 181, ONTARIO
2 PAGES, 2 REFERENCES, 1 FIGURE, CANADIAN JOURNAL OF PHYSIOLOGY AND PHARMACOLOGY, 49, PAGE 732-4, 1970, (TPS901)

IN VIVO NO. 44741. UNFOLDING NATURE OF TRITIUM IN BIOMASS, SUCH AS MAN, SHOWS NATURAL BACKGROUND, MAY OR MAY NOT CONSTITUTE A FURTHER SOMATIC OR GENETIC HAZARD TO MALIGNANT AGAINST REMOTE AND NEED FOR MORE POWER. TO DATE, EMPHASIS HAS BEEN ON TRITIATED WATER, EXPERIMENTS DAILY, AND THYMIDINE. FURTHERMORE INDEED GUIDANCE (G), USED TO STUDY C TURNOVER RATE IN BODY, HAS BEEN ASSUMED NOT TO EXCHANGE ITS LABEL WITH EXPERIMENTAL C AS UNFAVORABLE ASSUMPTION. PRESENT AUTHORS EXAMINED POSSIBILITY OF A NONENZYMATIC TRANSFER OF NT FROM C TO BODY WATER, WHICH WOULD GIVE FRUSTRATED HIGH TURNOVER RATE FOR C, USING EXTERNALLY-NONEXCHANGEABLE TECHNIQUE IDENTIFICATION. BETA EMISSIONS 99, 243 (1963). BRICKMAN, JBC 238, 404 (1963), DEMONSTRATED C LABELED WITH C14 IN 1-POSITION TO CORRECT FOR ERRORS FROM DISCRIMINATION OF TRACER. PRESENT AUTHORS USED 2-NT-G/1-C14-G SPECIFIC ACTIVITY RATIO VS TIME FROM 1 TO 90 DAYS, AND EASTER 270-300 CM WITH 90 FROM DATE. THE RATIO WAS EQUAL TO AND CREATED THREE 1 FOR EXCHANGE, DECREASING FROM 0.9 TO 0.5 FOR NORMAL DATE, TAKEN TO MEAN THAT LABEL FROM 2-NT-G WAS NOT LOST BY RADIOLYSIS IN 1ST HR OR TWO AS FROM 1-C14-G BY NONENZYMATIC MEANS. TURNOVER RATES AT 0.97 UCI/MG OF NT AND 0.97 UCI/MG OF C14 WERE 5.70-6.24 MG/KG WITH FOR 2-NT-G AND 3.40-6.04 MG/KG WITH FOR 1-C14-G.

BIOMEDICAL • ANALYTICAL TECHNIQUE • BACTERIOLITIC UPTAKE • ANIMAL, VERTEBRATE • BIOCHEMICAL • CHEMISTRY/CHEMICAL • FOOD CHAIN • BACTERIOLITIC TRANSFER • SPECIFIC ACTIVITY • TURNOVER RATE • NORMAL, RAT • EXPOSURE, IV • WATER • RAIN • ORGANIC • IN CONTROL NORMAL • IN PATHOPHYSIOLOGY • BLOOD, PLASMA • PHYSIOCHEMICAL FORM • METABOLIC KINETICS • FOOD

064764
CLEAVER JE
THYMIDINE METABOLISM - PATHWAYS OF INCORPORATION AND DEGRADATION
LABORATORY OF RADIOBIOLOGY, UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, CALIFORNIA
26 PAGES, 120 REFERENCES, 4 FIGURES, 7 TABLES, THYMIDINE METABOLISM AND CELL KINETICS, CHAPTER 7, PAGE 43-69, 1967 (T2297)

THYMINE (A) COMPARED WITH DEOXYRIBOSE FORMS THYMIDINE (B) WHICH REACTS WITH ATP TO FORM THYMIDINE MONOPHOSPHATE (C), THYMIDINE DIPHOSPHATE (D), AND THYMIDINE TRIPHOSPHATE (E). DNA AND RNA BOTH CONTAIN ADENINE, GUANINE, CYTOSINE, BUT ONLY DNA CONTAINS THYMINE AND RNA URACIL WITH RIBOSE(S). THYMINE CONTENT OF DNA NOW KNOWN THAN TO, WELLEV- SCIENCE 147, 1967 (T2649), ETC. THE NUCLEOTIDES (C), (D), (E) ARE MORE BRADLY ABSORBED THAN THE NUCLEOSIDE (B). NSIC NO. 04740, PYRIMIDINE (A), AND (B) MAY BE PRODUCED FROM DNA SYNTHESIS (NSIC NO. 047001. DNA OF SOME POTENTIAL PRODUCTIVES SUCH AS CHARMEAT MAY CONTAIN AS MUCH AS 900 DEOXYRIBOSE (C) + ADENYLATE. SKINNER, BIOCHEMISTRY 10, 1964 (1971). ALTERNATE TO THE BIOSYNTHETIC ROUTE (D)/(C)/(D)/(E)/DNA IS DIRDEGRADATION (B)/(A) AND THENCE TO B-AMINOISOBUTYRIC ACID, NSIC NO. 04767, AND UNIDENTIFIED ACID-SOLUBLE MATERIALS. NSIC NO. 04702. SOME INCORP OF (B) LABEL INTO DNA VIA BIOSYNTHESIS AND INTO PROTEINS VIA TRANSMETHYLATION. NSIC NO. 04776, OR B-ALANINE, OR INTO LIPIDS. NSIC NO. 04702. IN MAN 17% OF INJECTED C14-(B) IS RETAINED IN DNA. 9% EXCRETED AS B-AMINOISOBUTYRIC ACID. 80% AS CO2. WEISS. BIOCHEMIST 47 (1963), BUT RETENTION OF H3-(B) IS GREATER, ONLY 1% RECOVERED TO WATER AND B-AMINOISOBUTYRIC ACID. NSIC NO. 04767.

CARBON + CORRELATION + REVIEW + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + PHYSIOLOGY/METABOLISM + RING CHAIN + REACTION + DNA + MAMMAL, MOUSE + MAMMAL, RAT + MAN + RETENTION + THYMIDINE

064764
CLEAVER JE
THYMIDINE METABOLISM - THE FOUR-FACTOR MODEL, POOL SIZES AND GROWTH INHIBITION (T2497)
LABORATORY OF RADIOBIOLOGY, UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, CALIFORNIA
33 PAGES, 74 REFERENCES, 11 FIGURES, 4 TABLES, THYMIDINE METABOLISM AND CELL KINETICS, PAGE 70-103, 1967 (T2497)

CF NSIC NOS. 04765, 04764. THE METABOLIC PATHWAYS FOR INCORP AND DEGRADATION OF THYMIDINE (B) CAN BE REPRESENTED BY A SIMPLE MODEL TO INTERPRET KINETICS OF (A) INCORP INTO DNA UNDER DIFF EXPTL CONDITIONS. MODEL BASED ON ASSUMPTION THAT (B) METABOLISM PATHWAYS MEET IN A FREELY MIXING POOL OF ACID-SOLUBLE DP - TP. (B). (B)-MP. (B)-DP. (B)-TP, THE POOL HAVING 2 INPUTS - EXOGENOUS (B) AND ENDOGENOUS (B) SUPPLIED FROM OUTSIDE THE PRECURSOR - AND 2 OUTPUTS - DNA SYNTHESIS. (B) DEGRADATION. BY MOLECULES/MIN INCORP INTO DNA FROM POOL, B2 MOLECULES/MIN ENTER POOL FROM ENDOGENOUS SYNTHETIC PATHWAYS. B3 THE RATE OF DEGRADATION. FOR CELLS POOL ASSUMED TO CONSIST MAINLY OF (B)-TP (THYMIDINE TRIPHOSPHATE). RATE OF INCORP OF H3 LABEL INTO DNA DERIVED FROM POOL SPECIFIC ACTIVITY OF EXTERNAL (B) AND B1, SOLVING FOR STEADY STATE. NON-PERMEAT INHIBITION EXISTS IN CELL CULTURE ANALYSIS BUT NOT WHOLE ANIMAL. MODEL PREDICTS THAT WITH NON-PERMEAT INHIBITION UNDER FLUCTUATING CONDITIONS (EXTERNAL (B) SUPPLYING ALL THE (B)-TP) RATE OF INCORP OF LABEL INTO DNA IS .INDEPENDENT OF EXTERNAL (B) CONCN AND PROPORTIONAL TO SP ACT. WHILE UNDER TRACE CONDITIONS INCORP RATE IS PROP TO SP ACT + SQ RTT OF CONCN. RATE AT WHICH MOLECULES PASS THROUGH POOL IS 10 (EXP +7) MOLECULES/MINUTE(S). THROUGH POOL FLOWS IN 10 MIN. POOL NOT EXHAUSTED UNTIL 3-4 HR OF GROWTH.

COMPUTER, ANALOG + AUTORADIOGRAPHY + REVIEW + MATHEMATICAL TREATMENT + MODEL TESTING + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + PHYSIOLOGY/METABOLISM + SPECIFIC ACTIVITY + TURNOVER RATE + DNA + CELL + MODEL, BIOLOGICAL + MAMMAL, MOUSE + EXPOSURE, IP + MATURE + FEMALE + DISTRIBUTION, MICRO + EFFECT, DOSE + EFFECT, MASS + MOUSE + THYMIDINE + KINETIC KINETICS

064768
SMITH JR + TAYLOR DT
INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE, BIO-MEDICAL DIVISION
UCRL-50781 +, 24 PAGES, 27 REFERENCES, 4 FIGURES, 1969

QUOTE - BY MAKING ASSUMPTIONS THAT TRITIUM REMAINS ENTIRELY IN BODY WATER UNTIL IT IS ELIMINATED AND THAT ITS REMOVAL FOLLOWS A SINGLE EXPONENTIAL CURVE, THE BIOLOGICAL HALF-LIFE OF TRITIUM IN MAN HAS BEEN ESTIMATED TO BE 8.5 TO 10.4 DAYS (NSIC NOS. 04767, 047001. HOWEVER, THE FALLACY IN THESE ASSUMPTIONS HAS BEEN DEMONSTRATED SEVERAL YEARS EARLIER WITH THE OBSERVATION THAT TRITIUM CONCENTRATIONS IN THE FAT ORGANIC CONSTITUENTS WERE HIGHER THAN THE BODY WATER IN THE CASE OF A MAN WHO, PRIOR TO HIS DEATH, HAD BEEN EXPOSED TO HTO FOR A PERIOD OF 6 MONTHS (NSIC NO. 04720). RECENTLY, JUNGAS CLEARLY DEMONSTRATED IN-VITRO WITH RAT ADIPOSE TISSUE THAT INCORP OF TRITIUM WAS AN EXCELLENT INDEX OF UNSATD FATTY ACID BIOSYNTHESIS (NSIC NO. 047001. INQUOTE. CF NSIC NO. 04770. THIS BIOCHEMICAL REVIEW DIVIDED INTO 3 PARTS - (1) INTRODUCTION, (2) CONTRIBUTIONS OF SCIENCE METABOLISM TO TRITIUM RETENTION IN MAMMALIAN SYSTEMS, (3) ONE-CARBON METABOLISM - SPEAKING IN A QUALITATIVE WAY TO THE QUESTION - WHAT IS THE METABOLIC FATE OF TRITIUM IF INGESTED AS HTO AT A CONSTANT LEVEL OVER A PROLONGED TIME-SUGGESTING THAT THE STORAGE COMPARTMENTS FOR TRITIUM ARE CHEMICAL RATHER THAN STRUCTURAL IN NATURE, CITING THOMSON, JAC 200, 231 (1963), AND SPELLING OUT SOME OF THE CHEMICAL PATHWAYS INVOLVED.

INGESTION + OXIDE + WATER + HAZARDS ANALYSIS + REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + DNA + MODEL, BIOLOGICAL + MAMMAL, RAT + OXIDISUPP, CHRONIC + FEAT + MAN + PROTEIN + WHOLE BODY + ORGANIC + BODY FLUID

066769
JURGAS DI
FATTY ACID SYNTHESIS IN ENZYMES TISSUE INCUBATED IN TRITIATED WATER (TTRGO)
8 PAGES, 55 REFERENCES, 3 TABLES, 4 FIGURES, NEUROMECHEMISTRY, 7, PAGE 1700-1717, 1960 (TTRGO)

CF NSIC NO. 66766. THROUGH IN-VITRO TEST OF SELECTED METABOLISM IS FOR REMOVED FROM INTACT-BODY METABOLISM, SPECIFICALLY AND C- WHICH. SUCH BIOCHEMICAL INFORMATION SHOULD BE CONSIDERED IF IT LEADS TO NEW INSIGHT ON TRITIUM HAZARD TO MAN FROM CHRONIC INTAKE. IN-VITRO AND IN-VIVO STUDIES HAVE INDICATED THAT INCORPORATED AND TRITIATED WATER LABELS SHOW UP IN FATTY ACIDS (A) OF VARIOUS TISSUES IN SUBCELLULAR ORGS. PURPOSE OF PRESENT STUDY TO REVEAL MORE DETAILED PERSPECTIVES ON NATURE, MECHANISM AND EFFECT OF LABELING OF (A) AND OF ISOTOPIC MASS EFFECT IN ANIMALS, USING RATS, 1 TO 4 WKS, ON UNIFORMLY-LABELED (14-CHLORINE, 0.7 UCI, WITH ABOUT 150 MG OF TISSUE FROM VIVO. ON INCORP INTO (A) AVERAGED 0.0015 MG-ATOM/100 MG OF FROM TISSUE IN 7 HR IN THE SPECIFIC OF (A) SYNTHESIS, ON A MEMBER OF MOLECULAR LESS THAN IN PERSPECTIVE OF SYNTHESIS. FOR EACH C14 ATOM INCORP INTO (A), 720 MG OF H2O ATOM IS ALSO INCORP, OR AN AVERAGE OF 14 H2O ATOMS PER (A) MOLECULE, AVERAGE CHAIN LENGTH OF NEWLY SYNTHESIZED (A) BEING 16.0. 1 H2O ATOM ASSOCIATED WITH EVEN-NUMBERED C ATOMS, 2.73 WITH ODD, BETWEEN 1.00, BETA 0.96, GAMMA 0.96, DELTA 0.70 ATOMS OF H2O PER ATOM OF C14. NO DEFECTIVE ENZYME WHICH EXCHANGE THE HYDROGENS AT POSITIONS 1 AND 4 OF CITRATE. CF NSIC NO. 66766.

CARBON • DEUTERIUM • HYDROGEN • OXIDE • BIOLOGICAL TECHNIQUES • ISOTOPIC FRACTIONATION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOCHEMICAL • PHYSIOLOGY/METABOLISM • WOMEN, RAT • HEAT • PRESERVED RATIO • ORGANIC • SKIN WITH • EFFECT, RATS

066770
MOTCH RT • MEYERHOF JR • GREENBAUM SC • STRAUSS JJ • WOOD JT
STUDIES ON LIVER DNA IN TRITIATED BACKGROUND RATS LIVING AT SEDAN CRATER
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, BIO-MEDICAL DIVISION
UCRL-50661 0, 40 REFERENCES, 0 TABLES, 4 FIGURES, JULY 10, 1968, (TTRGO)

BACKGROUND RATE (EXPERIMENTAL) TRIPPED IN 1965 WITHIN 200 YARDS OF SEDAN CRATER OF 1962 AT THE NEVADA TEST SITE DESCRIBED THE CRATER VICINITY ABOUT 1963, WITH A MEAN LIFETIME OF 4 TO 5 MONTHS IN THESE DESERT ENVIRONMENT, CONSUMING NO FOOD WATER, NEARLY ALL OF ITS FROM ITS PRINCIPAL FOOD, SEEMS TO DESCRIBE THISTLE (SONCHUS & VARIE). A SMALL PART OF PERSPIRATION WATER EXCHANGE VIA WHICH ALSO IN THE KIDNEYS. LIVER DNA CONTAINED A X 10 (EXP 04) DPM/GM HYDROGEN OF 0.7 UCI/GM OF HYDROGEN IN LIVER AND BODY WATER, FROM 4 X 10 (EXP 04) DPM/MIN/GM LIVER OF 3.4 X 10 (EXP -7) CI/GM AND ASSUMING UNIFORM DISTRIB OF H3, AND THAT 1 CI/GM OF TISSUE DELIVERS 12700 RADS/YR, TISSUE DOSE WAS EST TO BE 3.0 MRAD/YR OR 25 RAD/YR. ASSUMING A X 10 (EXP -12) GM DNA/CELL, DOSE TO DNA WHICH IS 7 RAD/GM-DAY YIELDS A X 10 (EXP -17) GM DNA/CELL DIVIDED BY 24 X 10 (EXP -12) RAD/CELL OR 24 AY OR ALMOST 1 DNA-RATE/CELL/DAY TO DNA. LIFETIME CHRONIC DOSE TO BONE (30 GM) DATE ESTIMATED AT 10 RAD FROM H3 INTERNAL BETA + 10 RAD FROM EXTERNAL BETA AND GAMMA EMITTING RADIONUCLIDES 60.5 MRAD/YR FROM MEAN BETA + 7 MRAD/YR FROM GAMMA AT MIDPOINT DEPTH AS PERSISTENT CRATER AGES OLD. SMALL BUT SIGNIFICANT BIOCHEMICAL AND FUNCTIONAL CHANGES IN DNA COMPARED TO CONTROLS WAS NOTED. CF NSIC NO. 66766.

WATER • DISTANT HARTT • DOSE CALCULATION, INTERNAL • NEVADA TEST SITE • HAZARDS ANALYSIS • CONTROL, NUCLEAR DETONATION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOCHEMICAL • PHYSIOLOGY/METABOLISM • TOXICITY • ORGANIZATION EFFECT • DNA • MAMMAL, RAT • MUTATION, GENERATION • EXPOSURE, CHRONIC • LIVER • NATURE • RESPONSE, BACKGROUND • BODY FLUID

066771
BOST J
EFFECTS OF H3-THYMIDINE AS A DNA LABEL IN RAT LIVER (TTRGO)
NEW YORK UNIVERSITY SCHOOL OF MEDICINE, 550 FF 1ST AVENUE, NEW YORK, NEW YORK • NEW YORK UNIVERSITY RESEARCH SERVICE, GOVERNOR BELLEVUE HOSPITAL
NYO-2778-7 0, 20 PAGES, 12 REFERENCES, 15 FIGURES, 2 TABLES, SEPTEMBER 1, 1968 (TTRGO)

LARGER THE DOSE AND SMALLER THE WT IN WHICH TRITIUM CONCENTRATES, THE MORE HAZARDOUS THE SITUATION (PRESUMABLY). WHILE THE MORE DEFINITE INITIALLY OR WITH TIME, AND THE MORE READILY REPAIRED, THE LESS HAZARDOUS (ST STEP IN REMAINING EVALUATION BEING QUALITATIVE INDENTIFICATION. THE QUANTITATIVE CORRELATION OF PHYSIOLOGIC/PATHOLOGIC EFFECTS WITH DOSE CALCS, IN CONJUNCTION WITH BIOLOGIC STATISTICS. BUTTON EXAMINED 3 CELL POPULATIONS (SPLEEN, LIVER, ILEUM) WITH H3-THYMIDINE AND WITH AN ANALOG, IODODEOXYURIDINE, USING 21-28 DAY WISTAR RATS, SACRIFICING AT 2,4,24,48 HR, AND FROM DOW/MICELLIS CALCULATING 75, 160, 800 RADS/DAY TO THE LABELED DNA OF SPLEEN ARE 400, 800, 2000 RADS/DAYS TO LIVER DNA FOR 1, 2, 10 UCI/GM OF BODY WT RESPECTIVELY. THE REGULAR PHYSIOLOGICAL REPLICATION PATTERN OF HEPATOCYTES WAS DISRUPTED AND CELLS ARRESTED IN S AND G2 STAGES BY 10 AND 2 RUT NOT 1 UCI/GM. SPLEEN LYMPHOCYTES SHOWED ASYMMETRIC MITOTIC LABELING FIRST AT 1 UCI/GM AND THUS MORE SENSITIVE THAN LIVER OR ILEUM CELLS, RETAINING THE DISRUPTED CYCLE AFTER LARGE DOSES. UNLIKE LIVER AND ILEUM, H3-IODODEOXYURIDINE EVEN MORE EFFECTIVE THAN H3-THYMIDINE IN DISRUPTING CYCLE PATTERNS. CF NSIC NO. 66766. 1,2,10 UCI/GM GAVE 37,80,357 DECIMT/LABELED CHI/CHI/DAY, REPORTED BY DECAMPHY, ATOMIC BIOLOGY ACTA 144, 760 (1960) AS IMPORTANT EFFECTS ALTERATIONS AND CELL DEATH IN A, SUMMITES.

BIOMEDICAL • DOSE CALCULATION, INTERNAL • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • CONCENTRATION • TOXICITY • DISTRIBUTION • DNA • CELL, NUCLEUS • MAMMAL, RAT • EXPOSURE, SC • LIVER • NATURE • MITOSIS • MORTALITY • INTESTINE, SMALL • SPLEEN • MALE • EFFECT, DOSE • THYMIDINE

066772
DEWEY WC • WHIPPERTY BR • JONES RA
COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND CORMIT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (TTRGO)

[illegible]
DEPARTMENT OF PHYSICS, THE UNIVERSITY OF TEXAS, M.D. ANDERSON HOSPITAL AND TUMOR INSTITUTE, TEXAS MEDICAL CENTER, HOUSTON, TEXAS
[illegible] PAGES, [illegible] REFERENCES, 1 TABLE, 6 FIGURES, RADIATION RESEARCH, 24, PAGE [illegible], 1964

[illegible]

[illegible]

[illegible]
DICKINSON CD • GIRCHOFF JF • LANGHAM WH
EST OF THE PROBABILITY CURVES OF RADIOISOTOPES IN WATER UNDER FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR Zn-65 AND TRITIUM (1964)
LOS ALAMOS SCIENTIFIC LABORATORY, UNIVERSITY OF CALIFORNIA, LOS ALAMOS, NEW MEXICO
LAMS-2952 P., [illegible] PAGES, 4 REFERENCES, 7 TABLES, 7 FIGURES, PAGE [illegible], APRIL 1964

[illegible]

[illegible]
THOMPSON PC
REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE RADIOTOXICITY OF TRITIUM (1964)
BATTELLE MEMORIAL INSTITUTE • PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-SA-3770 P., 10 PAGES, 40 REFERENCES, 3 FIGURES, 1 TABLE, MAY 1971

[illegible]

[illegible]
THOMPSON PC
EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE

[illegible]

[illegible]

[illegible]

064[illegible]
MOORE R
COMPARISON OF HTO IN PLASMA AND EXPIRED WATER VAPOR
RESEARCH LABORATORIES, AMERICAN NATIONAL RED CROSS, WASHINGTON, D. C.
6 PAGES. HEALTH PHYSICS, VOL. 7, PP. [illegible]

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[illegible]
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGICAL SCIENCES
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-1550 VOL. 1, PT. 2 [illegible] PAGES. MARCH 1971

[illegible] RESEARCH EFFORTS ARE REPORTED. A SMALL BUT IMPORTANT PART OF THE TOTAL EFFORT IS IN PROGRAMS CONCERNED WITH THE ARID LANDS ECOLOGY RESERVE (ALE) WHERE THE LONG RANGE OBJECTIVE IS TO STUDY THE EFFECT OF ENVIRONMENTAL MODIFICATIONS BY MAN (FIRE, IRRIGATION, GRAZING, HERBICIDAL APPLICATIONS, ETC.). EFFORTS ARE DESCRIBED TO [illegible] CONSERVATION-ORIENTED GROUPS TO GAIN A BETTER UNDERSTANDING OF [illegible] INTEREST AND SUPPORT IN ECOLOGY. SEVERAL ELEMENTS OF THE [illegible] OF THE [illegible] FOOD CHAIN ARE BEING DEFINED. EFFORTS ARE CONTINUING IN REACTOR SITING PROBLEMS INCLUDING INJURY TO FISH BOTH FROM THERMAL EFFECTS AND FROM POTENTIAL HAZARDS ASSOCIATED WITH CHRONIC RADIOACTIVITY DISCHARGE. LONG-TERM STUDIES OF [illegible] GOOSE POPULATIONS ON THE COLUMBIA RIVER ARE REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + FIRE + WASTE DISPOSAL + [illegible] + RIVER, COLUMBIA + BATTELLE NORTHWEST + ECOSYSTEM, GRASSLAND + DESTRUCTIVE [illegible] + SOIL PROPERTY, IN SITU + THERMAL POLLUTION + [illegible] UPTAKE + ECOSYSTEM, AQUATIC + FOOD CHAIN + ECOSYSTEM + RADIATION EFFECT + ECOSYSTEM, ARCTIC + ECOSYSTEM, DESERT + RESEARCH, GOVERNMENT + PLANT, [illegible]

0[illegible]
STRAND JA + TEMPLETON WL + [illegible]
EFFECTS OF IRRADIATION ON EMBRYOGENESIS OF FISH AND FIXATION AND LONG-TERM ACCUMULATION OF TRITIUM IN AN EXPERIMENTAL AQUATIC ENVIRONMENT
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-1550, VOL. 1, PT. 2 [illegible], PAGE [illegible], MARCH 1971

PRELIMINARY CONSIDERATION OF DATA INDICATES NO SIGNIFICANT DEGREE OF RETARDMENT OF EMBRYOGENESIS OF MARINE TELEOST FISH, AS RESULTING FROM EXPOSURE TO LEVELS OF 0.01, 0.1 AND 1.0 MICROCURIE OF TRITIUM. HOWEVER, THE PRESENT REPORT TREATS ONLY A PORTION OF THE EARLY LIFE STAGES. LONGER-TERM STUDIES WILL BE NECESSARY TO INVESTIGATE THE PROBLEM FULLY, TO EXAMINE FIRST EMBRYONIC [illegible] STAGES, AND TO EXAMINE TIME OF DISAPPEARING OF YOLK SAC. A PROGRAM WAS INITIATED TO DETERMINE THE CONCENTRATION OF TRITIUM BY THE FOOD WEB.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

RADIONUCLIDE UPTAKE + ANIMAL, FISH + [illegible] + ECOSYSTEM, AQUATIC + MARINE ORGANISM + CONCENTRATION FACTOR + [illegible]

0[illegible]
ECOLOGICAL ASPECTS OF TRITIUM BEHAVIOR IN THE ENVIRONMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
12 PAGES. NUCLEAR SAFETY, 12(4), PP. [illegible], AUGUST 1971

REVIEW OF LITERATURE ON TRITIUM IN DISCHARGES FROM POWER REACTORS AND FUEL REPROCESSING PLANTS, AND ON UPTAKE BY PLANTS AND ANIMALS FROM FOOD AND WATER. WHEN ORGANISMS ARE EXPOSED TO TRITIATED WATER (HTO), [illegible] MORE TRITIUM IS FOUND IN BODY WATER THAN IN TISSUE. FOR HUMANS THE RETENTION HALF-LIFE IS GREATER FOR TISSUE-BOUND TRITIUM (AS LONG AS [illegible] DAYS FOR THE LONGER COMPONENT WITH CERTAIN ORGANS) THAN FOR TRITIUM IN BODY WATER ([illegible] DAYS). THE PROPORTION OF TRITIUM RETAINED IN BODY TISSUE OF MICE IS MUCH GREATER FOR UPTAKE FROM FOOD THAN FROM WATER. TURNOVER TIMES OF TRITIUM AND HYDROGEN DO NOT DIFFER SIGNIFICANTLY IN NATURAL ECOSYSTEMS, AND THERE IS NO SIGNIFICANT CONCENTRATION RELATIVE TO HYDROGEN IN FOOD CHAINS.

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0705 36 (CONTINUED)
ARE NUMEROUS ABSORPTION BY BODY OR LEAF, VAPOUR EXCHANGE) AND THE MECHANISM RESPONSIBLE FOR TRITIUM INCORPORATION IN PLANT ORGANIC MATTER IS THAT OF PHOTOSYNTHESIS.

CONTAMINATION EXPOSURE • CONTAMINATION • RADIOACTIVITY RELEASE • ABSORPTION • ORGANIZATIONS UPTAKE • CONCENTRATION • FOOD CHAIN • ORGANIZATIONS TRANSFER • VAPOR EXCHANGE

0752 46
RUSSELL AG • CARDILE TF • DAVIDSON RS
TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY
BATTELLE COLUMBUS LABORATORIES, OHIO
BNWL-171-907 0. 1?? PAGES, FIGURES, TABLES, REFERENCES, JUNE 30, 1971

THIS BIBLIOGRAPHY WAS COMPILED TO PROVIDE DETAILED SUBJECT ACCESS TO THE LITERATURE ON TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT, WITH EMPHASIS ON BIOL. THE ABSTRACTS ARE, FOR THE MOST PART, OF THE INDICATIVE TYPE -- INTENDED TO DESCRIBE THE CONTENT OF THE REFERENCES WITHOUT RELATING SPECIFIC DETAILS. ALL INDEX TERMS ASSOCIATED WITH EACH ARTICLE ARE LISTED IN THE COMPILATION IMMEDIATELY FOLLOWING THE ABSTRACT. TO PROVIDE ACCESS TO THE CONTENTS OF THE COMPILATION, A SUBJECT, AUTHOR, AND REPORT-NUMBER INDEX ARE PROVIDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY • BATTELLE NORTHWEST • ENVIRONMENT • IRRADIATION EFFECT • RADIATION EXPOSURE • OHNO • REPORT, ENVIRONMENTAL

0752 81
MOSHKALEV VI
TRITIUM OXIDE
JPRS-50-7290 0. 369 PAGES, FIGURES, TABLES, REFERENCES, 1969

A MONOGRAPH GENERALIZING EXTENSIVE THEORETICAL AND EXPERIMENTAL MATERIAL ON THE DISTRIBUTION, KINETICS OF EXCHANGE, AND BIOLOGICAL ACTION OF TRITIUM OXIDE. THE AUTHOR NOTE ON THE PHYSICAL PROPERTIES OF NEUTRITIUM AND TRITIUM, THE ISOTOPIC EXCHANGE OF HYDROGEN, THE KINETICS OF ISOTOPIC EXCHANGE. METHODS FOR MEASURING TRITIUM IN BIOLOGICAL MEDIA, THE KINETICS OF WATER EXCHANGE IN THE ANIMAL AND HUMAN ORGANISM, PATHWAYS AND RATES OF ASSIMILATION OF TRITIUM OXIDE THROUGH THE GASTROINTESTINAL TRACT, LUNGS, AND SKIN AND THE KINETICS OF THE ELIMINATION OF TRITIUM OXIDE FROM THE ANIMAL AND HUMAN ORGANISM ARE ANALYZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIOMEDICAL • NEUTRITIUM • HYDROGEN • MEASUREMENT • OXIDE • BIOLOGICAL MAXIMUM PATHWAY • ION EXCHANGE • PROPERTY, PHYSICAL • ANIMAL • ASSIMILATION • DISTRIBUTION • ELIMINATION • GI TRACT • LUNG • MAN • SKIN • BIOLOGICAL CONTROL • KINETIC KINETICS

0753 00
ANTONELLI A • BONACE PA • CIGNA AA • CIGNA A • LANFRI U
RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE TURBO NUCLEAR PLANT
CNEN, DIV. DI PROT. SAN. E CONTROLLI AMBIENTALI, PARTECIPAZIONE AMBIENTALE, ROME, ITALY
44 PAGES, 1 FIGURE, 1 TABLE, 9 REFERENCES, PRESENTED AT THE SYMPOSIUM ON RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1972

TRACER EXPERIMENTS WERE CONDUCTED OR MIXING IN THE PO RIVER DELTA RIVER AND IN THE PO RIVER DOWNSTREAM OF ITS CONFLUENCE WITH THE PO. ESTIMATES WERE MADE OF PARTICULATE PATHWAYS TO MAN VIA DRINKING WATER, IRRIGATION WATER (VEGETABLES AND MILK), AND FISH CONSUMPTION. MAXIMUM RELEASE RATES FROM TRITIUM, NA, FE, CO, ZN, SR, PU, CS, CE, AND PU RADIONUCLIDES ARE LISTED WHICH ENSURE A WIDE SAFETY MARGIN, AND IT IS SHOWN THAT IN ALL CASES DRINKING WATER IS THE MORE CRITICAL PATHWAY.

AVAILABILITY - OFFICE AND OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES, P.O.B. 1003, LUXEMBOURG !

RESIDUE • CONCRETE • CONCENTRATION, MAXIMUM • EURATOM • PLUTONIUM • RUTHENIUM • STRONTIUM • MANGANESE • WASTE DISPOSAL, RIVER • ZINC • MILK • DISTANCE MODEL • DOSE CALCULATION, INTERNAL • WATER, DRINKING • IRON • CRITICAL NUCLIDE PATHWAY • ITALY • WATER, IRRIGATION • RADIONUCLIDE UPTAKE • ANIMAL, FISH • FOOD CHAIN • FIELD EXPERIMENT • RECEPTOR, OTHER

0753 10
VAN DEN HOVE J • VIERENKEL G
TRITIUM SECRETION INTO COWS MILK AFTER ADMINISTRATION OF ORGANICALLY BOUND TRITIUM AND OF TRITIATED WATER
WAGENINGEN AGRICULTURAL UNIVERSITY, THE NETHERLANDS • S.C.K.-C.E.N., MOL, BELGIUM, DEPARTMENT OF RADIOBIOLOGY
17 PAGES, 3 FIGURES, 2 TABLES, 4 REFERENCES, PRESENTED AT THE COMMISSION OF THE EUROPEAN COMMUNITIES INTERNATIONAL SYMPOSIUM ON RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1972

TRITIUM IS POTENTIAL POLLUTANT FROM THE NUCLEAR INDUSTRY WHICH MAY REACH FOOD CHAINS THROUGH UPTAKE BY PLANTS) WAS ADMINISTERED TO LACTATING COWS AS TRITIATED ORGANIC CONSTITUENTS IN HAY WHICH HAD BEEN CONTAMINATED DURING GROWTH. THE RADIOLOGICAL HALF-LIFE OF TRITIUM IN ORGANIC MILK CONSTITUENTS WAS ABOUT TWO DAYS INITIALLY, BUT WITH SLOWER COMPONENTS BECAUSE DEPOSITION AFTER ABOUT TWO WEEK. POSSIBLY THIS RESULTS FROM SLOW TURNOVER OF TRITIUM WHICH BECOMES INCORPORATED INTO THE ANIMALS TISSUES.

[illegible]

AVAILABILITY - [illegible] OF THE [illegible] COMMISSION, D.C. [illegible]

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AVAILABILITY - [illegible] INC., D.C. [illegible]

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[illegible]

[illegible]

AVAILABILITY - NATIONAL [illegible] INC., [illegible] NEW YORK, N.Y. [illegible]

[illegible]

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[illegible]

[illegible]

077200 [illegible]
[illegible], EXPOSITION VIA FOOD WEB, BIOLOGICAL INDICATORS OF POLLUTED ENVIRONS CONTAMINANTS, POLLUTANTS OF AQUATIC ANIMALS, AND REMOVAL OF TRITIUM IN FISH.

ECOLOGY • POND • WATER • BIO • NIL • [illegible] • HAZARDS ANALYSIS • CHEMICAL KINETICS • CHEMICAL FOUR [illegible] • ORGANIC, INCORPORATE • ANIMAL, FISH • [illegible] • BIOLOGICAL HALF-LIFE • POND CHAIN • AQUATIC ORGANISM • EXCRETION • [illegible] • ENVIRONMENT • POND • [illegible] • [illegible] OF KINETICS • DOES

070460
PATZER DG • [illegible] AA • [illegible] WF, ET AL.
TRITIUM TRANSFER TO FOOD ITEMS FROM TRITIATED [illegible] USED FOR DOMESTIC COOKING
ENVIRONMENTAL PROTECTION AGENCY, WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS
7 PAGES, 4 TABLES, 3 FIGURES, 4 REFERENCES, HEALTH PHYSICS, 29(6), PP. 901-907 (DECEMBER 1975)

[illegible] FOODS WERE COOKED WITH TRITIATED [illegible] AND ANALYZED FOR TRITIUM IN THE [illegible] AND DRY PORTIONS OF THE FOOD. THE AMOUNT OF TRITIUM FOUND IN THE FOOD WAS [illegible] TO [illegible] SURFACE AREA, COOKING TIME, AND MOISTURE CONTENT OF THE FOOD. THE SPECIFIC ACTIVITY OF HYDROGEN WAS HIGHER IN SURFACE TISSUE IN ENTIRELY [illegible] OF COOKED FOOD, E.G., THE SPECIFIC ACTIVITY IN SURFACE AND CENTER PORTIONS OF BEAN LEAVE ABOUT 1 AND 0.75, RESPECTIVELY, OF THE SPECIFIC ACTIVITY IN [illegible] COOKING GAS. APPROXIMATELY 0.42 OF THE TRITIUM IN THE [illegible] USED TO COOK A BEEF ROAST WAS FOUND IN THE ROAST. THE UPTAKE RATE OF TRITIUM INTO [illegible] DURING COOKING CORRESPONDS TO AN UPTAKE RATE OF ABOUT 3 MICROCURIES/(GRAM-HOUR) OF HYDROGEN FROM THE [illegible].

CONTAMINATION • GAS • FUEL, FOSSIL • [illegible] TOBACCO • [illegible] • ENVIRONMENTAL PROTECTION AGENCY (EPA)

070104
BLAYLOCK, BG • ULOPIASZ CU • [illegible] WW • ET, AL
APPLIED AQUATIC STUDIES
[illegible] 0, 7 PAGES, FIGURES, TABLES,
PP. 70-80, FEBRUARY 1974 OAK RIDGE NATIONAL LABORATORY, TENNESSEE

STUDIES INCLUDE [illegible] IN GROSS ACTIVITY [illegible] IN THE SEDIMENT OF A HOLDING POND AS A RESULT OF DECREASED RADIOACTIVITY OF WASTE-WATER DISCHARGES, BIOLOGICAL HALF-LIFES AND ELIMINATION OF TRITIUM FROM FISH KEPT IN THE POND FOR 30 DAYS, SEASONAL [illegible] AND CHARACTERIZATION OF A METHOD [illegible] OF INSECT LARVAE BY, TRENDS OF THE POND [illegible] 1968-1973, SURVIVAL TIME AS A FUNCTION OF TEMPERATURE OF CERTAIN THAT DEFEATED A 1000-DAY [illegible], EFFECT OF 1-10 DAY FED ON THE WATCHING TIME OF FISH EGGS, APPLICATION OF A [illegible]-GAS CHROMATOGRAPHY [illegible] TO DETECTION OF CHLORINATED ORGANICS PRESENT DURING CHLORINATION PURIFICATION OF NATURAL WATERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM • WASTE DISPOSAL, TERRESTRIAL • WASTE HANDLING • WASTE TREATMENT, LIQUID • WASTE DISPOSAL, RIVER • WATER, DRINKING • SOIL, WATER [illegible] • [illegible] WATER [illegible] • WATER TREATMENT • CHEMICAL • WATER QUALITY • SOIL [illegible], IN SITU • EFFECT • [illegible] • ORGANIC, FISH • BIOLOGICAL HALF-LIFE • CHEMISTRY, EFFECT • ECOSYSTEM, AQUATIC • SEDIMENT • [illegible] • TEMPERATURE • [illegible] EFFECT • CONCENTRATION [illegible] • EGG • WATER, SEWAGE • IRON

040476
TERRELL JR • [illegible] JP • [illegible] DF
MARINE SCIENCES
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-1750 (WN), 1, PT. 2) 0, 0 PAGES, 5 FIGURES, 10 REFERENCES, SECTION 9, MARCH 1973

EFFECTS FROM CANAL DISCHARGE OF [illegible] WATER WERE ASSESSED IN TWO TYPES OF EXPERIMENTS: (1) LETHAL TEMPERATURES (30-31 DEGREES) WERE DETERMINED FOR YOUNG RATES OF [illegible] OF MARINE FISH (0.2-7 DEGREES/MIN) CONTAINED HEAD SPORE AND ACCLIMATED TO 10 DEGREES, AND (2) LETHAL EXPOSURE TIMES (10-100 MIN) WERE DETERMINED AT 24-30 DEGREES. OYSTER EGGS WERE EXPOSED FOR 48 HR IN SEAWATER CONTAINING 0.31-1 MICROCURIES/ML OF TRITIUM (THE CALCULATED DOSE WAS 0.0030-0.04 RADS). THERE WAS NO EFFECT ON EGG DEVELOPMENT. BATTELLE-NORTHWEST PARTICIPATED IN THE COMMERCIAL OCEAN SECTIONS STUDY TO DEVELOPED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BATTELLE NORTHWEST • [illegible] • CANAL • [illegible] POLLUTION • [illegible], FISH • MARINE ORGANISM • [illegible] EFFECT • [illegible] • [illegible], ESTIMATION • EGG • OCEAN, PACIFIC • DISCHARGE

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STEGEN JR • [illegible] CA • TERRELL JR
[illegible]
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-1750 (WN), 1, PT. 2) 0, 24 PAGES, 10 TABLES, 10 FIGURES, 17 REFERENCES, SECTION 4, MARCH 1973

[illegible] OF TRITIUM FROM A MICROCURIE/LITER OF TRITIATED WATER SOLUTION [illegible] A [illegible] IN ABOUT 5 MONTHS IN TISSUES OF WHITE AQUATIC ORGANISMS. [illegible] TRITIUM WAS 2-119 OF THE TOTAL IN MUSSEL, CRAYFISH, CARP, AND FILAMENTOUS ALGAE; 6-119 IN EMERGENT VEGETATION. THE [illegible] TRANSFERRING OF THE EMERGENT, ONLY TOOK ACTIVITIES WERE [illegible] IN MOST TISSUES, RIP 30-40% OF THIS TRACE WAS RETAINED BY FILAMENTOUS ALGAE AND EMERGENT VEGETATION; AFTER A MONTH, ONE WAS

001940 ORNOPTIMOPRO

DESIGNED BY DESCRIPTIVE. THE TOXICITY OF [illegible] AND VERSUS DAPHNIA TOXICITY AGAINST A NATURALLY OCCURRING DAPHNIA SPECIES WAS EXPERIMENTED FOLLOWING POTTING TOXICITY [illegible] COMPONENTS. COMPARED EFFECTS OF TOXICANTS AND OTHER ENVIRONMENTAL STRESSORS ON FISH AND INVERTEBRATES WERE STUDIED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESCRIPTORS: WATER QUALITY • WASTEWATER TREATMENT • WASTEWATER SITES • TOXICANT POLLUTION • BIOTECHNOLOGY UPTAKE • ANIMALS, INVERTEBRATES • ANIMALS, FISH • ORGANISMS, AQUATIC • FISH FOODS • AQUATIC ORGANISMS • WASTEWATER EFFLUENT, TOXICITY • BIOTICAL EFFECT • TOXICOLOGY • DIFFERENCE

001942

DESCHAMPS, T. • STEVENSON, R. • LEWIS, JJ
[illegible] SCIENTIFIC REPORT SERIES. CENTRE NATIONAL DE LEGERCHE APPLIQUEE, ARQ, CONCEPTION
CENTRE NATIONAL DE LEGERCHE APPLIQUEE, ARQ, BELGIUM
PUBLISHED-1983 p. 11 PAGES, 2 FIGURES, 0R. 0R-40 ISSERT. 11, I-7 ISSERT 41, 1977

AFTER CONTAMINATION OF POSTURES BY OUTPUT AT CHLORINE, FISHERIES ON MONOSIDE AND FINE-GRAINED SOIL PRODUCTIONS AT 0-4 CM DEPTH HAS GREATER THAN BY SOIL AT LARGE DEPTH. SOIL WATER CONTAMINATION IN EXCHANGERS DID NOT CHANGE IN OUTPUT ACTIVITY WITH DEPTH. UPTAKE OF SOIL BY OLDERS INCREASED WITH INCREASING MOLARITY OXIDES IN SOILS, AND INCREASED WITH INCREASING CLAY. WHEN SOME CRABS AND WITH HAY FROM CONTAMINATED DESCHAMPS WAS 70-75 TIMES HIGHER IN POTTING AS COMPARED WITH CRABS GIVEN POTTERED WATER. STUDIES THE UPTAKE OF POTTING BY WATER BEARS, BLSP THE UPTAKE OF MOLA AND CRAB BY DESCHAMPS FROM, WHEN, AND SEDIMENT; THE INTAKE OF VARIOUS DIFFERENT BY DESCHAMPS MOLASSES WAS INVESTIGATED AT WATER. PRIMARY-DEGRADABLE COMPONENTS WERE MORE OF POTTERED WATER DEPENDING BY THE FORMATE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTROL • WATER, DESCHAMPS • POLLUTION • DETERGENT • SOIL, BIOTECHNOLOGY WASTEWATER TREATMENT • DETERGENTS • ANIMAL FEED • WASTEWATER TREATMENT • DETERGENT • WASTEWATER • WATER • DETERGENT WASTEWATER PATHWAY • TOXIC EXCHANGE • ECOSYSTEM, CONSTRUCTED • BIOTECHNOLOGY UPTAKE • ANIMALS, FISH • ECOSYSTEM, AQUATIC • GROUND CHEMICAL • AQUATIC ORGANISMS • CONTAMINANT • WASTEWATER ORGANISMS • ECOSYSTEM • PLANT, REGENERATION • PLANT, ORGANISMS

001943

WEBSTER, TE • STEVENSON, JJ • DIRTYBUTS, WF
THE APPLICABILITY OF THE WATERFACE AS AN INDICATOR OF ENVIRONMENTAL CONTAMINATION
ETS ALAMOS SCIENTIFIC LABORATORY
PAPER NO. ETA p. PAPER PRESENTED AT THE 10TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1977

MICES OF RACE WERE PLACED NEAR THE OUTFALLS OF THREE LIQUID WASTE TREATMENT FACILITIES AT THE LABORATORY, WHERE THE RACE HAD ACCESS TO WATER AND VEGETATION WHICH WERE OCCASIONALLY CONTAMINATED WITH RADIOACTIVE MATERIALS. RESPIRATORY UPTAKE INVESTIGATIONS IN ONE OF THE TWO RACE AND OTHER SOURCES FROM THEIR LEVELS OF THIS MATERIAL IN EFFLUENT WATER WERE AS HIGH AS 1000 DETECTED. PLUTONIUM AND AMERICIUM LEVELS IN RACE, HOWEVER, AND EFFLUENT WATER WERE RELATIVELY DETECTABLE. LEVELS OF TRITIUM IN RACE TISSUES RANGE FROM ABOUT 1 DETECT IN PRE-EXPERIMENT RACE SAMPLES TO A MAXIMUM OF 4000 DETECT, 100 DETECT, AND 500 DETECT IN THREE SAMPLES. THE CONCENTRATION WAS 1000 MAXIMUM IN EFFLUENT WATER NEAR 100 DETECT, AND 1.2 DETECT, RESPECTIVELY. THE TRITIUM LEVELS IN MOUSE TISSUES PARALLEL THE DATA FOR THE RACE.

AVAILABILITY - DIRTYBUTS, WF, DIRTYBUTS, LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO 87544

RESEARCH • ECOLOGY • POLLUTION • WASTE • TEST • BIOTECHNOLOGY • CONTAMINATION • ORGANISMS EFFECT, SPECIES • DIFFERENT • BIOLOGICAL CONTROL • WATER • RATE

001944

FASSBENDER, HG • MORGAN, RE
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM OR POLYCHLORINATED WHITE FAMILY
CORNELL UNIVERSITY
PAPER NO. ETA p. PAPER PRESENTED AT THE 10TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1977 (SEE • CONFERENCE)

THE FULL WHITE FAMILY WERE GIVEN IN WATER IN THERAPEUTIC DOSES INCLUDING TRITIUM OXIDE, ACTIVITY LEVELS RANGED FROM 10 TO 1000 MICROCURIES/ML. WITH DEVELOPMENT TO ALASTOVKET AS THE END POINT, THE LOSS WAS DETERMINED TO BE 650 MICROCURIES/ML, BY ACTIVITY CORRESPONDING TO A CALIBRATION DOSE RATE OF 115 RADS PER DAY, OR A TOTAL EFFECTIVE DOSE FOR THE LIFTIME PERIOD OF 200 RADS. STUDIES FOLLOWING WERE EXPOSED TO AIRED TO CHRONIC GAMMA RADIATION FROM COBALT-60 DURING THE SAME PERIOD OF DEVELOPMENT. THE CORRESPONDING LOSS VALUES FOR DOSE RATE AND EFFECTIVE DOSE WERE 100 RADS PER DAY OR 150 RADS TOTAL DOSE. OTHER EXPOSURE DEVELOPED, IN WHICH, IN FEMALE MICE WHICH WERE WATER CONTAINED TRITIUM OXIDE AT LEVELS OF 25 TO 500 MICROCURIES/ML. THE LOSS WAS DETERMINED TO BE 800 MICROCURIES/ML, CORRESPONDING TO A DOSE RATE OF 120 RADS PER DAY OR A TOTAL EFFECTIVE DOSE OF 474 RADS. EXPOSURE OF EMBRYOS TO VIRUS TO CHRONIC GAMMA RADIATION DESIGNED IN AN EFFECTIVE LOSS OF 375 RADS, AT A DOSE RATE OF 270 RADS PER DAY. IT IS CONCLUDED, THAT THE USE OF TRITIUM FOR THESE EXPERIMENTAL CONDITIONS IS SAFE.

AVAILABILITY - RICHARD R. FASSBENDER, NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIVERSITY, ITHACA, NEW YORK 14853

BIOMEDICAL • CHARGE • DOSE • DOSING • DIETARY DOSE • ORGANISMS EXPOSURE • WOMAN, DOSING • EFFECT, DOSE RATE •

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ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT THE ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 1973

LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO

LA-4797-MS 0. 47 PAGES, 17 TABLES, 17 FIGURES, 44 REFERENCES, NOV 1973

LIQUID-WASTE-DISPOSAL-AREA HISTORY IS SUMMARIZED. PRELIMINARY INVESTIGATIVE DATA, WHICH WERE [illegible] TOTITION LEVELS FROM THE EFFLUENT WATER; [illegible] HIGHER LEVELS, APPARENTLY FROM THE [illegible] THE AREA IN FORMER CONTROL AREA DISPOSAL PITS. THERE WAS ALSO EVIDENCE OF UPTAKE OF CS-137 [illegible] IN AN AREA WITHIN ABOUT 1000 METERS OF THE WASTE MATERIALS; HOWEVER, MOST CS-137 [illegible] EFFLUENT ON IN MEDIATING CS-137 [illegible] BY VEGETATION WILL BE STUDIED. RADIOMETRIC [illegible] PERFORMED IN SOILS AND WATER IN THE VICINITY OF THE 1945 TRINITY SHOT AREA [illegible], NEW MEXICO.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM • EFFLUENT • [illegible] • SURVEY, ENVIRONMENT • WASTE DISPOSAL, TECHNOLOGY • WATER [illegible] • [illegible] • CRITICAL [illegible] PATHWAY • ENVIRONMENTAL IMPACT • [illegible] • [illegible] • SOIL [illegible] • [illegible], [illegible] • [illegible], [illegible]

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VII Health Physics Aspects

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VIII - HEALTH PHYSICS ASPECTS

002991
ORTENSON W. • ANSPAUGH L.R.
ASSESSMENT OF POTENTIAL RADIOLOGICAL HAZARDS FROM PROJECT GASBUGGY
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-50701 v. 39 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 10, 1969

THIS REPORT SUMMARIZES THE OFF-SITE RADIOLOGICAL HAZARDS ASSOCIATED WITH THE PROPOSED DETONATION AND TESTING OPERATIONS. UPON FRACTURING OF THE NATURAL GAS IS BEGUN THE MAJOR ISOTOPE TO BE RELEASED WILL BE TRITIUM. THE REPORT THEREFORE CONSIDERS SEVERAL QUESTIONS CONCERNING THE BIOLOGY AND PHYSICS OF TRITIUM IN THE LIGHT OF THE DATA AVAILABLE IN THE LITERATURE. THE GENERAL CONCLUSIONS ARE THAT ORDINARY CALCULATIONS OF ABSORBED DOSE BASED ON ENERGY UNIFORMLY DISTRIBUTED THROUGHOUT A VOLUME ARE SUFFICIENT TO DESCRIBE THE OBSERVED EFFECTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE • DESIGNATED • OPERATIONAL • HAZARD, RELATIVE • TESTING • NUCLEAR DETONATION • DOSE CALCULATION, EXTERNAL • RADIOBIOLOGY • GAS • OFF SITE • CONSUMED PRODUCT • ABSORPTION • RECONCENTRATION • RADIATION EFFECT

003299
MACKERRAS D.
TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATOR REACTOR
ATOMIC ENERGY OF CANADA, LIMITED, CHALK RIVER, ONTARIO, CANADA
6 PAGES, 2 FIGURES, 1 TABLE, 7 REFERENCES- AN. INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 28- 87-90 (1967)- APRIL-1967

IT CONTAINS THE HAZARDS OF TRITIUM EXPOSURES AT THE NRU REACTOR OF ATOMIC ENERGY OF CANADA LIMITED. A VARIED SAFETY PROGRAM EMPHASIZES EDUCATION, MONITORING, FORCED VENTILATION, PROTECTIVE CLOTHING, AND BIOCHEMICAL ANALYSES FOR TRITIUM IN THE BODY. THE ICRP STANDARD OF 5 X 10 DPMS/G HO CACO 3 IS USED FOR PERSONAL [illegible] EXPOSURE. TRITIUM RELEASE IS CONTROLLED BY OPERATIONAL PROCEDURES AND VENTILATION.

CANADA • HEALTH PHYSICS TRAINING • REACTOR, HWR • PERSONNEL PROTECTIVE DEVICE • RADIATION SAFETY AND CONTROL

004490
MINNAR DA
HEALTH PHYSICS BIBLIOGRAPHY ON TRITIUM
LOS ALAMOS SCIENTIFIC LABORATORY
87 PAGES, MARCH 29, 1966, LAMS-2966- OTS

A LIST OF 87 PAPERS WITH ABSTRACTS IS GIVEN. THE PAPERS WERE SELECTED TO COVER THOSE ASPECTS OF THE SUBJECT WHICH WOULD BE OF INTEREST TO MONITORING AND HEALTH PHYSICS PERSONNEL INVOLVED IN RADIATION PROTECTION WORK. A FEW BIBLIOGRAPHIES ARE LISTED.

BIBLIOGRAPHY • MONITOR, GENERAL PRACTICE

004672
STUDY IV-313, HAZARDS ANALYSIS, RADIOLOGICAL HAZARDS
ALLIS-CHALMERS MANUFACTURING COMPANY
196 PAGES, TABLES, FIGURES, 17 REFERENCES- JULY 31, 1963, ACNP-61595 (REV. 1), EGCR-STUDY IV-313, REV. 5- OTS

THE OBJECTIVES OF THIS STUDY ARE TO DETERMINE THE DOSES RECEIVED BY PERSONS LOCATED BOTH OFF SITE AND IN THE EGCR CONTROL ROOM FOLLOWING THE MAXIMUM CREDIBLE ACCIDENT, AND TO DETERMINE THE MAXIMUM DOSES RECEIVED BY PERSONS NEAR THE EGCR SITE DUE TO THE NORMAL OPERATIONAL STACK RELEASE.

ACCIDENT ANALYSIS • CONTAINMENT, HIGH PRESSURE • DOSE • EGCR (ERDA) • FALLOUT • FISSION PRODUCT RELEASE • REACTOR, GCR • ACCIDENT, MAXIMUM CREDIBLE (MCA) • FALLOUT • CONTAINMENT, SAR • VENTILATION SYSTEM • RADIO • STACK • CONTROL ROOM/ROOM

006261
HUTCHENS JF • VANGUNDY RF
SKIN CONTACT TRANSFER OF TRITIUM FROM WATER
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
20 PAGES, 3 FIGURES, 7 TABLES, JUNE 29, 1966, USNRDL-TR-761 (AD-639.509)- CFSTI

THE STUDIES REPORTED HERE SHOW THAT CONTACT OF SKIN WITH CONTAMINATED METAL CAN FACILITATE THE TRANSFER OF TRITIUM, THAT THE RADIOACTIVITY ASSUMED WHEN THE SKIN STRIPS THE BODY WATER, AND THAT IT FOLLOWS THE METABOLIC PATTERN, OF TRITIUM PRESENT BY OTHER MODES. TRITIUM IN THE SKIN WAS DETERMINED AFTER CONVERTING ALL FORMS TO TRITIATED WATER BY DRY COMBUSTION. STANDARDIZED TRANSFERS WERE CHECKED BY LIQUID SCINTILLATION COUNTING. CURVES FOR THE DISAPPEARANCE OF TRITIUM IN THE SKIN COULD BE DESCRIBED INTO 0.7, 1, AND 10 DAY HALF-TIMES, AND AFTER 15 DAYS THERE WAS LITTLE DIFFERENCE BETWEEN WET AND DRY TISSUES. THE ACCUMULATIVE EXCRETION CURVES, BASED ON THE MEASURED HALF-TIME VALUE OF 5.5 DAYS FOR WHOLE RADIOACTIVITY, SHOWED THAT SUBSTANTIALLY ALL OF THE SKIN RADIOACTIVITY CAN BE ACCOUNTED FOR IN BODY WATER BY 20 DAYS.

RADIOTRACER TECHNIQUE • PERSONNEL PERSONNEL, RADIATION • DECONTAMINATION • MAN

000067
WATTS JD
HEALTH PHYSICS UTILIZATION OF AN IBM 1620 COMPUTER
SAVANNAH RIVER PLANT
6 PAGES. MAY 1963. DPSPU-63-30-1- PRESENTED AT 9TH ANNUAL HEALTH PHYSICS MEETING, NEW YORK CITY, JUNE 1963

MANY ROUTINE HEALTH PHYSICS FUNCTIONS ARE PERFORMED, AND MORE COMPLICATED SPECIAL PROBLEMS ARE EVALUATED, BY AN IBM 1620 COMPUTER. AUTOMATION OF RADIOACTIVE ASSAY TECHNIQUES IMPROVES THE UTILIZATION OF EMPLOYEES AND THE QUALITY AND QUANTITY OF DATA. PARTICULAR USES OF THE COMPUTER ARE DISCUSSED, AND ADVANTAGES OF USING IT ARE POINTED OUT.

ACCUSTICON • ACCOUNTING PROGRAM • SAMPLING • GROSS ALPHA • GROSS BETA

000097
COOPER G
THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
12 PAGES, 5 FIGURES, 5 REFERENCES- FEBRUARY 1963. AECL-2154 (CONF-650307-11150-46/20)- PRESENTED AT I. A. E. A. SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION, VIENNA, MARCH 8-12, 1965- AECL

THE FOLLOWING CONSIDERATIONS ARE IMPORTANT IN DEALING WITH EMERGENCY HIGH EXPOSURE LEVELS. (A) RELIABILITY OF METHODS IS OF GREATER IMPORTANCE THAN ACCURACY. (B) INSTRUMENTS AND METHODS WHICH RECEIVE ONLY OCCASIONAL USE SHOULD BE AS SIMPLE AS POSSIBLE. (C) ROUTINE SERVICES SHOULD HAVE THE CAPABILITY OF ABSORBING SUDDEN INCREASES IN WORK LOAD.

DOSIMETRY • MONITOR, EMERGENCY • MONITOR, PERSONNEL • RADIATION PROTECTION, ORGANIZATION • CHALK RIVER • CONTAMINATION • PERSONNEL EXPOSURE, RADIATION

007726
DRURY PJ
MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
29 PAGES, 29 REFERENCES, 11 TABLES, OCTOBER 1962, CRFD-1300 (AECL-1626)- AECL

THE MAXIMUM PERMISSIBLE CONCENTRATIONS IN AIR OF VARIOUS BIOLOGICALLY SIGNIFICANT RADIONUCLIDES HAVE BEEN CALCULATED FOR MEMBERS OF THE PUBLIC WHO LIVE IN THE NEIGHBORHOOD OF A NUCLEAR POWER REACTOR. THEY HAVE BEEN CALCULATED BOTH FOR CONTINUOUS EXPOSURE DURING NORMAL REACTOR OPERATION AND ALSO FOR EMERGENCIES RESULTING FROM REACTOR ACCIDENTS. THE RECOMMENDATIONS ARE NOT INTENDED TO BE USED AS NORMAL HEALTH PHYSICS CONTROL LEVELS BUT TO SERVE AS A GUIDE TO REACTOR DESIGNERS. THE PROBLEMS OF ATMOSPHERIC DIFFUSION ARE DISCUSSED AND VALUES FOR MAXIMUM PERMISSIBLE DISCHARGES OR DISCHARGE RATES ARE RECOMMENDED SO THAT THE MAXIMUM PERMISSIBLE CONCENTRATIONS IN AIR SHOULD NOT BE EXCEEDED.

CARBON • CESIUM • ECOLOGY • ATMOSPHERIC DIFFUSION • EFFLUENT • IODINE • MPC • STRONTIUM • AGRICULTURE • MILK • DIETARY HABIT • DOSE CALCULATION, INTERNAL • POPULATION EXPOSURE • DOSE CALCULATION, EXTERNAL • ICRP • REACTOR POWER

007903
MCREE VC • WEST CH • HELENDON JD
Y-12 RADIATION SAFETY MANUAL
Y-12, PLANT, OAK RIDGE, TENNESSEE
119 PAGES, 64 FIGURES, 9 REFERENCES, TABLES- MAY 11, 1965, Y-1401 (REVISED)- CESTI

THIS REPORT IS A COMPREHENSIVE OUTLINE OF THE PROGRAMS OR METHODS BY WHICH THE HEALTH PHYSICS DEPARTMENT DISCHARGES ITS RESPONSIBILITIES WITH REGARD TO FULFILLING THE POLICIES OF THE Y-12 PLANT. LINE ORGANIZATION IS RESPONSIBLE FOR THE PROTECTION OF PLANT EMPLOYEES TO THE SAME EXTENT THAT IT IS RESPONSIBLE FOR PLANT OPERATIONS, PRODUCTION, OR RESEARCH. WHILE THE PRIME RESPONSIBILITY FOR IMPLEMENTING THE POLICY RESTS WITH LINE SUPERVISION, STAFF AND SERVICE GROUPS HAVE BEEN ESTABLISHED TO PROVIDE TECHNICAL ASSISTANCE, TO RENDER ANY SERVICE THAT WILL HELP IN THE INVESTIGATION AND EVALUATION OF RADIATION AND INDUSTRIAL HYGIENE PROBLEMS, TO MAINTAIN EXPOSURE RECORDS, AND TO GIVE PROPER TRAINING TO EMPLOYEES.

DOSIMETRY • MPC • MONITOR, LIQUID • MONITOR, PERSONNEL • PLUTONIUM • REGULATION • THORIUM • WASTE DISPOSAL • MPD • MONITOR, AIR • SAMPLING • ANALYTICAL TECHNIQUE • MONITOR, ENVIRONMENTAL • INSTRUMENT CALIBRATION • RADIATION PROTECTION, ORGANIZATION • DOSE CALCULATION, EXTERNAL • EMERGENCY PROCEDURE • RADIATION SAFETY AND CONTROL • EXCRETION, URINE

007940
RUDDER DA
THE NITROUS OXIDE DOSIMETER--INFLUENCE OF CELL DIAMETER ON THE NITROGEN YIELD
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO, CALIFORNIA
8 PAGES, 2 TABLES, 11 REFERENCES- JANUARY 9, 1965, USNRDL-TR-886- DOC

THE EFFECT OF CELL DIAMETER ON THE NITROGEN YIELD FROM COBALT-60 GAMMA-IRRADIATED GASEOUS NITROUS OXIDE HAS BEEN EXAMINED. THE FRICKE DOSIMETER WAS USED AS THE REFERENCE OF ABSORBED DOSE. THE DOSE ACTUALLY ABSORBED BY THE GAS WAS CALCULATED BY THE BRAGG-GRAY PRINCIPLE. THE RESULTS

007990 (CONTINUED)
OBTAINED INDICATE THERE IS NO SIGNIFICANT DEPENDENCE OF NITROGEN YIELD ON CELL DIAMETER. THE NEW NITROGEN YIELD OF 11.0+-0.8 OBTAINED HERE COMPARES WELL WITH VALUES REPORTED BY OTHER WORKERS.

CHARLY • DOSIMETRY • DOSE MEASUREMENT, INTERNAL • DOSE CALCULATION, INTERNAL

007999
GIBSON JA
THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
8 PAGES, 1 TABLE, 9 REFERENCES- JUNE 1965, AERE-M-1169- UNCL

THE RATE OF EVOLUTION OF TRITIUM FROM TRITIUM SOURCES ABSORBED ON TITANIUM WAS MEASURED WITH A FLOW IONISATION CHAMBER TO ASSESS THE POSSIBLE HAZARD THAT MAY ARISE FROM THESE SOURCES. IT WAS FOUND THAT THE RATE OF TRITIUM EVOLUTION WAS LESS THAN 20 MICROCURIES PER 8 HOURS PER CURIE OF ABSORBED TRITIUM. IT SEEMS UNLIKELY THAT THE EVOLVED TRITIUM WOULD PRESENT AN INGESTION OR INHALATION HAZARD. THE BREMSSTRAHLUNG RADIATION WAS ALSO MEASURED AND WOULD BE A NEGLIGIBLE HAZARD UNDER NORMAL CIRCUMSTANCES. SOURCES USED AS TARGETS FOR PARTICLE ACCELERATORS MAY PRESENT INGESTION OR INHALATION HAZARDS DUE TO LOSS OF PARTICULATE MATERIAL IF THE SOURCES ARE STORED IN THE OPEN LABORATORY.

HAZARD, RELATIVE • HAZARDS ANALYSIS • PERSONNEL EXPOSURE, RADIATION

007811
ASSESSMENT OF RADIOACTIVITY IN MAN. VOLUME II.
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
640 PAGES, FIGURES, TABLES, REFERENCES- OCTOBER 1964, STI/PUB/94, PROCEEDINGS OF THE SYMPOSIUM ON THE ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN, HEIDELBERG, MAY 11-16, 1964. (CONF4401)

THIS SYMPOSIUM ON THE ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN WAS ORGANIZED JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY, THE INTERNATIONAL LABOUR ORGANIZATION AND THE WORLD HEALTH ORGANIZATION AND WAS HELD IN HEIDELBERG FROM 11-14 MAY 1964. IT WAS THE OBJECTIVE OF THE SYMPOSIUM TO BRING TOGETHER EXPERTS FROM THE VARIOUS SCIENTIFIC DISCIPLINES OF PHYSICS, CHEMISTRY, BIOLOGY, MEDICINE AND MATHEMATICS, AND TO SURVEY THEIR EXPERIENCE IN THE ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN AND THE RESULTANT RADIATION DOSES. IN MOST INVESTIGATIONS OF INTERNAL CONTAMINATION THE ERRORS IN THE PHYSICAL MEASUREMENTS ARE SMALLER THAN THE ERRORS ASSOCIATED WITH THE INTERPRETATION OF MEASUREMENTS. FOR THIS REASON SPECIAL EMPHASIS WAS LAID IN THIS MEETING ON THE INTERPRETATION OF MEASURED DATA. VOLUME II INCLUDES THOSE PAPERS CONCERNED WITH RADIOISOTOPES OF SPECIFIC ELEMENTS- CAESIUM, RADIUM, RADON, STRONTIUM, TRITIUM, THORIUM, URANIUM, PLUTONIUM AND RARE EARTH ELEMENTS.

CESIUM • INGESTION • PLUTONIUM • STRONTIUM • URANIUM • RARE EARTH • ANALYTICAL TECHNIQUE • DOSE CALCULATION, INTERNAL • RADIUM • RADON • FOUNDED, WHOLE BODY • POPULATION EXPOSURE • PERSONNEL EXPOSURE, RADIATION • RADIOCHEMICAL ANALYSIS • MICROCONTAMINATION • MAN

007820
JACKSON S • DOLPHIN GW
THE ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
21 PAGES, 9 FIGURES, 20 REFERENCES- JANUARY 1965, AHSB(RP)-R-9;

DETERMINATION OF THE AMOUNT OF RADIONUCLIDE IN URINE HAS AS ITS OBJECT THE MOST PRACTICABLE ESTIMATE OF THE RADIATION DOSE COMMITMENT TO THE CRITICAL ORGAN. IT IS DESIRABLE TO ANALYZE A CAREFULLY PLANNED SERIES OF URINE SAMPLES TO PROVIDE DATA FOR A COMPARISON WITH THE MOST DOCUMENTED CASES OF DEFINED INTAKE, WHICH PROVIDE THE BASIS FOR INTERPRETATION. THE PRIMARY PURPOSE OF ROUTINE URINE ANALYSIS OF SAMPLES FROM A GROUP OF RADIATION WORKERS IS TO DETECT ANY SIGNIFICANT INTAKE WHICH HAS OTHERWISE ESCAPED ATTENTION. A REVIEW IS PRESENTED OF THE HUMAN DATA AVAILABLE ON THE METABOLISM AND EXCRETION OF CAESIUM, PHOSPHORUS, PLUTONIUM, RADIUM, STRONTIUM, SULPHUR, TRITIUM AND URANIUM, AND VALUES OF INVESTIGATION LEVEL ARE SUGGESTED FOR THESE RADIONUCLIDES.

CESIUM • PLUTONIUM • STRONTIUM • MAN • PHOSPHORUS • SULFUR • DOSE CALCULATION, INTERNAL • RADIUM • PERSONNEL EXPOSURE, RADIATION • CONCENTRATION • MAN

007872
HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS REPORT, JANUARY - DECEMBER 1964
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
77 PAGES, 8 FIGURES, 7 TABLES, 20 REFERENCES- MARCH 1965, AERE-PR/HPD-7- UNCL, $7.00

THIS ANNUAL REPORT OF THE HEALTH PHYSICS AND MEDICAL DIVISION IS DEVOTED PRIMARILY TO RESEARCH. MEASUREMENTS HAVE BEEN MADE OF THE UPTAKE BY RABBITS OF SMALL-DOSE CAESIUM-137 FROM FOOD. PROGRESS ON THE ACCURATE MEASUREMENT AND COMPUTER ANALYSIS OF GAMMA-RAY SPECTRA HAS CONTINUED. FURTHER PROGRESS WAS MADE IN THE DEVELOPMENT OF A COMPREHENSIVE SYSTEM OF PERSONNEL DOSIMETRY. THE PROTOTYPES OF THE AUTOMATIC PROTON-TRACK COUNTER FOR NUCLEAR EMULSION DOSIMETERS AND THE FOREY AUTOMATIC DENSITOMETER FOR MEASURING THE FILM DENSITIES OF THE TYPE FOR FILM DOSIMETRY WERE DELIVERED AND ARE BEING COMMISSIONED. INVESTIGATIONS INTO THE DANGER OF REMOVING AND CONTROL OF RADIOIODINE RELEASED IN AN ACCIDENT TO A GAS-COOLED REACTOR HAVE BEEN CONTINUED AND EXTENDED TO

[illegible]
INCLUDE SIMILAR PROBLEMS ASSOCIATED WITH WATER-COOLED REACTORS.

ABSORPTION • AIRBORNE RELEASE • CESIUM • COMPUTER PROGRAM • DEPOSITION • DOSIMETRY • FALLOUT • INGESTION • INHALATION • IODINE • PLUTONIUM • STRONTIUM • MONITOR, AIR • SAMPLING • CHARCOAL • SOIL, NUCLIDE OCCURRENCE • COMPUTER, WHOLE BODY • DIFFUSION COEFFICIENT • ION EXCHANGE • PARTICLE SIZE DISTRIBUTION • RADIOCHEMICAL ANALYSIS • RESUSPENSION • SPECTROMETRY, ALPHA • SPECTROMETRY, GAMMA • CONCENTRATION • MPA

[illegible]
BLOCK S • [illegible] • [illegible] A • [illegible] CL • SCHWARZENBACH V
INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
38 PAGES- NOV 29, 1965, UCRL-14616, CFSTI, $2.00 CY, $0.50 MF

BOTH SUBJECT AND AUTHOR INDEXES ARE GIVEN FOR THE FIRST 19 QUARTERLY REPORTS (THROUGH DECEMBER 1964) OF THE HAZARDS CONTROL DEPARTMENT OF LAWRENCE RADIATION LABORATORY, LIVERMORE. THE SUBJECT INDEX IS CROSS-REFERENCED TO SERVE THE INTERESTS OF WORKERS ON VARIOUS DISCIPLINES WITHIN THE FIELD OF HEALTH AND SAFETY. A TOTAL OF 275 ARTICLES ARE INDEXED.

AIR CLEANING • BERYLLIUM • COMPUTER • DECONTAMINATION • DEUTERIUM • DOSIMETRY • FALLOUT • GLOVE BOX • IODINE • MERCURY • MONITOR, SPACE • PLUTONIUM • URANIUM • WASTE DISPOSAL • MONITOR, AIR • SAMPLING • INSTRUMENT CALIBRATION • COMPUTER, WHOLE BODY • HAZARDS ANALYSIS • MONITOR • REACTOR • SHIELDING • X-RAY • SPECTROMETRY, GAMMA • INSTRUMENTS, MISC. • FILTERS

[illegible]
JONES HS • LANGHOLT DE
THE RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, SURREY
14 PAGES, TABLES, FIGURES, REFERENCES- 1964, SYMPOSIUM ON ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN, HEIDELBERG, FEDERAL REPUBLIC OF GERMANY, MAY 11-16, 1964- CONF-440-16 (SR-52/21)

THE TRADITIONAL RADIOACTIVE CONSTITUENT OF LUMINOUS COMPOUNDS HAS BEEN RADIUM, A SUBSTANCE OF POTENTIALLY GREAT HAZARD. IN RECENT YEARS, SUITABLE ALTERNATIVES TO RADIUM HAVE BEEN SOUGHT AND IN THE UK AND ELSEWHERE OFFICIAL ENCOURAGEMENT HAS BEEN GIVEN TO THE USE OF TRITIATED COMPOUNDS. WE HAVE FOR SOME TIME BEEN MONITORING THE WORK OF USERS OF THESE TRITIATED COMPOUNDS AND HAVE MADE COMPLEMENTARY MEASUREMENTS OF TRITIUM IN AIR. THE STABILITY OF THE COMPOUNDS THEMSELVES HAS ALSO BEEN INVESTIGATED.

INGESTION • INHALATION • MPC • MONITOR, PERSONNEL • UNITED KINGDOM • MONITOR, ENVIRONMENTAL • RADIUM • HAZARDS ANALYSIS • CONCENTRATION • MPA

[illegible]
HEALTH AND SAFETY DIVISION ANNUAL PROGRESS REPORT, 1963
YOUNG OPPENHEIMER OFFICE, USAEC
99 PAGES, 21 FIGURES, 10 FIGURES, REFERENCES- AUGUST, 1964, ROO-12097, CFSTI, $3.00

THIS PROGRESS REPORT SUMMARIZES FOR 1963 THE SIGNIFICANT HEALTH AND SAFETY DATA CHARACTERIZING THE PROTECTION PROGRAM FOR OVER 5000 PERSONS AT THE NATIONAL REACTOR TESTING STATION IN SOUTHEASTERN IDAHO. INFORMATION PRESENTED HERE IS BRIEFED FOR THE READERS CONVENIENCE, AND EMPHASIZES THE MAJOR INNOVATIONS, CONCEPTS, AND NEW TRENDS. REPETITIVE INFORMATION, ESSENTIAL FOR PERSPECTIVE IN A CONTINUING PROGRAM, HAS BEEN KEPT TO A MINIMUM, ALLOWING SPACE FOR REPORTING DEVELOPMENTS CONSIDERED TO BE OF SPECIAL INTEREST TO PERSONS WORKING IN THE FIELD OF HEALTH AND SAFETY.

CESIUM • COBALT • DEPOSITION • DOSIMETRY • FISSION GAS RELEASE • GERMANIUM • IODINE • IONIZATION • SAFETY [illegible] • STRONTIUM • SURVEY, ENVIRONMENT • WASTE DISPOSAL, TERRESTRIAL • WASTE STORAGE • CALCINATION • AIR • WELL • WATER, DRINKING • MONITOR, ENVIRONMENTAL • GROUND WATER, NUCLIDE OCCURRENCE • INSTRUMENT CALIBRATION • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE DISPOSAL, SOLID • COMPUTER, WHOLE BODY • DOSE MEASUREMENT, EXTERNAL • HAZARDS ANALYSIS • METEOROLOGICAL SUPPORT • WASTE MANAGEMENT • HYDROLOGY • IODINE FILLS • ION EXCHANGE • MINERAL EXCHANGE • PERSONNEL EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL • RADIOCHEMICAL ANALYSIS • SOIL PROPERTY • SPECTROMETRY, ALPHA • SPECTROMETRY, GAMMA • CONCENTRATION • FIGURE

[illegible]
[illegible] JF
GENERAL HANDBOOK FOR RADIATION MONITORING
LOS ALAMOS SCIENTIFIC LABORATORY
100 PAGES, FIGURES, TABLES, 20 REFERENCES- NOVEMBER 1954, LA-1895(R), ED.1- GPO

THE FIRST EDITION OF THE GENERAL HANDBOOK FOR RADIATION MONITORING WAS PREPARED IN 1947 AS AN ATTEMPT TO PROVIDE THE MEMBERS OF THE MONITORING GROUP AT THE LOS ALAMOS SCIENTIFIC LABORATORY WITH THE BASIC DATA WHICH IT WAS FELT SHOULD BE AVAILABLE TO THEM AT ALL TIMES. THIS, THE THIRD EDITION, HAS BEEN ALMOST ENTIRELY REWRITTEN AND ITS PUBLICATION WAS DELAYED TO PERMIT INCLUSION OF THE MOST UP-TO-DATE DATA FOR PERMISSIBLE EXPOSURES AND PERMISSIBLE BODY BURDENS. THE FORMAT REMAINS UNCHANGED, HOWEVER, AND THE HANDBOOK IS STILL DESIGNED TO SERVE THE PURPOSES OF THE LOS ALAMOS SCIENTIFIC LABORATORY. NOT ALL OF THE QUANTITIES GIVEN HAVE OFFICIAL SANCTION- THERE ARE SOME INSTANCES WHERE OFFICIAL NUMBERS DO NOT EXIST, AND IT IS NECESSARY TO ESTABLISH SOME LEVEL WHICH CAN SERVE AS A GUIDE TO LOCAL WORK.

ADMINISTRATIVE CONTROL • DECONTAMINATION • DOSIMETRY • MPC • MONITOR, FREQUENCY • MONITOR, GENERAL PRACTICE • MONITOR, PERSONNEL • PERSONNEL PROTECTIVE DEVICE • REGULATION • SURVEY, EMERGENCY • MPD • SAMPLING • AIR •

007877 (CONTINUED)
ANALYTICAL TECHNIQUE • GROSS ALPHA • GROSS BETA • GROSS GAMMA • RADIATION UNIT • LASL • RADIATION PROTECTION, ORGANIZATION • MONITOR • PERSONNEL EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL • EXCRETION, URINE

007877
BUTLER WL • LEROY JH
OBSERVATIONS OF BIOLOGICAL HALF-LIFE OF TRITIUM
SAVANNAH RIVER LABORATORY
7 PAGES, 3 FIGURES, 2 TABLES, 10 REFERENCES- HEALTH PHYSICS 11(4)- 203-205 (APRIL, 1965)

OVER THE PAST 10 YEARS 300,000 URINE SAMPLES HAVE BEEN RADIOASSAYED FOR TRITIUM IN SRPS HEALTH PHYSICS PROGRAM. MOST OF THESE HAVE ANALYZED USING A LIQUID SCINTILLATION COUNTING TECHNIQUE DEVELOPED AT SRP. IN 310 CASES THE TRITIUM CONCENTRATION IN URINE WAS AT LEAST 20 MICRO CURIES PER LITER. THE BIOLOGICAL HALF-LIFE VALUES FOR THESE CASES RANGED FROM 6 TO 18 DAYS, WITH AN AVERAGE OF 9.5 PLUS MINUS 0.1 DAYS AND PERCENT CONFIDENCE LEVELS. FACTORS WHICH INFLUENCE BIOLOGICAL HALF-LIFE, SUCH AS OUTDOOR TEMPERATURES, AMOUNT OF TRITIUM ASSIMILATED, AND AGE OF EMPLOYEE WERE STUDIED. DURING THE WARMER MONTHS, THE AVERAGE HALF-LIFE WAS OBSERVED TO BE LONGER- THIS WAS ATTRIBUTED TO INCREASED WATER INTAKE. DATA SHOWED NO CORRELATION BETWEEN THE AMOUNT ASSIMILATED AND BIOLOGICAL HALF-LIFE. A TREND TOWARD A SHORTER HALF-LIFE WAS OBSERVED FOR INCREASING AGE.

SAVANNAH RIVER PLANT • BIOCONCENTRATION • MAN

007940
MOSLEY JR
INDIRECT METHODS OF ESTIMATING RADIONUCLIDE BODY BURDEN OF EXPOSURE
NEW YORK OPERATIONS OFFICE
17 PAGES, REFERENCES- DECEMBER, 1964. EUR-2210 (CONF-6210071)- INTERNATIONAL SYMPOSIUM ON RADIOACTIVE CONTAMINATION OF WOUNDS HELD IN MUNICH FROM OCTOBER 26-30, 1962- PP 201-217 OF RADIOACTIVE CONTAMINATION OF WOUNDS

A BRIEF DISCUSSION OF THE CHIEF INDIRECT METHOD FOR ESTIMATING THE BODY CONTENTS OF BOTH ALPHA AND BETA EMITTERS, WHICH IS THE MEASUREMENT OF THEIR EXCRETION IN URINE, FECES, OR EXHALED BREATH, IS GIVEN. A BIBLIOGRAPHY ON TECHNIQUES USED IN THE INDIRECT DETERMINATION OF RADIONUCLIDE BODY BURDEN IS ALSO PRESENTED.

PLUTONIUM • STRONTIUM • THORIUM • URANIUM • ANALYTICAL TECHNIQUE • RADIUM • RADON • DOSE MEASUREMENT, INTERNAL • BIOCONCENTRATION • EXCRETION, URINE • MAN

007952
JACKSON S • TAYLOR RA
A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN URINE
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL AND ALDERMASTON
25 PAGES, 6 TABLES (REFERENCES- SM-57/16, P. 169 OF STI/PUB/04 (CONF-440-13)- SYMPOSIUM ON ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN, HEIDELBERG, FEDERAL REPUBLIC OF GERMANY, MAY 11-16, 1964

IN ASSESSING THE FUNCTION AND SCOPE OF URINE ANALYSIS, THE FACTORS AFFECTING THE CHOICE OF A SUITABLE ANALYTICAL METHOD ARE DISCUSSED. THE SENSITIVITY AND PRECISION OF THE METHOD MUST BE ADEQUATE IN RELATION TO THE MAXIMUM PERMISSIBLE BODY BURDEN, THE EXCRETION RATE AND THE SAMPLING FREQUENCY. THE METHOD MUST BE SUFFICIENTLY SPECIFIC OR SELECTIVE TO ELIMINATE THE POSSIBILITY OF INTERFERENCE BY OTHER RADIONUCLIDES- AND FINALLY, THE COST MUST BE ASSESSED IN RELATION TO ALL THESE FACTORS AND ALSO TO THE SPEED AND CONVENIENCE OF THE METHOD. THE ELEMENTS WHICH ARE OF GREATEST IMPORTANCE IN THE WORK PROGRAMMES ON URINE ANALYSIS ARE PLUTONIUM, URANIUM, TRITIUM AND FISSION PRODUCTS (MAINLY STRONTIUM 90 AND CAESIUM-137). FROM THE AVAILABLE DATA ABOUT THESE METABOLISMS AN APPROXIMATE URINARY EXCRETION RATE IS PROPOSED FOR EACH OF THE ABOVE RADIONUCLIDES.

CADMIUM • CESIUM • ECONOMICS • OMEGA • PLUTONIUM • STRONTIUM • THORIUM • UNITED KINGDOM • URANIUM • PHOSPHORUS • POLONIUM • SAMPLING • SULFUR • ANALYTICAL TECHNIQUE • GROSS ALPHA • GROSS BETA • PROTACTINIUM • RADIUM • SPECIMEN • EXCRETION, URINE

007962
HEALTH PHYSICS
INSTITUTE FOR ATOMENERGIE, KJELLER RESEARCH ESTABLISHMENT, KJELLER, NORWAY
25 PAGES, 17 FIGURES- OCTOBER 1964, 88-90, PP. 23-25 OF QUARTERLY PROGRESS REPORT, APRIL-MAY-JUNE 1964- DEF/RR

HEALTH PHYSICS ACTIVITIES INCLUDING THE FILM BADGE SERVICE, DIAGNOSIS, ENVIRONMENTAL SURVEILLANCE AND THE MONITORING SYSTEM IN METALLURGICAL LABORATORY II FOR THE PERIOD APRIL - JUNE 1964, ARE SUMMARIZED.

CESIUM • CESIUM • IODINE • PLUTONIUM • RUTHENIUM • STRONTIUM • ASSAYS, ENVIRONMENT • URANIUM • MANGANESE • MONITORS, AIR • MONITORS, GAS • PHOSPHORUS • SOIL AND WATER, RADIOIODINE OCCURRENCE • GROSS ALPHA • GROSS BETA • GROSS GAMMA • SURFACE WATER, SEDIMENT • WASTE DISPOSAL, LIQUID • NOISE MEASUREMENT, EXTERNAL • NOISE MEASUREMENT, INTERNAL • NORWAY • PERSONNEL EXPOSURE, RADIATION • VEGETATION • CONCENTRATION • AQUATIC ORGANISM • MAN

000700
HOWIG LA • ZEHNE S
THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. II
ATOMKERNTECH 11 (5)- 260 •. 8 PAGES. FIGURES. TABLES. REFERENCES- MAY 1965

THE ARTICLE PRESENTS A METHOD OF CALCULATING THE LIMITS OF THE PERMISSIBLE AMOUNT OF ACTIVITY DISCHARGED FROM A NUCLEAR PLANT. A DISTINCTION IS MADE BETWEEN CONTINUOUS AND SHORT-TERM DISCHARGE. FOR PARTICULARLY IMPORTANT RADIONUCLIDES, THE LIMITS WERE CALCULATED ON THE BASIS OF THE RECOMMENDATIONS OF THE ICRPHMB FIRST RADIATION- PROTECTION PUBLICATION (L. SSW) AND OF THE ICRP RESPECTIVELY.

BARIUM • CARBON • CESIUM • DOSE • IODINE • KRYPTON • MMAC • PLUTONIUM • STRONTIUM • XENON • AIRGEN • STACK • AIR • GERMANY

000806
DOLPHIN GW • JACKSON S • LISTER DH
INTERPRETATION OF BIO-ASSAY DATA
UNITED KINGDOM ATOMIC ENERGY AUTHORITY. HARWELL
AHSDARPSP-61 •. 21 PAGES. 8 FIGURES. 49 REFERENCES. APRIL 1964. UNCLA

IN THIS REVIEW THREE BROAD CATEGORIES HAVE BEEN USED IN CLASSIFYING THE DIFFERENT MODES OF METABOLISM OF VARIOUS RADIONUCLIDES. THE FIRST GROUP INCLUDES THOSE RADIO-NUCLIDES WHICH ARE DEEMED UNIFORMLY DISTRIBUTED THROUGHOUT THE BODY. THE SECOND GROUP INCLUDES THOSE WHICH ARE CONCENTRATED PARTICULARLY IN ONE OR MORE ORGANS OF THE BODY. THE THIRD GROUP, REALLY A SPECIALLY IMPORTANT SUB-GROUP OF THE SECOND, COMPRISES THE BONE SEEKERS. THE PATTERN OF URINARY EXCRETION AND PARTICULARLY ITS RELATIONSHIP TO THE RADIATION DOSE DELIVERED TO THE CRITICAL TISSUES, ARE DISTINCTLY DIFFERENT FOR THESE DIFFERENT GROUPS. A SUMMARY IS PRESENTED OF THE HUMAN DATA AVAILABLE ON METABOLISM AND URINARY EXCRETION OF TRITIUM, CESIUM, URANIUM, STRONTIUM, RADIUM AND PLUTONIUM. THE SMALL AMOUNT OF REFERENCE DATA AVAILABLE ABOUT THE METABOLISM OF RADIONUCLIDES IS STILL, HOWEVER, A VERY SERIOUS WEAKNESS AND A GREAT DEAL MORE RESEARCH IS URGENTLY NECESSARY.

CESIUM • INGESTION • INHALATION • MONITOR. PERSONNEL • PLUTONIUM • SODIUM • STRONTIUM • URANIUM • WPD • DOSE CALCULATION. INTERNAL • COUNTER, WHOLE BODY • DOSE MEASUREMENT, INTERNAL • CONCENTRATION • MAN

000909
HUTCHIN RE • VAUGHAN DE
SKIN CONTACT TRANSFER OF TRITIUM FROM GLASS
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY. SAN FRANCISCO. CALIF.
7 PAGES. 2 TABLES. 3 FIGURES. 17 REFERENCES- HEALTH PHYSICS 11(10)- 1047-1053 (OCTOBER 1965)

THE STUDIES REPORTED HERE SHOW THAT CONTACT OF SKIN WITH CONTAMINATED METAL CAN FACILITATE THE TRANSFER OF TRITIUM, THAT THE RADIOACTIVITY ABSORBED INTO THE SKIN ENTERS THE BODY WATER, AND THAT IT FOLLOWS THE METABOLIC PATTERN OF TRITIUM ENTERING BY OTHER MODES. TRITIUM IN THE SKIN WAS DETERMINED AFTER CONVERTING ALL FORMS TO TRITIATED WATER BY DRY COMBUSTION. STANDARDIZED EXPOSURES WERE CHECKED BY LIQUID SCINTILLATION COUNTING. CURVES FOR THE DISAPPEARANCE OF TRITIUM IN THE SKIN COULD BE RESOLVED INTO 0.5, 3 AND 14 DAY HALF-TIMES, AND AFTER 15 DAYS THERE WAS LITTLE DIFFERENCE BETWEEN WET AND DRIED TISSUES. THE ACCUMULATIVE EXCRETION CURVES, BASED ON THE MEASURED HALF-TIME VALUE OF 5.5 DAYS FOR URINE RADIOACTIVITY, SHOWED THAT SUBSTANTIALLY ALL OF THE SKIN RADIOACTIVITY CAN BE ACCOUNTED FOR IN BODY WATER BY 20 DAYS. SPECIAL METHODS WERE DEVELOPED FOR ASSAYING TRITIUM RELIABLY AT A MINIMUM LEVEL OF TWO TIMES TEN-TO-THE-MINUS-THREE PICOCURIES.

DOSE • ANALYTICAL TECHNIQUE • PERSONNEL EXPOSURE, RADIATION • CONCENTRATION • MAN

000922
HAPP W
TRITIUM EXPOSURE AT TRACERLAB. JANUARY 10, 1966
TRACERLAB
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(12)- 56 (MARCH 21, 1966)

VARIOUS TRITIUM CONTAMINATED OBJECTS WERE DOUBLE BAGGED, AND PLACED IN WASTE DRUMS TO BE CEMENTED IN. EITHER DURING THE CEMENT POURING OR PUSHING DOWN A FLOATING OBJECT, TRITIUM MUST HAVE BEEN RELEASED.

WASTE DISPOSAL • PERSONNEL EXPOSURE, RADIATION

000925
PUSCHEL RH
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION. FEBRUARY 24, 1966
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(12)- 28 (MARCH 21, 1966)

A TRITIUM EXPOSURE MAY RESULT IN A WHOLE BODY EXPOSURE OF 5 REM, DUE TO HANDLING TRITIATED WATER DURING PRODUCTION OF AN ORGANIC COMPOUND.

PERSONNEL EXPOSURE, RADIATION • PINCIDENT, NONREACTOR

009307
HILLIAN CP
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE. ATOMIC ENERGY CLEARING HOUSE 121151 PAGE 46, APRIL 11, 1966

A CHEMIST OPENED AN EVACUATED SYSTEM SEVERAL TIMES IN A HOOD, TO ADD MATERIAL TO TRITIATED WATER. HIS CUMULATIVE INTERNAL EXPOSURE WAS 4.26 REMS DURING A THREE-WEEK PERIOD.

*FAILURE, OPERATOR ERROR * PERSONNEL EXPOSURE, RADIATION

013200
TRITIUM CONTAMINATION AT THE GEORGE A. SCHWALM, INC.
DIVISION OF STATE AND LICENSEE RELATIONS, USAEC
2 PAGES, APRIL 14, 1966, ATOMIC ENERGY CLEARING HOUSE, 121221, PAGES 20-21 (MAY 30, 1966)

AEC INSPECTION REVEALED THAT EMPLOYEES LEAVING TRITIUM PAINTING AREAS HAD 59,000 DIS/MIN OF REMOVABLE TRITIUM ON THEIR HANDS AND STREET SHOES. EMPLOYEES HAD MONITORED THEMSELVES WITH AN ULTRAVIOLET LIGHT (USED FOR LUMINOUS PAINT) INEFFECTIVE AGAINST TRITIUM. IN ADDITION, CONTAMINATED CLOTHES ARE REUSED WITHOUT WASHING, INADEQUATE CHANGE ROOMS EXIST, AND CONTAMINATED DIAL HOLDERS ARE PASSED INTO UNRESTRICTED AREAS. AEC INDICATES THAT OTHER PAINTERS WITH CAREFUL HOUSEKEEPING CAN OPERATE WITHIN THEIR LIMITS.

*CONTAMINATION * *FAILURE, ADMINISTRATIVE CONTROL

010561
WAUGH HA
TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966
U. S. RADIUM CORPORATION
1 PAGE, JUNE 2, 1966, ATOMIC ENERGY CLEARING HOUSE, 121271, PAGE 29 (JULY 4, 1966)

AN ENGELHARD PROCESSOR AVERAGED 70 MICROCURIES OF TRITIUM PER LITER FOR 7 DAYS, DUE TO TWO CONTINGENCIES NOT FORESEEN (IMPROPER HANDLING OF LEAKING TRITIUM-FILLED GLASS TUBES, AND BEING TOO CLOSE TO A LEAKING GAS-FILLING PORT).

*PERSONNEL EXPOSURE, RADIATION * *INCIDENT, NONREACTOR * FAILURE, ADMINISTRATIVE CONTROL

011639
SOUDAIN G
CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF TRITIUM IN THE PRESENCE OF INACTIVE OR ACTIVE GASES)
COMMISSARIAT A L'ENERGIE ATOMIQUE, CENTRE ETUDES NUCLEAIRES, FONTENAY-AUX-ROSES
CEA-R-2841 *, 80 PAGES, 21 FIGURES, 3 TABLES, 1966, THESIS PRESENTED TO TOULOUSE UNIVERSITY (FRANCE) FACULTE DES SCIENCES, MARCH 16, 1965, DEP. FR.

TRITIUM IS A DANGEROUS GAS FOR MAN, AND THE MAXIMUM ADMISSIBLE DOSES IN THE ATMOSPHERE ARE SUFFICIENTLY LOW FOR THE DOSAGE TO BE FAIRLY DIFFICULT. WE HAVE DEVELOPED AN APPARATUS FOR MEASURING SELECTIVELY THE CONTAMINATION OF AIR BY THIS GAS WHEN ALONE OR WHEN ASSOCIATED WITH OTHER GASEOUS CONTAMINANTS. THE DIFFERENTIAL APPARATUS USING TWO IONIZATION CHAMBERS MAKES IT POSSIBLE TO ELIMINATE A PARASITIC GAMMA-RADIATION FIELD. IN A FEW PARTICULAR CASES, THE PRESENCE OF THE RADIOACTIVE GAS HAS BEEN STUDIED. FROM THE PRACTICAL POINT OF VIEW, THE USE OF THESE CHAMBERS (MADE OF STAINLESS STEEL) MAKES FOR EASIER USE SINCE THE PROBLEMS CONNECTED WITH WALL ADSORPTION HAVE BEEN SATISFACTORILY RESOLVED. THE METHOD CAN BE APPLIED WITHOUT RESTRICTION AND VERY EASILY TO THE DETERMINATION OF TRACES OF TRITIUM IN AIR OR IN THE FORM OF TRITIATED WATER OR STEAM IN THE ATMOSPHERE.

COUNTER * HPC * *MPD * SAMPLING * ANALYTICAL TECHNIQUE * DOSE MEASUREMENT, EXTERNAL * GAS

011919
COWPER G * KNIGHT GB * ROWE PC
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1965
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2540 *, 18 PAGES, 8 FIGURES, 9 TABLES, FEBRUARY 1966, AECL 60.50 CY

AN ANALYSIS OF OCCUPATIONAL RADIATION EXPOSURES RECEIVED BY WORKERS AT AECL SITES IN 1965 HAS BEEN CARRIED OUT BY MACHINE ACCOUNTING METHODS. RESULTS ARE PRESENTED IN TABLES AND GRAPHS.

*CANADA * DOSE MEASUREMENT, EXTERNAL * *PERSONNEL EXPOSURE, RADIATION

013459
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM
SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE
CONF-660413 *, 130 PAGES, TABLES, SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM, LE VESINET, FRANCE, APRIL 16-18, 1966, IN FRENCH

THE 21 PAPERS, TOGETHER WITH THE DISCUSSIONS FOLLOWING THEIR PRESENTATION, PRESENTED AT THE

013050 (CONTINUED)
SEMINAR AT LE VESINET ON PROTECTION AGAINST THE DANGERS OF TRITIUM ARE COMPILED.

AVAILABILITY - SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE, FREE.

FISSION PRODUCT RELEASE

013050
HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1965
OAK RIDGE NATIONAL LABORATORY
ORNL-3949 O. 225 PAGES, FIGURES, TABLES, OCTOBER 1965

RECENT DATA AND FINDINGS ARE SUMMARIZED IN THE AREAS OF (1) WASTE DISPOSAL, (2) RADIATION ECOLOGY, (3) RADIATION PHYSICS, (4) RADIATION DOSIMETRY (5) INTERNAL DOSIMETRY, AND (6) HEALTH PHYSICS TECHNOLOGY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U. S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $4.00 CY

AEROSOL • CRUSTACEAN • CESIUM • ECOLOGY • DOSIMETRY • HEALTH PHYSICS TRAINING • KRYPTON • PLUTONIUM • RUTHENIUM • STRONTIUM • WASTE DISPOSAL • WASTE DISPOSAL, TERRESTRIAL • WASTE DISPOSAL, ECONOMICS • DOSE CALCULATION, INTERNAL • RIVER, CLINCH • POPULATION EXPOSURE • DOSE MEASUREMENT, EXTERNAL • HAZARDS ANALYSIS • AMERICIUM • CURIUM • MINERAL EXCHANGE • RADIATION SAFETY AND CONTROL • WASTE DISPOSAL, HYDRAULIC FRACTURING • WASTE DISPOSAL, SALT • RADIATION EFFECT

013750
RICHMOND CR • PUPCHEK JE
ESTIMATION OF RADIATION PROTECTION GUIDES - INTERSPECIES CORRELATIONS
LOS ALAMOS SCIENTIFIC LABORATORY, UNIVERSITY OF CALIFORNIA, LOS ALAMOS, NEW MEXICO
LAMS-183 O. 52 PAGES, 7 TABLES, 12 FIGURES, 28 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

VALUES RECOMMENDED FOR MAXIMUM PERMISSIBLE CONCENTRATIONS (MPC) OF RADIONUCLIDES IN AIR AND WATER AND FOR RETENTION BY THE BODY AND ITS COMPONENTS TISSUES ARE COMMONLY BASED ON DATA OBTAINED FROM ACUTE TRACER STUDIES IN RODENTS. CONCEPTUALLY, HOWEVER, CONDITIONS OF CHRONIC EXPOSURE FOR HUMAN SUBJECTS ARE EMBODIED IN MPC CALCULATIONS. ONE APPROACH TO RESOLVING THIS PROBLEM IS TO FIND INTERSPECIES CORRELATIONS IN RADIONUCLIDE METABOLISM AND WAYS TO EXTRAPOLATING TO MPC VALUES FOR MAN. FOLLOWING CONTINUOUS INGESTION OF A CONSTANT AMOUNT OF A MATERIAL, AN EQUILIBRIUM LEVEL WILL BE REACHED WITHIN THE BODY. THIS LEVEL IS PREDICTABLE FROM ACUTE ADMINISTRATION STUDIES. THE INTEGRAL OF THE EFFECTIVE RETENTION FUNCTION (LIMITS OF ZERO TO INFINITY) IS PROPORTIONAL TO EQUILIBRIUM LEVEL AND HAS DIMENSIONS TO MULTIPLES OF THE DAILY INTAKE - EQUILIBRIUM LEVEL IS ALSO PROPORTIONAL TO RADIATION DOSE. WE HAVE DEVELOPED INTERSPECIES CORRELATIONS OF THE FORM Y EQUALS AX-B, WHICH RELATE EQUILIBRIUM LEVELS (Y) OBTAINED FOR MICE, RATS, DOGS, MONKEYS AND MAN TO G BODY WT. (X) FOR H-3 (TRITIUM WATER, NA-22, K-42, MN-54, ZN-65, RU-106, I-131, AND CS-137.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 ($000)

CESIUM • IODINE • MPC • SODIUM • MANGANESE • POTASSIUM • ZINC • POPULATION EXPOSURE • RUBIDIUM • ANIMAL • CONCENTRATION • MAMMAL, DOG • MAN • MAMMAL, RODENT

014000
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(3) PAGES 20-21 (JANUARY 16, 1967)

(LETTER NOVEMBER 22) A CHEMIST RECEIVED 0.46 REM TRITIUM DOSE AFTER THE BREAKING OF A GLASS REACTION VESSEL BY A STIRRING BAR, WHILE INCORPORATING 175 CURIES OF TRITIUM INTO A PLASTIC.

FAILURE, OPERATOR ERROR • PERSONNEL EXPOSURE, RADIATION

015001
JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967
JOHN HOPKINS UNIVERSITY, BALTIMORE
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGE 34, (MARCH 13, 1967)

JOHNS HOPKINS REPORTS FEB. 21, THAT 10 CURIES OF TRITIUM (IN URANIUM HYDRIDE) WERE RELEASED AS A GLASS TUBE BROKE AND THE UP BURNED SPONTANEOUSLY. TWO PERSONS WERE EXPOSED TO 3 MPC AIR, URINE SPECIMENS PEAKED AT 0.1 MPC. VENTILATION SYSTEM SPREAD AIR CONTAMINATION THROUGHOUT BUILDING. INCIDENT OCCURRED AT 6 PM.

INHALATION • VENTILATION SYSTEM • PINCIDENT • PERSONNEL EXPOSURE, RADIATION

015003
TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 19, 1966
U.S. RADIUM CORPORATION

019009 *CONTINUED*
7 PAGES, ATOMIC ENERGY CLEARING HOUSE 19(11), PAGES 35-36, MARCH 13, 1967

U.S. RADIUM CORP. REPORTS JAN. 24 THAT AN R AND D SCIENTIST BREATHED AIR CONTAINING TRITIUM FROM A LEAKY GLASS TUBE FILL FACILITY. LATE REPORTING IS DUE TO ORIGINAL USE OF SUBMERSIBLE TRITIUM MPC (WHICH INDICATED NO OVEREXPOSURE). IF THE SOLUBLE MPC VALUE IS USED, ASSUMING OXIDATION HAD TAKEN PLACE, AN OVEREXPOSURE OCCURRED. IN ADDITION, AN ION CHAMBER INDICATED 100 TIMES MORE TRIUM AN IMPINGED SAMPLE.

*FAILURE, EQUIPMENT * INHALATION * MPC * INCIDENT, EQUIPMENT * PERSONNEL EXPOSURE, RADIATION

019024
TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967
U.S. RADIUM CORPORATION
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 19(11), PAGE 36, MARCH 13, 1967

U.S. RADIUM CORP., JAN. 25, REPORTS THAT A DIAL PAINTER WAS EXPOSED TO 1.44 MPC, DUE TO (1) AN ACCUMULATION OF FRESHLY PAINTED DIALS NEXT TO THE MACHINE, (2) RESIDUAL CONTAMINATION OF SAMPLING-TRAIN COMPONENTS (DRY GAS METER). THE MACHINE IS COMPLETELY ENCLOSED AND KEPT AT MINUS 3 INCHES (WATER) PRESSURE, ALTHOUGH THE AIR FLOW IS BARELY PERCEPTIBLE.

*GLOVE BOX * VENTILATION SYSTEM * INCIDENT * PERSONNEL EXPOSURE, RADIATION * FAILURE, DESIGN ERROR * FAILURE, ADMINISTRATIVE CONTROL

016512
QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.
4 PAGES, NATIONAL BUREAU OF STANDARDS REACTOR, FINAL SAFETY ANALYSIS REPORT, SUPPL. 6, PAGES 15-1715-6, OCTOBER 1, 1960, DOCKET NO. 50-184

DISCUSS THE PROVISIONS FOR TRITIUM CONTROL FOR BOTH ON-SITE AND OFF-SITE PERSONNEL DURING NORMAL OPERATION OR IN THE EVENT OF AN INCIDENT, INCLUDING A HEAT-EXCHANGER TUBE-BUNDLE FAILURE WHICH CAUSES CARRYOVER OF ALL PRIMARY WATER TO THE SECONDARY COOLING SYSTEM. IN THE EVENT IT IS NECESSARY TO ISOLATE THE MAIN HEAT EXCHANGER TO EFFECT TRITIUM CONTROL (OR FOR OTHER REASONS), DISCUSS HOW CORE COOLING WOULD BE ACCOMPLISHED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*DECAY HEAT * REACTOR, MAN * REACTOR, RESEARCH * REPORT, 500 * RESPONSE TO NRC QUESTION * COOLANT PURIFICATION SYSTEM * FAILURE, TUBING * HEAT EXCHANGERS

010910
CONSER 88 * RAYF 5V * POWER 85 * SNYDER 85 * STOUNESS 66
DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I
OAK RIDGE NATIONAL LABORATORY, HEALTH PHYSICS DIVISION, TENN.
ORNL-4101 P. 210 PAGES, 19 FIGURES, 11 TABLES, 3 REFERENCES, MARCH 1967

THIS REPORT PRESENTS INFORMATION OBTAINED BY ORNL IN PHASE I OF DOSE-ESTIMATION STUDIES TO EVALUATE THE RADIOLOGICAL-SAFETY FEASIBILITY OF EXCAVATING AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. THE INFORMATION INCLUDES (1) METHODS FOR ESTIMATING EXTERNAL AND INTERNAL DOSE EQUIVALENTS, FOR CLARIFYING THE TRANSFER OF RADIONUCLIDES THROUGH CRITICAL EXPOSURE PATHWAYS, AND FOR IDENTIFYING THE RADIONUCLIDES LIKELY TO BE CRITICAL, (2) CRITERIA FOR EVALUATING THE RADIOLOGICAL SAFETY OF THE OPERATION, AND (3) LISTS OF RADIONUCLIDES ARRANGED ACCORDING TO THE DOSE COMMITMENT THAT RESULTS FROM EXPOSURE TO A UNIT QUANTITY OF EACH RADIONUCLIDE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

*ECOLOGY * DOSE * EQUATION * FALLOUT * MPC * INGESTION * INHALATION * LOSSES * SURFACE WATER, NUCLEAR OCCURRENCE * DOSE CALCULATION, INTERNAL * MOBILITY, ENVIRONMENTAL * NUCLEAR DETONATION * SOIL, NUCLEAR OCCURRENCE * DOSE CALCULATION, EXTERNAL * NUCLEAR EXPLOSION DEBRIS * PERSONNEL EXPOSURE, RADIATION * RADIATION SAFETY AND CONTROL * MATHEMATICAL TREATMENT * CONCENTRATION * MPC

017118
JOHNS HOPKINS UNIVERSITY CITED FOR NRC COMPLIANCE
JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD.
7 PAGES, ATOMIC ENERGY CLEARING HOUSE 19(33), PAGE 29 AND 30 (AUGUST 14, 1967)

(LETTER, JUNE 8) INSPECTION AFTER A RELEASE OF 30 CURIES OF TRITIUM INTO AN UNRESTRICTED LAB ON FEBRUARY 20 REVEALED (1) TRITIUM POSSESSION, BUT NO VALID NRC LICENSE, (2,3) SURVEYS FOR AIRBORNE TRITIUM WERE INADEQUATE, (4) TWO INDIVIDUALS WERE EXPOSED TO ABOVE MPC FOR TRITIUM, (5-7) TRITIUM WAS STORED IN AN UNRESTRICTED, UNMARKED AREA AND RECORDS NOT KEPT, (8) THE EXPOSURE IN ITEM 4 AND THE RELEASE ITSELF WERE NOT REPORTED IN WRITING. THERE APPEARS TO BE A LACK OF CENTRAL CONTROL OF PROCUREMENT AND USE OF BY-PRODUCT MATERIAL, WITH NO ONE ASSIGNED OVERALL RESPONSIBILITY TO ENSURE COMPLIANCE WITH LICENSES.

*UNAUTHORIZED RELEASE * COMPLIANCE * INCIDENT * RADIATION SAFETY AND CONTROL * FAILURE, ADMINISTRATIVE CONTROL

017134
BOND VP
EVALUATION OF POTENTIAL HAZARDS FROM TRITIUM WATER
BROOKHAVEN NATIONAL LABORATORY
BN-100/11 • CONF-700810-6 •. 29 PAGES. PAPER PRESENTED AT THE INTERNATIONAL ATOMIC ENERGY AGENCY SYMPOSIUM ON ENVIRONMENTAL ASPECTS OF NUCLEAR POWER PLANTS, NEW YORK, AUGUST 10-14, 1970

THE MCRP-ICRP HAVE ESTABLISHED 1000 MICROCURIES CI AS THE MAX. PERMISSIBLE BODY BURDEN OF TRITIUM FOR OCCUPATIONAL EXPOSURE WITH BODY TISSUE AS THE CRITICAL ORGAN. A VALUE OF MICRONS CI IS ALSO LISTED WITH THE WHOLE BODY AS THE CRITICAL ORGAN. SINCE THESE FIGURES HAVE BEEN WIDELY MISINTERPRETED, IT MAY BE WELL TO EXPLAIN HOW THEY WERE OBTAINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE • DATA • HAZARD, RELATIVE • ATMOSPHERIC POLLUTION • BETA EMITTER • DOSE CALCULATION, INTERNAL • POPULATION EXPOSURE • ICRP • DEFECT • ABSORPTION • CONCENTRATION • FOOD CHAIN • TOXICITY • EXCRETION • DISTRIBUTION • TURNOVER RATE • DNA • EMBRYO • FETUS • ORGAN • BODY BURDEN

017399
WRIGHT GO • ADAIR D
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1966
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-2670 •. 14 PAGES. 9 FIGURES, 2 TABLES, FEBRUARY, 1967

AN ANALYSIS OF OCCUPATIONAL RADIATION EXPOSURES RECEIVED BY WORKERS AT AECL SITES IN 1966 WAS CARRIED OUT BY MACHINE ACCOUNTING METHODS. RESULTS ARE PRESENTED IN TABLES AND GRAPHS.

AVAILABILITY - ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO, CANADA, $1.50 COPY

CANADA • DOSE • DOSE CALCULATION, INTERNAL • DOSE CALCULATION, EXTERNAL • OCCUPATIONAL EXPOSURE, RADIATION

019034
JOHNSTON JE
HEALTH PHYSICS AND MEDICAL DIVISION RESEARCH PROGRESS REPORT, JANUARY - DECEMBER 1966
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-PR-HPD-11 •. 41 PAGES. MARCH 1967

COVERS RESEARCH ON AEROSOLS, RADIATION PHYSICS (INCLUDING DOSIMETRY AND FALLOUT), METABOLIC STUDIES, BIOLOGICAL MEASUREMENTS, ANALYTICAL DEVELOPMENT, AND MEDICAL SERVICES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

AEROSOL • CESIUM • DOSIMETRY • FALLOUT • STRONTIUM • UNITED KINGDOM • POTASSIUM • IODINE • RADIUM • GAMMA • NEUTRON • RADIOLOGY • CONCENTRATION • MAN

019575
BUSH WR
TRITIUM HAZARDS
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER
AECL-2994 •. 16 PAGES. JUNE 1968

THIS LECTURE WAS BASED ON VARIOUS TALKS ON THE RADIATION HAZARDS OF TRITIUM OXIDE WHICH HAVE BEEN GIVEN BY THE AUTHOR TO PROCESS OPERATORS AND SUPERVISORS, LABORATORY TECHNICIANS, AND MECHANICAL TRADESMEN. THE ABSORPTION OF TRITIUM OXIDE INTO THE BODY THROUGH THE SKIN AND LUNGS, ITS EXCRETION IN URINE, AND THE ADMINISTRATIVE CONTROLS (REMOVAL, CAUTION, MINIMA, AND NEGLIGIBLE) ARE DESCRIBED. THE CONCENTRATION OF TRITIUM IN AIR, EXPRESSED AS MPCA, AND THE RADIATION DOSE RESULTING FROM A NUMBER OF MPCA-HOURS OF EXPOSURE ARE EXPLAINED. FINALLY, THE METHODS FOR PROTECTING AGAINST TRITIUM (VENTILATION, AIR-SUPPLIED MASKS, AND PLASTIC CLOTHING) ARE DISCUSSED.

AVAILABILITY - ATOMIC ENERGY OF CANADA LTD., $.50 COPY

AIRBORNE RELEASE • DOSE • CHALK RIVER • CONTAMINATION

020044
VERMART J
THE USAGE OF RADIOACTIVE LUMINOUS COMPOUND AND THE NEED FOR BIOLOGICAL MONITORING OF WORKERS
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY
6 PAGES, 11 REFERENCES, HEALTH PHYSICS 19(10), PAGE 950-956, (SEPT. 1971)

THE USE OF RADIOACTIVE LUMINOUS PAINTS GIVES RISE TO CONTAMINATION OF LUMINISERS AND OF THE PUBLIC USING THE LUMINISED ARTICLES. WHERE THE PUBLIC IS CONCERNED, RADIONUCLIDES WHICH DO NOT EMIT PENETRATING RADIATIONS, SUCH AS TRITIUM AND PROMETHIUM-147, ARE MORE SUITABLE THAN RADIUM. EXPERIENCE IN THE UNITED KINGDOM OF MONITORING LUMINISERS FOR RADIUM AND TRITIUM IN THEIR BODIES IS REVIEWED AND DISCUSSED IN RELATION TO THE POSSIBLE USE OF PROMETHIUM-147. PRESENT CONDITIONS IN THE LUMINISING INDUSTRY ARE SUCH THAT THERE IS A NEED FOR REGULAR MONITORING OF WORKERS, AND THE PROBLEMS CREATED BY TRITIUM AND PROMETHIUM-147 ARE SUFFICIENT TO RESTRICT THEIR USE, PROBABLY

[illegible]
[illegible] A REVIEW. THERE IS THUS A CONSIDERABLE DIFFERENCE BETWEEN WHAT IS DESIRABLE FROM THE POINT OF VIEW OF THE PUBLIC AND WHAT IS POSSIBLE BY THE INDUSTRY. [illegible] THIS DILEMMA, IT IS SUGGESTED THAT THE [illegible] AND [illegible] SHOULD BE BROUGHT UP TO MORE HIGHER STANDARDS FOR CONTROLLING THE RADIOACTIVITY [illegible].

[illegible] • TRITIUM • WASTE DISPOSAL • [illegible] • [illegible] • RADIATION PROTECTION, ORGANIZATION • RADIOCHEMICAL PLANT SAFETY • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
[illegible] IN RADIATION PROTECTION IN CONNECTION WITH TRITIUM
[illegible], GERMANY
[illegible] • [illegible] • [illegible] REFERENCES, ATOMKERNENERGIE (DEUTSCH), PAGE 454-457, NOVEMBER 1967, IN GERMAN

PRESENTS A SURVEY ON PROBLEMS CONNECTED WITH THE SUPERVISION OF PROTECTION MEASURES COMPLYING WITH THE USE OF TRITIUM. SOME TECHNICAL DETAILS ARE DISCUSSED. A SHORT REPORT DESCRIBING TRITIUM SUPERVISION AT THE KARLSRUHE REACTOR IS GIVEN.

RADIATION PROTECTION, ORGANIZATION • RADIATION SAFETY AND CONTROL

[illegible]
HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1967. PART I. RADIOACTIVE WASTE DISPOSAL
OAK RIDGE NATIONAL LAB., TENN.
[illegible] • [illegible] PAGES, [illegible] FIGS. • TABLES, [illegible] REFERENCES, PAGE I-[illegible], OCTOBER 1967

DISCUSSION IS DEVOTED TO - (1) RATE OF RADIONUCLIDES IN TERRESTRIAL ENVIRONMENT, (2) DISPOSAL BY HYDRAULIC FRACTURING, (3) DISPOSAL IN NATURAL SALT FORMATIONS, (4) APPLICATION OF NUCLEAR EXCHANGE TO REACTOR TECHNOLOGY, (5) ENGINEERING, ECONOMIC, AND SAFETY EVALUATIONS, (6) VENTILATION AND REACTOR SITING, (7) DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTERCOASTAL CANAL WITH NUCLEAR EXPLOSIVES, AND (8) RELATED COOPERATIVE PROJECTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

TESTING • MECHANICS • ADSORPTION • [illegible] • SOIL, RADIONUCLIDE MOVEMENT THROUGH • WASTE DISPOSAL, TERRESTRIAL • WASTE STORAGE • DOSE CALCULATION, INTERNAL • [illegible] • WASTE DISPOSAL, GAS • WASTE MANAGEMENT • DOSE CALCULATION, EXTERNAL • [illegible] • [illegible] FORMULA • SORPTION • WASTE DISPOSAL, HYDRAULIC FRACTURING • WASTE DISPOSAL, SALT • GEOLOGY, SALT STRUCTURE • SAFETY EVALUATION • ENGINEERING • ROCK MECHANICS • VENTILATION • CONCENTRATION

[illegible]
[illegible]
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2756 • CONF-670210-1 P., 17 PAGES, 4 FIGURES, 4 TABLES, 7 REFERENCES, JULY 1967, PRESENTED AT SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL, ALBUQUERQUE, N. MEX.

THE GROWTH OF THE TRITIUM INTO HAZARD IN THE NRU REACTOR BUILDING IS REVIEWED, AND THE METHODS AND EXPOSURE GUIDES INTRODUCED TO KEEP THE HAZARD UNDER CONTROL ARE OUTLINED. HTO INTAKES ARE CLASSIFIED AS REMOVAL, CAUTION, MINOR, OR NEGLIGIBLE, DEPENDING ON THE HTO CONCENTRATION IN WATER. REMOVAL EXPOSURES (70 MICROCURIES/LITER) ARE INVESTIGATED, AND A REPORT ON THE EXPOSURE INCIDENT IS DISTRIBUTED TO ALL PERSONNEL. THE AVERAGE HTO DOSE RECEIVED IN 50 REMOVAL EXPOSURES IN 1966 WAS 230 MREM. RECEIVED DESPITE FROM MINOR AND NEGLIGIBLE EXPOSURES. OUR LARGEST HTO EXPOSURE RESULTED IN A DOSE OF 4300 MREM, AND IN OTHER SINGLE EXPOSURES HAVE RECEIVED 500 MREM. MOST OF THESE RESULTED FROM INTAKE OF HTO VAPOR THROUGH THE UNBITTEN SKIN OF MEN WEARING AIR-SUPPLIED MASKS AND COTTON COVERALLS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

ABSORPTION • MECHANICAL • CANADA • DOSE • REACTOR, HWR • DOSE CALCULATION, INTERNAL • CHALK RIVER • RADIOBIOLOGY

[illegible]
EVANS AC
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES
SAVANNAH RIVER LAB., E. I. DU PONT DE NEMOURS AND CO., AIKEN, S. C.
1 PAGE, ABSTRACT IN HEALTH PHYSICS 13, PAGE 591, (1967), PAPER PRESENTED AT THE TWELFTH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, WASHINGTON, D. C., JUNE 19-22, 1967

WORLD-WIDE POPULATIONS ARE CHRONICALLY EXPOSED TO TRITIUM FROM NUCLEAR WEAPONS TESTS AND RELEASES FROM NUCLEAR FACILITIES. ESTIMATES OF THE RADIATION DOSE FROM ASSIMILATION OF TRITIUM OXIDE, THE COMMON FORM OF ENVIRONMENTAL TRITIUM, ARE BASED ON THE ASSUMPTION THAT TRITIUM REMAINS IN BODY WATER UNTIL EXCRETED. ANALYSES OF BODY TISSUES, HOWEVER, INDICATE THAT CHRONIC EXPOSURE TO TRITIUM CAUSES SIGNIFICANT LABELING OF ORGANIC MOLECULES. THE DEGREE OF LABELING WAS DETERMINED FROM TRITIUM ASSAYS OF SEVEN TISSUES (HEART, LIVER, KIDNEYS, SPLEEN, BRAIN, MUSCLE AND FAT) FROM

023261 HEDTDUNDO+
FORTY-TWO DEER HARVESTED ON THE SAVANNAH RIVER PLANT SITE. IN MOST TISSUES, THE TRITIUM-HYDROGEN RATIOS IN BODY WATER AND IN THE WATER OF COMBUSTION OF DRIED TISSUES WERE THE SAME. THIS INCORPORATION OF TRITIUM IN THE ORGANIC COMPONENT OF DEER TISSUES RESULTS IN DOSES UP TO 1.5 TIMES HIGHER THAN ESTIMATED IF ONLY THE TRITIUM IN BODY WATER IS CONSIDERED.

*DOSE CALCULATION, INTERNAL * SAVANNAH RIVER PLANT * ANIMAL * CONCENTRATION

020243
BANDER RL
REVIEW OF SANDIA SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL
SANDIA CORP., ALBUQUERQUE, N. MEX.
SC-DC-67-2101 * CONF-671010-1 *. 7 PAGES, SEPT. 1967. PRESENTED AT MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, MIAMI, FLA.

TRITIUM IS NOT A RADIATION HAZARD UNLESS TAKEN INTO THE BODY, WHICH IS MOST EASILY DONE IN THE FORM OF TRITIUM WATER OR TRITIUM WATER VAPOR. ESSENTIALLY ALL TRITIUM WATER VAPOR INHALED IS RETAINED, AND AS FOUND ABOVE MAY BE ABSORBED THROUGH THE UNPROTECTED SKIN. THE ONLY WAY OF MEASURED IN THE URINE AND MAY BE PRODUCED BY FLUID INTAKE. THE PROBLEM WITH REFERENCE TRITIUM IS THAT THE RADIATION EMITTED IS SO WEAK THAT IT WILL NOT PENETRATE THE WALLS OF NORMAL REFERENCE EQUIPMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA. $3.00 COPY, $0.65 MICROFICHE

*SAVANNAH RIVER * DOSE MEASUREMENT, INTERNAL * ENERGY LEVEL * RADIATION MONITORS

020429
BASIS HEALTH PHYSICS
DEFENSE ATOMIC SUPPORT AGENCY, ALBUQUERQUE, N. MEX.
AD-160901 *. 100 PAGES, DECEMBER 1, 1967

HEALTH PHYSICS IS DEDICATED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT FROM UNWARRANTED RADIATION EXPOSURE. THE ARTICLE, BASIC HEALTH PHYSICS, BREAKS DOWN THE SUBJECT MATTER INTO THE FOLLOWING CATEGORIES - RADIATION UNITS AND THEIR BIOMEDICAL EFFECTS, TELEMETRY, HAZARDS, DETECTION AND MEASUREMENT, RADIATION MATHEMATICS, AND PROTECTIVE EQUIPMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA. $3.00 COPY, $0.65 MICROFICHE

*AIRBORNE RELEASE * DOSE * HEALTH PHYSICS TRAINING * HYDROGEN * INGESTION * INHALATION * PLUTONIUM * RADIATION DAMAGE * SURFACE CONTAMINATION * URANIUM * RADIATION UNIT * HAZARDS ANALYSIS * CONTAMINATION * X-RAY * MATHEMATICAL TREATMENT * *CONCENTRATION * RADIATION EFFECT * MAN

020439
VERGHESE J
THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS
NATIONAL RADIOLOGICAL PROTECTION SERVICE, ORLEANS, SUTTON, SURREY, ENGLAND
8 PAGES, 3 TABLES, 27 REFERENCES. HEALTH PHYSICS 14(6), PAGES 941-948 (1968)

THE EXPERIMENTAL EVIDENCE FOR THE USE OF BETA-PARTICLES FOR TRITIATED WATER IS REVIEWED. REPORTED VALUES ARE IN THE RANGE 1-7. THIS VARIATION IS NOT REMARKABLE IN VIEW OF THE DIFFERENT FOR POINTS USED BUT IT IS MISC BUT TO EXPERIMENTAL ERRORS. TO DIFFERENT VIEWS CONCERNING THE SPATIAL DISTRIBUTION OF THE DOSE, TO THE QUALITY OF THE REFERENCE RADIATION AND TO DOSE RATE. THE RESULTS ARE REVIEWED IN RELATION TO RECOMMENDATIONS OF I.C.R.P. CONCERNING QF AND IT IS CONCLUDED THAT A VALUE OF QF DIFFERENT FROM UNITY FOR TRITIUM OR OTHER BETA-EMITTERS IS HARDLY JUSTIFIED.

*DOSE * BETA EMITTER * ICRP * RADIATION SAFETY AND CONTROL * ENERGY LEVEL * *RADIOLOGY

020007
INTERNAL EXPOSURE OF CHEMIST TO TRITIUM
NEW ENGLAND NUCLEAR CORP., ALBANY ST., BOSTON, MASS.
1 PAGE. ATOMIC ENERGY CLEARING HOUSE 14(25), PAGE 19, (MAY 17, 1968)

(LETTER, NOV 8) ON APRIL 4, A JUNIOR CHEMIST WAS SYNTHESIZING AN ORGANIC COMPOUND CONTAINING TRITIUM IN A HOOD UNDER VACUUM WITH A GAS CHROMATOGRAPH. HE RECEIVED A CALCULATED INTERNAL WHOLE-BODY EXPOSURE OF 667 MREM FROM TRITIUM AND CARBON-14. EXPOSURE WAS FROM MULTIPLE CAUSES - (1) LOOSENING OF FAN BELTS, (2) PLACING HEAD IN THE HOOD, (3) POSSIBLE FAILURE OF PUMPS TURNING AND LEAKS. A NEW FACE DESIGN FOR HOOD WILL PREVENT ENTRY OF HEAD. PUMPS TURNING WILL BE CHANGED OFTENER. CHROMATOGRAPH EXIT PORTS WILL BE DIRECTED TO THE SIDE OF HOOD RATHER THAN TO FRONT.

GLOVE BOX * FAILURE, OPERATOR ERROR * *INHALATION * VENTILATION SYSTEM * *PERSONNEL EXPOSURE, RADIATION * *RADIOISOTOPE

[illegible]
HUMAN BIOLOGY AND PHYSIOLOGICAL RESEARCH
UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON
WCH-[illegible]-22 p. 4 FIGS. PAGES 30-45, HEALTH PHYSICS AND MEDICAL DIV. PROGRESS REPORT, JUL.-DEC. 1967

REPORTS PROGRESS IN RESEARCH, AND DEALS WITH DEPOSITION AND METABOLISM OF INHALED METAL IODIDE AND ALDINE VAPORS. EFFORTS ARE BEING MADE TO OBTAIN BASIC INFORMATION ON THE DEPOSITION OF PARTICLES IN VARIOUS REGIONS OF THE HUMAN RESPIRATORY TRACT AND THEIR SUBSEQUENT CLEARANCE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00 COPY, $0.65 MICROFICHE

DEPOSITION • DISSEMINATION • IODINE • PLUTONIUM • IRON • PARENTAL, RADIOACTIVE • A AND B PROGRAM • CONCENTRATION • HUM

C27060
RUSH WD
ANALYSIS OF OCCUPATIONAL EXPOSURES IN 1967
ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO
AECL-[illegible] p. 10 PAGES, 4 FIGURES, 2 TABLES, MARCH, 1968

EXPOSURES TO EXTERNAL BETA AND GAMMA RADIATION AND TO INTERNAL RADIATION FROM TRITIATED WATER DOSES ARE ANALYZED AND COMPARED WITH EXPOSURES IN PREVIOUS YEARS. THE TOTAL, AVERAGE, AND HIGHEST EXPOSURES RECEIVED AT AECL SITES IN 1967 ARE GIVEN. ABOUT 85% OF THE EXTERNAL AND 100% OF THE INTERNAL EXPOSURE WAS RECEIVED AT CRNL, OF WHICH NEARLY 100% WAS RECEIVED BY OPERATING, MAINTENANCE AND RADIATION CONTROL PERSONNEL, MOSTLY IN THE NRX AND NRU REACTOR BUILDINGS. THE COMBINED DOSES FROM EXTERNAL AND INTERNAL EXPOSURES TO THE WHOLE BODY, THE GONADS, AND SKIN, AND THEIR DISTRIBUTION AMONG GROUPS AND INDIVIDUALS, ARE PRESENTED IN GRAPHICAL FORM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DOSIMETRY • HUMAN, PERSONNEL • GROSS BETA • GROSS GAMMA • CHALK RIVER • RADIATION SAFETY AND CONTROL • DECONTAMINATION • HUM

C27062
BROWN RS • HAYS SB
AGE-DEPENDENT MODELS FOR USE IN RESIDUALITY EVALUATIONS OF PLUTONIUM EVENTS. PLUTONIUM RESEARCH AND DEVELOPMENT PROGRESS REPORT, OCTOBER 1, 1967-APRIL 1, 1968
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-2729 p. 16 PAGES, FIGURES, REFERENCES, APRIL 1, 1969

PRESENTS AGE-DEPENDENT MODELS WHICH ARE USED IN THE INHOM COMPUTER CODE FOR CALCULATING THE RADIATION DOSE RESULTING FROM INHALATION OR INGESTION OF RADIONUCLIDES. USE OF AGE-DEPENDENT MODELS IN RESIDUALITY STUDIES PERMITS IDENTIFICATION OF THE CRITICAL SEGMENT OF THE POPULATION AND PROVIDES THE ESTIMATE NECESSARY FOR PLANNING OF REMEDIAL ACTION. RESULTS OF EXAMPLE DOSE CALCULATIONS ARE PRESENTED FOR TRITIUM AND I-131 TO ILLUSTRATE USE OF THE INHOM CODE. THE PARTICULAR INPUT USED FOR THE TRITIUM EXAMPLE IS BASED ON ESTIMATED CONCENTRATIONS RELEASED TO AIR AFTER COMBUSTION OF HYDROGEN GAS STORED IN THE PROJECT REACH RESERVOIR. THE I-131 EXAMPLE ILLUSTRATES THE INFLUENCE OF THE AGE-DEPENDENT PARAMETERS IN THE DOSE MODEL UPON THE RESULTING DOSE ESTIMATES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00 COPY, $0.65 MICROFICHE

INGESTION • RADIOIODINE • PLUTONIUM • DOSE CALCULATION, INTERNAL • HYDROGEN EXPOSURE • RADIATION MODEL

C27077
CROLEY RC
CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS
SAVANNAH RIVER LABORATORY
DPSPU-68-30-19 p. CONF-680607-1 p. 19 PAGES, TABLES, MAY 1968, FROM 15TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

IN HEAVY-WATER-MODERATED REACTORS, TRITIUM IS FORMED AS NEUTRONS ARE ABSORBED BY THE HEAVY WATER. HAZARDS FROM TRITIUM RELEASED TO PERSONNEL ZONES DURING REPAIR AND MAINTENANCE OPERATIONS ARE MINIMIZED BY PROPER AIR EVALUATION AND SELECTION OF CORRECT PROTECTIVE EQUIPMENT. AT SAVANNAH RIVER PLANT, BASIC INFORMATION HAS BEEN DEVELOPED TO FACILITATE THIS PROCESS. DATA IS GIVEN RELATIVE TO BUILDUP OF TRITIUM IN MODERATOR, AIRBORNE CONCENTRATION OF TRITIUM, CONCENTRATION OF TRITIUM IN SPILLED MODERATOR AND WATER, ASSIMILATION OF TRITIUM BY PERSONNEL THROUGH INHALATION AND SKIN CONTACT, AND DESCRIBES TWO BY URINE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00 COPY, $0.65 MICROFICHE

OPERATION, HWR • INHALATION • ANALYTICAL TECHNIQUE • HAZARDS ANALYSIS • RADIATION SAFETY AND CONTROL • SORPTION • MONITORING SYSTEM, RADIATION • CONCENTRATION • EXPOSITION, URINE • HUM

[illegible]
[illegible] W. [illegible]
THE RADIOLOGICAL HAZARD FROM TRITIUM SORBED ON METAL SURFACES PART I THE SORPTION OF TRITIUM ON GROSS
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL
AERE-R 5080 O. 12 PAGES, FIGURES, TABLES, REFERENCES, APRIL 1965

A STUDY WAS MADE OF THE PARAMETERS AFFECTING THE SORPTION OF TRITIUM GAS ON GROSS AND ITS SUBSEQUENT DESORPTION. SORPTION OFFERS IN TRITIUM PRESSURE, EXPOSURE TIME, SURFACE CHARACTERISTICS AND THE PRESENCE OF AIR. IT WAS OFTEN SHOWN TO BE PRESUMMARILY A PROCESS OF ADSORPTION, FOLLOWING THE LANGMUIR ADSORPTION ISOTHERM AT LOW PRESSURES. IT IS CONCLUDED THAT FROM THE VIEW POINT OF RADIOLOGICAL PROTECTION THE RISK OF GENERATING AN SIGNIFICANT LEVELS OF TRITIUM FROM CONTAMINATED GROSS SURFACES IS NEGLIGIBLE, PROVIDED THE SURFACES HAVE NOT BEEN RECENTLY EXPOSED TO TRITIUM GAS. FURTHER STUDIES ARE BEING CARRIED OUT TO ASSESS THE HAZARD DUE TO PERCUTANEOUS ABSORPTION OF TRITIUM FROM METAL SURFACES.

AVAILABILITY - SCIENTIFIC ADMINISTRATION OFFICE, ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, BERKS, DIDCOT, ENGLAND

ADSORPTION • FALLOUT • METAL • DESORPTION • SORPTION

[illegible]
GEY A
TRITIUM AND TRITIATED WATER- TIME LIMITS OF ACCIDENTAL EXPOSURE IN STORAGE TO DEGRADED ATMOSPHERES ETC PREMIUM
[illegible], COMMISSARIAT A L ENERGIE ATOMIQUE
CONF-337-40 O. 40 PAGES, FIGURES, NOV 22, 1961

GENERALLY, ACCIDENTAL RELEASES OF TRITIUM ARE TREATED AS THOUGH THEY ARE THE FORM OF TRITIATED WATER VAPOR. THIS GIVES POSSIBLE ESTIMATES OF DOSES OBTAINED BY BASE DETERMINATION OF TRITIUM IN THE BODY IS CONDUCTED FOR WHY THEN FOR HT. RELEASES OF HT ARE ONLY SLOWLY OXIDIZED TO HTO SO THAT THE IMPACT OF THE RELEASE OF HT LIES SOMEWHERE BETWEEN THAT TO AN HT RELEASE WITH NO OXIDATION AND THAT OF HTO RELEASE. THIS PAPER MAKES A MATHEMATICAL TREATMENT OF THE EFFECT OF OXIDATION RATE ON THE IMPACT OF HT RELEASES.

MAXIMUM RELEASE • CONCENTRATION, MAXIMUM • ATMOSPHERE DISPERSION • INGESTION • INHALATION • HTO • OXIDATION • DOSE CALCULATION, INTERNAL • POPULATION EXPOSURE • DOSE CALCULATION, EXTERNAL • MATHEMATICAL TREATMENT

[illegible]
DEUTSCH F • HOFMANN LA
PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH TRITIUM
[illegible], KARLSRUHE, GER.
6 PAGES, ATOMKERNEN, 15, PAGE 414-7, OCT, 1970, IN GERMAN

A SURVEY IS PRESENTED ON PROBLEMS CONNECTION WITH THE SUPERVISION OF PROTECTIVE MEASURES FOR THE USE OF TRITIUM, AND SOLUTIONS ARE OFFERED. A SHORT REPORT DESCRIBING TRITIUM SUPERVISION AT THE FR 2 REACTOR IS INCLUDED.

RADIATION PROTECTION, ORGANIZATION • GERMANY • RADIATION SAFETY AND CONTROL

[illegible]
HOFMANN A
ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING
KARLSRUHE NUCLEAR RESEARCH CENTRE, GERMANY
CONF-670821 O. 17 PAGES, PP. 941-957 OF RADIATION DOSE MEASUREMENTS. THEIR PURPOSE, INTERPRETATION, AND REQUIRED ACCURACY IN RADIOLOGICAL PROTECTION, PARIS, EUROPEAN NUCLEAR ENERGY AGENCY, 1967

TRITIUM IN THE HUMAN BODY CAN BE ASSESSED WITH A HIGH DEGREE OF ACCURACY BY MEASUREMENTS OF TRITIUM EXCRETED IN URINE IF THE MEASUREMENTS ARE NOT LONGER THAN SEVERAL WEEKS AFTER THE INITIAL INTAKE AND IF THE MEASUREMENT: ARE REPEATED SUFFICIENTLY SO THAT THE HALF-TIME OF EXCRETION WILL BE KNOWN. LATER MEASUREMENTS HAVE TO TAKE INTO ACCOUNT THAT 1.4 FRACTION OF TOTAL-BODY TRITIUM CONTAINED IN THE BODY WATER DECREASES WITH TIME.

MONITORING, PERSONNEL • DATA • MATHEMATICAL TECHNIQUE • DOSE MEASUREMENT, INTERNAL • CONCENTRATION • EXCRETION, URINE • BOD

[illegible]
[illegible] DR • O BOTTA PG • MERIGHETTI
RAPID MONITORING OF TRITIUM AND C-14 IN URINE
MERCK AND COO, INC., RAHWAY, N.J.
9 PAGES, AMER. IND. HYG. ASS. J., 28, PAGES 480-488 (SEPT.-OCT, 1967)

GIVES A RAPID SCREENING OR MONITORING PROCEDURE FOR TRITIUM AND C-14. THIS IS UTILIZED AS A VALUABLE SUPPLEMENT TO FILM BADGES, DOSIMETERS, AND OTHER PERSONNEL MONITORING DEVICES. ANY POSSIBLE DAMAGE THAT MAY RESULT FROM ACCIDENTAL CONTACT, SPILLS, OR FAULTY LABORATORY PROCEDURES LEADING TO INTERNAL ABSORPTION CAN BE ESTIMATED FROM THIS TYPE OF ANALYSIS. A SIMPLE MIXING OF URINE AND PHOSPHOR AND MEASUREMENT IN A TYPE OF SPECTROMETER USUALLY AVAILABLE IN MOST RADIATION LABORATORIES IS ALL THAT IS NEEDED FOR THIS TEST.

DECAYED • DOSIMETRY • MONITOR, PERSONNEL • ANALYTICAL TECHNIQUE • MEASUREMENT, RADIOACTIVITY • EXCRETION, URINE

[illegible]
HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1960
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-[illegible] 0, [illegible] PAGES, OCTOBER 1960

PROGRESS OF THE HEALTH PHYSICS DIVISION AT ORNL IS REPORTED IN PERIODS - PART I, RADIOACTIVE WASTE DISPOSAL - III PART OF WASTE PRODUCTS AND RADIOACTIVITY IN ENVIRONMENTAL [illegible], [illegible] OF [illegible] PRACTICE, [illegible] DISPOSAL [illegible] WASTE SALT REPROCESSING, [illegible] PROCESSING, DECONTAMINATION, AND SAFETY EVALUATIONS, [illegible] CONTAMINATION AND REACTOR SAFETY, [illegible] DISTRIBUTION STUDIES RELATED TO POSITIVE USES OF RADIATION EXPOSURES, [illegible] RELATED CO-SPONSORED PROJECTS. PART II, RADIATION DOSIMETRY. PART III, RADIATION PHYSICS. PART IV, RADIATION BIOCHEMISTRY RESEARCH. PART V, INTERNAL DOSIMETRY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $1.00 COPY, $0.50 MICROFICHE

KEYWORDS - COMPUTER PROGRAM - MONITORING - HEALTH PHYSICS PROGRAM - REACTOR SAFETY SYSTEM - WASTE DISPOSAL, INJECTION - WASTE DISPOSAL, REACTORS - DOSE CALCULATION, INTERNAL - CONTAMINATION PROGRAM - WASTE MANAGEMENT - DOSE CALCULATION, EXTERNAL - RADIATION SAFETY AND CONTROL - PERSONNEL - WASTE DISPOSAL, RADIOACTIVE PRODUCTION - WASTE DISPOSAL, SALT - THERMODYNAMIC INVESTIGATION - ACTIVE [illegible]

[illegible]
[illegible] BY - [illegible] M
EFFECT OF ATMOSPHERIC TRITIUM ON PHOTOGRAPHIC, THERMOLUMINESCENT AND RADIOPHOTOLUMINESCENT, DOSIMETERS
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-SA-1[illegible] - [illegible] 7 0, 17 PAGES, 1960, PAPER [illegible] HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

WITHIN THE [illegible] GLASS DOSIMETERS EXPOSED TO THE TRITIUM GAS IN CONTAINER RANGE OF 4 TO [illegible] HOURS. HOWEVER, THESE DESIGNATED CANNOT BE USED AS ANALOGUE TRITIUM DETECTORS BUT IS PROTECTION DEPENDS IF THEY ARE USED AS PROTOTYPE IN TRITIUM CONTAMINATED ENVIRONMENTS. [illegible] REPRESENTS FIRST WAS EXPECTED BY ATMOSPHERIC TRITIUM WITH THE EXPOSURE FOR WHICH PROVIDE DOSE CONCENTRATION DEPENDENT FOR PERMANENT TIMES OFTEN ABOUT 700 HOURS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $1.00 COPY, $0.50 MICROFICHE

CHEMISTRY, [illegible] - MONITOR, PERSONNEL - SOLID STATE DEVICE - THERMOLUMINESCENCE DOSIMETRY - [illegible], DEPENDENCY - [illegible], [illegible] - [illegible], [illegible] - [illegible], [illegible]

[illegible]
[illegible] BY - [illegible] SP
DISSEMINATION OF TRITIUM IN MAN
SAVANNAH RIVER LABORATORY
DP-[illegible] - [illegible] 0, 16 PAGES, APRIL 17, 1967

THE CAPABILITY OF ACCURATELY EVALUATING THE RADIATION DOSE FROM TRITIUM TO MAN IS BECOMING MORE IMPORTANT BECAUSE APPLICATIONS FOR THIS RADIONUCLIDE ARE INCREASING AND GROWING TRITIUM IS BEING PRODUCED IN INCREASING QUANTITIES IN ALL NUCLEAR REACTORS BY TERNARY FISSION AND IN SOME BY NEUTRON CAPTURE IN HEAVY WATER MODERATORS. PARTICLES OF THE SUBSTANCE WITHIN BLOOD MAY BE ACCURATELY EXPOSED TO [illegible]. URINE SAMPLES ARE COLLECTED ROUTINELY TO DETERMINE THE RADIATION DOSE FROM TRITIUM ACCURA[illegible] THESE STUDIES TO AUDIT THE EFFECTIVENESS OF RADIOLOGICAL CONTROL PROCEDURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $1.00 COPY, $0.50 MICROFICHE

KEYWORDS - ANALYTICAL TECHNIQUE - [illegible] PLANT - DOSE - RADIOLOGICAL ASSISTANCE - MATHEMATICAL STUDY - [illegible] - [illegible], URINE - MAN

[illegible]
[illegible] BY -
TRITIUM MEASUREMENTS IN RADIATION PROTECTION
[illegible], [illegible], GERMANY
7 PAGES, [illegible] LAB., NO. 0, PAGES [illegible] 1971, IN GERMAN

TRITIUM, APART FROM THE [illegible] SOURCES USED IN RADIATION TECHNIQUE, IS THE MOST FREQUENTLY USED RADIONUCLIDE. DUE TO ITS LOW ENERGY EMISSION ENERGY LEVELS IN [illegible], IT DEMONSTRATES SUBSTANTIAL PROBLEMS OF MEASURING TECHNIQUE. TRITIUM IS INCORPORATED AS WATER VAPOR AND WELL SUITED IN AN EXTREMELY SHORT DISTANCE IN THE BODY. THIS IS ONE MORE REASON WHY ITS IMPORTANCE IN RADIATION PROTECTION SHOULD NOT BE UNDERESTIMATED. APART FROM SOME SPECIFIC PROPERTIES OF TRITIUM, THE PAPER DISCUSSES SPECIAL MEASURING PROCEDURES, COMPARING THEM TO THOSE SPECIFIC APPLICATIONS.

KEYWORDS - [illegible] - RADIATION PROTECTION, ORGANIZATION - GERMANY - RADIOISOTOPE - [illegible] - MAN

[illegible]
PAPER [illegible]
[illegible] ESTIMATES FROM CHRONIC TRITIUM EXPOSURES
[illegible] LABORATORY, [illegible], [illegible] CALIFORNIA
7 PAGES. 0 FIGURES. 3 TABLES. 12 REFERENCES, HEALTH PHYSICS DATA. PAGES [illegible] [illegible], 1980

[illegible] OF THE [illegible] FROM ASSIMILATION OF TRITIUM [illegible]. THE [illegible] FORM OF [illegible] TRITIUM, AND BASED ON THE ASSUMPTION THAT TRITIUM REMAINS IN BODY WATER WHILE [illegible]. ANALYSES OF [illegible] TISSUES, WHICH [illegible] PRODUCE THAT CHANGE PARTICLE TO TRITIUM CAUSES SIGNIFICANT LOSSES OF ORGANIC MATERIALS. THE DEGREE OF LOSSES WAS DETERMINED FROM TRITIUM ASSAYS OF SEVEN TISSUES OBTAINED, LIVER, KIDNEY, SPLEEN, BRAIN, MUSCLE, AND FATS FROM 42 [illegible] COLLECTED ON THE SAVANNAH RIVER PLANT SITE. IN MOST TISSUES, THE TRITIUM-TO-[illegible] RATIOS IN [illegible] BODY WATER AND THE RANGE OF CONCENTRATION OF [illegible] TISSUE [illegible] IN [illegible] BODY WATER 1.0 TO 1.5 TIMES HIGHER THAN EXPECTED IF ONLY TRITIUM IN BODY WATER IS CONSIDERED.

[illegible] • [illegible] • [illegible] • [illegible] CIRCULATION, [illegible] • [illegible] PLANT • [illegible] • [illegible] • [illegible]

[illegible]
[illegible] WD • [illegible] ERC
[illegible] OF TRITIUM CONCENTRATION IN STANDARD WATER [illegible] AS A MEANS OF ESTIMATING BODY [illegible]
[illegible] ATOMIC ENERGY AUTHORITY, [illegible], ENGLAND
4 PAGES. 3 FIGURES. 2 TABLES. 9 REFERENCES, HEALTH PHYSICS. [illegible]. PAGES [illegible] [illegible] 1980

A METHOD FOR ESTIMATING TRITIUM BODY BURDENS FROM THE TRITIUM CONCENTRATION IN STANDARD WATER [illegible] IS DESCRIBED. IT IS SUGGESTED THAT IT MAY BE A LESS OBJECTIONABLE [illegible] THAN WHOLE SAMPLING FOR FACTORY PERSONNEL.

[illegible] • [illegible] • [illegible] • [illegible] TECHNIQUE • [illegible] MEASUREMENT, [illegible] • [illegible] WATER • [illegible] • [illegible]

[illegible]
[illegible] JR
TRITIUM IN [illegible] REACTORS
[illegible] MEMORIAL INSTITUTE, COLUMBUS LABORATORIES
8 PAGES. 3 FIGURES. 17 REFERENCES, REACTOR AND FUEL-REPROCESSING TECHNOLOGY. [illegible]. PAGES [illegible] [illegible] 1980

DISCUSSES HEALTH PHYSICS ASPECTS, PRODUCTION RATES IN POWER REACTORS, MIGRATION OF TRITIUM, ADVERSITY FOR WATER, [illegible] FROM FUEL PROC, CHEMICAL AND DISPOSAL. FOR A TYPICAL 1000-MWTE REACTOR, 40 CURIES/DAY IS PRODUCED BY FISSION. FOR 1000-MWTE FUEL WITH [illegible] CHEMICAL [illegible], ADDITIONAL TRITIUM IS GENERATED AS A RESULT OF NEUTRON CAPTURE BY [illegible]. THE PRODUCTION CONTINUALLY INCREASES UNTIL 16 CURIES/DAY IS PRODUCED AFTER 365 DAYS OF OPERATION.

[illegible]TIVITY [illegible] • FISSION PRODUCT, VOLATILE • [illegible] • [illegible] • [illegible] DISPOSAL • [illegible], POWER • [illegible] COOLANT • COOLANT CHEMISTRY • [illegible], [illegible] • CHEMICAL [illegible] • MAIN COOLING SYSTEM • [illegible] EFFECT

[illegible]
ADV. COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS
CONGRESS OF THE UNITED STATES
6 PAGES. PG 595-900 OF JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES. 1969

AT THESE HEARINGS CONCERN WAS EXPRESSED BY INDIVIDUAL CITIZENS AS TO THE POSSIBLE ENVIRONMENTAL EFFECTS THAT MIGHT RESULT FROM ROUTINE RELEASES OF LOW LEVELS OF RADIOACTIVE HYDROGEN (TRITIUM) INTO THE DAY. THE BIOLOGICAL EFFECTS, IF ANY, OF EXPOSURE TO SUCH A LOW LEVEL WOULD BE THE [illegible] TO BE DETECTED. EVEN IF VERY LARGE POPULATIONS WERE EXPOSED, AND WERE [illegible] THE PERIODICAL SIGNIFICANCE. IN DERIVING LIMITS FOR TRITIUM APPLICABLE TO MEMBERS OF THE GENERAL PUBLIC, THESE EXPERT GROUPS HAVE TAKEN INTO ACCOUNT THE ENERGY AND ABSORPTION PROPERTIES OF TRITIUM AS THEY RELATE TO DISTRIBUTION OF THE DOSE IN BODY TISSUE.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

[illegible] QUESTION • ECOLOGY • [illegible], [illegible] • [illegible] EXPOSURE • [illegible] CLASS 1 [illegible] • CALVERT CLIFFS 2 [illegible]

[illegible]
AEC [illegible] TO GET [illegible] STANDARD ON TRITIUM
2 PAGES. NUCLEAR INDUSTRIES, [illegible]. PG [illegible] [illegible] 1969

COMMISSIONER LARSON DISCUSSES BIOLOGICAL ASPECTS OF TRITIUM. TRITIATED WATER IS COMPLETELY AND RAPIDLY ABSORBED BY THE GASTRO-INTESTINAL TRACT FOLLOWING INGESTION. HOWEVER PERMISSIBLE BODY BURDEN IS ONE MCI. BIOLOGICAL HALF-LIFE OF TRITIUM IS ABOUT 10 DAYS PER MAN. THE RELATIVE BIOLOGICAL EFFECTIVENESS FOR TRITIUM IS 1.7. NO KNOWN METHODS AVAILABLE TRITIUM CAN BE CONCENTRATED THROUGH THE FOOD CHAIN.

[illegible] • [illegible] • [illegible], AEC

[illegible]
[illegible] • [illegible] • [illegible] • [illegible]
[illegible] PROTECTION AT THE NATIONAL NUCLEAR RESEARCH CENTER, PELINDABA
[illegible] AND RADIATION DIVISION, ATOMIC ENERGY BOARD, PELINDABA, [illegible]
7 PAGES, 3 TABLES, 10 REFERENCES. SOUTH AFRICAN NUCLEAR JOURNAL, VOL. 49, PAGE, 110-7 (SEPTEMBER 27, 1980)

THE ORGANIZATION AND RESULTS OF RADIATION PROTECTION AND CONTROL AT THE NATIONAL NUCLEAR RESEARCH CENTRE, PELINDABA, WHICH IS THE RESEARCH INSTITUTE OF THE SOUTH AFRICAN ATOMIC ENERGY BOARD, ARE DESCRIBED.

[illegible] AND STANDARDS • [illegible] • RADIATION PROTECTION, ORGANIZATION • [illegible] • RADIATION SAFETY AND CONTROL • [illegible] • [illegible] • [illegible], [illegible] • [illegible], [illegible] • [illegible]

[illegible]
[illegible] OF
[illegible] OF [illegible]-LABELED MOLECULES DURING THEIR THROUGHPUT AND OF [illegible]-LABELED AMINO ACIDS
4 PAGES, PP. [illegible] OF [illegible]-LABELED MOLECULES IN [illegible] AND [illegible], [illegible] • [illegible] AND [illegible], [illegible] PRESS, 1980

[illegible]-LABELED LEUCINE, [illegible], AND [illegible] WERE LESS TOXIC IN ESCHERICHIA COLI THAN [illegible]-[illegible] ARE LED TO A [illegible] PRODUCTION OF APPROXIMATELY ONE-HALF THE WEIGHT OF [illegible] AND [illegible]-[illegible]. STUDIES ON [illegible] PROPERTY OF [illegible]-[illegible] AND [illegible]-[illegible] IN WHOLE CELLS IN CULTURE SHOWED THAT UP TO 0.1 MICROMOLES/M [illegible] AND [illegible] TO [illegible] SIGNIFICANT EFFECT ON [illegible], WHILE THE SAME DOSE OF [illegible]-[illegible] DEPRESSED [illegible] TO 20.0 PERCENT.

[illegible] • [illegible] • AMINO ACID • CELL, [illegible] • CULTURE • [illegible]

[illegible]
[illegible]
[illegible] EFFECT
7 PAGES, PP. [illegible]-7 OF [illegible]-LABELED MOLECULES IN [illegible] AND [illegible], [illegible] • [illegible] AND [illegible], [illegible] PRESS, 1980

WITH THE CONSTRUCTION OF [illegible] WAS LABELED WITH [illegible] THYMIDINE. [illegible] LOSSES CORRESPONDED TO AN INCREASING [illegible] OF TRITIUM DISINTEGRATIONS. [illegible] EFFECT [illegible] WAS NOT AFFECTED. THE EFFECT OF TRITIUM ON THE [illegible] OF [illegible] [illegible] OF [illegible] WAS INVESTIGATED. TRITIUM [illegible] TO DNA WAS SIGNIFICANTLY MORE EFFECTIVE IN YIELDING [illegible] MUTANTS [illegible] THAN WAS TRITIUM [illegible] TO [illegible] OF [illegible]. TRANSMUTATION EFFECTS ARE CONSIDERED [illegible] OF LOCALIZED [illegible] REACTIONS [illegible] AND [illegible] WITH OUR CURRENT TO [illegible] MUTATIONS - [illegible] THEY SHOULD [illegible] [illegible] TO CELLS OF HIGHER ORGANISMS WITH [illegible] GENETIC TECHNIQUES.

[illegible] • EFFECT, GENETIC • [illegible] EFFECT • DNA • [illegible] • [illegible] • [illegible] • DNA

[illegible]
[illegible] • [illegible]
[illegible] OF [illegible] POPULATION EXPOSURES FROM [illegible] APPLICATIONS
[illegible] NATIONAL LABORATORY, TENNESSEE
IN PAPERS, 6 FIGURES, 3 TABLES, PP. [illegible] OF THE PROCEEDINGS OF THE SYMPOSIUM ON PUBLIC HEALTH ASPECTS OF [illegible] USES OF NUCLEAR EXPLOSIVES, [illegible] 7-11, 1980

A COMPUTER CODE CALLED [illegible] HAS BEEN WRITTEN WHICH CAN CONSIDER ALL [illegible] BODY PARAMETERS AS A FUNCTION OF AGE. THE MAIN LIMITATION IN USING THIS COMPUTER CODE FOR ALL [illegible] IS THE PAUCITY OF NON-[illegible] TRACE DATA FOR MANY [illegible]. [illegible], [illegible], CESIUM, AND STRONTIUM HAVE BEEN STUDIED IN DETAIL WITH [illegible] AND THE RESULTS ARE INTERPRETATIONS ARE DISCUSSED. [illegible] COMPUTES THE [illegible] DOSE RATES AND CUMULATIVE DOSES FROM [illegible] PARTICLES AND GAMMA PHOTONS FROM SUBMERSION IN A RADIOACTIVE CLOUD. SUBMERSION IN CONTAMINATED WATER AND [illegible] ARISE A COMPREHENSIVE [illegible] SUPPORT. THIS CODE CAN CONSIDER UP TO 24 [illegible] DETERMINANTS. THE [illegible] OF USING [illegible] AND [illegible] TO ESTIMATE THE TOTAL DOSE TO A POPULATION GROUP IS STRESSED.

[illegible]ILITY - S. V. [illegible], OAK RIDGE NATIONAL LABORATORY, P.O. BOX [illegible], OAK RIDGE, TENNESSEE [illegible]

CESIUM • COMPUTER PROGRAM • [illegible] • STRONTIUM • DOSE CALCULATION, INTERNAL • NUCLEAR INFORMATION • [illegible] • MODEL • POPULATION EXPOSURE, CHEMICAL

[illegible]
[illegible] CH
CHROMATID ABERRATIONS RESULTING FROM IN-[illegible] INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS
CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE, MANCHESTER, ENG.
6 PAGES, INTERNATIONAL JOURNAL OF RADIATION BIOLOGY, VOL. 11, PAGES 479-84 (1967)

CHROMATID ABERRATIONS WERE INDUCED BY [illegible]-[illegible] INCORPORATED IN EARLY AND LATE S PERIODS OF HUMAN [illegible], [illegible], AND [illegible] CELLS. AT SAMPLED TOTAL [illegible] DISINTEGRATIONS, LATE S CELLS WERE FOUR TIMES (EV) OR SEVEN TIMES (EMV) MORE SENSITIVE THAN EARLY S CELLS. THIS DIFFERENCE IS PARTLY ATTRIBUTABLE TO DOSE-RATE DIFFERENCES BETWEEN SAMPLES. LOCALIZATION PRODUCES AN INTERMEDIATE

[illegible]
[illegible]

[illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $1.00 COPY, $0.65 MICROFICHE

[illegible] • PARTICIPATION IN INVESTIGATION • SAFETY DEVICES • [illegible] SAFETY AND CONTROL • [illegible] • EQUIPMENT • [illegible] EQUIPMENT

[illegible]
NATIONAL [illegible] LABORATORY
[illegible] LABORATORY, TENNESSEE
[illegible] 9 PAGES, DE 175-7, MARCH 19, 1965

THE DETERMINATION OF [illegible] BY AN EXPLOSIVE FUNDED IN THE CRATER OF [illegible] IS STUDIED. THE DETERMINATION IS CLOSELY APPROXIMATED BY THE SUM OF THE FUNDAMENTALS, [illegible] ON FLUORESCENCE HALF-TIME OF [illegible] 4 DAYS AND THE GROUND ABOUT 17 DAYS. [illegible] THE FUNDAMENTAL DETERMINATION PARTITIONS [illegible] CONTRIBUTED TO [illegible], THIS IS THE FIRST DIRECT DETERMINATION OF SUCH A DETERMINATION TO [illegible]. [illegible], INDIRECT PATHWAYS WERE [illegible].

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $1.00 COPY, $0.65 MICROFICHE

[illegible], [illegible] • [illegible] WATER • [illegible] • [illegible] HALF-LIFE • [illegible] • [illegible], [illegible]

[illegible]
[illegible] JR • [illegible] JR
[illegible] OF [illegible] IN [illegible] WITH THE USE OF TRITIUM
[illegible] FOR [illegible]
9 PAGES, [illegible] FOR [illegible] PHYSICISTS [illegible] 3RD [illegible] 1966, [illegible], VOL. 24, PP. [illegible]
[illegible]

[illegible] IN HUMANS HAS [illegible] BY COMPARISON WITH [illegible] CONCENTRATIONS IN [illegible] AND, SERUM, AND URINE SAMPLES [illegible] DISTRIBUTION OF [illegible]. [illegible] INDICATE THAT THE CONCENTRATION OF [illegible] IN [illegible] AND HAS A SIMILAR [illegible] OF [illegible] WITH CHANGES.

[illegible] • [illegible] WATER • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible], CLINICAL • [illegible], SERUM • [illegible] DOSE

[illegible]
[illegible] G • [illegible] G
TRITIUM LABORATORY - STUDY OF THE MAXIMUM POSSIBLE ACCIDENT
[illegible] OF LABORATORY [illegible], [illegible]
ALO-200 9, 9 PAGES, JULY 1964

IN THE CASE OF THE TRITIUM LABORATORY THE MAXIMUM CREDIBLE ACCIDENT IS [illegible] AS A FIRE THAT [illegible] DESTROY THE [illegible] AND RELEASE TO THE ATMOSPHERE ALL THE TRITIUM CONTAINED IN THE LABORATORY. THE QUANTITY OF TRITIUM SUPPLIED TO OR IN THE LABORATORY [illegible] THE [illegible] STUDY IS THE MAXIMUM POSSIBLE QUANTITY WITH RESPECT TO THE PERTINENT INSTALLATIONS. THE RESULTS OF DIRECT [illegible] FROM THE DOSIMETRIC CODE AND THE [illegible] TASKS WERE CALCULATED AND FOUND TO BE SMALLER THAN THE CORRESPONDING [illegible].

FIRE • [illegible] • [illegible], MAXIMUM CREDIBLE [illegible] • [illegible] • [illegible], [illegible] • DOSE CALCULATION, [illegible] • [illegible] RELEASE

[illegible]
[illegible] • [illegible] • [illegible]
TRANSFER OF WATER AND ELECTROLYTES ACROSS [illegible] TISSUE IN PATIENTS [illegible]
UNIVERSITY OF [illegible]
9 PAGES, SURGERY, GYNECOLOGY AND OBSTETRICS, VOL. 110, PP. [illegible] [illegible] 1960

THE TRANSFER OF [illegible], [illegible], AND [illegible] ACROSS [illegible] SKIN WAS STUDIED IN 10 PATIENTS. SOLUTIONS OF THE RADIOISOTOPES WERE APPLIED DIRECTLY TO THE SKIN AND LOCAL LOSS OF RADIOACTIVITY WAS MEASURED. ABSORPTION OF ALL THREE ISOTOPES FROM THE SOLUTION TRANSFER TO THE SKIN CIRCULATION TISSUE WAS RAPID. [illegible] FROM 11 TO 50 MINUTES TO 10 HRS. RESULTS INDICATED THAT WATER WAS TRANSFERRED FROM THE CIRCULATING TISSUE SURFACE AT NEARLY THE SAME RATE AT WHICH IT WAS ABSORBED. DATA SUGGEST LARGE TRANSFERS OF WATER AND ELECTROLYTE ACROSS [illegible] TISSUE. THAT ABSORPTION IS CONCENTRATION DEPENDENT AND SUGGEST THAT A MORE PHYSIOLOGIC SOLUTION SHOULD HAVE ELECTROLYTE CONCENTRATIONS APPROXIMATING THOSE OF THE EXTRACELLULAR FLUID.

SODIUM • WATER • CHLORINE • ABSORPTION • CONCENTRATION • [illegible] TRANSFER • [illegible] TISSUE, [illegible] • DOSIMETRY, CLINICAL

[illegible]
[illegible] M • LEDDY JP
OBSERVATIONS OF BIOLOGICAL HALF LIFE OF TRITIUM
DU PONT DE NEMOURS [illegible] AND COMPANY, SAVANNAH RIVER PLANT, S.C.
DPSPU-66-30-9 • CONF-663-74 9, 9 PAGES, MAY 1966, [illegible] HEALTH PHYSICS SOCIETY MEETING, CINCINNATI, JUNE 1966

[illegible]

[illegible]

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[illegible]

UNIVERSITY OF CALIFORNIA, LOS ALAMOS SCIENTIFIC LABORATORY

[illegible]

[illegible]

[illegible]

LARSON CE
ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS [illegible] CONGRESS OF THE U.S. - 91ST CONGRESS
U.S. ATOMIC ENERGY COMMISSION
[illegible] PAGES, PG [illegible] OF THE HEARINGS BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, NINETY-FIRST CONGRESS, FIRST SESSION, [illegible]

STATEMENT OF C. E. LARSON, AEC COMMISSIONER ON ENVIRONMENTAL EFFECTS. RADIATION EFFECTS ARE EQUIVALENT TO JET-PLANE FLIGHT ONCE A YEAR. [illegible] STUDIES AT [illegible] LEVELS SHOW VERY SMALL EFFECTS. EFFECTS OF ALLOWABLE LEVELS SO SMALL AS TO BE UNDETECTABLE BY PRESENT TECHNIQUES. GIVES DETAILS OF TYPES AND RESULTS OF STUDIES ON ENVIRONMENTAL EFFECTS. INCLUDES RADIONUCLIDE CYCLING, SOMATIC AND GENETIC EFFECTS, TRITIUM, KRYPTON-85, THERMAL EFFECTS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

[illegible] - EFFLUENT - KRYPTON - [illegible] - THERMAL POLLUTION - [illegible] UPTAKE - FOOD CHAIN

[illegible]
[illegible]
BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
CONF-[illegible], 11 PAGES, PP. [illegible] OF THE PROCEEDINGS OF A SYMPOSIUM ON BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE, LIVERMORE, CALIFORNIA, [illegible]

THE RELEASES OF RADIONUCLIDES FROM REACTORS AND THE ENVIRONMENTAL EFFECTS OF THESE RELEASES HAVE BEEN STUDIED SINCE THE EARLY 1960S. CONTROLS BASED ON THE KNOWLEDGE GAINED FROM THESE STUDIES HAVE BEEN ADEQUATE TO MAINTAIN THE RADIATION EXPOSURE OF THE PUBLIC WELL WITHIN ACCEPTABLE LIMITS. THE SIGNIFICANT PATHWAYS OF EXPOSURE HAVE BEEN IDENTIFIED. OVER THE YEARS [illegible] METHODS OF WASTE TREATMENT AND CONTAINMENT TECHNOLOGY FOR REACTORS HAVE EVOLVED TO THE POINT

040074 (CONTINUED)
WHERE RELEASE OF WASTE HEAT FROM POWER REACTORS HAS APPEARED TO BE RECEIVING MORE PUBLIC ATTENTION THAN THE RELEASE OF RADIONUCLIDES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ENVIRONMENTAL • ECOLOGY • FALLOUT • WASTE TREATMENT • CONTAINMENT B AND E • SAVANNAH RIVER PLANT • CHALK RIVER • RADIOISOTOPE • ENVIRONMENT • HANFORD SITE • REACTOR, PRODUCTION • RADIONUCLIDE TRANSFER

040010
FULL A
ENERGY FUEL CYCLE REVIEW, TRITIUM
ATOMIC TRANSNATIONAL FORUM, INC.
1 PAGE, DOC ISSUE NO. 27 (SUPPLEMENTS), PG 5 (MAY 1970)

THE SUBJ. OF ENVIRONMENTAL MONITORING OF ONE DISCUSSED NUCLIDES OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF NUCLEAR POWER OPERATIONS -- PRIMARILY TRITIUM AND KRYPTON. TRITIUM APPEARS TO BE ONE OF GREATEST CONCERN. IF THE 1000 MEGAWATT (E) PRESSURIZED WATER REACTORS EACH DISCHARGED 1000 CI/YR INTO LONG ISLAND SOUND, A PERSON DRINKING HIS DRINKING FOOD SUPPLY FROM AQUATIC ORGANISMS IN THE SOUND WOULD RECEIVE A DOSE OF 0.00007 REM/YR. HE STATES THAT THE LOW LEVELS OF RADIATION ASSOCIATED WITH ROUTINE RELEASES FROM REACTORS ARE YET DETERMINABLE BUT ARE RATHER AN INFERRED PROBABILITY FROM MEASURED HIGH-LEVEL, DOSE-EFFECT RATIOS.

DOSE • FISSION GAS RELEASE • FISSION PRODUCT RELEASE • KRYPTON • REACTOR, POWER • RADIOACTIVITY RELEASE • WATER POLLUTION • DATA COLLECTION • AQUATIC ORGANISM • RADIATION EFFECT • SPECIFICATION, REC

040104
MCCHESSI AA • LIEBERMAN R
TRITIUM DRIN NUMBER OF CHILDREN, 1967-1969
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY • SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
5 PAGES, 2 FIGURES, 15 TABLES, 17 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(5), PG 227-231 (MAY 1970)

THE TRITIUM CONCENTRATION IN DRIN WATER OF CHILDREN WAS DETERMINED FROM SAMPLES OF URINE TAKEN FROM THE CHILDREN IN EACH OF NINE INSTITUTIONAL TOTAL DIET SAMPLING STATIONS. THE TRITIUM CONCENTRATIONS IN DRIN WATER OF CHILDREN GRADUALLY DECREASED FROM ABOUT 1.4 PCI/LITER TO LESS THAN 0.7 PCI/LITER DURING THE PERIOD, JANUARY 1967 TO DECEMBER 1969. SEVERAL ANOMALIES WERE NOTED. THE DOSE EQUIVALENT FROM TRITIUM FOR STANDARD MAN WAS CALCULATED TO BE 0.15 MREM FOR 1967 AND 0.13 MREM FOR 1969. THE DOSE EQUIVALENT FOR CHILDREN VARIES ACCORDING TO AGE AND IS ROUGHLY 0.3 MREM FOR A 10-YEAR-OLD CHILD.

DOSE • DRINKING HABIT • DECONTAMINATION • EFFECT, AGE • INGESTION, URINE • MAN • STUDIES • ANNU PLUTO

040104
MCCHESSI AA • LYON RJ
TRITIUM CONCENTRATIONS IN MILK, 1967-1969
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY • SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
4 PAGES, 2 FIGURES, 4 TABLES, 4 REFERENCES, RADIOLOGICAL HEALTH DATA (NC REPORTS), 11(5), PG 233-236 (MAY 1970)

TRITIUM CONCENTRATIONS WERE DETERMINED IN MILK SAMPLES OBTAINED FROM SEVERAL CHILDREN'S HOMES IN THE UNITED STATES. THE AVERAGE CONCENTRATIONS OF TRITIUM IN MILK INDICATE A DECREASING TREND FROM 1967 TO 1969. THE AVERAGE DOSE EQUIVALENT FROM TRITIUM IN MILK WAS CALCULATED TO BE 0.00 MREM FOR 1967 AND 0.03 MREM FOR 1969.

DOSE • DRINKING HABIT • UNITED STATES • CONCENTRATION • MILK CHILD • MAN • MILK

040199
JOHNSTON JF
HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS REPORT, JAN - DEC 1969
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL (ENGLAND)
AERE-PR/PPM-17 P., 40 PAGES, MARCH 1970

STUDIES ARE REPORTED UNDER THE FOLLOWING HEADINGS - AEROSOLS, PHYSICAL CHEMISTRY, NATURAL ENVIRONMENT, PHYSICS, ATMOSPHERIC POLLUTION, RADIATION PHYSICS, NEUTRON DOSIMETRY AND PARTICLEPHYSICS, PERSONNEL DOSIMETRY, SPECIAL INVESTIGATIONS, RADIATION SPECTROMETRY AND COMPUTER PROCESSING, PARTICLE, METABOLIC STUDIES, MEASUREMENT OF PU IN LUNG, RETENTION OF ALKALINE EARTHS, ACTINIDES, CS AND K, RETENTION IN THROAT, NEUTRON ACTIVATION ANALYSIS IN VIVO, INSTRUMENTATION, TRACERS AND DCMR, INTERNATIONAL GROUP, HUMAN BIOLOGY AND BIOMEDICAL RESEARCH (INHALATION STUDIES; ABSORPTION STUDIES; TRITIUM STUDIES), RADIOLOGY, MEDICAL SERVICES, STUDY OF ISCHAEMIC HEART DISEASE, SMOKING CLINIC, TETANUS IMMUNIZATION, CLINICAL PATHOLOGY, RADIOLOGY, A LIST OF PUBLICATIONS BY THE STAFF ARE INCLUDED.

RESPONSE • BIOMEDICAL • DOSIMETRY • INHALATION • RADIOBIOLOGY • RADIOLOGY • PHYSIOLOGY/METABOLISM • OPERATIONS

047898
WHEELER JR • MOGHISSI AA • REMBERG AF • CALVIN W
COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS
SOUTHERN ENVIRONMENTAL RADIATION LABORATORY, ALABAMA
4 PAGES, 2 FIGURES, 1 TABLE, 6 REFERENCES, HEALTH PHYSICS, 22(1), PP. 35-38 (JANUARY 1972)

A SINGLE ORAL DOSE OF A TRITIATED LUMINOUS COMPOUND IN COMMON USAGE BY THE LUMINOUS DIAL PAINTING INDUSTRY WAS GIVEN TO RATS AND CATS, AND THE TRITIUM CONCENTRATION RECORDED IN THE URINE, FECES AND VARIOUS BODY TISSUES. A MAJOR FRACTION OF THE ADSORBED TRITIUM WAS ELIMINATED WITH A BIOLOGICAL HALF-LIFE ESSENTIALLY THE SAME AS THAT OF TRITIATED WATER.

ORGAN • ABSORPTION • BIOLOGICAL HALF-LIFE • CONCENTRATION • COMPARISON • MAMMAL, SMALL • LUMINANT • ANIMAL, RAT • EXCRETION, FECAL • EXCRETION, URINE

040819
MAERE J • JACOBI W
RADIATION PROTECTION PROBLEMS IN THE RELEASE AND INCORPORATION OF RADIOACTIVE MATERIALS. FOURTH ANNUAL MEETING OF THE ASSOCIATION OF SPECIALISTS FOR RADIATION PROTECTION, BERLIN, 20-22 NOV 1969
KFK-NEUTRON-INSTITUTE FUER KERNFORSCHUNG, KARLSRUHE (WEST GERMANY)
CONF-690900 -, 630 PAGES, NOV 1969

REPORTS ON THE VARIOUS PROBLEMS ASSOCIATED WITH RADIOACTIVITY RELEASE, THEIR CONTROL, AND THE BIOLOGICAL EFFECTS ON MAN. ONE PAPER OF 52 IS IN ENGLISH, THE REMAINDER IN GERMAN.

DECONTAMINATION • DEPOSITION • DOSIMETRY • IRRADIATION • IODINE • MPC • MEASUREMENT • URANIUM • ABSORB • FAST NEUTRON • INSTRUMENT CALIBRATION • RADON • HIGH RADIATION • CONTAMINATION • GERMANY • ICRP • REACTOR POWER • RADIOACTIVITY RELEASE • METEOROLOGY • ACCELERATOR • OPERATING EXPERIENCE • EFFECT • BIOLOGICAL HALF-LIFE • CONCENTRATION • DOSIMETRY, CLINICAL • THERAPY • BODY BURDEN • FOOD • INSTRUMENTS, MISC.

040519
LAMBERT SF • VERMART J
RADIATION DOSES RECEIVED BY WORKERS USING TRITIUM IN INDUSTRY
RADIOLOGICAL PROTECTION SERVICE, DELMONT, SWITZ. U. K.
8 PAGES, 1 FIGURE, 2 TABLES, 20 REFERENCES, HEALTH PHYSICS, 22(1), PP. 23-30 (JANUARY 1972)

IN RECENT YEARS TRITIUM HAS FOUND MORE AND MORE COMMERCIAL USE PARTICULARLY IN THE LUMINESING INDUSTRY. EXPERIENCE OVER THE PAST 7 YR AT THE RADIOLOGICAL PROTECTION SERVICE WAS SHOWN THAT ENVIRONMENTAL CONTROL ALONE WAS NOT PREVENTED THE INTAKE OF TRITIUM BY WORKERS. BIOLOGICAL CONTROL WAS, THEREFORE, NECESSITATED CONTINUOUS BIOLOGICAL MONITORING OF WORKERS FOR TRITIUM IN URINE. THE RESULTS OF THIS MONITORING ARE PRESENTED AND SHOW THAT THE RADIATION DOSES RECEIVED BY SOME WORKERS ARE NOT INCONSIDERABLE.

EXPOSITION, PERSONNEL • OCCUPATIONAL EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL • CONSUMER PRODUCT • EXCRETION, URINE • BIOLOGICAL CONTROL

040197
MOGHISSI AA • TORNER ED • REGALER JE • CARTER RW • PUSEY CA
HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING
SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY, ALABAMA
7 PAGES, 2 FIGURES, 9 REFERENCES, HEALTH PHYSICS, 18(3), PG 255-261 (MARCH 1970)

THE SURVEY OF A LUMINOUS DIAL PAINTING PLANT IS DESCRIBED. UNDER THE CONDITIONS INVESTIGATED, SKIN CONTAMINATION WAS INDICATED AS A MAJOR MODE OF ENTRY OF TRITIUM INTO THE BODY OF THE WORKERS. A NEW UNIT, GRAM-LAMBERT (G-L) IS PROPOSED FOR COMPARISON OF RADIOACTIVE LUMINOUS PAINTS. IT IS SHOWN THAT THE BENEFIT OF THE PRODUCTION OF 1 G-PICRON L IS ASSOCIATED WITH THE RISK OF APPROXIMATELY 0.10 MREM TO THE WORKERS STUDIED. A MAXIMUM TRITIUM ACTIVITY WHICH MAY BE PROCESSED BY A WORKER WITHOUT EXCEEDING THE MAXIMUM PERMISSIBLE BODY BURDEN IS PROPOSED.

BODY • REGULATION • CONTAMINATION • PERSONNEL EXPOSURE, RADIATION • OCCUPATIONAL, CHEMICAL • OCCUPATIONAL, SKIN

049517
CANGELL DI • STEINATZ DG • GOSWELL E • BEACH VL • WELI A • FUJIMOTO GI • REYNOLDS AW
RATE OF INGESTED RADIOLABELED ETHYNYLESTRADIOL AND ITS 3-CYCLOPENTYL ETHER IN PATIENTS WITH MILD FISTULAS
WOMAN-LAMBERT RESEARCH INSTITUTE, N.J. • ALBERT EINSTEIN COLLEGE OF MEDICINE, N.Y. • MISERICORDIA HOSPITAL, N.Y.
11 PAGES, 3 FIGURES, 5 TABLES, 27 REFERENCES, JOURNAL OF CLINICAL ENDOCRINOLOGY AND METABOLISM, 29(8), PG 1051-1061 (1969)

RETENTION OF THE ETHER, GIVEN ORALLY TO HUMANS, IS GREATER THAN ITS PARENT, THOUGHT TO BE DUE TO STORAGE AND SLOW RELEASE FROM FAT DEPOTS OF THE FORMER. 3 FEMALES AND 1 MALE WERE GIVEN ORAL DOSES OF THE TITLE COMPOUNDS RANGING FROM 3 TO 63 MICROCURIES, LABELED EITHER WITH H-3 OR C-14. URINARY EXCRETION CURVES CUT TO 4 DAYS ARE SHOWN, AND COMBINED URINARY PLUS MILD EXCRETION FROM 0 TO 1 DAY. PERCENTAGES OF GLUCURONIDE VS SULFATED CONJUGATE FORMS TABULATED. IN THE FIRST 30 HOURS POSTORAL, URINARY AND BILIARY EXCRETION OF TRITIUM FROM THE 17 ALPHA-ETHYNYL-6,7-DI-H3-ESTRADIOL-17 BETA SPIKED WERE BOTH FIVE TO SIX TIMES THAT FROM THE 6,7-H3-3-CYCLOPENTYL-1 PRIME-C14 ETHER DERIVATIVE.

CARBON • INGESTION • RADIOBIOLOGY • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOCHEMICAL • PHYSIOLOGY(METABOLISM) • EXCRETION, URINE • MAN • FEMALE • MALE • ORGANIC • IC PATHOLOGICAL • RADIOPHARMACEUTICAL • STEROID

049527
MOSKALEV JI • DOLGANOV LA • LYAGINSKAYA AP • OVCHINNIKOV EP • FEDOROV TP
PARTIAL STUDY OF RADIONUCLIDE TRANSFER THROUGH THE PLACENTA AND THEIR BIOL ACTION ON THE FETUS
INSTITUTE OF BIOPHYSICS, MINISTRY OF PUBLIC HEALTH, MOSCOW, USSR
CONF-690501 P. 8 PAGES, 4 TABLES, PG 199-200 OF THE PROCEEDINGS OF THE NINTH ANNUAL HANFORD BIOLOGY SYMPOSIUM ON RADIATION BIOLOGY OF THE FETAL AND JUVENILE MAMMAL, RICHLAND, WASHINGTON, MAY 5-8, 1969

RADIONUCLIDES WERE INJECTED AT 1,4,7,9,11,13,19, AND 17 DAYS OF GESTATION AND 1 TO 10, 90, AND 100 DAYS BEFORE IMPREGNATION, AND SACRIFICED AT VARIOUS TIMES POSTINJECTION. THE SMALLER THE AMOUNT OF AM-241 INJECTED, THE GREATER THE FRACTION RETAINED IN THE PLACENTA. NP-237 PLACENTAL RETENTION INCREASED AS PREGNANCY TIME INCREASED, AS WAS RECORDED WITH CS-137, SR-90, H-3, AND I-131. IN LATE PREGNANCY, H-3 CONTENT OF PLACENTA WAS 4.3 TIMES GREATER THAN THAT OF FETUS. PERCENT OF ADMINISTERED DOSE FOUND IN VARIOUS ORGANS OF THE FETUS AT VARIOUS PREGNANCY DAYS (MOTHER AND FETUS SACRIFICED 2 DAYS POST I.V.) ARE TABULATED FOR THE TRANSURANICS STUDIED. FETAL DOSES IN RADS ARE GIVEN FOR SR-90, AM-241, I-131, AND H-3, AND CORRESPONDING PERCENT FETAL LETHALITIES. DECREASES IN POSTNATAL SIZE AND WEIGHT DUE TO SR-90 ARE TABULATED. VASCULAR DISORDERS FROM NTO ARE DISCUSSED. PERCENT CHROMOSOMIC LETHALITIES FROM AM-241 ARE TABULATED. EFFECT OF SR-90 ON FETAL AND PLACENTAL WEIGHTS ARE TABULATED. CS-137 CONTENTS OF NEWBORN ANIMALS ARE TABULATED IN PERCENT OF DOSE PER GRAM OF ANIMAL, PER OFFSPRING, AND PER LITTER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

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049533
CAPELLE GM • TUELL CL
SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT
UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE AND DENTISTRY, N.Y.
CONF-690501 P. 5 PAGES, 6 TABLES, 5 REFERENCES, PG. 201-207 OF THE PROCEEDINGS OF THE NINTH ANNUAL SYMPOSIUM ON RADIATION BIOLOGY OF THE FETAL AND JUVENILE MAMMAL, RICHLAND, WASHINGTON, MAY 5-8, 1969

TERM FETAL ORGAN WEIGHTS ARE TABULATED FOR MALE AND FEMALE RAT, AS WELL AS ORGAN-BOUND TRITIUM. SPLEEN BEING HIGHEST IN MICROCURIES PER MILLIGRAM AT ALL 3 TIME LEVELS STUDIED. ORGANICALLY BOUND TRITIUM WAS PROPORTIONAL TO LEVELS OF TRITIUM IN BODY FLUIDS AND SEEMS TO BE PROPORTIONAL TO LEVELS IN WATER EXCEPT FOR A DILUTION FACTOR OF ABOUT 30%.

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049550
SANDERS SP • PRINIC WC
ASSESSMENT OF TRITIUM IN MAN
9 PAGES, 2 FIGURES, 3 TABLES, 9 REFERENCES, PG [illegible] OF THE PROCEEDINGS OF THE SYMPOSIUM ON DIAGNOSIS AND TREATMENT OF DEPOSITED RADIONUCLIDES, RICHLAND, WASHINGTON, MAY 15-17, 1967

PICOCURIES WHILE WORKING IN A PROCESS AREA, PRIMARILY AT TANDALATION, AND HIS URINARY EXCRETION WAS COLLECTED FOR 415 DAYS. IN PICOCURIES PER LITER, TO WHICH WAS FITTED THE 3-EXPONENTIAL FUNCTION, NORMALIZING TO 100 AT TIME ZERO - 99.72 EXP (-0.11393) + 0.2776 EXP (-0.2907T) + 0.00470 EXP (-0.0020277). THE ORGANICALLY BOUND TRITIUM COMPARTMENT FOR A 100-KG MAN WAS CALCULATED TO BE PERHAPS 20.5 KG, THAT IS, THE MASS OF ALL BODY COMPONENTS EXCEPT WATER, COMPACT BONE AND TEETH. IT WAS CONCLUDED THAT THE DOSE CONTRIBUTED BY ORGANICALLY BOUND TRITIUM FOR SUCH A CASE SHOULD BE LESS THAN THAT CONTRIBUTED BY THE BODY WATER, AND THAT THE USUAL PRACTICE OF ESTIMATING ABSORBED DOSE FROM THE 1ST EXPONENT ONLY, OF THE EXCRETION RATE CURVE RESULTS IN A GROSSAPPROXIMATION OF THE DOSE FROM BODY-WATER TRITIUM.

INHALATION • WATER • DOSE CALCULATION, INTERNAL • PERSONNEL EXPOSURE, RADIATION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • EXCRETION, URINE • PERIPHERAL FUNCTION • MAN • ORGANIC • OTHER

049589
LASSEN NA
ASSESSMENT OF TISSUE RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT GASES, WITH EXAMPLES OF ABSORBED DOSES FROM H-3, KR-85 AND XE-133
7 PAGES, 5 TABLES, 8 REFERENCES, *PHYSICA NUCLEARE*, VOL. A, PG 211-217 (1964)

NO ORIGINAL DATA. ASSUMES THAT INERT GASES CAN ONLY EXIST IN SIMPLE PHYSICAL SOLUTION IN TISSUES. THAT ELIMINATION FROM BODY IS THEREFORE SOLELY DETERMINED BY PHYSICOCHEMICAL FACTORS, NAMELY, SOLUBILITY, DIFFUSION COEFFICIENT, DIFFUSION DISTANCE, BLOOD FLOW AND VENTILATION. INTERACTION OF WHICH FACTORS RESULTS IN A BIOLOGICAL HALF-LIFE OF THE ORDER OF MINUTES. SOLUBILITY COEFFICIENTS

040805 <CONTINUED>

ARE TABULATED FOR FAT, BLOOD, AND OTHER TISSUE. DATA AND GAMMA DOSES FOR XE-133 ARE TABULATED FOR THE KEY-BODY ORGANS. FOR 1-MINUTE INHALATION AT A CONCENTRATION OF 1 MICROCURIE PER MILLILITER IN AN AVERAGE NORMAL SUBJECT FROM THE USUAL DOSE FORMULAS, DATA GIVE TO GONADS 15 0.6 MILLIRAD, WHILE THE TOTAL DOSE FOR 3 BODY TYPES ARE 0.9 FOR A BODY CONTAINING 14 PERCENT FAT, 1.1 FOR 30 PERCENT, AND 1.4 FOR 50 PERCENT FAT. THE HIGHEST GONADAL DOSE FROM INJECTION OF 5 MILLICURIES OF XE-133 IS CALCULATED TO BE 1 MILLIRAD, THE SAME AS WOULD BE RECEIVED FROM BACKGROUND BY LIVING 1 DAYS AT SEA LEVEL. IT IS CONCLUDED BY AUTHOR THAT INHALATION OF 1 MICROCURIE PER MILLILITER FOR 1 MINUTE, OR INJECTION OF 5 MILLICURIES OF THE NEWBORN NUCLIDES MAY BE USED IN MAN SAFELY IF CLINICALLY REQUIRED.

INHALATION • INJECTION • XENON • DOSE CALCULATION, INTERNAL • REVIEW • GAS • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOCHEMICAL • PHYSIOLOGY/METABOLISM • DISTRIBUTION • BONE • EXPOSURE, IV • FAT • KIDNEY • LUNG • MAN • MUSCLE • OVARY • SOLUBILITY • TESTIS • MASS • HEART • TRACHEA

040806

WEHNER J

RADIOTOXICOLOGY OF TRITIUM AND C-14 COMPOUNDS

RADIOLOGICAL PROTECTION SERVICE, DELMONT, SUTTON, SURREY, ENGLAND

12 PAGES, 7 TABLES, 29 REFERENCES, HEALTH PHYSICS, VOL. 16, PG 429-440 (1969)

NO ORIGINAL DATA. REVIEW OF TRITIUM ASSUMPTIONS, AND NON-PER-MILLICURIE DOSES ARE TABULATED FOR THE REVIEWED ORGANS BY INJECTION AND BY INGESTION FOR TRITIATED WATER, FOLIC ACID, THYMIDINE, CORTISOL, ALDOSTERONE, AND CORTICOSTERONE. DOSE TO RATS FROM INGESTED THYMIDINE WAS CALCULATED TO BE 9 FOR TESTES AND 10.5 WHEN INJECTED. LIVER DOSE FROM TRITIATED WATER WAS 16 AND FROM TRITIATED FOLIC ACID 110. WHOLE FOR CORTISOL-1,2-T IT WAS 1.1. FOR ALDOSTERONE-1,2-T 0.55 AND FOR CORTICOSTERONE-1,2-T IT WAS 0.9, ALL BY INJECTION. FOR INGESTION AND INJECTION, RESPECTIVELY, OF TRITIATED THYMIDINE DOSES TO BONE MARROW WERE CALCULATED AS 12 AND 42.5 RADS PER MILLICURIE. ASSUMING A QUALITY FACTOR OF 1.7, MAXIMUM PERMISSIBLE ANNUAL INTAKES OF TRITIATED COMPOUNDS TO BLOOD OF ADULT WORKERS, BASED ON AVERAGE DOSES TO ORGANS, ARE CITED FOR THE FOLLOWING CRITICAL TISSUES - TO MILLICURIES TO TESTES AND BONE MARROW FOR WATER, 10 TO LIVER FOR FOLIC ACID, 10 TO BONE MARROW FOR THYMIDINE AND 1000 TO LIVER FOR CORTICOSTEROIDS. FOR CORRESPONDING COMPOUNDS LABELED WITH C-14 INSTEAD OF H-3, RESPECTIVE VALUES SHOULD BE UP TO 10 TIMES LESS, ASSUMING SAME EXCHANGE AND BREAKDOWN PROCESSES FOR THE TWO NUCLIDES.

CARBON • INGESTION • DOSE CALCULATION, INTERNAL • RECORRELATION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • TOXICITY • DISTRIBUTION • BLOOD • BONE, MARROW • MAMMAL, RAT • EXPOSURE, IV • GI TRACT • KIDNEY • LIVER • LUNG • MAN • PANCREAS • SPLEEN • TESTIS • WHOLE BODY • INORGANIC • ORGANIC • RADIOPHARMACEUTICAL • STEROID • THYMIDINE • THYMUS

040808

CHEETHAMFIELD D

TRITIUM UPTAKE HALF-LIVES AND ABSORBED DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHOQUINONE DIPHOSPHATE

UNIVERSITY OF CAMBRIDGE • ADDENBROOKES HOSPITAL, ENGLAND

19 PAGES, 9 FIGURES, 4 TABLES, 24 REFERENCES, INTERNATIONAL JOURNAL OF CANCER, VOL. 2, PG 391-395 (1967)

3 TRITIATED FORMS OF THE TITLE COMPOUND WERE STUDIED - (1) 6 POSITION OF THE 8 RING TRITIATED, (2) 6,7 POSITIONS, AND (3) 5,6,7 POSITIONS, AND USED IN THERAPEUTIC AMOUNTS ON 10 PATIENTS WITH DIFFERENT CANCERS. FROM DATA OBTAINED, THE FOLLOWING BIOLOGICAL HALF-LIVES WERE CALCULATED (THE COMPOUND USED UNSPECIFIED) - HEART 5.7, LUNG 6.2, SMALL INTESTINE 7.6, KIDNEY 7.0, SKELETAL MUSCLE 9, BONE MARROW 12.5, LIVER 14.5, TESTIS 17, SPLEEN 21.0, AND BRAIN 34.5. THE RESPECTIVE STANDARD DEVIATIONS BEING 1.0, 1.3, 1.3, 1.0, 4.5, 7.9, 6.5, 7.1, 7.0, AND 10. WET-TISSUE CONCENTRATIONS PER CASE (1) IN MICROCURIES PER GRAM FOR THE SAME RESPECTIVE ORGANS WERE 15.0, 10.9, 12.2, 40.0, 13.1, 11.0, 21.5, 20.0, 17.7, AND 15.9.

RADIOBIOLOGICAL • DOSE CALCULATION, INTERNAL • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOCHEMICAL • PHYSIOLOGY/METABOLISM • DISTRIBUTION • BONE, MARROW • CANCER • INTESTINE, LARGE • EXPOSURE, IV • KIDNEY • LIVER • LUNG • MAN • MUSCLE • INTESTINE, SMALL • SPLEEN • TESTIS • THYROID • ORGANIC • IC PATHOLOGICAL • PATHOLOGY • RADIOPHARMACEUTICAL • RETENTION FUNCTION • BRAIN • HEART • MOUTH • PHYSICOCHEMICAL FORM

040809

SNYDER WS • FISHER HL • DERMANT SR • FORD MR • HUNT JG

URINARY EXCRETION OF TRITIUM FOLLOWING EXPOSURE OF MAN TO HTO - A TWO EXPONENTIAL MODEL

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

13 PAGES, 2 FIGURES, 2 TABLES, 10 REFERENCES, PHYSICS IN MEDICINE AND BIOLOGY, VOL. 13(4), PG 547-559 (1968)

ACCIDENTAL INHALATION OF HTO IN A MAN BY A SCIENTIST AT OAK RIDGE POSSIBLE URINARY, BLOOD SALIVA, AND SPUTUM SAMPLES, URINARY OUT TO 200 DAYS, IN THE LATTER OF WHICH WAS FITTED A 2-EXPONENTIAL, WITH RESPECTIVE BIOLOGICAL HALF-LIVES OF ABOUT 9 AND 34 DAYS. WITH ADULT MICE, RC THOMPSON (ORNL 1097, DE-7 (1952)) FOUND 9- AND 90-DAY BIOLOGICAL HALF-LIVES IN A 100-DAY STUDY. BUT TO THE HUMAN DATA WAS MADE WITH THE LOCAL COOP (RICHMOND, CA, HEALTH PHYSICS 10, 7 (1964)) OF LPS ALAMOS. THE SUBJECTS TOTAL BODY WATER WAS ESTIMATED BY (1) WEIGHT, (2) AGE, (3) WEIGHT/HEIGHT RATIO, AND (4) WHOLE-BODY PHYSIOLOGY, AND TO LITERS WAS DECIDED ON AS THE AMOUNT OF BODY WATER FOR THE 41-YEAR-OLD, 86.9 KILOGRAM, 161-CENTIMETER-TALL MAN. TABULATION FROM LITERATURE OF HYDROGEN CONTENTS OF THE MAJOR ORGANS AVERAGED ABOUT 10 PERCENT, EXCEPT FOR BONE, WHICH IS 3.4 PERCENT ACCORDING TO WOODARD (1962). IT IS CONCLUDED BLANDLY BY THE AUTHORS THAT ANY TISSUE CAN GET A DOSE FROM INGESTED HTO THAT IS HOWEVER IN EXCESS OF THAT TO BODY WATER, WHICH THEY CALCULATE TO BE ABOUT 10 REMS, THE LONG TERM-COMPARTMENT OF 34 DAYS CONTRIBUTING ABOUT 7 PERCENT OF TOTAL, FROM THE 2-COMPARTMENT MODEL USED. THE 2ND COMPARTMENT BEING A 1440-GRAM MASS OF UNKNOWN TISSUE WITHIN A FACTOR OF 7.

C40805 CONTINUED

OXIDE • WATER • DOSE CALCULATION, INTERNAL • PERSONNEL EXPOSURE, RADIATION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • BLOOD, SERUM • EXCRETION, URINE • REPRODUCTIVE FUNCTION • MAN • MATURE • MALE • BC GRESSLY NORMAL • RETENTION FUNCTION • BODY FLUID • MONTH

C40839

LYSCHINSKAYA OV • ISTOMINA AG

TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN PERIODS OF PREGNANCY AND POSTNATAL LIFE

INSTITUTE OF BIOPHYSICS, MINISTRY OF HEALTH, USSR, MOSCOW

AEC-TR-7013 v. 4 PAGES. TRANSLATED FROM RADIOBIOLOGIYA, VOL. 8, PG. 959-962 (1968)

100-190 GRAM RATS WERE INJECTED WITH A DOSE OF 3 X 10 (EXP -4) PER GRAM OF BODY WEIGHT, BOTH PREGNANT AND NONPREGNANT, AND SACRIFICED ON 22ND DAY OF PREGNANCY, 18 RATS TOTAL. ELIMINATION FROM THE AQUEOUS PHASE OF THE MOTHERS BODY WAS 2 EXPONENTIAL. IN THE NONPREGNANT FEMALES, 99 PERCENT WAS ELIMINATED FROM THE AQUEOUS PHASE IN 9.1 DAYS, AND IN THE PREGNANT 84 PERCENT ON 2.7 DAYS. THE REMAINING AMOUNTS IN THE 1ST DAY. AUTHORS SUGGEST DECREASED ELIMINATION TIME MAY BE DUE TO (1) INCREASED METABOLISM AND (2) MORE RAPID BODY-WEIGHT INCREASE IN PREGNANCY. TRITIUM OXIDE CONTENT OF THE WATER EXTRACTED FROM UTERUS, PLACENTA, AND FETUS WAS THE SAME AS IN THE WATER OF THE MATERNAL ORGANS, NAMELY 1.5 X 10 (EXP -4) CURIES PER ML.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 PICROFICHE

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C40884

PATTERN DC

RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE INGESTION

UNIVERSITY OF MICHIGAN

90 PAGES, 19 FIGURES, 8 TABLES, 43 REFERENCES, 1968 (THESIS), T 6636

PRESENCE OF NONLABILE TRITIUM IN TISSUES OF MAN AFTER INTAKE OF HTO WAS NOT ACKNOWLEDGED BY ICRP IN 1959 FOR CALCULATING MAXIMUM PERMISSIBLE INTAKES, AND SO THE PURPOSE OF THESIS WAS TO COMPARE DOSE FROM NON-EXCHANGEABLE TRITIUM WITH THAT CALCD ON ASSUMPTION THAT ALL OF THE TRITIATED WATER INTAKE IS TO BE FOUND IN BODY WATER ONLY, USING A TOTAL OF 6 RATS AND 3-COMPARTMENT MODEL. AUTHORS RESULTS DO NOT WARRANT, IN HIS OPINION, ANY CHANGE IN THE RECOMMENDED MPC OF ICRP 1959, SINCE THE LONG-TERM COMPONENT DOES NOT ADD TO SIGNIFICANTLY TO ORGAN DOSES. FOR EXAMPLE, 254 DAYS AFTER HAVING CONSUMED 3 MICROCURIES/ML OF TRITIUM OXIDE (HTO) IN DRINKING WATER OVER 111 DAYS, CONTINUOUS, TESTES RECEIVED 51 RADS (CONSIDERING TRITIUM TO BE PRESENT ONLY IN BODY WATER, 1 EXPONENTIAL) AS AGAINST 93 RADS (BODY WATER TRITIUM + NONEXCHANGEABLE TRITIUM).

MPC • OXIDE • DOSE CALCULATION, INTERNAL • WATER, DRINKING • ICRP • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • DISTRIBUTION • PLASMA • BLOOD, SERUM • BONE, MARROW • CELL, NUCLEUS • MAMMAL, RAT • REPRODUCTIVE FUNCTION • EXPOSURE, CHRONIC • LIVER • MUSCLE • INTESTINE, SMALL • TESTIS • RETENTION FUNCTION • BODY FLUID • BRAIN • MONTH

C40700

JACKSON S • DALGARNO GW

ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL

6 PAGES, HEALTH PHYSICS, VOL. 12, PG 494-497 (1966)

REVIEW, NO ORIGINAL DATA. TRITIATED HYDROGEN GAS AND TRITIATED WATER ARE MOST COMMON. FRACTION OF TRITIATED ORGANIC COMPOUNDS MAY BE SLOWER THAN TRITIATED WATER, AND EVEN WITH THE LATTER THERE IS A SMALL, LONG-TERM COMPONENT. ICRP 2 (1960) ACCEPTED A NOT UNREALISTIC AVERAGE BIOLOGICAL HALF-LIFE OF 12 DAYS. 0.6 OF THE ENTERED TRITIATED WATER BEING VIA URINE, SO THAT THE URINARY EXCRETION RATE WOULD THEN BE REPRESENTED AS WITH FOURIS 3.5 X (EXP -0.057T). URINARY EXCRETION RATE EXPRESSED AS A PROPORTION OF THE BODY CONTENT AT TIME T WOULD BE 3.5 PERCENT. WITH A MAXIMUM PERMISSIBLE BODY BURDEN OF 1000 MICROCURIES, CORRESPONDING URINARY EXCRETION RATE WOULD BE 35 MICROCURIES/DAY, 1/10 OF WHICH, 3 MICROCURIES PER LITER, WOULD BE THE INVESTIGATION LEVEL.

OXIDE • OCCUPATIONAL EXPOSURE, RADIATION • REVIEW • RADIONUCLIDE UPTAKE • MAMMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • PERCEPTION, URINE • MAN • WHOLE BODY • RETENTION FUNCTION

C40707

PUTLEN DF

ASSESSMENT OF TRITIUM IN PRODUCTION WORKERS

SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA

12 PAGES, 7 FIGURES, 1 TABLE, 15 REFERENCES, PG 431-442 OF THE PROCEEDINGS OF THE SYMPOSIUM ON THE ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN, HEIDELBERG, MAY 15-18, 1966

MORE THAN 100,000 URINE SAMPLES WERE ANALYZED FOR TRITIUM IN THE FIRST 10 YEARS OF SAVANNAH RIVER PLANT OPERATION. THE BIOLOGICAL HALF-LIFE OF TRITIUM WAS FOUND TO VARY INVERSELY WITH THE AMBIENT TEMPERATURE, 7 DAYS IN JULY AND 12 DAYS BETWEEN NOV.-MAR. THE HALF-LIFE DECREASES WITH AGE, POSSIBLY DUE TO DECREASED ANTIDIURETIC HORMONE PRODUCTION WITH INCREASED AGE. IN 310 CASES

040702 [illegible]
UNDER THE INITIAL TRITIUM CONCENTRATIONS IN URINE RANGED FROM 70 TO 110 MICROCURIES PER LITER. WITH A 12-DAY BIOLOGICAL HALF-LIFE ASSUMED WHEN URINARY TRITIUM IS LESS THAN 70 MICROCURIES PER LITER. TRITIUM RETENTION IS A FUNCTION OF THE BODY-WATER TURNOVER. CF JACKSON AND DOLPHIN, HEALTH PHYSICS 12, 495 (1966).

DOSE CALCULATION, INTERNAL • PERSONNEL EXPOSURE, RADIATION • ENVIRONMENT • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • OTHER/TEMPERATURE • EFFECT, AGE • MAN • BODY FLUID

040711
WHITTEN JT
CRITICAL ANALYSIS OF ICRP DERIVATION OF MAXIMUM PERMISSIBLE CONCENTRATION OF TRITIUM
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY NUCLEAR LABORATORIES, ENGLAND
RD/B/N-1354 +. 19 PAGES. NOVEMBER 1969. 77270

NO ORIGINAL DATA. REVIEWS ICRP NUMERICAL METHOD OF CALCULATING WHOLE-BODY INCIDA AND INCIDW PER WEEK. AUTHOR STATES THAT THE MPC VALUES TO SKIN FOR TRITIUM-GAS SUBMERSION ARE UNRELIABLE, CITING PRIVATE COMMUNICATION BETWEEN WEATHLEY AND WEYMANT. THE FACT THAT THE SOLUBILITY OF TRITIUM GAS IN THE BODY WATER AND OXIDATION OF TRITIUM GAS IN THE ATMOSPHERIC AIR OR IN THE BODY ARE IGNORED, AND THAT THE METHOD OF ESTIMATING SKIN DOSE IS SUSPECT SINCE RANGE OF TRITIUM BETAS IS LESS THAN THICKNESS OF EPIDERMIS. AUTHOR ARGUES THAT MPC VALUES FOR TRITIUM ARE INDEPENDENT OF AGE, BODY WEIGHT, WATER TURNOVER, AND EXCRETION RATE AND SUGGESTS CONFIRMATION FROM WEYMANT BY AN ALTERNATIVE ARGUMENT. SHE CONCLUDES IT IS UNLIKELY THAT ICRP CALCULATIONS HAVE OVERESTIMATED OR UNDERESTIMATED DOSES BY A FACTOR GREATER THAN 2.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

MPC • DOSE • ICRP • PERSONNEL EXPOSURE, RADIATION • REVIEW • GAS • LIQUID • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • MAN • RBE • SKIN • SOLUBILITY

040712
WEYMANT J
THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS
RADIOLOGICAL PROTECTION SERVICE, HELMSLEY, SUTTON, SURREY, ENGLAND
8 PAGES, 3 TABLES, 27 REFERENCES. HEALTH PHYSICS, VOL. 16, PG 941-948 (1969)

NO ORIGINAL DATA. REVIEWS THE QUALITY FACTOR (QF) AND THE STOPPING POWER OR LINEAR ENERGY TRANSFER (LET) IN TERMS OF THE RELATIVE BIOLOGICAL EFFECTIVENESS (RBE). FOR REPORT OF THE RBE COMMITTEE TO ICRP AND ICRU, SEE HEALTH PHYSICS 9, 357 (1963). LITERATURE VALUES FOR RBE RANGED FROM 1 TO 2 WHEN RATS AND PKCF WERE INJECTED IN VIVO WITH TRITIUM OXIDE, AND WHEN HUMAN HELA CELLS, BACTERIA AND PLANT CELLS, WERE GROWN IN VITRO IN SAME. RBE IS THE INVERSE RATIO OF DOSES FROM TWO RADIATIONS WHICH PRODUCE THE SAME BIOLOGICAL EFFECT. REFERENCE RADIATION IS COMMONLY 175 TO 250 KEV X RAY, OR GAMMA RAYS FROM CO-60 OR RA-226. VARIATION FROM 1 TO 2 OF THE LITERATURE RBE VALUES CAN BE PARTIALLY EXPLAINED IF THE CO-60 OR RA-226 GAMMA RAYS RELATIVE TO 200-KEV X RAYS ARE DIFFERENT FROM UNITY IN BIOLOGICAL EFFECT, AND AT THE RELATIVELY HIGH DOSE RATES COMMONLY USED.

DOSE • HAZARD, RELATIVE • ICRP • REVIEW • PHAGOBIOLOGY • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • EFFECT, GENETIC • MAN • RBE • IN VITRO

040713
EVANS AG
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES
SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA
7 PAGES, 8 FIGURES, 3 TABLES, 12 REFERENCES. HEALTH PHYSICS, VOL. 16, PG 47-63 (1969)

ONLY A SMALL FRACTION OF THE TOTAL DOSE DO ACUTE EXPOSURE IS ATTRIBUTABLE TO LOADING OF ORGANIC MOLECULES IN THE BODY, BUT ANIMAL DATA SHOW THAT SUCH LOADING INCREASES WITH EXPOSURE TIME. IN POST ANIMAL WORK, EQUILIBRIUM BETWEEN AQUEOUS AND ORGANIC TRITIUM HAS NOT BEEN REACHED WITHIN THE FEW WEEKS STUDIED. AND LONG-TERM ENVIRONMENTAL WORK IS EQUALLY DIFFICULT BECAUSE OF THE VERY LOW TRITIUM CONCRS IN THE NATURAL ENVIRONMENT. 47 DEER KILLED OVER 4 MONTHS IN THE SAVANNAH RIVER PLANT AREA WERE ANALYZED FOR TRITIUM AND THE AVERAGE BODY-WATER CONCN FOUND TO RANGE FROM 6 TO 55 PICOCURIES/ML, AND COMBUSTION WATER FROM FATTY-DRIED TISSUES (7 CHGRVS) RANGED FROM 8 TO 90 PICOCURIES/ML. OR AN ORGANIC TRITIUM CONTENT OF 8 PICOCURIES/ML OF COMBUSTION WATER FROM THE ORGANIC MATTER OF ONY TISSUES ANALYZED WHEN BODY-WATER TRITIUM CONCENTRATIONS WERE EXTRAPOLATED TO ZERO.

SAVANNAH RIVER PLANT • ENVIRONMENTAL CONTROL MEASURE • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • CONCENTRATION • DISTRIBUTION • NORMAL, LARGE • EXPOSURE, CHRONIC • FAT • KIDNEY • LIVER • MUSCLE • SPLEEN • BODY BURDEN • EXPOSURE, BACKGROUND • BODY FLUID • BRAIN • HEART

040714
BOND VP • FEINENDEGEN LE
INTERNAL: FAR M-3 TRITIOIRE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION ASPECTS
BROOKHAVEN NATIONAL LABORATORY
10 PAGES. 2 FIGURES, 1 TABLE, 66 REFERENCES. HEALTH PHYSICS, VOL. 17, PG 1067-1070 (1969) 77764

NO ORIGINAL DATA. REVIEW. AUTHORS CONCLUDE THAT THE OBSERVED BIOLOGICAL EFFECTS OF TRITIATED

C49714 (CONTINUED)
THEORETICAL STUDIES ARE PREDICTABLE ON BASIS OF AVERAGE ABSORBED DOSE TO NUCLEUS. WHILE RECOIL ENERGY LEVEL OF THE HE ATOM FROM TRANSMUTATION OF THE 3H ATOM IN THE THYMIDINE MOLECULE IS INADEQUATE TO RUPTURE CHEMICAL BONDS, CHEMICAL CONSEQUENCES COULD RESULT FROM THE MOLECULAR EXCITATION, WITH SOMATIC AND GENETIC EFFECTS. THE BETA ON WATER HAS AN AVERAGE RANGE OF 1 MICRON. IN A 2 MICRON UNIT DENSITY SPHERE 37 PERCENT OF THE TOTAL ENERGY ESCAPES. NUCLEAR VOLUME INCREASES DURING DNA SYNTHESIS. AUTHORS CONSIDER THE EDGE EFFECT (RECOIL OF BETAS AT THE NUCLEAR SURFACE).

ABCSF CALCULATION, THERMAL • AUTORADIOGRAPHY • MOUSE • RADIOBIOLOGY • RADIONUCLIDE UPTAKE • ANIMAL, WOMBAT • CHROMOSOME EFFECT • PHYSIOLOGY/METABOLISM • TOXICITY • EFFECT, GENETIC • INSECT • DNA • HISTOPATHOLOGY • BONE, MARROW • MAMMAL, RAT • EXPOSURE, IN • MAN • MOUSE • TUMOR • ORGANIC • IN VITRO • MAMMAL, ACCIDENT • EFFECT, DOSE • THYMIDINE

C51314
SPALDING JF
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.
RADIATION RESEARCH 4 PAGES 221-227 1956

TESTING • EFFECT • BIOCHEMICAL • VEGETATION • FOOD CHAIN • BETA RAY

C51402
TRUJILLO TT
BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.
LA-1900 •.

INHALATION • GAS • EFFECT • HIGH • BIOCHEMICAL • CONCENTRATION • MAMMAL, MOUSE

C51403
ANDERSON PC
A THEORETICAL CONSIDERATION OF THE HAZARDS ASSOCIATED WITH ACUTE EXPOSURE TO HIGH CONCENTRATIONS OF TRITIUM GAS.
LA-1040 •.

DOSE • GAS • HIGH • CONCENTRATION • RADIATION EXPOSURE • MAN

C51404
PINSON FA
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN.
JOURNAL OF APPLIED PHYSIOLOGY 10 PAGES 309-12a 1957

MAN

C51405
PINSON FA
THE ABSORPTION OF INGESTED TRITIUM WATER AND THE WATER DILUTION VOLUME OF MAN.
LA-1044 •.

DILUTION • WATER • ABSORPTION • MAN

C51406
PINSON FA
ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF MAN.
LA-1046 •.

LIQUID • ABSORPTION • MAN • SKIN

C51407
PINSON FA
THE SPECIFIC ACTIVITY OF TRITIUM IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF MAN FOLLOWING EIGHT MONTHS CHRONIC EXPOSURE TO HTO IN BODY FLUIDS.
LA-1049 •.

COMPONENTS • REMOVING • RADIATION EXPOSURE • EXPOSURE, CHRONIC • FAT • MAN • SKIN • ORGANIC • MONTH

C51408
PINSON FA
THEORETICAL CONSIDERATIONS OF ACUTE EXPOSURE OF MAN TO HTO OF TOXIC ACTIVITY IN THE ATMOSPHERIC ENVIRONMENT.
LA-1050 •.

051600 (CONTINUED)
DOSE • AIR • ENVIRONMENT • DEVICES • RADIATION EXPOSURE • MAN

051573
RICHMOND CR
ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.
LAMS-2920 P.

MPC • WATER • ZINC • RADIOISOTOPE • ANIMAL • CONCENTRATION • RADIONUCLIDE TRANSFER • COMPARISON • MAN

051582
THOMPSON RC
STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.
JOURNAL OF BIOLOGICAL CHEMISTRY 206 PAGES 101-107 1954

DEUTERIUM • TRACER • COMPARISON • TURNOVER RATE • MAMMAL, RAT

050670
DELONG CW
PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE.
AMERICAN JOURNAL OF ROENTGENOLOGY, RADIUM THERAPY AND NUCLEAR MEDICINE 71 PAGES 1058-1064 1954

DOSE • ABSORPTION • MAMMAL, RAT • SKIN

051967
DASERGA P
UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.
LABORATORY INVESTIGATION 11 PAGES 360-364 1962

RADIONUCLIDE UPTAKE • MAN • TUMOR • THYMIDINE

051960
BATEMAN AJ
MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.
NATURE 193 PAGES 705-706 1962

EFFECT, GENETIC • MAMMAL, MOUSE • THYMIDINE

051990
DELING EA
DETERMINATION OF K-42, NA-24, BR-82 AND TRITIATED WATER CONCENTRATION IN MAN.
ANNALS OF THE NEW YORK ACADEMY OF SCIENCE 110 PAGES 244-254 1963

SODIUM • WATER • POTASSIUM • BROMINE • CONCENTRATION • MAN • INSTRUMENTS, MISC.

052309
GIBSON JAB
THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM.
AERE-M-1169 P.

TITANIUM • RADIOLOGY

052315
GOODHEART CR
RADIATION DOSE CALCULATION IN CELLS CONTAINING INTRANUCLEAR TRITIUM.
RADIATION RESEARCH 15 PAGES 767-773 1961

DOSE • MATHEMATICAL TREATMENT • RADIATION EFFECT • CELL

052034
GUSSEL MP
CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.
RADIATION RESEARCH 18 PAGES 46-57 1963

DOSE • DAMAGE • HIGH • RECOVERY • RADIATION EXPOSURE • MAMMAL, RAT • THYMIDINE

C52000
SAMUELS LE
TOXICOLOGICAL STUDIES ON TRITIATED THYMIDINE.
RADIATION RESEARCH 18 PAGES 620-632 1963

EFFECT • CHROMOSOMAL EFFECT • MAMMAL, MOUSE • THYMIDINE

C59130
WINDER DE
EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.
ORL-7060 P. ADVANCES IN RADIATION BIOLOGY 1 PAGES 89-115 1964

EFFECT • ANIMAL • RADIATION EXPOSURE

C59994
BACHMELER R
THE EFFECTS OF TRITIUM DECAY ON DNA. PROGRESS REPORT. JUNE 1, 1966 TO DECEMBER 31, 1966.
COO-1009-1 P.

BACTERIA • EFFECT • CHROMOSOMAL EFFECT • DECOMPOSITION

C60436
VERNADY J
RADIOTOXICOLOGY OF TRITIUM AND 14-C COMPOUNDS.
HEALTH PHYSICS 10 PAGES 429-440 1964

CARBON • COMPOSITE MATERIAL

C60639
DEWEY WC
COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER, AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS.
RADIATION RESEARCH 24 PAGES 714-730 1964

COBALT • WATER • GAMMA • CHROMOSOMAL EFFECT • COMPARISON • THYMIDINE

C60807
WOMACK DCV
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.
EA-1001 P.

BIOCHEMICAL • MAMMAL, MOUSE • BETA RAY • THYMUS

C60816
PURCHASE J
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.
EA-1004 P.

IRON • GASTROINTESTINAL UPTAKE • BIOCHEMICAL • MAMMAL, RAT

C59181
BARTON CJ • BUTLER WW • CLEMENS RP • DEMORE PS
THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS
11 PAGES, 1 TABLE, 7 REFERENCES, NUCLEAR SAFETY, 13(3), PP. 225-235 (MAY-JUNE 1972)

A TRITIUM SYMPOSIUM SPONSORED BY THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY OF THE ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA AT LAS VEGAS WAS HELD IN LAS VEGAS AUG. 30 TO SEPT. 2, 1971. NEARLY 100 PAPERS WERE PRESENTED COVERING A BROAD RANGE OF TOPICS, INCLUDING TRITIUM PRODUCTION, ITS MOVEMENT IN THE ENVIRONMENT, ENVIRONMENTAL RELEASE AND MONITORING, DETECTION AND MEASUREMENT, BIOLOGICAL EFFECTS, DOSIMETRICS, APPLICATIONS IN BIOLOGY AND MEDICINE, AND HEALTH PHYSICS. THIS ARTICLE TOUCHES ON ALL ASPECTS OF THE MEETING, BUT PAPERS OF PARTICULAR INTEREST IN THE FIELD OF NUCLEAR SAFETY ARE EMPHASIZED.

ENVIRONMENT RELEASE • PHOTOMETRICAL • MONITOR, LIQUID • MONITOR, AIR • ANALYTICAL TECHNIQUE • MONITORING SYSTEM, RADIATION

C60140
BUTLER PS
CONTROLLED RESPIRATORY HELP-LIFE OF TRITIUM AT THE SAVANNAH RIVER PLANT
SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA

056158 (CONTINUED)
DP-898 .. 8 PAGES, PG 30-45, 1962 (TT1990)

REVIEW OF WORK AT SAVANNAH AND ELSEWHERE. SUMMARY OF BIOLOGICAL HALF-LIFE DATA AT SAVANNAH ON MORE THAN 200 CASES WHERE URINARY TRITIUM WAS FROM 70 TO 110 MICROCURIES/LITER. BETWEEN 5 AND 20 MICROCURIES/LITER. A 12 DAY BIOL HALF-LIFE IS USED TO COMPUTE DOSE, TO GIVE 45 MREMS FROM A 5 MICROCURIE/LITER UPTAKE. PINSON AND LANGHAM (J APPL PHYSIOL 10, 100 (1957)) FOUND A 10-DAY HALF-LIFE WHEN WATER INTAKE WAS 2.7 LITERS/DAY, BUT WHEN WATER INTAKE WAS INCREASED TO 12.0 LITERS/DAY, HALF-LIFE WAS REDUCED TO 2.4 DAYS. IN 4 CASES OF AN LIB. WATER INTAKES, THEY NOTED 4.3 TO 13 DAYS. PRESENT AUTHOR REPORTS 4 TO 18 DAYS FOR AN LIB. WATER INTAKE BY SAVANNAH EMPLOYEES. AVERAGE MEAN TEMP FOR SAVANNAH PLANT AREA FOR 1959-1962 WAS 63 F, COMPARED WITH 80 F AVERAGE FOR SOUTHERN NIGERIA, WHERE A 7.5-DAY HALF-LIFE WAS FOUND. SEASONAL AVERAGE BIOLOGICAL HALF-LIFE VALUES AT SAVANNAH FOR SPRING, SUMMER, FALL, AND WINTER WERE RESPECTIVELY 8.1, 8.9, 10.6 AND 10.4 DAYS. VARIATIONS WITHIN A GIVEN INDIVIDUALS BIOL HALF-LIFE ARE TABULATED. PRESENT AUTHOR DOES NOT CONFIRM THE RELATION BETWEEN HALF-LIFE AND BODY WEIGHT AS A POWER FUNCTION OF 0.8 BODY WEIGHT REPORTED BY RICHMOND ET AL., J CELL COMP PHYSIOL 59, 45-53 (1962).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MONITOR, SAMPLING • WATER, DRINKING • SAVANNAH RIVER PLANT • PERSONNEL EXPOSURE, RADIATION • ENVIRONMENT • CORRELATION • REVIEW • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • TEMPERATURE • EFFECT, AGE • MAN • NATURE • WHOLE BODY • MASS • AVAILABILITY

056159
OSBORNE RV
ABSORPTION OF TRITIATED WATER VAPOUR BY PEOPLE
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
11 PAGES, 7 FIGURES, 8 TABLES, 19 REFERENCES, HEALTH PHYSICS, VOL. 12, PG 1527-1537 (1966) (TT0954)

BY EXTRAPOLATION TO WHOLE-BODY SKIN AREA FROM FOREARM EXPOSURE, OTHER WORKERS HAVE SHOWN THAT HTO SKIN ABSORPTION IS ABOUT EQUAL TO THE INTAKE BY INHALATION, UPON WHICH CONSIDERATION ICRP (1959) (IPCC) A VALUE OF 5 MICROCURIES/CU METER WAS BASED. IN THE PRESENT PAPER, 17 SUBJECTS VOLUNTEERED TO EXPOSE THEMSELVES IN A CHAMBER TO AIR CONTAINING HTO VAPOUR, WITH AND WITHOUT ORONASAL MASK, AND WITH COTTON OVERALLS, 1- AND 2-PIECE POLYVINYL CHLORIDE SUITS, AND OTHER TYPE CLOTHING. THE UNPROTECTED EXPOSURE DESIGNED TO KEEP BODY BURDEN OF ABSORBED TRITIUM BELOW 0.4 MILLICURIE, WITH AN UPPER LIMIT OF 1.2 MC FOR OTHER EXPOSURES. AIR TRITIUM CONCNS UP TO 1M. OC (MPC)A WERE GENERATED. SKIN INTAKE RATE CORRELATED WITH AVERAGE SKIN TEMP IN THE RANGE 86.5 TO 93 F, SIGNIFICANT AT THE 5 PERCENT LEVEL, AND CORRESPONDING TO 0.73 LITERS PER MINUTE PER DEG F OR 7.6 PERCENT PER DEG F AT 90 F. AVERAGE INTAKE RATE DURING UNPROTECTED EXPOSURES WAS 15.8 + OR - 1.8 LITERS/MIN AND 9.6 + OR - 1.7 WITH MASKS. BODY-WATER VOLUME CORRELATES WITH BODY SURFACE AREA BETTER THAN BODY WT, 22.6 LITERS/SQ METER AVERAGE FOR 10 SUBJECTS. INTAKE RATES FOR 3 UNPROTECTED SUBJECTS WERE 14.0, 14.0, AND 17.9 MICROCURIES/MIN PER MICROCURIE/LITER, AVERAGE SKIN INTAKE RATE BEING 9.6. BIOL. HALF-LIVES BETWEEN 6.6 AND 14.4 DAYS WERE FOUND.

CANADA • SIMULATION • URINE • REACTOR SAFETY SYSTEM • CHALK RIVER • CHEMICAL KINETICS • PERSONNEL EXPOSURE, RADIATION • ENVIRONMENT • ABSORPTION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • EXCRETION, URINE • REPOSURE, SKIN • MAN • NATURE • SKIN • WHOLE BODY • MASS • BODY BURDEN • IC GROSSLY NORMAL • BODY FLUID • METABOLIC KINETICS

056179
WORNER FAD • HOICELL RD • MEYER KA
DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE
10 PAGES, JOURNAL OF NUCLEAR MEDICINE, VOL. 4, PG. 60-69 (1963) (TA591)

USING A MODIFIED LANGHAM METHOD (J LAB CLIN MED 47, 819 (1956)) PRESENT AUTHORS ESTIMATED TOTAL BODY WATER IN 100 MALE PATIENTS OF ALL AGES BY INJECTING 2 MILLICURIES IN THE ADULTS, 1 MILLICURIE INTO CHILDREN AND 0.1 MILLICURIE INTO INFANTS AND NEWBORNS, FOLLOWED BY BLOOD SAMPLINGS AT 1.5, 2.5, 3.5 AND 4.5 HR POSTINJECTION, AND EXTRAPOLATING TO ZERO TIME ON SEMILOG PAPER TO CALCULATE TOTAL BODY WATER. MEAN VALUES OF GROUPS OF 10 PATIENTS IN EACH AGE DECADE ARE TABULATED AS FOLLOWS - AGE GROUPS, MEAN AGE, WT IN KG, SURFACE AREA IN SQ METERS, TOTAL BODY WATER IN LITERS AND PER CENT BODY WATER, SEX MALES - 1 TO 10 YEARS, 5.4 YRS, 21.93 KG, 0.82 SQ.M., 13 LITERS WATER, 64.06 PERCENT WATER - 11 TO 20, 16.4 57.96, 1.66, 37.96, 65.03 - 21 TO 30, 27.2, 77.52, 191, 63.65, 57.54 - 31 TO 40, 36.4, 70.9, 1.91 66.6, 57.70 - 41 TO 50, 45.6, 69.64, 1814, 99.26, 56.39 - 51 TO 60, 55.5, 78.01, 1.825, 68.67, 57.99 - 61 TO 70, 64.7, 70.72, 1.79, 37.89, 46.60 - 71 TO 80, 73.1, 69.86, 1.774, 35.26, 52.2 - 81 + 83.8, 50.61, 166, 29.51, 49.84.

URINE • WATER • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • EFFECT, AGE • TEMPERATURE • MAN • NATURE • NEWBORN / AGED • WHOLE BODY • FEMALE • YOUNG • MALE • INFANT

056210
SIMPSON JR
JEDI BOUND TWO - THE SCIENTIFIC GAMUT
1 PAGE, INFO, FEBRUARY 1976 (SUPPLEMENT)

PRES. OF WESTINGHOUSE POWER SYSTEMS REVEALED TWO JOINT STUDIES OF WASTE HEAT USE - WITH CON. ED. OF N.Y. ON UTILIZATION FOR URBAN USE, AND WITH COMMONWEALTH EDISON ON POTENTIAL AGRICULTURAL USE IN AQUACULTURE. EN. DEP. OF NAT. WILDLIFE FEDERATION SAYS A POLL SHOWS 75 PERCENT OF PUBLIC WOULD PAY UP TO 25 CENTS/MON. MORE ON THEIR UTILITY BILLS TO CLEAN UP ENVIRONMENT. HE STATED THAT THIS WAS ENOUGH TO HANDLE PROBLEM EMBARGO DISCAPTION. F. BOOTHOF AND OPPOSED CALVERT CLIFFS ON TRITIUM PROBLEM WHE STATES HE WOULD CERTIFY PLANT AS BEING SAFE, ALTHOUGH HE STILL

090410 *CONTINUED*

FEARS TRITIUM FROM REPROCESSING PLANTS. V. BOND (DISPUTING RADFORD ON SEVERAL POINTS) STATED THAT GIVEN DOSE OF BETA RAYS OF TRITIUM (INHALATION OR INGESTION) IS SAME AS DOSE FROM X-RAYS OR GAMMA RAYS -- NO ADDED SIGNIFICANCE OR HAZARD TO BE ATTACHED TO FACT THAT DOSE IS DERIVED FROM TRITIUM.

*ECOLOGY * CONGRESSIONAL ACTIVITY * DOSE * ECONOMICS * ECONOMY * REACTOR, POWER * FUEL REPROCESSING * *THERMAL POLLUTION * CALVERT CLIFFS 1 (MD) * RADIATION EFFECT * INDUSTRY, NUCLEAR * BENEFICIAL USE, AGRICULTURE * BENEFICIAL USE, SPACE HEATING * WASTE HEAT, WATER * INDUSTRY, UTILITY * ORGANIZATION, CITIZEN * SPONSOR, ACADEMIC * SPONSOR, AEC * CONGRESSMAN

041912

SUMMARY OF

MAXIMUM PERMISSIBLE CONCENTRATION FOR TRITIATED WATER AND TRITIATED THYMIDINE

UNIVERSITY OF MINNESOTA, MINNEAPOLIS

5 PAGES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, VOL. 30, PG. 514-519 (SEPTEMBER-OCTOBER 1969)

THE ELECTRONS OF IMPORTANCE BIOLOGICALLY IN THE ABSORPTION OF ENERGY FROM BETA PARTICLES EMITTED BY TRITIUM HAVE ENERGIES BELOW 1 MEV. THESE ELECTRONS HAVE EXTREMELY SHORT RANGES THAT PROMPT THE EXAMINATION OF ABSORBED ENERGY ON SOME BASIS OTHER THAN AVERAGE DOSE, SUCH AS ERGS/GM. TENTATIVE MPCS FOR TRITIATED WATER AND TRITIATED THYMIDINE ARE DERIVED IN THIS PAPER WITHOUT REFERENCE TO ABSORBED DOSE. THE MPCS THUS OBTAINED ARE 10 TO 100 TIMES PRESENT RECOMMENDED VALUES.

*MPC * *WATER * BETA EMITTER * ABSORPTION * PHYSIOLOGY/METABOLISM * MAN * *THYMIDINE

050570

VAUGHAN, B * BETTEL, P

THE HAZARD FROM TRITIUM CONTAMINATION

CENTRE D'ETUDES NUCLEAIRES DE FONTENAY-AUX-ROSES, FRANCE

CEA-BIB-102 * FUR-4577F *, 1970

CONTENTS - OBJECTIVE OF THIS REPORT. NUCLEAR CHARACTERISTICS. FORMATION AND ASSOCIATED HAZARDS. BEHAVIOR VIS-A-VIS HYDROGEN, CARBON, WATER AND VARIOUS ORGANICS OF BIOLOGICAL IMPORTANCE. RADIOCHEMISTRY. EXCHANGE REACTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY * OCEAN AND SEA * RADIATION IN PERSPECTIVE * HAZARD, RELATIVE * RIVER * PLANT * RADIONUCLIDE UPTAKE * BIOACCUMULATION/TURNOVER

050580

PLANET, J * UZZAN, G * LE GRAND, J

RADIATION EXPOSURE TO MAN FROM DISPOSAL OF TRITIATED WATER VAPOR TO THE ATMOSPHERE

CENTRE D'ETUDES DE NUCLEAIRES, FONTENAY-AUX-ROSES, FRANCE

CEA-CONF-1560 *, CONF-700507-11 *, 25 PAGES, 1970, PRESENTED AT THE INTERNATIONAL RADIATION PROTECTION ASSOCIATED CONGRESS, BRIGHTON, ENGLAND

BOTH CONTAMINATION BY INHALATION AND INGESTION OF FOODS INCLUDING WATER, VEGETABLES, ANIMAL PRODUCTS ARE CONSIDERED. THE STUDY SHOWED THAT IN CERTAIN CASES THE DOSE THROUGH INGESTION OF MILK IS APPRECIABLE FOR INFANTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE * WASTE DISPOSAL, ATMOSPHERIC * MILK * WATER, DRINKING * CONTAMINATION * BIOACCUMULATION/TURNOVER * FOOD CHAIN * MAN * FOOD

090835

WATE L * SHAW E

PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED THYMIDINE

UNIVERSITY OF KANSAS, LAWRENCE

19 PAGES, 5 FIGURES, 7 TABLES, 22 REFERENCES, RADIATION RESEARCH, VOL. 43, PG 439-454 (1970) (773363)

FOR ESTIMATING HAZARD TO MAN OF INGESTED TRITIATED THYMIDINE, ASSUMPTIONS WERE MADE (1) THAT MAN IS A WHOLE MEMBRANE, (2) THAT ALL THE NONVOLATILE TRITIUM (-10 DPS C PROTEE-TRYP) IS LOCATED IN THE NUCLEUS, (3) THAT THE VOLATILE TRITIUM IS WATER AND UNIFORMLY DISTRIBUTED, (4) THAT ACTIVITY IN EACH TISSUE DECREASES EXPONENTIALLY WITH TIME, (5) THAT TISSUE ACTIVITY REMAINS CONSTANT DURING 1ST 24 HOURS AFTER STOMACH-TUBE ADMINISTRATION. NUCLEAR RADIUS OF DIFFERENT ORGAN CELLS 17.8 TO 5.0 MICRONS) AND CELL VOLUMES WERE MEASURED FROM PHOTOMICROGRAPHS IN AN ATLAS OF ULTRASTRUCTURE, BY RUNDIN, SAUNDERS (1963). FASTED 10-20 WEEK-OLD MICE (17-31 G) WERE GIVEN 1 OR 10 MICROCURIES (SP. ACT. 1.0 CURIES/MILLIMOLE) BY STOMACH TUBE OR SC. NONVOLATILE TRITIUM IN MICROCURIES TIMES 10 (EXP -7) PER MG WET TISSUE AT 1,2,4,8,16,30,60 DAYS, RESPECTIVELY ARE GIVEN IN ORDER OF ATTACHED ORGANS (ESTIMATE BELOW AS FOLLOWS PER 10 MICROCURIE INGESTION - 21, 14, 13,9.0,-5.2, 1.9, 0.00, - 45, 47, 30, 19, 6.7, 6.9, 7.4 - 40, 26, 10, 9, 5.1, 1.9, 2 - 27, 15, 10, 7, 3, 2, 0.00 - 80, 70, 20, 11, 1.2, 1.3, 1.1 - 100, 70, 30, 14, 1, 1.0, 1.3. ALSO 1 MICROCURIE TO WHICH DATA THE DESIRED REPRESENTATION FUNCTIONS CAN BE FITTED. EFFECT OF 15 RADS TO ALVEOLUS CONSIDERED.

INGESTION * HAZARD, RELATIVE * DOSE CALCULATION, INTERNAL * RADIONUCLIDE UPTAKE * ANIMAL, VERTEBRATE *

050095 *CONTINUED*
PHYSIOLOGY/METABOLISM • TOXICITY • DISTRIBUTION • DNA • CELL, NUCLEUS • MAMMAL, MOUSE • EXPOSURE, SC •
KIDNEY • LIVER • MATURE • MUSCLE • INTESTINE, SMALL • SPLEEN • TESTIS • MALE • ORGANIC • METABOLISM FUNCTION
• DISTRIBUTION, MICRO • EFFECT, DOSE • MONTH • THYMIDINE

060033
AUTHOR U
INTERNAL CONTAMINATION WITH TRITIUM
BUNDESGESUNDHEITSAMTES, BERN
5 PAGES, STRAHLENTHERAPIE, VOL. 137, NO. 700-704 (JUNE 1969)(IN GERMAN)

REPEATED AND LONG LASTING INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS IN AIR LED TO VERY SERIOUS CONTAMINATION EFFECTS WITH FATAL CONSEQUENCES IN ONE CASE. STUDIES OF TRITIUM CONTENT IN URINE DURING 10 MONTHS AFTER STOPPING WORK WITH RADIOACTIVE MATERIAL SHOWED AT LEAST TWO DIFFERENT ELIMINATION VELOCITIES, ONE CORRESPONDING TO BIOLOGICAL HALF LIFE OF MORE THAN FOUR MONTHS, THE OTHER OF THE ORDER OF MAGNITUDE OF WEEKS. DEFINITE FIGURES WERE RATHER STRONGLY INFLUENCED BY THE MODE OF CALCULATION. IN ALL INVESTIGATED ORGANS, TRITIUM WAS FOUND IN A FORM COMPLETELY INSOLUBLE IN WATER.

*INCIDENT, EXPOSURE • *INHALATION • *DOSE CALCULATION, INTERNAL • INCIDENT, FATALITY • BIOLOGICAL HALF-LIFE •
CONCENTRATION • EXCRETION, URINE • *ORGAN

061130
BASSON JA • VANAS D • VLEGGAAR CP • VANDERWESTHUIZEN
RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE
11 PAGES, SOUTH AFRICAN JOURNAL OF SCIENCE, 66(7), PP. 214-224

MEASUREMENTS SINCE 1963 WITH SPECIAL ATTENTION TO 1966-67 SHOWED THE FRENCH NUCLEAR TESTS DID NOT PRODUCE A HAZARDOUS INCREASE. ANALYSES OF AIRBORNE FALLOUT, SR-90 IN MILK, CS-137 IN BONE, TRANSIT TIME AND AGE ANALYSIS. THE RATIO OF CE-144/CS-137 INDICATED FALLOUT AGE, AND SHOWED FALLOUT TOWARDS THE END OF 1966. INCREASES IN CUMULATIVE SR-90 DEPOSITION AND H-3 IN RAIN WERE ATTRIBUTABLE TO INTERHEMISPHERIC MIXING. THE AVERAGE DOSE RATE FOR THE POPULATION WAS CALCD. TO BE 0.9 MRAD/YEAR TO GONADS AND 3.3 TO THE BONE MARROW. (CA 70-10119 A)

CERIUM • CESIUM • *FALLOUT • STRONTIUM • DOSE CALCULATION, INTERNAL • *POPULATION EXPOSURE • *SOUTH AFRICA •
RADIONUCLIDE UPTAKE • BIOACCUMULATION/TURNOVER • BONE, MARROW • TESTIS

061721
PLANET J • UZZAN G • LE GRAND J
HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER
CEA, FONTENAY-AUX-ROSES, FRANCE
2 PAGES, HEALTH PHYSICS, VOL. 19, PP. 100-102 (1970)

CONTAMINATION MECHANISMS ARE (1) INHALATION AND SKIN ABSORPTION AND (2) INGESTION OF CONTAMINATED FOOD. THE DOSE TO POPULATIONS WAS ESTIMATED BY CONSIDERING DISPERSION IN THE AIR AS A FUNCTION OF METEOROLOGICAL CONDITIONS, CONTAMINATION OF RAIN BY WASHOUT FROM THE ATMOSPHERE, CONTAMINATION OF THE WATER TABLE, CONTAMINATION OF VEGETABLE PRODUCTS TAKING INTO ACCOUNT THE EXCHANGE OF WATER IN THE VAPOUR PHASE BETWEEN THE ATMOSPHERE AND THE EXPOSED PARTS OF PLANTS, OF THE FOLIAR ABSORPTION OF TRITIATED WATER, AND OF UPTAKE THROUGH THE ROOTS, CONTAMINATION OF MILK AND MEAT FROM PASTURE AND FROM THE METHOD OF REARING LIVESTOCK.

*INHALATION • *RAINOUT • *WASTE DISPOSAL, ATMOSPHERIC • *MILK • WATER, DRINKING • ABSORPTION • RADIONUCLIDE
UPTAKE • *FOOD CHAIN • LIVESTOCK • MAN • SKIN

061931
BUTLER WP • MAYNOOR EP
RADIATION SAFETY PRACTICES - OPERATION PENNY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CEX-69.09 V. 34 PAGES, APRIL 1970

DURING 1967 AN EXPERIMENT WAS CONDUCTED AT THE NEVADA TEST SITE USING A HIGH-YIELD NEUTRON GENERATOR SUPPORTED AT SEVERAL ELEVATIONS ON A 1577-FT STEEL TOWER. NUMEROUS PERSONNEL RADIATION HAZARDS WERE ASSOCIATED WITH THE ROUTINE OPERATION OF THIS GENERATOR, AND SPECIALIZED EQUIPMENT AND PROCEDURES WERE REQUIRED. THE MOST NOTABLE HAZARD RESULTED FROM HANDLING TARGETS FOR THE GENERATOR, EACH OF WHICH CONTAINED 1500 TO 2000 CI OF TR. HANDLING WAS REQUIRED FOR TARGET FABRICATION, PACKING AND SHIPPING, MOUNTING INTO GENERATOR, REMOVAL AND TRANSFER TO STORAGE, AND DISPOSAL OF WASTES. THIS REPORT INCLUDES AREA MONITORING AND BIO-SAMPLING TECHNIQUES, INTERNAL-DOSE ESTIMATION, AND SPECIFIC PROCEDURES FOR LIMITING PERSONNEL EXPOSURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HAZARD, RELATIVE • *TESTING • TRANSPORTATION AND HANDLING • *WASTE DISPOSAL • WASTE STORAGE • SAMPLING • DOSE
CALCULATION, INTERNAL • NEVADA TEST SITE • PERSONNEL EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL •
REPORT, 0-70

[illegible]
[illegible]
BIOLOGICAL HALF-LIFE OF TRITIUM (TTTTT)
BATTELLE MEMORIAL INSTITUTE, COLUMBUS LABORATORY, OHIO
4 PAGES, 2 FIGURES, 1 TABLE, 11 REFERENCES, HEALTH PHYSICS, VOL. 9, PP. 911-914 (1963)

SAWICKI ET AL. (HPS NEWS REPT 13, 567 (1964)) MADE A 2-EXPONENTIAL FIT TO AN ACCIDENTAL HUMAN EXPOSURE, GIVING RESPECTIVE BIOLOGICAL HALF-LIVES OF 9 AND 34 DAYS. THOMPSON, JAC 197, 81 (1962) FOUND 9 AND 40 DAY BIOLOGICAL HALF LIVES FOR MICE. THE PRESENT AUTHORS FIND AN AVERAGE BIOLOGICAL HALF-LIFE OF 4.5 DAYS OVER THE 50-DAY URINARY MEASUREMENT PERIOD STUDIED FOR 6 HALF WOMEN AND CONSERVATIVELY TRIMMED TRITIATED-WATER. THE LOWEST HALF-LIFE FOR THE PERIOD OF STUDY WAS 6.4 +- 0.4 DAYS AND THE LONGEST WAS 12.1 +- 0.7. THE CORRESPONDING BODY WTS FOR THESE TWO SUBJECTS WERE 66.7 AND 79.4 KG. TOTAL BODY WATER 33.1 AND 47.0 LITERS AND AVERAGE DAILY WATER OUTPUT OF 3.6 AND 2.7 LITERS.

WATER • PERSONNEL EXPOSURE, RADIATION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • EXCRETION, URINE • MAN • NATURE • WHOLE BODY • MALE • RETENTION FUNCTION • MONTH

002507
MOSKALEV VI • SHTUKAENKOVA VM • ZHUKOVLEV VF
RECOMMENDATIONS ON MAXIMUM PERMISSIBLE CONCENTRATION IN AIR OF INDUSTRIAL PREMISES FOR TRITIUM OXIDE
5 PAGES, GIGIENA TRUDA I PROFESSIONALNYE ZABOLEVANIYA/MOSCOW, VOL. 13, PP. 39-43 (1969)

NO ORIGINAL DATA. AUTHORS CONSIDER AS OF MARCH 1967 THAT THE USSR STANDARD OF 2 X 10 (EXP-0) CURIES/LITER PER 40-HR WEEK (MPC) IN SHOULD BE CHANGED TO THE ICRP (1959) RECOMMENDATION OF 5 X 10 (EXP-0) FOR THE AIR OF INDUSTRIAL PREMISES, WITH A URINARY LEVEL OF 7 X 10 (EXP-0) CURIES PER ML OF URINE. REVIEW OF RDF EVALUATION AND OF DOSE CALCULATION FOR TRITIATED WATER VAPOR INHALATION AND SKIN ABSORPTION ON ASSUMPTIONS THAT (1) 90 PERCENT OF TRITIATED WATER GETTING TO THE BODY ENTERS WATER COMPARTMENT, 2 PERCENT IN THE SOLID COMPARTMENT (SKIN) AND BONES, TRITIUM IN BONES AND BIOL SCIENCES 2, 71 (1962), (2) ABSORPTION RATE OF HTO THROUGH SKIN IS 0.029 TO 0.005 MICROCURIES/SQ CM, AND SAME ORDER OF MAGNITUDE FOR LUNG ABSORPTION, (3) TOTAL BODY WATER OF A HEALTHY ADULT WOMAN IS 42 LITERS, (4) A HEALTHY ADULT WOMAN IS 42 LITERS, (4) HEALTHY ADULT TAKES IN 2.0 TO 3 LITERS OF FLUID PER DAY AS DRINKING WATER + FOOD WATER + METABOLIC WATER (30 ML), (5) TOTAL BODY WATER EXCEEDS DAILY WATER INTAKE BY A FACTOR OF NOT MORE THAN 14 TO 17, (6) 1500 ML WATER ELIMINATED VIA URINE, 200 ML VIA STOOLS, 750 TO 1000 ML VIA SKIN AND EXPIRED AIR, (7) RECOMMENDED RDF OF 9 FOR MPC, (8) 4000 LITERS OF AIR INHALED PER SHIFT. MAX DAILY INTAKE SHOULD NOT EXCEED 70 MICROCURIES, FOR 5 DAYS/YR.

ABSORPTION • CODES AND STANDARDS • INHALATION • MPBB • MPC • OXIDE • WATER • AIR • DOSE CALCULATION, INTERNAL • PERSONNEL EXPOSURE, RADIATION • USSR • REVIEW • GAS • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • TOXICITY • EXCRETION, URINE • INTAKE • MAN • NATURE • RDF • SKIN

002023
LAMBERT RE • CLIFTON DJ
RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND TRITIATED WATER IN THE RAT
RADIOLOGICAL PROTECTION SERVICE, PELHAM, SUTTON, SURREY, ENGLAND
7 P . BRITISH JOURNAL OF RADIOLOGY, VOL. 40, PP. 50-61 (1967) (T3002)

[illegible] AT ORGAN RETENTION DATA AND ICRP (1959) DOSE LIMITS TO ORGANS, PRESENT AUTHORS CONCLUDE THAT [illegible] FOLIC ACID (T) IS TWICE AS TOXIC AS TRITIATED WATER (T). REMS/MILLICURIE WERE AS [illegible] FOR T AND T RESPECTIVELY - LIVER 91.16 - KIDNEY 65.16 - MARROW 16.15 - BLOOD 7.16 - WHOLE BODY 12.17. GROUPS OF 6 RATS WERE SACRIFICED FROM 1 HR TO 6 WKS AFTER INJECTING 10 MICROCURIES (SP. ACT. 270 MILLICURIES/MILLIMOLE OF T) INTRAVENOUSLY. GROUPS OF 4 RATS WERE GIVEN AN IP DOSE OF 270 MICROCURIES OF (T), AND SACRIFICED FROM 1 TO 90 DAYS POSTINJECTION. AN AMOUNT TOO LOW TO FOLLOW ORGANIC TRITIUM (T) AFTER 90 DAYS. 3 PERCENT OF INITIAL ACTIVITY WAS (T), INCREASING TO 50-70 PERCENT BY 90 DAYS. THOMPSON, JAC 200, 791 (1959), AT THE RISK OF ALTERING METABOLISM BY HIGH DOSE, SUGGESTED A 900 EXPONENTIAL OF 80 TO 120 DAYS BIOL HALF LIFE AFTER INJECTING 14700 MICROCURIES. PRESENT AUTHORS FOUND PEAK ACTIVITY IN NANOCURIES/GM OF TISSUE AS FOLLOWS - KIDNEY HOPE 900 WITHIN 30 MIN - LIVER 190 AT 24 HRS - FAT 82 AT 14 HRS - [illegible] 60 AT 24 HRS - GUT 60 AT 17 HRS - PANCREAS 60 AT 19 - MARROW 51 AT 10 - THYMUS 46 AT 18 - SPLEEN 30 AT 21 - ETC. DOSE WAS CALCD BY THE FORMULA OF VERNOFF AND MENSER, HP 15, 377 (1962). 1 MILLICURIE OF FOLIC ACID GAVE TO LIVER, KIDNEY, MARROW 90,65,15 REMS, RESPECTIVELY - WITH A UNIFORM DOSE OF 12 REMS/MILLICURIE.

ORIGINAL • WATER • DOSE CALCULATION, INTERNAL • ICRP • PHYSICAL MASS • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • CONCENTRATION • TOXICITY • DISTRIBUTION • ACID • BONE, MARROW • MAMMAL, RAT • EXPOSURE, IP • EXPOSURE, IV • FAT • GI TRACT • KIDNEY • LIVER • LUNG • LYMPH NODE • NATURE • MUSCLE • PANCREAS • SKIN • SPLEEN • TESTIS • WHOLE BODY • ORGANIC • RADIOPHARMACEUTICAL • RETENTION FUNCTION • BRAIN • HEART • MEAT • THYMUS

047007
LOUGH SB
THE NATURAL RADIATION ENVIRONMENT
HEALTH AND SAFETY LABORATORY, NEW YORK
24 PAGES, PP. 605-628 OF RADIATION BIOLOGY AND MEDICINE, READING, MASSACHUSETTS, ADDISON-WESLEY PUBLISHING COMPANY, INC., 1959

DISCUSSES THE VARIOUS IMPLICATIONS OF NATURAL RADIATION WITH RESPECT TO COMPONENTS OF THE ENVIRONMENT, UNITS OF DOSE, COSMIC AND TERRESTRIAL GAMMA RADIATION, EXTERNAL DOSE DUE TO RADON AND THORON, EXTERNAL BETA RADIATION, INTERNAL LUNG DOSE FROM RADON AND THORON, AND THE NATURALLY OCCURRING RADIOACTIVE MATERIALS OF THE HUMAN BODY.

002687 [illegible]
CARBON • DEPOSITION • DOSIMETRY • INHALATION • MONITORING, GROUND LEVEL • POTASSIUM • GROSS BETA • GROSS GAMMA • RADIUM • RADON • DOSE MEASUREMENT, EXTERNAL • MONITOR, BACKGROUND • COSMIC RADIATION • DOSE MEASUREMENT, INTERNAL • ENVIRONMENT • THORIUM • CONCENTRATION • LUNG • WHOLE BODY

002720
BALLENTINE P
OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS
COMMISSARIAT A L'ENERGIE ATOMIQUE, BRUYERES-LE-CHATEL (FRANCE)
CEA-BIB-170 •. 65 PAGES. NOVEMBER 1970

TRITIATED WATER IS THE MOST HAZARDOUS SPECIES OF TRITIUM. IN PRESENCE OF AIR, TRITIUM AND ITS COMPOUNDS CAN BE CONVERTED INTO OXIDE BY TWO REACTIONS INDEPENDENT FROM EACH OTHER - (1) SELF-OXIDATION BY THE BETA RADIATION EMITTED. (B) ISOTOPIC EXCHANGE BETWEEN GASEOUS H2 AND THE H ATOMS OF WATER VAPOUR. KNOWLEDGE OF CONDITIONS AND RATE CONSTANTS FOR THE CONVERSION OF TRITIUM IN TRITIATED WATER IS NECESSARY FOR THE PROTECTION OF WORKERS IN A TRITIATED ENVIRONMENT. THIS BIBLIOGRAPHY, WHICH PROVIDES A THOROUGH STUDY OF THE INCREDIBLY TOO RARE PUBLISHED MATERIALS, ENABLES TO SHOW THAT THE DATA, PRESENTLY AVAILABLE, ARE INADEQUATE AND THAT FURTHER EXPERIMENTAL WORK MUST BE CARRIED OUT TO CONSIDER THEM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY • OXIDATION • ENVIRONMENT • WATER VAPOR

004729
BUSH WB
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (TS0065)
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER NUCLEAR LABORATORY, CANADA
AECL-2756 •. 17 PAGES, 6 FIGURES, 3 TABLES, 7 REFERENCES, 1967

MOST OF THE EXPOSURES RESULTED FROM INTAKE OF HTO VAPOUR THROUGH THE UNWETTED SKIN OF MEN WEARING AIR-SUPPLIED MASKS AND COTTON OVERALLS, WHERE HTO IS EXPOSED TO THE AIR IN VICINITY OF THE NRU REACTOR WHICH IS WATER-COOLED, D2O MODERATED. AVERAGE HTO ABOVE THE REACTOR WAS 0.17 CURIES IN 1964-5, A STANDARD MAN RECEIVING 850 MREM/YR FROM SUCH A CONCN. 40 MR/HR, BUT SINCE REAL MEN ABSORB HTO ONLY HALF AS FAST (BSIC NO. 5A1591, ANY WORK 30 MR/HR, THEY SHOULD HAVE RECEIVED 320, BUT ACTUALLY GOT 120 MREM/YR, IN AREAS AVERAGING LESS THAN OVER THE REACTOR, 5000 MREM/YR BEING THE LIMIT SET BY CANADIAN LAW. AVERAGE DOSES TO NRU OPERATING PERSONNEL IN 1966 WERE 700 MREM FROM HTO + 1.2 R FROM GAMMA RAYS, AVERAGE HTO DOSE RECEIVED BY 50 MEN REMOVED FROM EXPOSURE AREAS BEING 230 MREM. MEN ARE REMOVED FROM FURTHER HTO EXPOSURE IF THEIR URINE CONTAINS 20 MICROCURIES PER LITER OR MORE AND KEPT AWAY UNTIL URINE LEVEL DROPS TO 8 UCI/L (USUALLY 3 WKS). MEN WITH 7 TO 10 UCI/L ARE CLASSIFIED AS HAVING MINOR HTO CONTAM. AIR-SUPPLIED MASKS WORN IF ANTICIPATED DAILY EXPOSURE EXCEEDS SEVERAL HOURS, BUT NOT ALWAYS WHEN HTO CONCN WAS TRULY 7 TO 9 MICROCURIES PER LITER OF D2O. ROUGHLY EQUAL AMTS OF HTO ARE ABSORBED THROUGH SKIN AND LUNGS. INTERNAL-HTO PERMISSIBLE WITH MASKS.

CANADA • CODES AND STANDARDS • OXIDE • DOSE CALCULATION, INTERNAL • PERSONNEL EXPOSURE, RADIATION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • RESPIRATION, URINE • EXPOSURE, SKIN • MAN • LEGISLATION

004777
PINSON EA • LANGHAM WH
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0772)
UNIVERSITY OF CALIFORNIA, LOS ALAMOS SCIENTIFIC LABORATORY
10 PAGES. JOURNAL OF APPLIED PHYSIOLOGY, VOL. 10, PP. 108-124 (1957)

TRITIUM WAS DISCOVERED IN 1934. THIS INDUSTRIAL HEALTH HAZARD STUDY MEASURES (1) ENTRY RATES OF HT AND HTO BY INGESTION, INHALATION AND SKIN ABSORPTION INTO THE BODY, (2) DISTRIB AND RETENTION IN BODY COMPARTMENTS AND TISSUES, (3) EXCRETION RATE OF TRITIUM. SUBJECT WAS INGESTED 100,200,1000 ML OF WATER CONTAINING 1440, 1440, 2920 UCI OF HTO RESPECTIVELY, TO GIVE BODY DILUTION VOLS IN % OF BODY WT AS FOLLOWS - 67,58,47. CORRESPONDING VALUES FOR WOMEN WERE 100 ML WATER CONTAINING 1440 UCI HTO TO GIVE 47 AND FOR 25 1000,1440,67. SUBJECT WTS WERE 48,40,49 KG RESP. WATER TRANSFERRED FROM GI TRACT TO BLOOD PER UNIT TIME WAS PROP TO VOL INGESTED. VENOUS BLOOD ACTIVITY STARTING 2 TO 4 MIN POSTINGESTION, MAX IN 40 TO 45 MIN, IN AGREEMENT WITH DEUTERIUM DATA OF BETTERBERG, JAC 184,APT1950). 2.5 MR EQUIV ACTIVITIES WERE USED TO CALC ABOVE BODY DIL VOLS, WHICH WERE IN GOOD AGREEMENT WITH SCHLOERB, J CLIN INV 29,1290(1950). SUBJECTS THEN INHALED FOR 4 TO 5 MIN OF SATD WITH HTO VAPOR BY PASSING THROUGH WATER CONTAINING 1.37 MCI HTO/ML OF H2O. HTO IN BODY FLUIDS AT EQUIL RANGED FROM 22 TO 27 UCI/L, BODY DILUTION VOL FROM 37 TO 44 L, CALCD INCREASE OF HTO IN BODY FROM 810 TO 1080 UCI. HTO INSPIRED FROM 810 TO 1080, 97 TO 100% OF INHALED HTO REACHING THE BODY FLUIDS. CONCD TO BSIC NO. 6A770.

INGESTION • INHALATION • MAN • OXIDE • WATER • THERMAL CONSIDERATION • ICRP • PERSONNEL EXPOSURE, RADIATION • GAS • LIQUID • ABSORPTION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • RESPIRATION • PHYSIOLOGY/METABOLISM • BLOOD • EXCRETION, URINE • EXPERIMENTAL FUNCTION • HEAT • GI TRACT • PINSON • MAN • NATURE • ARM • SKIN • HALF • BODY FLUID • MOUE • METABOLIC KINETICS

004778
PINSON EA • LANGHAM WH
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0772A)
10 PAGES. JOURNAL OF APPLIED PHYSIOLOGY, VOL. 10, PP. 108-124 (1957)

[illegible]

[illegible]

[illegible] ABSTRACT [illegible]

[illegible] STUDIES WERE MADE OF 3 HUMAN SUBJECTS EXPOSED TO ATMOS SATD WITH [illegible] AT 24 DEG C FROM 1 TO 4 MIN RANGED FROM 3.3966 TO 3.317 MG/CM2/MIN WITH FROM 100 TO [illegible] IN THE AVERAGE. EFFECTS ON WATER AND ELECTROL BIRSES STUDIED, AND OF TEMP. ON SKIN [illegible] SKIN ABSORPTION AT 24 DEG C AT GREATER THAN 15 MIN 0.[illegible] MG/CM2/MIN, COMPARABLE TO ABSORPTION [illegible] PERSPIRATION. [illegible] IN DRY WARM SKIN OF RAT ATMOSES AFTER 4 MONTHS CHRONIC [illegible] THROUGH SKIN. [illegible] TRACT ABSORP FROM 200 TO 430 MICROCURIES/KG DRY WT. WITH BLOOD ACTIVITY RANGING FROM 4 TO 23 UCI/ML, EQUIV TO 0.[illegible] RAD/WK WHOLE-BODY RADIATION. ALTHOUGH [illegible] OF BODY WT OF 70 KG WAS TO BE TOTAL BODY WATER RATHER THAN THE GIVEN BY ICRP, ABS. [illegible] RAT. ABOVE HUMAN DATA. RAT DEUTERIUM WT TO WAS 50 TIMES FASTER THAN WAS PER KG OF BODY WT. [illegible] WERE GIVEN 6.14 UCI/ML OF ATD IN DRINKING WATER FOR 4 MONTHS, BODY FLUIDS 2000 [illegible], THEN NORMAL WATER INTAKE FOR 12 DAYS, AND URINE TISSUES PURGED TO GIVE FOLLOWING WATER OF [illegible] ACTIVITY IN UCI/ML AVERAGE FOR 4 MONTH - BRAIN 261, SKIN 193, MUSCLE 134, HEART 44, BONE 81, SPLEEN 4 THYMUS 47, GI TRACT 67, FAT 67, KIDNEY 64, LIVER 27, URINE 6. ABOVE RAT AND MOUSE [illegible].

INGESTION + INHALATION + TRITIUM + DOSE CALCULATION, INTERNAL + CORRELATION + GAS + LIQUID + RADIONUCLIDE UPTAKE + ANIMAL, LABORATORY + PHYSIOLOGY/METABOLISM + CONCENTRATION + TOXICITY + DISTRIBUTION + BONE + MAMMAL, MOUSE + MAMMAL, RAT + BIOPSYSTEM, CHEMICAL + EXPOSURE, IP + RAT + GI TRACT + KIDNEY + LIVER + MUSCLE + SKIN + SPLEEN + BODY FLUID + BRAIN + HEART + MONTH + THYMUS

[illegible]

[illegible] + [illegible]

DETERMINATION OF INTERNAL RADIATION DOSES FOR TRITIUM INTAKE (TRSA47)

[illegible], 1 FIGURE, 1 TABLE, 7 REFERENCES, PP. 93-97 OF THE PROCEEDINGS OF THE II. SYMPOSIUM ON HEALTH PHYSICS, [illegible], HUNGARY, SEPTEMBER 26-30, 1966

WHEN EVALUATING DOSES OF TRITIUM UPTAKE BY WORKERS AT THE HUNGARIAN INSTITUTE OF ISOTOPES WHERE AMONG THE TRITIUM-LABELED COMPOUNDS ARE SYNTHESIZED ARE TRITIATED HYDROGEN GAS AND TRITIATED WATER, ABOVE BY INHALATION OR SKIN ABSORPTION. TRITIATED WATER TAKES LESS THAN 1 HR TO EQUILIBRATE IN THE BODY FLUIDS. A PERMANENT BODY BURDEN OF 1.7 MILLICURIES OF TRITIUM HOMOGENEOUSLY DISTRIBUTED DELIVERS A NEW ANNUAL DOSE TO THE 63 KG OF SOFT TISSUE IN STANDARD MAN. THE WORK IS 1 MILLICURIE OF TRITIUM, CORRESPONDING TO 25 MICROCURIES/LITER SPECIFIC ACTIVITY IN BODY FLUIDS INCLUDING URINE. BODY BURDEN USUALLY DETERMINED FROM URINE OR EXHALED WATER VAPOR, [illegible] MINIMUM DETECTABLE BY METHOD USED. INVESTIGATION LEVEL BEING 3 MICROCURIES/LITER OF URINE OR LESS. 2 WORKERS ACCIDENTALLY EXPOSED TO TRITIUM GAS (TT) GAVE URINARY FUNCTIONS OF 19 [illegible] AND [illegible] RESPECTIVELY FOR THE 1ST 50 DAYS MEASURED. A 3RD WORKER VAPORIZED TRITIATED WATER (HTO) GAVE 120 E (ERR -0.0021%) DURING THE SAME TIME PERIOD. [illegible] MONITORING OF 12 PERSONS ENGAGED IN CHEMICAL SYNTHESIS FOR 2 YRS GAVE IN SOME CASES 1.4 [illegible] OF 33 MG/WK (1.35 TO 1.4 R/WK) MAXIMUM.

WORK + [illegible] + TRIBUTYLTIN TECHNICAL + DOSE CALCULATION, INTERNAL + HUNGARY + PERSONNEL EXPOSURE, RADIATION + [illegible] + LIQUID + [illegible] UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + RESPIRATION, URINE + [illegible] + [illegible] + MAN + WORK

[illegible]

[illegible]

[illegible] TRITIATED COMPOUNDS (TR2S7)

[illegible], 1 FIGURE, 1 TABLE, 4 REFERENCES, PP. 419-430 OF THE PROCEEDINGS OF THE SYMPOSIUM ON THE ASSESSMENT OF [illegible] IN MAN HELD BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AT HEIDELBERG, MAY 11-16, [illegible]

[illegible] LEVELS OF TRITIATED COMPOUNDS, WERE MONITORED BY THE RADIOL PROT SERVICE AND [illegible] TRITIUM, ONE OVER 4 TIMES THE MAX PERMISSIBLE BURDEN OF 1 MILLICURIE TRITIATED WATER WHICH IS ASSUMED TO BE AN KG EVENLY DISTRIBUTED THROUGHOUT THE 70 KG STANDARD MAN AND WHICH DELIVERS ABOUT 4 REM/YR TO BODY WATER (TISSUES CONTAINING THIS WATER) AND [illegible] UNFORTUNATELY, ICRP2 (1959) HAS ANOTHER MAX PERMISSIBLE [illegible] 1 MILLICURIE, 1 TRITIATED WATER FOR THE WHOLE BODY CORRESPONDING TO 1.046 UCI/ML [illegible] NOT AGREE ON WHICH SHOULD BE CONSIDERED THE CRITICAL TISSUE (BODY WATER OR WHOLE BODY), NOR DO ICRP (1959) GIVE GUIDANCE ON OTHER TRITIATED COMPDS. BEFORE [illegible], THE CONCENTRATION BUILD UP FACTOR BY A COMPANY FACTORY (CHEMICAL, 40-HR WK, 5 X 10 (ERR -4)) [illegible] TO BODY WATER, AND AFTER IMPROVEMENTS 5.7 X 10 (ERR -7) [illegible] A NEW [illegible] 30 DAYS FROM COMMISSION. BODY GAVE A BIOL HALF-LIFE (TB) OF 12.1 AND [illegible] WATER (HTO) RATHER THAN INGESTION AND PROBABLY NOT RATHER THAN HT, TT, OR TRITIATED [illegible] FROM THE PROCESSED. RADIUM STATISTICS BY BR GODBERY [illegible].

[illegible] INTERNATIONAL PUBLICATIONS, INC., 317 EAST 16TH STREET, NEW YORK, N.Y. [illegible]

WORK + [illegible] + BIOL [illegible], MAXIMUM + RADIUM + STATISTICAL FLUCTUATION + ICRP + PERSONNEL [illegible] + CORRELATION + [illegible] + PARTICIPATION UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + [illegible] + LIMITARY + RESPIRATION, URINE + EXPONENTIAL FUNCTION + MAN + WHOLE BODY + INDUSTRIAL + [illegible] + PHYSIOLOGY/METABOLISM + WORK

[illegible]

[illegible]

[illegible] OF TRITIUM (TR2S7)

[illegible], PP. [illegible] OF TRITIUM [illegible] OF TRITIUM, APRIL 14-18, 1966

[illegible] OF THE [illegible], MAY 13, [illegible] - MAX RANGE IN TISSUE 4 MICRONS, 20T

064731 *CONTINUED*
OF ALL BETAS ABSORBED WITHIN 1 MICRON, BREMSSTRAHLUNG ENERGY IN WATER 0.30025 KEV - SPECIFIC ACTIVITY 9000 CURIES/GM - RADIOL HALF-LIFE 12.4 YRS. CHEMICAL DATA - TT DISSOCIATION ENERGY 4.59 EV - IONIZATION ENERGY OF T 13.55 EV - 1 TRITIUM UNIT (TU) DEFINED AS 1 T ATOM PER 10 (EXP +18) H ATOMS - TRITIUM CONTENT OF RAIN AND RIVERS BEFORE 1954 4 TU, AFTER 1954 20 TO 500 TU - G VALUES (MOLECULES DEGRADED PER 100 EV) FOR ALCOHOL, CARBOXIC ACID, AMINO ACIDS RESPECTIVELY 4 TO 12, 5, 2 TO 30. RADIOLOGICAL DATA - ENERGY LOSS BY IONIZATION IN TISSUES 1.36 KEV/MICRON, AVERAGE NUMBER OF IONIZATIONS 47 PER MICRON, AVERAGE DISTANCE BETWEEN IONIZATIONS 0.02 MICRON - SINGLE TRITIUM DISINTEGRATION GIVES AN AVERAGE OF 53.5 RADS TO THE INNER 0.5 MICRON RADIUS AND 5.4 RADS TO THE NEXT 0.5 MICRON SHELL... - 1 CI/GM OF T IN A 500 CUBIC MICRON CELL NUCLEUS PRODUCES AN ABSORBED DOSE RATE OF ABOUT 12 RADS/HR. BIOLOGICAL DATA - WATER BALANCE, TOTAL WATER, EXTRACELLULAR WATER, INTRACELLULAR WATER (%), FLUID WATER INTAKE, FOOD WATER INTAKE (ML/DAY), WATER LOSS THROUGH SKIN, LUNGS, URINE, FECES (ML/DAY) ARE AS FOLLOWS - CONTD TO NSIC NO. 64732.

OXIDE * WATER * DOSE CALCULATION, INTERNAL * WATER, DRINKING * PROPERTY, PHYSICAL * REVIEW * RADIOLOGY * GAS * LIQUID * RADIONUCLIDE UPTAKE * ANIMAL, VERTEBRATE * PHYSIOLOGY/METABOLISM * SPECIFIC ACTIVITY * RANGE EXTENSION * ENERGY SPECTRUM * LINEAR ENERGY TRANSFER * MAN * EXPOSURE, BACKGROUND * BODY FLUID

064732
NUMBER H
SURVEY OF AVAILABLE DATA ON TRITIUM (TONES)
PAPER FROM SEMINAIRE SUR LA PROTECTION CONTRE LES DANGERS DU TRITIUM, APRIL 16-19, 1964

CONTD FROM NSIC NO. 64731. WATER BALANCE DATA FOR MALE AND FEMALE, RESPECTIVELY, AS FOLLOWS - 60.55 - 15.15 - 69.60 - AND FOR MALE ONLY STARTING WITH FLUID WATER INTAKE, 1500 - 1000 - 500 - 400 - 1500 - 100. AUTHOR CITES 12 DAYS AS AN AVERAGE BIOL HALF-LIFE FROM THE LITERATURE BUT SINGLES OUT MYLIF (NSIC NO. 62563) IN OF 9.5 DAYS. SEE ALSO NSIC NOS. 69550, 69550, 69700, 69702, 50150, 50150, 62507, 64725, 64727, 64729, 64730 FOR DATA ON BIOL HALF-LIFE OF TRITIUM IN MAN. MENDER (NSIC NO. 69549) IN A HUMAN LETHAL EXPOSURE REPORT POINTS A 280 DAY HALF-LIFE FOR 5% AND 30 DAYS FOR 90% CHRONIC INTAKE OF HT OR TT GAS. SNYDER (NSIC NO. 69535) FOUND A 36-DAY HALF-LIFE FOR 2% OF AN ACUTE INTAKE OF HTO. BIOL-HALF-LIFE IS DECREASED BY INCREASED WATER INTAKE (NSIC NO. 64727), 265 HRS AT 2.7 L/DAY AND 47 HRS AT 17.4 L/DAY WATER INTAKE. AUTHOR INDICATES THAT ABSORPTION OF HTO THROUGH SKIN IS AS IMPORTANT AS ABSORPTION VIA RESPIRATION, CITING WENZEL-SCHULZE, TRITIUM-HANDLING (1962), RUTLER, NUCLEAR SAFETY 4, 77 (1963), REINIG, ATMAD 26 27A (1964) - NOT SEE ALSO NSIC NO. 64728 AND DEERING, AW 3 POINTS 71, 1037 (1951). AT A CONCN OF 0.01 UCI/CM3, 1 MCI OF HTO IS ABSORBED IN 2 MIN WITHOUT RESP PROTECTION, IN 5 MIN WITH AIR-SUPPLIED MASK ONLY, IN 17 HR IN A 12 MIL AIR-SUPPLIED 1-PIECE PLASTIC SUIT.

MPRB * MPC * OXIDE * DOSE CALCULATION, INTERNAL * WATER, DRINKING * HAZARDS ANALYSIS * ICRP * PERSONNEL EXPOSURE, RADIATION * REVIEW * GAS * LIQUID * REPORT * ABSORPTION * RADIONUCLIDE UPTAKE * ANIMAL, VERTEBRATE * BIOLOGICAL HALF-LIFE * RESPIRATION * PHYSIOLOGY/METABOLISM * EXPOSURE, SKIN * MAN * NATURE * SKIN * FEMALE * MALE

064733
VERLY WG
CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES
PAPER FROM SEMINAIRE SUR LA PROTECTION CONTRE LES DANGERS DU TRITIUM, APRIL 16-19, 1964 (TONES)

REVIEW OF TRITIATED HYDROGEN GAS (T2), TRITIATED WATER (HT), TRITIATED THYMIDINE (T), OTHER TRITIATED ORGANICS (O). 0.0048 CI (T) GETS OXIDIZED IN THE HUMAN BODY (PINSON, LA-1214 (1951)), AND FOR 0.3 REM/WK TO EXPD THE (MPC)A, 40-HR-WK, IS 0.17 UCI/CM3, TROUGH ANIMALS DIE WITH WHOLE-BODY IRRADIATION SYMPTOMS AND NO ACUTE LUNG LESIONS, 0.08 UCI/CM3 BEING THE (MPC)A FOR WHOLE-BODY, 0.1 REM/WK (NSIC NO. 64729). INGESTED (T) IS COMPLETELY ABSORBED, BUT INHALATION IS THE MORE COMMON RISK ACCOMPANIED BY SKIN ABSORPTION FROM THE ATMOSPHERE. MPAR OF 1.7 MCI CORRESPONDS TO A SPECIFIC ACTIVITY OF 2.5 MCI/CM3 OF WATER IN 70 KG STAND MAN WHO CONTAINS 40,000 CM3 OF WATER. 40-HR-WK (MPC)A FOR (T) IS 5 X 10 (EXP -4) UCI/CM3. I.V. (T) DISAPPEARS RAPIDLY FROM PLASMA (1/2H BEFORE EQUILIBRATION). 50% OF (T) USED FOR DNA BIOSYNTHESIS. MITOSING CELLS WITHIN 1/2 HR AND A SMALL % OF A-AMINOISO-BUTYRIC ACID EXCRETION IN URINE WITHIN 24 HRS. REMAINDER CATABOLIZED TO WATER. HUMAN BODY CONTAINS 10 (EXP +13) CELLS, OLIVER, NATURE 144, 91 (1940), UNDERGOING DNA SYNTHESIS, WHICH CAN BE CONSIDERED THE CRITICAL ORGAN, 30% OF THE BETA ENERGY ABSORBED IN A UNIT DENSITY SPHERICAL CELL OF 500 CUBIC MICRON VOL, RAD 1.7. GIVEN IS 1 MCI MPAR, IF UNIFORMLY DISTRIBUTED, CELLS PERMANENTLY LABELED. CONTD TO NSIC NO. 64734.

MPRB * MPC * OXIDE * HAZARD, RELATIVE * WATER * DOSE CALCULATION, INTERNAL * ICRP * REVIEW * CRITICAL MASS * GAS * LIQUID * RADIONUCLIDE UPTAKE * ANIMAL, VERTEBRATE * BIOLOGICAL HALF-LIFE * PHYSIOLOGY/METABOLISM * TOXICITY * DNA * AMINO ACID * MODEL, BIOLOGICAL * MAMMAL, MOUSE * MAN * PROTEIN * INORGANIC * ORGANIC * THYMIDINE

064734
VERLY WG
CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES
4 PAGES, 1 FIGURE, 11 REFERENCES, PP. 117-127, OF SEMINAIRE SUR LA PROTECTION CONTRE DU DANGERS DU TRITIUM, APRIL 16-18, 1964

CONTD FROM NSIC NO. 64733. SOME LABELED CELLS SUBSEQUENTLY MULTIPLY, DILUTING THE TRITIUM (CORNEISE, NATURE 184, 193 (1959)) OR DIE AND THE TRITIUM LIBERATED. LISCO, NATURE 192, 477 (1961), NOTED 50% PHOSPS IN 17-FOLD-FOLD MICE AFTER A SINGLE DOSE OF 1 MCI TRITIATED THYMIDINE PER GM OF BODY WT. CORRESPONDING TO 70 MCI IN THE WHOLE-BODY OF STANDARD 175 KG MAN. HOWEVER, INTRAVENOUS INJECTION IS NOT AS LIKELY AN ACCIDENT FOR MAN AS SKIN ABSORPTION + INHALATION. INGESTION WOULD GIVE INTENSE LABELING OF THE INTESTINAL EPITHELIUM MAINLY. IT THE CRITICAL ORGAN FOR ORGANIC MOLECULES OTHER THAN THYMIDINE, BASED ON A REFERENCE STUDY (SORENSON, JNC 140, 115

064734 (CONTINUED)

(1964) WITH 3H-GLYCINE. THE PRESENT AUTHOR SUGGESTS A 3-COMPARTMENT QUALITATIVE MODEL CONSISTING OF (1) FREE AMINO ACID SPACE, (2) PROTEINS SUBDIVIDED INTO 3 POOLS, (3) TOTAL WATER. SPRESSER AND WITTENBERG GAVE A NORMAL SUBJECT 0.2 CM OF HTO/DAY. URINARY EXCRETION OF GLYCINE INITIATED IN THE 2-POSITION NEGLIGIBLE BUT 30% CATABOLIZED TO WATER WITHIN A FEW HRS. REMAINDER INTEGRATED INTO PROTEINS WITH A HALF-LIFE OF 60 DAYS. THESE PROTEINS DIVIDED INTO 3 MAIN POOLS - 40% OF THE HT FIXED IN LIVER AND PLASMA PROTEINS WITH HALF-LIFE 10 DAYS, 14% IN KIDNEY, SPLEEN, HEART, TESTES, INTESTINE WITH 70 DAYS AND 46% IN LUNG, MUSCLE, SKIN, BRAIN, BONE FOR 150 DAYS.

NEWSLETTER • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • TOXICITY • AMINO ACID • BONE • MODEL, BIOLOGICAL • MAMMAL, MOUSE • KIDNEY • LUNG • MAN • MUSCLE • PROTEIN • SKIN • INTESTINE, SMALL • SPLEEN • TESTIS • ORGANIC • BLOOD, PLASMA • BRAIN • HEART • MONTH • THYMIDINE

064737
SLATER TF • SAWYER B • STRAUSS W
DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (1964)
UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, LONDON, ENGLAND
3 PAGES, JOURNAL OF CLINICAL PATHOLOGY, VOL. 17, PP. 494-496 (1964)

CF ASIC NO. 64736. ENVIRONMENTAL TRITIUM GETTING INTO THYMIDINE OF THE PLANT FOOD CHAIN CAN BE INCORPORATED INTO DNA, RNA, AND PROTEIN OF ANIMALS INCLUDING MAN TO THE EXTENT THAT THYMINE OR THYMIDINE CROSSES THE INTESTINAL MEMBRANE. IF DNA IS THE CRITICAL ORGAN (MOLECULE) FOR THYMIDINE TRITIATED IN ONE OR MORE ACCESSIBLE POSITIONS, THEN DOSE IN VARIOUS ORGANS CAN BE CALCD FROM DNA CONTENT OF THOSE ORGANS IF ORGAN UPTAKE AND RETENTION OF THYMIDINE ARE KNOWN. A 70-KG MAN EATS 100 GM PROTEIN/DAY AND IF ALL OF IT WERE CATTLE OR FOWL LIVER WHICH CONTAINS 20% PROTEIN, THEN LIVER CONTAINING 0.34 MG DNA-P/GM FRESH WT IF CONTENT OF DNA 9.27% WOULD GIVE A DAILY INTAKE OF 1.86 GM DNA/100 GM PROTEIN CONSUMED AS LIVER. ACCORDING TO N.F. SUDDERICH, U.S. ARMY MED.RES. AND NUTRITION LAB, FITZSIMONS GEN HOSP, DENVER, COLORADO. PRESENT AUTHORS ANALYZED ORGANS OF 3 MALES (60,70,71 YR) AND 2 FEMALES (19,71 YR) TO GIVE FOLLOWING - ORGAN, MEAN WT OF ORGAN (FROM SPECTER (1964)), DNA-P IN MG/TOTAL ORGAN WT - LIVER, 1838,106.5 - LUNG, 993,117.0 - SPLEEN, 204,67.0 - KIDNEY, 313,50.2 - BRAIN, 1355,20.0 - TESTIS, 20,6.20 - THYROID, 25,7.6 - PROSTATE, 17.1.94 - ORGAN WTS FOR 20- TO 30-YR-OLD 71-KG MALES, AND 56-KG FEMALES, OVARY 10.7.53.

LIVER DEFENSE • ABSORPTION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • CONCENTRATION • FOOD CHAIN • DNA • PLANT • CELL • CELL, NUCLEUS • MODEL, BIOLOGICAL • MAMMAL, RAT • MAN • MATURE • RNA • FEMALE • OFFSPRING INTAKE • MALE • PASS • ORGAN • THYMIDINE

064740
OLIVER R • LASTHA LG
HAZARD OF TRITIUM AS A DNA LABEL IN MAN (1964)
OXFORD HOSPITAL, ENGLAND
2 PAGES, NATURE, 204(4971), PP. 91-92 (1964)

MAN IS NOT A HELA CELL IN A CULTURE MEDIUM, BUT SINCE THE 1 MICRON AV-RANGE TRITIUM BETA IS ABSORBED WITHIN THE CELL (1/2 MAX DOSE-RATE IN 15 CUBIC MICRONS) A CELLULAR APPROACH IS SUGGESTED TO SOME. 0.03 UCI/GM WITHIN A 500 CUBIC MICRON NUCLEUS DELIVERS 0.04 RAD OR 0.1 REM IN 1 WEEK SO THAT NUCLEUS (CF ASIC NO. 64739), AND IF ADULT MAN HAS 10 (EXP +13) CELLS IN HIS ADULT (ASIC NO. 64739) AND ALL OF THEM WERE DIVIDING, THEN PRESENT AUTHORS CLAIM THIS WORLD CONSTITUTE A BODY BURDEN OF 15 UCI AVERAGING OVER TOTAL NUCLEI, OR 0.03 OF THE ICRP2 (1959) VALUE. PAINTER, SCIENCE 127, 1264 (1958). INCEPTION 24-HR GROWTH OF HELA CELLS WITH 4,000 UCI/ML OF TRITIATED WATER AND 5 UCI/ML OF TRITIATED THYMIDINE. A 0.054-MEV PARTICLE DISSIPATES ITS ENERGY WITHIN A 1 MICRON SPHERE TO GIVE AN ABSORBED DOSE OF 160 RADS (200 REMS FOR AN RBE OF 1.3) OR 4 TIMES MORE ENERGY THAN WOULD BE DEPOSITED IN THE 1ST PART OF A C-14 BETA TRACK IN THE SAME VOL. CROMMITE, ASIC NO. 64741, PRODUCED IN-VIVO MITOTIC INHIBITION OF MOUSE SPERMATOGONIA AT 60 HR BY INJECTING 1 UCI/GM OF BODY WT OF HT-THYMIDINE OR BY GIVING 5 R OF EXTERNAL GAMMA IRRADIATION. A GOOD AUTORADIOGRAPHY REQUIRES 8 X 10 (EXP +4) ATOMS/NUCLEUS OF 500 MS VOL, OR A UCI/GM OF NUCLEUS, OR 10 TIMES AS MUCH THYMIDINE IN NUCLEI AS IN WHOLE-BODY. A UCI/GM GIVES A DOSE OF 4 RADS (0.8 REMS) IN 40 HRS. BIOL HALF-LIFE OF DNA THYMIDINE IN-VIVO IS NOT KNOWN.

DOSIMETRY • HAZARD, RELATIVE • DOSE CALCULATION, INTERNAL • RADIATION MODEL • REVIEW • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • TOXICITY • CELL • CELL, NUCLEUS • MODEL, BIOLOGICAL • ABSORBED FRACTION • LINEAR ENERGY TRANSFER • MAN • MITOSIS • DOSE • DISTRIBUTION, MICRO • EFFECT, DOSE • THYMIDINE

064741
JOHNSON RA • CROMMITE EP
EFFECTS OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (1964)
BROOKHAVEN NATIONAL LABORATORY, NEW YORK
7 PAGES, RADIATION RESEARCH, VOL. 11, PP. 825-831 (1959)

MIN DOSE (EXP) AT WHICH TRITIATED THYMIDINE (T) PRODUCES OBSERVABLE RADIATION INJURY TO MAMMALS WAS NOT DEFN OBTAINED, AND THEORETICAL PREDICTION IS NOT EASY. MOUSE SPERMATOGONIA (S) HAVE AN LD50 OF 20 TO 24 R OR EXTERNAL CO60 GAMMA AND ARE AFFECTED BY AS LITTLE AS 4 R ACCORDING TO CROMMITE, J EXPTL ZOOL 140, 349 (1959). FOR HISTOL EVAL OF RADIATION DAMAGE FROM (S) PRESENT AUTHORS USED METHOD OF DARNBRE WHICH INCLUDES FAILURE OF (S) TO PASS SUCCESSFULLY THROUGH 2 MITOSES AND TO DIFFERENTIATE INTO SPERMATOCYTES. THOUGH HIGHLY RADIOSENSITIVE, MOUSE TESTIS MIGHT BETTER BE USED AS A CONSISTED BIO THYMIDINE-US HIGH-ENERGY RADIATION SINCE HT LABELING OF THE SEMINIFEROUS TUBULES IS NOT UNIFORM. AN ID DOSE OF 1 UCI/GM BODY WT OF (T) PRODUCES EFFECT ON (S) COMPARABLE TO THAT PRODUCED BY 5 R OF ACUTE WHOLE-BODY EXTERNAL GAMMA, 5 AND 10 UCI/GM DOSES CORRESPONDS TO 10 AND 20 R OF GAMMA RESPECTIVELY. FRACTIONS OF CELLS SURVIVING 0.0,5,1,5,10,20 UCI/GM DOSES WERE RESPECTIVELY 1,0.97,0.92, 0.74,0.69,0.66. EACH REPRESENTING AN AVERAGE OF 40 TUBULES IN A RATE OF 40 (P). CORRESPONDING RATIOS OF SPERMATOCYTES/SPERMAL CELLS

004741 <CONTINUED>
DEBNG 4.87,4.92,4.94, 3.49,3.59,3.93. A SERIOUS LIMITATION OF EDPT IS THAT ALL MEMBERS OF THE CELL POPULATIONS STUDIED WERE NOT EQUALLY IRRADIATED.

MAMMAL, OPERATIVE + DOSE CALCULATION, INTERNAL + DOSE CALCULATION, INTERNAL + AUTORADIOGRAPHY + CORRELATION + ORGAN + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + MORPHOLOGY + DNA + CELL + CELL, NUCLEUS + MAMMAL, MOUSE + EXPOSURE, IP + NATURE + ANALYSIS + TESTES + MALE + EFFECT, DOSE + THYMIDINE

004742
RECOMMENDED DIETARY ALLOWANCES (1750272270741
NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD
6 PAGES, PP. 16-20 OF RECOMMENDED DIETARY ALLOWANCES, SIXTH REVISED EDITION, 1980

A DESIMETRIC MODEL FOR DIETARY INTAKE OF TRITIUM IN THE FORM OF DNA, PROTEIN, OR OTHER ORGANIC FORM REQUIRES DIET AND EXCRETION DATA. THE BASAL HEAT REQUIREMENT PER 70-KG REFERENCE MAN IS 1750. AND PER IDEAL PROTEIN 70 KG/DAY AT HEAL. SO TOTAL REQUIREMENT PER IDEAL PROTEIN IS 96 SP/DAY. ON ALLOWING FOR PCD INDIV VARIABILITY IN A LARGE POPULATION IT IS 45.5 GM/DAY OF IDEAL PROTEIN. TAKING FOR UTILIZATION OF FOOD PROTEINS, THE DOSE RECEIVES AS SPV/DAY OR 0.9 GRAMS OF DRY W/DAY FOR THE 70-KG PER MAN AS RECOMMENDED BY THE FOOD AND NUT BOARD. ASSUMING 2 GM OF [illegible] GM OF PROTEIN OF ANIMAL PROTEIN SUCH AS CATTLE OR FISH LIVER, AND TAKING 33 GM E AS WT OF [illegible] IN AN AVERAGE DNA MOLECULE, ADULT MAN SHOULD CONSUME 0.4 GM TRYMIDINE/DAY. IF WHICH SHOULD BE ADDED THE CONTRIBUTION FROM DNA INTAKE, SEE ALSO ACIC NO. 04787. [illegible] 5, AT 11-55) ICP REC-70-06671 POLAR WOMAN DRINKS TRYMIDINE IN DAY DRINK TO BE FROM 45 TO 120 MG IN SPRING/SUMMER AND 100 TO 200 IN AUTUMN/WINTER, AVERAGE 70 9 MATURE DATS. WE FREQUENTLY IN OTHER FORMS SUCH AS ANTIHISTAMINIC ACID (19 MG/DAY), ANSEDDIO-71 (1969). 100 UGM PROVIDED FROM 100 PARS TO THE BODY STORE OF 25 GM OF TRYMIDINE.

INGESTION + DIETARY HABIT + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + DNA + MODEL, BIOLOGICAL + RECEPTION, URINE + MORPHOLOGY RATIO + DEPOSITION + DNA + FOOD INTAKE + TRYMIDINE

004743
LONG C + KING EJ + SPERRY WM
CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (1975)
6 PAGES, PP. 443, 474, AND 744 OF BIOCHEMISTRY HANDBOOK, [illegible], E. JAN E. W. SPRS 1975, 1977

ASSUMING 100 P CONTENT FOR DNA ARE PRA TO BRAIN, THE CONC OF DRA/DG ARE THE CONC OF BRAIN/DG OF CONS- BRAIN WT CAN BE APPROXIMATED FROM DNA-P AND DNA-P LITERATURE VALUES AS FOLLOWS - MAN 3.6 TO 1.7, 0.6 TO 1.2 - DOG 0.5 TO 0.4, 0.5 TO 1.1 - GUINEA PIG 3.1 TO 1.1, 0.6 TO 1.5 - RAT 1.5, 1.5 TO 2.0 - CHICKEN 0. 1.05 - FISH 21. 2.05. BRAIN WTS IN G OF ADULT BODY WT IN SAME ORDER ARE 1.77 TO 3.07 - 0.49 - 0.97 TO 1.33 - 1.27 - 0.40 TO 0.44 - 0.4. THE DNA CONTENT OF LIVER CELLS FOR MAN, GUINEA PIG AND RAT IS ABOUT 10 MICROGRAMS PER 10 1000 MAN CELLS. FOR BRAIN 7.7. FOR ADULT RICE WEIGHING 25 GM, THE CONC OF DNA IN A 33 UG TRYMIDINE IS ABOUT 1 GM OF DNA/GM OF WET WT TISSUE. FOR RAT PANCREAS (P 7171) IS 4.3 GM/KG WET TISSUE AND DNA IS 13.0. FROM DNA CONTENT OF EACH ORGAN THE DOSE TO EACH ORG [illegible] TISSUE) FROM DNA-INCORPORATED 3-TRYMIDINE CAN BE CALCD IF BRAIN DATA SUCH AS TURNOVER RATES A [illegible] MAMMAL. CF MISC NOS. 04742, 04740, 04739, 04738, 04736, 04724, 50193, 50100, 49507, 49504. DNA IS NOT CONSTANT HOWEVER, F.G., 18 UG DNA/100 MG WET RAT LIVER IN DAYTIME ALT 79 AT NIGHT ACCORDING TO HOROVITZ, NATURE 202, 201 (1964).

CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BRAIN, FISH + PHYSIOLOGY/METABOLISM + CONCENTRATION + FOOD CHAIN + DNA + DIVERSITY, SPECIES + MAMMAL, SMALL + MAMMAL, DOG + MODEL, MATHEMATICAL + MAMMAL, RAT + LIVER + PANCREAS + DNA + MASS + ORGAN + BRAIN + THYMIDINE + THYMUS + FISH

004747
RUSTAD JR + CROMARTIE EP + FLIEDNER TM
METABOLISM AND RATE OF INITIATED TRYMIDINE IN MAN (1750)
10 PAGES, 7 FIGURES, 1 TABLE, 25 REFERENCES, JOURNAL OF CLINICAL INVESTIGATION, VOL. 10, PP. 900-910 (1960)

AVAILABILITY TIME OF INJECTED TRYMIDINE-3H3-DEOXYRIBOSIDE (A) IS SHORT, PLASMA H3 RAT WITHIN 1 MIN AND THEN DECLINING PRECIPITOUSLY. ROUGH MAMMAL H3 UPTAKE WITHIN 1 MIN. MOST TRYMIDINE IN 1ST 10-15 MIN. ESSENTIALLY COMPLETE IN 60 MIN. AFTER WHICH H3 PLASMA ACTIVITY DUE TO TRYMIDINIC ACID, 6-OH-AMINOISOBUTYRIC ACID (B) AND OTHER DECOMPOSITION PRODUCTS OF (A). AT LEAST 90% OF INJECTED (A) OBTAINED IN-VIVO AND POSSIBLY INTO NEW DNA OF PROLIFERATING CELLS, AT LEAST 75% OF (A) DEGRADED TO HTO, WITH (B) THE MAJOR COMPONENT OF URINE WHICH ALSO H3. EVEN IN THE 1ST URINE SAMPLES. BIOL HALF-LIFE OF THE HTO POOLED WAS FROM 7 TO 17 DAYS. IN CALCULATING HAL (A) DEGRADED TO HTO, THE URINE OR PLASMA WITH HIGHEST HTO WAS TAKEN TO BE REPRESENTATIVE OF TOTAL BODY WATER (TBW) AT THAT TIME. TBW TAKEN TO BE 52% IN NORMAL MAN. NON-VOLATILE H3 TAKEN AS DIFF BETWEEN TOTAL H3 AND HTO OF PLASMA. 90% OF INJECTED ACTIVITY LOST FROM BLOOD IN 1ST MIN. BOTH PATIENTS DIAGNOSED AS GLIOBLASTOMA MULTIFORME, A 46-YR-OLD MACHINIST, COMATOSE WAS DECEPTIVE AFTER CRANIOTOMY SURVIVING 4 MONTHS, AND A 65-YR-OLD SURVIVING 4 MONTHS. GIVEN SP ACT 0.2 TO 7 CI/MM, 1ST WAS 5 INJECTIONS OF 10 MCI EACH AND 1 OF 20. THE 2ND WAS SINGLE INJECTION OF 8 MCI (0.1-0.5 MCI/GM).

BIOMEDICAL + WATER + AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOMEDICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + BRAIN, PERIPH + EXCRETION, URINE + EXPOSURE, IV + DNA + MATURE + RATE + IC PATHOLOGICAL + RETENTION FUNCTION + BLOOD, PLASMA + BODY FLUID + MODEL + THYMIDINE + WATER

004748
RUSTAD JR + KELLER S + WAGE L + CROMARTIE EP
INCORPORATION OF INITIATED TRYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (1750)

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[illegible]

FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER [illegible]

[illegible]

COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND [illegible] GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS [illegible]

DEPARTMENT OF PHYSICS, THE UNIVERSITY OF TEXAS, M.D. ANDERSON HOSPITAL AND TUMOR INSTITUTE, TEXAS MEDICAL CENTER, [illegible]

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[illegible]

LOS ALAMOS SCIENTIFIC LABORATORY, UNIVERSITY OF CALIFORNIA, LOS ALAMOS, NEW MEXICO

[illegible]

[illegible]

ASSESSMENT OF INTERNAL CONTAMINATION RESULTING FROM RECURRENT OR PROLONGED UPTAKES (ICRP [illegible])
ICRP PUB [illegible] P. [illegible] PAGES, 1 REFERENCE, 2 TABLES, 2 FIGURES, 19[illegible]

[illegible]

CODES AND STANDARDS • [illegible] • DOSE CALCULATION, INTERNAL • ICRP • [illegible] UPTAKE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • EXCRETION, URINE • EXPONENTIAL FUNCTION • WHOLE BODY • [illegible] • RETENTION FUNCTION • [illegible]

[illegible]

MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS [illegible]
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
[illegible]-1429 P. 29 PAGES, OCTOBER 1962

[illegible]

AIRBORNE RELEASE • CANADA • CODES AND STANDARDS • [illegible] • [illegible] • SITING, REACTOR • [illegible] • DOSE

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CODES AND STANDARDS • POLICY • DEVICES • DECONTAMINATION, STAFF • WASTE STORAGE • ELECTRIC POWER • OCEANS • WASTE MANAGEMENT • RADIATION SAFETY AND CONTROL • MEASUREMENT • FUEL REPROCESSING • SURVEY • DATA COLLECTION • EFFECT, GENETIC • POLLUTION • RADIATION EFFECT • RADIATION EXPOSURE • AGENCY, FEDERAL • R-CHEM, SAFETY OF • SEQUESTRAL, FEDERAL

[illegible]
JOHNSON DC
THE USE OF INTERNATIONAL ORGANIZATIONS IN THE FIELD OF RADIOLOGY
10 PAGES, REFERENCES, 20, PAGES 120-130, JUNE 1971(?) CONFERENCE

REPORT OF AGENCIES OF THE UN PARTICIPATION OF 3-GROUP DIFFERENT SOURCES CONTAINING ALL ASPECTS OF RADIATION. VOLUMES ALREADY PUBLISHED INCLUDED REPORTS ON USE OF RADIONUCLIDES, NON-IONIZING RADIOTHERAPY, TOXICITY OF RADIONUCLIDES, SAFE HANDLING, DETECTION OF FALLOUT, SAFETY STANDARDS, AND MEANS OF RADIOPROTECTION. FURTHER SUBJECTS DISCUSSED INCLUDED USE TO SMALL-SCALE COMMUNITY, ENVIRONMENTAL CONTAMINATION, STANDARDS AND DOSES AND MEASUREMENT OF NUCLIDE CONCENTRATIONS, DOSIMETRY OF X RADIATION, ACCURACY AND REPRODUCIBILITY OF STANDARDS AND REFERENCE DOSES. THE TEN VOLUMES MENTIONED IN THIS ARTICLE (CHECKED C-16, W-9, I-129, P-32, AND S-35, AVAILABILITY AND SOURCES OF PUBLICATIONS (1969 IN THESE VOLUMES ARE GIVEN.

CATEGORY • CODES AND STANDARDS • DOSE • FISSION PRODUCT RELEASE • IODINE • TRANSPORTATION AND HANDLING • PHOSPHORUS • SULFUR • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • RADIOISOTOPE • RADIOGRAPHY • X-RAY • PHOTOGRAPHY • THERAPY • ORGANIZATION, INTERNATIONAL

[illegible]
MERRIFIELD AD • PATTERSON DC
HEALTH PHYSICS ASPECTS OF TRITIUM
1 PAGE, AMERICAN NUCLEAR SOCIETY TRANSACTIONS, 14(1), PAGE 161, JUNE 1971

TRITIUM RELEASED TO THE GENERAL ENVIRONMENT FROM REACTOR CYCLES SUCH AS THE AIR-PLANT, PLANT-ENVIRONMENT, PLANT-MAN, AND ENVIRONMENT-MAN LINKS. TRITIUM DERIVED IN THE LAST PART OF THE ABOVE LINKS CAN BE DESCRIBED BY SIMPLE MATHEMATICAL EQUATIONS. HOWEVER, THE INTERACTIONS OF TRITIUM WITH ORGANIC COMPOUNDS PRESENT IN TISSUE OF FACT THE OF THESE LINKS IS COMPLICATED AND, TO A GREAT EXTENT, UNKNOWN.

DOSE • EXPOSURE • DESORPTION • ORGANIZATION • MATHEMATICAL TECHNIQUE • RADIOACTIVITY RELEASE • MATHEMATICAL TREATMENT • MODERATION • MEASUREMENTS • EXCITATION, WORK • MAN • MAIN • PHYSICAL CONTROL • ORGANIC

[illegible]
SPEECH BY PAUL C. TOMPKINS, ED. DIR., AEC
20 PAGES, REPRINT REPORT JCAP CONF, ON ENVIRONMENTAL EFFECTS OF PRODUCTING ELECTRICAL POWER, NOVEMBER 1969

SPEAKER GIVES A HISTORY OF DEVELOPMENT OF RADIATION CONDITIONS AND OF VARIOUS GROUPS FORMED TO DEVELOP THESE STANDARDS. THIS PAPER DATE TO THE REPORT. HE SHOWS HOW THE VARIOUS BODIES WERE FORMULATED AND IN THE COURSE OF TIME, AS CIRCUMSTANCES DEMANDED (E.G., MORATORIUM PROJECT, TOTAL ATMOSPHERIC TESTS, ETC.), PUBLICATIONS WERE REPRINTED AND MODIFIED. AS TIME PROGRESSED, MORE AUTHORITATIVE AND PRESTIGEOUS BODIES WERE ORGANIZED AND THEIR EXTENSIVE STUDIES LED TO DEVELOPMENT OF UNDERSTANDING OF RADIATION EFFECTS AND SETTING OF REVISED STANDARDS. HE PRESENTS A NUMBER OF IMPORTANT FINDINGS THAT WERE LISTED IN THE 1967 REPORT AS SUCCEED WHICH OUTLINED AREAS WHERE RELIABLE ASSUMPTIONS MUST BE MADE BUT WHERE FURTHER EXPERIMENTAL DATA IS ALMOST MANDATORY ALTHOUGH PROBABLY DIFFICULT TO ACHIEVE. HE SAYING HOW FOR POSSIBLE ANALYSIS OF ITS CONCLUSIONS AND THOUGH WHAT IT REGARDS ITS INFORMATION.

CATEGORY • CODES AND STANDARDS • FISSION PRODUCT RELEASE • IODINE • STRONTIUM • RADIUM • DEAD • WEAR • RADIOACTIVITY RELEASE • EFFECT, GENETIC • EFFECT, SOMATIC • RADIATION EXPOSURE • MAN • AGENCY, FEDERAL • WORK • OPERATIONS, FEDERAL

[illegible]
SPEECH BY CLARENCE F. LARSON, COMMISSIONER, USAEC
TO CHEMS, FIBERS, TEXTILE, HEARINGS REPORT JCAP CONF, ON ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER, DECEMBER 30, 1969

A COMPREHENSIVE REPORT OF THE ACTIVITIES OF THE AEC IN ENVIRONMENTAL STUDIES IS PRESENTED BY THE SPEAKER. CONCERNING SOMATIC EFFECTS, HE REMARKS THAT AT PRESENT, IT IS NOT CLEAR WHETHER SOME OBSERVED LOW EFFECTS OF RADIATION HAVE A THRESHOLD DOSE FOR PRODUCTION. HE DETAILS SOMATIC AND GENETIC EFFECTS, OBSERVED AND MADE EXPERIMENTS. TRITIUM AND NOVOTCH ORIGINAL-MULTI-LINES, NATURAL PRODUCTION AND CONCENTRATION OF DEBRIS, AND PLUTONIUM, AND WORK PERFORMED IN DATA GOALS. PRODUCTIVE-EFFICIENT-CONTROL OBSERVE AND DEVELOPMENT ARE DETAILED. THESE INCLUDE DESCRIPTIONS OF THE NEW PROCESSES THEMSELF AND USED IN DECONTAMINATING AND TREATING NUCLIDES FROM PROCESSING WASTE STREAMS. RADIOACTIVE GAS (POWER REACTORS ARE ALSO CONSIDERED. THE FATE OF HEAVY-METAL NUCLIDE DISCHARGES FROM STREAMS IS CONSIDERED. AS ARE THE VARIOUS METHODS TO DISPOSING OF THE WASTES BY SUCH METHODS AS HYDROLIC FRACTURING -- AND REPORTED BY COMPREHENSIVE GAUGE FROM REPORTS AND UNDERGROUND REPORTINGS. OTHER TOPICS DISCUSSED AND DISCUSSED IN DETAIL CONTROL REFRIGERANTS AND THERMAL EFFECTS STUDIES.

CATEGORY • COOLANT • FISSION PRODUCT RELEASE • CERAMICS • CONTAMINATION • STRONTIUM • TIME • INVESTIGATION EXPENSES • WASTE MANAGEMENT • METHODOLOGY • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • REFRIGERANT • THERMAL POLLUTION • CALCULATE FLUXES I (PUBL) • DATA COLLECTION • EFFECT, GENETIC • EFFECT, SOMATIC • RADIATION EFFECT • AGENCY, AEC • CONSERVATION, NOV • ENVIRONMENT, SAFETY OF • OPERATIONS, AEC

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(AD-[illegible]) [illegible] PAGES, SEPTEMBER 30, 1969

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AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

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INVESTIGATION OF IRRITATED LUNGS'S COMPONENTS
[illegible]
[illegible]-71-7 [illegible] 16 PAGES, 7 FIGURES, 6 TABLES, JUNE 1971

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AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

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(AD-[illegible]) [illegible] PAGES, 1971

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(AD-[illegible]) [illegible] PAGES, PAPER PRESENTED AT THE [illegible] UNITED NATIONS INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, SEPTEMBER 16, 1971

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[illegible]
[illegible] JR
[illegible] HANDBOOK OF RADIATION MONITORING. 1990
[illegible] SCIENTIFIC LABORATORY. NEW MEXICO
LA-[illegible] P. 210 PAGES. FIGURES. TABLES. 1990

SINCE 1950, THERE HAVE BEEN MANY CHANGES IN THE TECHNOLOGY OF RADIATION PROTECTION AND IN THE MEANS OF MORE EFFECTIVELY IMPLEMENTING THIS TECHNOLOGY. IN THE PRESENT REVISION OF THE HANDBOOK, THE ARRANGEMENT HAS BEEN CHANGED TO PERMIT INCLUSION OF MORE BACKGROUND INFORMATION, AND SUPPLEMENTARY TABLES OF DATA ARE GATHERED IN APPENDICES. DESPITE THE MORE CIRCUMSTANCE OF THE PREVIOUS EDITIONS, THE PURPOSE OF THE HANDBOOK REMAINS THAT OF SERVING THE NEEDS OF THE LOS ALAMOS SCIENTIFIC LABORATORY.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

KEYWORDS AND STANDARDS • RECOMMENDATIONS • MEASUREMENT • MONITOR, INTEGRITY • HANDBOOK, GENERAL PRACTICE • HANDBOOK, PERSONNEL • PERSONNEL PROTECTIVE DEVICE • PLUTONIUM • WASTE DISPOSAL • PLUMBING • MONITOR, ENVIRONMENTAL • HANDBOOK • RADIATION SAFETY AND CONTROL • SAFETY PRINCIPLES AND PHILOSOPHY • MONITORING SYSTEM, RADIATION • RADIATION HAZARDS

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[illegible] BY
[illegible] LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (1972)
[illegible] ENERGY OF CANADA LTD., CHALK RIVER LABORATORIES
19 PAGES. RADIATION RESEARCH, VOL. 50, PP. 197-211 (1972)

THE DEPOSIT OF PRODUCING 1 GIGA-WATT-ELECTRICAL-HOUR HAS A RISK OF 0.10 MILLIREM ACCORDING TO THE TRITIUM LIMITING POINT PLANT STUDY GENERIC NO. 04700. EMPLOYEES AVERAGING 20 MREM TO WHOLE BODY. WORKERS AT THE PLANT REACHED THE NON-OCCUPATIONAL DOSE BUDGET WITHIN A FEW WEEKS GENERIC NO. 04700. REMAINS 1000 MREM. ASSUMING ALL DATA TRITIUM IN MAN FROM AND ASSUMPTIONS WHICH HAS BEEN CONSIDERED GENERIC NO. 04700. FOR MORE ASSUMPTIONS ABOUT TRITIUM PRODUCTION IN MAN SEE NRIC NO. 04770, 04777,04779,04780, 04781. [illegible] TRITIUM IN PRODUCTS WEARING TRITIUM-ACTIVATED LUMINOUS-PAINT WRIST WATCHES MAY AVERAGE 7 MCI/L AS DEGREES 0.7 +-0.2 PPM THESE WERE NO NOT GENERIC NO. 07900. -- PURPOSE OF PRESENT REPORT BY CSIRONO WAS TO REPORT TRITIUM LEVELS IN MAN AND MIS FUNDAMENTAL TO A BASE FOUNDATION FOR MAN. ABOUT 400 ML A PERSON'S WATER THROUGHOUT IS TAKEN IN AS DRINKING WATER SPOND WATER EXCLUDING. MEAT WT COMES IN BODY WATER TAKEN TO BE 60% TO THAT INGESTED. HIGHEST WATER COMES OF 90% IS 5% GRAMS OR 375 OF INGESTED WATER. ASSUMP GRAMS 1000 WATER. THEN AT BODY WATER MI TO 40 MCI OR 1.0 MCI/ML. DESP-EQUIV DATE IS 170 MREM/YR TO CORRECT. THE AVERAGE POPULATION DOSE-RATE LIMIT RECOMMENDED BY ICRP TO 170 MREM. USING ICRP 2 (1960) AND ICRP 10 (1960) GENERIC NO. 04700 ASSUMPTIONS, DESIGNED ESTIMATES A CONCEPTUALLY MAINTAINED BODY BURDEN OF 91 MCI OR MI AS DEGREES 64 BY ICRP TO DELIVERED 170 MREM/YR WHEN INGESTED WATER CONTAINS 0.7 MCI/ML AS DEGREES 1.0. OR CORRESPONDING BIO CONCENS OF 0.10 AND 0.00 MCI/ML RESPECTIVELY.

DOSE RECEIVED • MONITORING • INGESTION • IONIZATION • WATER • MAN • [illegible] • HAZARD, RELATIVE • WATER • BIO • DOSE CONCENTRATION, INTERNAL • WATER, DRINKING • PERMISSIBLE EXPOSURE • ICRP • ICRP • PERSONNEL EXPOSURE, RADIATION • ENVIRONMENT • PROVIDED • PERMISSIBLE LEVEL • ANIMAL, VERTEBRATE • POSITRON/EMISSION • EFFECT, GENETIC • DOSE • MODEL, DEVELOPMENT • PERMISSIBLE, DEGREE • EXPOSURE, CHRONIC • DATA • PATHWAY • REPORT VS DATA • BODY FLUID

[illegible]
[illegible] J
[illegible] OF [illegible] AND C-14 CONTRIBUTES (1972)
U.S.E. DISTRIBUTED UNIT, HANFORD, DIRECT, PRESSURE, [illegible]
1 PAGE 7 REFERENCES, [illegible] ON NUCLEAR [illegible], [illegible], PP. [illegible] (1972)

CD NRIC NO. [illegible]. RADIATION PROTECTION STANDARDS HAVE BEEN DERIVED BY ASSUMING LINEAR RELATION BETWEEN DOSE AND EFFECT AND TERMINATING FROM HIGHER DOSE RATES TO LOWER INTERMEDIATE RECEIVED INTERPRETED DATA, ASSUMING [illegible] RESTRICTIONS OF DOSE TO [illegible] TISSUE. REFERENCE TO SHORT-LIVED FOR TRITIUM AND CARBON DATES, [illegible] IS DOSE SHOWN BY CONSIDERED AT EXTRA-DISTRIBUTED LEVEL, AND TRANSMUTATION OF [illegible] CIA INCORPORATED INTO MACROMOLECULES OF THE BODY. THE 1962 SUPPLEMENT TO ICRP 2 (1960), RESTRICTED AS ICRP 6 (1962), PRESENTED BY PROGRAM PRESS (1960). DISCUSSES QUALITY AND DISTRIBUTION OF RADIATION AS IT PASSES THROUGH AND IS ABSORBED BY MATTER. ASSUMING DISTRIBUTION AND QUALITY FACTORS TO 1 FOR THE TRITIUM COMPONENT THROUGH, WATER, FOLIC ACID AND CONTAMINATION, THERE IS NO MORE WORK CONSIDERED TO AND PERMISSIBLE DOSES BASED RECOMMENDED BY ICRP AND ARMY 7000, 50, 70, 70 WEI RESPECTIVELY AND ARMY 700, 7, 7 FOR THE RESPECTIVE COMPONENTS LOWER WITH CIA, SINCE THE MORE DATA -BASED FROM CIA IS 54 INSTEAD OF 5.7 RDS. SEE ALSO NRIC NOS. 07[illegible], 04900, 04907, 04777, 04780, 04784, 07137.

CONTROL • FOODS AND STANDARDS • [illegible] • UNITED KINGDOM • MAN • MAN CONTAMINATION, INTERNAL • ICRP • PERSONNEL EXPOSURE, RADIATION • REPRODUCTION • [illegible] • ENVIRONMENT IMPACT • ANIMAL, VERTEBRATE • PERMISSIBLE/EXPOSURE • HUMAN, MAN • DOSE • OTHER • MAGNETIC • CHLORIN • TRITIUM

[illegible] AT
[illegible] AND • [illegible] AN
[illegible] DEGREES FROM CHANGES BROADCASTING TO TRITIUM DOSING TO DEGREES
[illegible] 1-[illegible] P. 4 PAGES, 1 FIGURE, 1 [illegible] 15, 19 REFERENCES, [illegible], VOL. 11, PP. [illegible] (1972) [illegible]

[illegible] TRITIUM IN TRITIUM [illegible] IN MAN DOSE OF TISSUE IS [illegible] THAN THAT DISPOSED THROUGHOUT THE WHOLE BODY OF THE BODY. THE RATIO OF DOSE [illegible] AND [illegible] TO THAT FOR THE WHOLE BODY IS NEGLECTED BUT ONLY [illegible] 110,001 BUT A [illegible] 17,001.

267769 RECONTINUED

LIVER, SKELETAL MUSCLES, KIDNEYS, HEART MUSCLE, BLOOD, BRAIN AND BONE RESPECTIVELY 1.30, 0.90, 0.79, 0.69, 1.99, 0.51, 0.44. THE 50-DAY DOSES TO PARTICIPATING GROUP WERE CALCD TO BE PER THE ORV COMPONENT IN: HEART OF GROUP 4169, 3.7, 012, 6770, 67, 20, 461, 12, 1.7 RADS RESPECTIVELY. THE BONE MOSES 9 MONTHS AFTER CESSATION OF THE DAILY 8.5, INJECTION OF 9 UCI/KG TRITIUM OXIDE RESPECTIVELY 7000, 2.4, 249, 7002, 34, 14, 481, 30, 7.0. RADS/DAY WERE CALCD BY THE FORMULA A (1 - E TEXP -0T)) WITH A VALUES OF 5.54, 10.00, 10.04, 10.52, 10.60, 11.20, 11.42, 10.40, 10.47 AND A VALUES OF 0.250, 0.154, 0.101, 0.061, 0.109, 0.104, 0.150, 0.140, 0.150 RESPECTIVELY FOR ABOVE ORGANS IN ABOVE ORDER. THE 8 WATER DEP LB/MIN. OVAL PROPORTION DOSE I MRD 67.0(1)(0.61) FOR THESE RESPECTIVELY ORGANS IS 32.0, 72.7, 79.5, 70.0, 86.4, 81.5, 89.3, 79.5, 70.0 AND CORRESPONDING 8 DAY DESIRES THE DIFFERENCE FROM 100, PER 3 AS HALF CHRONICALLY RADIATE 120 ARRAYS USED TO EMPTY. OF CHANGES, RADIOSENSITIVE 11.4911199(1). MORAN 48 OF BODY WT. ARRANGES 0.002, LIVER 3.2, SKELETAL MUSCLES 47.0, ETC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

TRITIUM • HAZARD, RELATIVE • MAXIMUM • MPCW CALCULATION, INTERNAL • CRITICAL MASS • PHARMACOLOGY UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/PATHOLOGY • DISTRIBUTION • BLOOD • MORAL, SMALL • DRUG, HUMAN • EXPERIMENTAL FUNCTION • EXPOSURE, CHRONIC • EXPOSURE, IN • KIDNEY • LIVER • NATURE • MUSCLE • BONE • BODY • MALE • MASS • MORGAN • OPERATIONAL FUNCTION • ANIMAL • BRAIN • HUMAN

CO7961

MYERS RS • STANLY JR • GUDINSEN DG

HEALTH PHYSICS ASPECTS OF THE TRITIUM RELEASE

LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA

UCRL-73916 P. 10 PAGES, JULY 16, 1971

ON AUGUST 6, 1970, 200,000 CI OF TRITIUM WAS ACCIDENTALLY RELEASED THROUGH AN EXHAUST STACK AT THE LAWRENCE RADIATION LABORATORY, IN LIVERMORE, CALIFORNIA. SOON AFTER THE RELEASE, EMERGENCY-RESPONSE PERSONNEL SURVEYED THE SITE WITH PORTABLE TRITIUM AIR MONITORS AND AN EXTENSIVE ENVIRONMENTAL SAMPLING WAS STARTED. THE RESULTS FROM THE SAMPLING PROGRAM INDICATE THAT NO SIGNIFICANT EXPOSURE TO ON- OR OFF-SITE INDIVIDUALS RESULTED FROM THE RELEASE. ALL ENVIRONMENTAL SAMPLES OF WATER, MILK, AND URINE CONTAINED NORMAL BACKGROUND LEVELS OF TRITIUM.

AVAILABILITY - U.S. NTIS, LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA

EFFLUENT • ACCIDENT, MONITOR • SAMPLING • STACK • ACCIDENT, RADIOISOTOPE • MONITOR, ENVIRONMENTAL • DOSE CALCULATION, EXTERNAL • RADIOACTIVITY RELEASE • CONCENTRATION

CO7964

MARTIN JR • MORANDA JJ

IMPORTANCE OF TRITIUM IN THE CIVIL DEFENSE CONTEXT

CALIFORNIA UNIVERSITY, LIVERMORE, LAWRENCE RADIATION LABORATORY

UCRL-73005 P. 15 PAGES, MARCH 8, 1971

THE IMPORTANCE OF TRITIUM IN THE CIVIL DEFENSE CONTEXT IS ASSESSED BY COMPARING THE DOSE RATE AND 50-YEAR DOSE INTEGRAL FOR TRITIUM FROM FUSION WITH THE EXTERNAL DOSE OF GAMMA-EMITTING FISSION PRODUCTS. TRITIUM IS SHOWN TO BE RELATIVELY UNIMPORTANT IN THE CIVIL-DEFENSE CONTEXT WHEN COMPARED WITH THE EXTERNAL GAMMA DOSE FROM AN EQUAL YIELD OF FISSION PRODUCTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION PRODUCT RELEASE • CIVIL DEFENSE • DOSE CALCULATION, EXTERNAL • GAMMA EMITTER • SAFETY EVALUATION • COMPARISON

CO7994

COPER JJ • HIGGINS GH

SUBCHRONIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT

LAWRENCE RADIATION LABORATORY, LIVERMORE

UCRL-73197 • CONF-710800-14 P. 22 PAGES, FROM THE TRITIUM SYMPOSIUM LAS VEGAS, NEVADA, AUGUST 30, 1971

IN ACCORDANCE WITH CURRENT GUIDANCE, TRITIUM RELEASES MUST BE KEPT BELOW QUANTITIES WHERE NRC LIMITS ARE EXCEEDED, AND SHOULD BE KEPT AS LOW AS PRACTICABLE. DETERMINATION OF PRACTICABILITY REQUIRES AN ANALYSIS OF BENEFIT VERSUS RISK CONSIDERATIONS. SUCH AN ANALYSIS HAS BEEN PERFORMED FOR CERTAIN GENERAL CASES. IT IS BASED ON A MRD VALUE OF 0250 IN MRD IS THE AMOUNT OF BENEFIT REQUIRED TO JUSTIFY A RADIATION EXPOSURE OF ONE MAN-REM AND CONSIDERS THE NATURE OF TRITIUM DISTRIBUTION IN THE BIOSPHERE AS WELL AS CERTAIN GEOGRAPHIC FACTORS. IT ALSO ASSUMES THAT CONSTRAINTS IMPOSED BY EXPOSURE GUIDES ARE OBSERVED. THE ASSUMPTIONS AND CALCULATIONS ARE REVIEWED IN DETAIL. THE POSSIBLE SOCIAL AND MORAL IMPLICATIONS OF SUCH AN ANALYSIS ARE ALSO DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

NRC • RADIATION IN PERSPECTIVE • RADIOACTIVITY RELEASE • ENVIRONMENT • RADIATION EXPOSURE • BENEFIT VS RISK • SOCIO/PHILOSOPHICAL CONSIDERATION

CO7995

ANSPAUGH LR • MORANDA JJ • MORISCH WL • MARTIN JR

DOSE TO MAN VIA ROOT-CROP TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR

070070 CONTINUED
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-73805 • CONF-710804-12 •. 31 PAGES. FROM THE TRITIUM SYMPOSIUM HELD IN LAS VEGAS, NEVADA, AUGUST 30, 1971

POST REPORTS TO PROJECT THE DOSE TO MAN AS A RESULT OF POSSIBLE FOOD-CHAIN CONTAMINATION FOLLOWING THE RELEASE OF THE WATER HAVE DATA BASED UPON MODELS HAVE APPROPRIATE FOR THE RELEASE OF RADIONUCLIDES WHICH DIFFER SUBSTANTIALLY FROM THOSE IN THE EXAMPLES AND PATHWAYS OF ECOLOGICAL TRANSPORT. FIELD STUDIES IN CONJUNCTION WITH PROJECT ROLLPIN AND CONTROLLED PARAGUAY EXPERIMENTS INDICATE THAT SUCH MODELS CORRESPONDS THE DOSE TO MAN BY GROUPS OF RADIONUCLIDES. DATA FROM THESE AND OTHER PRESENT EXPERIMENTS ARE USED TO DERIVE A MORE REALISTIC, SIMPLE MODEL WHICH MAY BE USED TO PROJECT THE DOSE TO MAN VIA INHALATION PLUS ABSORPTION AND VIA THE INGESTION OF VEGETABLES, MILK, AND MEAT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECOLOGY • BODY • INGESTION • INHALATION • MILK • CRITICAL NUCLIDE • CRITICAL NUCLIDE PATHWAY • WATER VAPOR • ABSORPTION • MODEL • CONCENTRATION • FOOD CHAIN • IRRADIATION EXPOSURE, ACUTE • IRRADIATION EXPOSURE, CHRONIC • FOOD

070019
MERKLE G • SCHIFFRODECKER H
INCORPORATION HAZARDS AND THEIR ESTIMATION
HEINRICHSCHWEIZERTHAL, KARLSRUHE, GERMANY
9 PAGES. RADIOLOGIE, 10(5), PP. 301-305 (SEPTEMBER 1970 (IN GERMAN)

THE INCORPORATION OF RADIOACTIVE MATERIAL IS DISCUSSED WITH RESPECT TO HAZARD. THE SURVEY CONSIDERS THE EFFECTIVE HALF-LIFE OF INCORPORATED RADIONUCLIDES AND RATE OF INCORPORATION AND DISTRIBUTION IN THE BODY. DETERMINATION IS DETERMINATION OF THE INCORPORATED RADIOACTIVITY BY WHOLE-BODY COUNTING AND BY EXCRETION ANALYSIS. IT WAS CONCLUDED THAT INTERVALS BETWEEN EXAMINATION OF PERSONNEL SHOULD NOT EXCEED THE EFFECTIVE HALF-LIFE OF THE RADIONUCLIDE UNDER CONSIDERATION. MEASUREMENTS OF INCORPORATION SHOULD BE PERFORMED MONTHLY FOR TRITIUM AND CO-60, WEEKLY FOR URANIUM, AND FOUR TIMES A YEAR FOR PLUTONIUM.

COBALT • COUNTER • DEPOSITION • DOSE • PLUTONIUM • HAZARD, RELATIVE • URANIUM • ANALYTICAL TECHNIQUE • CONTAMINATION • DOSE MEASUREMENT, INTERNAL • RADIOISOTOPE • SAFETY EVALUATION • BIOLOGICAL HALF-LIFE • EXCRETION • WHOLE BODY

070044
MASHISSI AA • LIEDERMAN D
COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS • EASTERN ENVIRONMENTAL RADIATION LABORATORY, MONTGOMERY
9 PAGES. 1 FIGURE, 1 TABLE, 7 REFERENCES. HEALTH PHYSICS. VOL. 22, PP. 509-527 (MAY 1972)

CONSERVATIVE DOSE ESTIMATES TO THE POPULATION ARE OBTAINED BY THE ASSUMPTION THAT THE CONCENTRATION IN BODY WATER IS EQUAL TO THAT IN DRINKING WATER. THIS IS SHOWN BY STUDY OF RESIDENTS DOWNSTREAM FROM THE SAVANNAH RIVER NUCLEAR PLANT FOR WHOM TRITIUM IN URINE WAS 1-8 NC/LITER, AVERAGING 0.4 OF THAT IN TAP WATER.

DOSE CALCULATION, INTERNAL • WATER, DRINKING • RIVER, SAVANNAH • ENVIRONMENT • BIOACCUMULATION/TURNOVER • FOOD CHAIN • FIELD EXPERIMENT • CONCENTRATION FACTOR • EXCRETION, URINE • MAN • BODY FLUID

071194
MASHISSI AA • LIEDERMAN D
COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER
WESTERN ENVIRONMENTAL RESEARCH LABORATORY • EASTERN ENVIRONMENTAL RADIATION LABORATORY
9 PAGES. 1 FIGURE, 1 TABLE, 7 REFERENCES. HEALTH PHYSICS. 22(5), PP. 509-511 (MAY 1972)

BASED ON LIMITED STUDY, IT IS CONCLUDED THAT THE TECHNIQUE OF ESTIMATING DOSE TO THE POPULATION USING THE ASSUMPTION THAT THE CONCENTRATION OF TRITIUM IN BODY WATER IS EQUAL TO THAT IN DRINKING WATER IS CONSERVATIVE FOR THE PROTECTION OF PUBLIC HEALTH, UNLESS SOURCES OF TRITIUM INTAKE OTHER THAN DRINKING WATER ARE SIGNIFICANT.

WATER, DRINKING • POPULATION EXPOSURE • DOSE MEASUREMENT, EXTERNAL • DOSE MEASUREMENT, INTERNAL • CONCENTRATION • DECOMPOSITION • EXCRETION, URINE • BODY FLUID

071195
FITZSIMMONS CH • MENELIS DA • WAWLF CT
TRITIUM ACTIVITY IN URINE FROM LUMINOUS DIAL WRIST WATCHES
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA
9 PAGES. 1 FIGURE, 2 TABLES, 9 REFERENCES. HEALTH PHYSICS. 22(5), PP. 514-516 (MAY 1972)

STUDIES AT THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY HAVE SHOWN THAT TRITIUM IN VARIOUS CHEMICAL FORMS IS RELEASED FROM TRITIUM ACTIVATED LUMINOUS COMPOUNDS. IT WAS SPECULATED, THEREFORE, THAT TRITIUM LUMINOUS WATCHES MIGHT BE RESPONSIBLE FOR THE ELEVATED TRITIUM BODY BURDENS OF SOME OF THE RESIDENTS. EXPERIMENTS ARE DESCRIBED AND DATA GIVEN WHICH SUPPORT THIS SPECULATION.

URANIUM • PERSONNEL EXPOSURE, RADIATION • RADIOACTIVITY RELEASE • HUMANBODY • BODY BURDEN

[illegible]
[illegible]
[illegible] DOSE DUE TO ACUTE INGEST OF TRITIUM IN MAN
[illegible] ENERGY AND SAFETY LABORATORY, NEW YORK OPERATIONS OFFICE
[illegible] 0. 19 PAGES. [illegible] 1972

SMALL AMOUNTS OF THE ION RECOVERED AS WATER BY MAN ARE INCORPORATED INTO TISSUE COMPONENTS AND OTHERWISE PERSISTENTLY LONGER THAN THE 0-TY-10-DAY HALF-TIME ASSOCIATED WITH DISTRIBUTION IN THE BODY WATER. A REVIEW OF THE DATA FROM THE [illegible]-TYPE CONTAMINATIONS OF HUMAN CASES OF EXPOSURE TO TRITIUM SHOWS THAT THE BOUND COMPONENTS WITH ASSOCIATED HALF-TIMES OF ABOUT 10 AND 450 DAYS CAN BE IDENTIFIED. A TWO-COMPARTMENT SYSTEMIC AND MODEL-COMPARTMENT-MODEL CALCULATION HAS BEEN USED TO DETERMINE THE CONTRIBUTION TO THE TISSUE DOSE FROM TRITIUM IN THE BODY WATER AND IN THE BOUND COMPONENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • WATER • [illegible] CALCULATION, [illegible] • MODEL • [illegible] • [illegible] • [illegible]-TIME, EFFECTIVE • [illegible], [illegible] • [illegible], [illegible] • MAN • [illegible] • [illegible]

[illegible]
[illegible] • [illegible]
[illegible] OF INTERMEDIATE TRITIUM, [illegible] AND [illegible]
THE OHIO STATE UNIVERSITY, COLUMBUS • [illegible] UNIVERSITY SCHOOL OF MEDICINE, [illegible]
[illegible] PAGES, [illegible] FIGURES, [illegible] REFERENCES. RADIATION RESEARCH, VOL. [illegible], NO. [illegible] (JULY 1972)

[illegible] CELLS WERE EXPOSED [illegible] DOSES OF [illegible]. [illegible]-DEPENDENT, OR [illegible] AND [illegible] TYPE DATA. [illegible] DOSES TO OBTAIN A QUANTITATIVE EVALUATION OF THE [illegible] EFFECTS RESULTING FROM [illegible] DECAY OF THE [illegible] ENVIRONMENTS. INTRACELLULAR TRITIUM AND [illegible] PRODUCE [illegible] EFFECTS. THE TWO [illegible], [illegible] [illegible], [illegible] SURVIVAL CURVES WHICH ARE [illegible] OF LOW-LET RADIATIONS. IN TERMS OF ENERGY [illegible] PER CELL, THE [illegible] FROM [illegible] EXCEED THE EFFECTS OF TRITIUM BY [illegible] BY A FACTOR OF 4 TO 9. IN SPITE OF A [illegible] SPREAD OF RESPONSE, THE [illegible] SURVIVAL CURVE RESEMBLES THE [illegible] CURVE WITH [illegible] RADIATION.

[illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible] • [illegible] OF
SUMMARY REPORT ON LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY
[illegible] 1972. 11 • [illegible]-19 0. 19 PAGES. FROM THE TRITIUM SYMPOSIUM, LAS VEGAS, NEVADA, AUGUST 30, 1972

IN ACCORDANCE WITH CURRENT CITCHANGE, TRITIUM RELEASES MUST BE KEPT WELL BELOW QUANTITIES WHERE NPC LEVELS ARE EXCEEDED, AND SHOULD BE KEPT AS LOW AS PRACTICABLE. DETERMINATION OF PRACTICABILITY REQUIRES AN ANALYSIS OF BENEFIT-VERSUS-RISK CONSIDERATIONS. SUCH AN ANALYSIS WAS PERFORMED FOR CERTAIN GENERAL CASES. IT IS BASED ON A NET VALUE OF $750 OR MORE IS THE AMOUNT OF BENEFIT REQUIRED TO JUSTIFY A RADIATION EXPOSURE TO ONE MAN-REM AND CONSIDERS THE NATURE OF TRITIUM DISTRIBUTION IN THE ENVIRONMENT AS WELL AS CERTAIN DEMOGRAPHIC FACTORS. IT ALSO ASSUMES THAT TERRESTRIAL [illegible] BY EXPOSURE GROWTH ARE CONSERVED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GUIDE • [illegible] • NRC • [illegible] • HAZARDS ANALYSIS • [illegible] RELEASE • DISTRIBUTION • BENEFIT VS RISK • [illegible]

[illegible]
[illegible]
TRITIUM CHIPS
ARC-TR-7239 0. 161 PAGES, FIGURES, TABLES, REFERENCES, 1968

A RESEARCH COMPREHENSIVE EXTENSIVE THEORETICAL AND EXPERIMENTAL MATERIAL ON THE DISTRIBUTION, KINETICS OF EXCHANGE, AND BIOLOGICAL ACTION OF TRITIUM OXIDE. THE VERY DATA ON THE PHYSICAL PROPERTIES OF DEUTERIUM AND TRITIUM, THE ISOTOPIC EXCHANGE OF HYDROGEN, THE KINETICS OF ISOTOPIC EXCHANGE, METHODS FOR MEASURING TRITIUM IN BIOLOGICAL MEDIA, THE KINETICS OF WATER EXCHANGE IN THE ANIMAL AND HUMAN ORGANISM, PATHWAYS AND RATES OF ASSIMILATION OF TRITIUM OXIDE THROUGH THE GASTROINTESTINAL TRACT, LUNGS, AND SKIN, AND THE KINETICS OF THE ELIMINATION OF TRITIUM OXIDE FROM THE ANIMAL AND HUMAN ORGANISM ARE ANALYZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] PATHWAY • ION EXCHANGE • [illegible], PHYSICS • ANIMAL • ASSIMILATION • DISTRIBUTION • ELIMINATION • GI TRACT • LUNG • MAN • SKIN • [illegible] (ORGAN) • [illegible] KINETICS

[illegible]
RISK OF
ASSESSING AND CONTROLLING THE HAZARD FROM TRITIATED WATER

079523 <CONTINUED>
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER NUCLEAR LABORATORIES, ONTARIO
AECL-4150 ?. 100 PAGES, FIGURES, TABLES, REFERENCES, APRIL 1972

PRACTICAL AND THEORETICAL INFORMATION IS PRESENTED TO HELP RADIATION SURVEYORS AND OPERATORS OF HEAVY-WATER REACTORS AND UPGRADING PLANTS TO UNDERSTAND, ASSESS AND CONTROL THE OCCUPATION HAZARD FROM TRITIATED WATER VAPOR OR ETHYL. THE INGRESS OF HTO THROUGH THE SKIN AND LUNGS, ITS RECEPTION AND THE ASSOCIATED RADIATION DOSE ARE DISCUSSED, AND CONCEPTS SUCH AS CRITICAL ORGAN, DOSE COMMITMENT, MAXIMUM PERMISSIBLE CONCENTRATION IN AIR (MPCIA) AND (MPCIW-WAT) ARE EXPLAINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + IONIZATION + MPC + PERSONNEL PROTECTIVE DEVICE + REACTOR, POWER + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + RADIOPHOTON + RECEPTION + LUNG + MAN + SKIN

079576
SHEVTS JEAN + DERLEN A + ANDRES D.;
SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT
COMMISSION OF THE EUROPEAN COMMUNITIES, LUXEMBOURG (BELGIUM)
12 PAGES, 1 TABLE, NUCLEAR SAFETY, 1972, PP. 405-501 (SEPTEMBER/OCTOBER 1972)

THE SYMPOSIA PAPERS SEPARATE PROTOCOLS APPEAR IN NSIC PROTOCOLS FOR WASTE AND LISTED AND CHARACTERIZED BRIEFLY. SOME OF THE QUESTIONS RAISED AT A 2.5-HOUR PANEL DISCUSSION ARE PRESENTED - EFFECTS FROM TRITIUM PRODUCED BY FAST REACTORS, ACCOUNTING FOR PARAMETERS WHICH AFFECT RADIONUCLIDE UPTAKE, THE TERM "LIFE ING RADIOLOGICAL CAPACITY" INCLUDES OR SAFETY FACTORS, THE TERM "CRITICAL POPULATION" DOES NOT ACCOUNT FOR MULTIPLE SOURCES AND EFFECTS FROM OTHER POLLUTANTS, AND EXTENSION OF THE FARMER TREATY TO NONRADIOACTIVE POLLUTANTS. ANSWERS TO NONE OF THESE QUESTIONS REQUIRE FURTHER WORK IN "RADIOLOGICAL FORECASTING" FOR A NONRADIOGENIC WASTE. ALSO IN ANALYSIS OF HAZARDS IN CONNECTION WITH BOTH RADIOACTIVE WASTE DISPOSAL AND ENVIRONMENTAL CONTAMINATION BY TRITIUM AND THE NOBLE-GAS RADIONUCLIDES.

ECOLOGY + EUROPE + NOBLE GAS + ATMOSPHERIC POLLUTION + WASTE DISPOSAL + CRITICAL NUCLIDE PATHWAY + ENVIRONMENT + WATER POLLUTION + FORECAST + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + NOND EARTH + POLLUTION + ECOSYSTEM, MARINE + ECOSYSTEM, MODEL + SYSTEM ANALYSIS + MODEL, DETERMINISTIC + ECOSYSTEM, ESTUARINE + ORGANIZATION, INTERNATIONAL

079015
CORNET M + GERARD B
RADIOLOGICAL RISKS RELATIVE TO THE DISTRIBUTION OF CONTAMINATED GAS
UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-TRANS 10017-2 ?. 19 PAGES, 1 TABLE, 5 REFERENCES, MAY 1971

EVALUATED THE AVERAGE AND MAXIMUM DOSES LIKELY TO REACH CONSUMERS WHO, FOR ALL THEIR USUAL REQUIREMENTS, USE A STORED GAS SLIGHTLY CONTAMINATED BY REMAINING IN A NUCLEAR CAVITY. ALTHOUGH THE INVESTIGATION WAS CARRIED OUT IN THE CONTEXT OF A WELL-DEFINED PROJECT IN AN ATTEMPT TO OBTAIN REALISTIC VALUES, IT IS FULLY APPLICABLE TO ALL SIMILAR CASES OF STORAGE OR STIMULATION, LEADING TO MODIFICATION OF THE RESULTS IN THE SAME WAY AS THE MODIFICATION OF THE STARTING PREMISES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT, UNDERGROUND + EXPLOSION + PRICE HAZE + NUCLEAR DETONATION + RECONTAMINATION + GAS + CONSUMER PRODUCT + CONCENTRATION + BENEFICIAL USE, AGRICULTURE + BENEFICIAL USE, COMMERCIAL + RESOURCE, NATURAL + BENEFIT VS RISK

076789
HOGNESST AB + CARTER RW + BRETHAUER FW
FURTHER STUDIES ON THE LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM
WESTERN ENVIRONMENTAL RESEARCH LABORATORY
2 PAGES, 2 TABLES, 2 FIGURES, 2 REFERENCES, HEALTH PHYSICS, 2?(6), PP. 805-806 (DECEMBER 1972)

IN A PREVIOUSLY PUBLISHED STUDY IT WAS REPORTED THAT THE ELIMINATIONS OF TRITIUM FROM TWO HUMAN SUBJECTS FOLLOWED A MULTI-COMPONENT CURVE. ADDITIONAL DATA HAVE BEEN COLLECTED ON ONE OF THE SUBJECTS WHO EXHIBITED A LONG HALF-LIFE COMPONENT OF 2020 DAYS WHICH ADVISE THAT ESTIMATE TO 550 DAYS. ANOTHER SUBJECT WHO RECEIVED AN INDUSTRIAL EXPOSURE WAS STUDIED, AND THE RESULTS INDICATE A LONG HALF-LIFE OF 350 DAYS FOR THIS SUBJECT. A POSSIBLE SEASONAL VARIATION IN TRITIUM EXCRETION NOTED IN THE PREVIOUS REPORT WAS CONFIRMED BY THE ADDITIONAL DATA REPORTED HEREIN.

RESPIRATION PRODUCT EXCRETION + BIOLOGICAL HALF-LIFE + EXCRETION + WHOLE-LIFE, EFFECTIVE + PERIODICITY, SEASONAL + MAN + BIOLOGICAL TOXICOLOGY

077917
IONIZING RADIATION, VOL. 1: LEVELS (RPIS/RPI
UNITED NATIONS SCIENTIFIC COMMITTEE
197 PAGES, FIGURES, TABLES, REFERENCES, 1972

FOR THE NON-SPECIALIST DESIRING AN AUTHORITATIVE REVIEW OF NATURAL AND MAN-MADE BACKGROUND LEVELS OF RADIATION AND RESULTING DOSES TO MAN AND HIS TISSUES. OVER 900 REFS GIVE ENTRY TO THE TYPE LITERATURE IN QUESTION. FOR RADIATION EFFECTS, ESP GENETIC, SEE VOL 2 (REF/000101). FOR SOMATIC

C77087 [illegible]

EFFECTS, [illegible]. [illegible] TO [illegible] PER [illegible], 0.9 PER [illegible], 0.9 PER [illegible] AND 0.[illegible] PER [illegible] A TOTAL OF 20 [illegible] PER YR, [illegible] IN [illegible] CERTAIN [illegible] OTHER [illegible]. [illegible] 0.0 [illegible] FOR PC-210, 2.27 PER [illegible], 3.09 PER [illegible], 0.09 PER [illegible], 0.02 PER [illegible], 0.001 PER [illegible]. [illegible] THE [illegible] DATA IS [illegible] BY [illegible] IS 20 PER THE [illegible] [illegible] AND [illegible] 0.[illegible] PER THE [illegible] COMPONENT. [illegible] DOSE RATES FROM NATURAL SOURCES IN SO-CALLED NORMAL AREAS IS ABOUT [illegible] MREM/YR TO [illegible], AND ABOUT THE SAME FOR OTHER [illegible]. [illegible] DOSE AT PC-210 IS ABOUT [illegible] MREM/YR PER [illegible], 4 PER FINLAND, [illegible] PER GERMANY, [illegible] PER USSR, 1 TO 10 PER UK, 2 PER USA. SEE [illegible] AND ABOVE DATA, INCLUDING [illegible] AS ELECTRICAL OUTPUT PER POWER [illegible].

AVAILABILITY - [illegible] NATIONAL, SALES SECTION, NEW YORK, NEW YORK 10[illegible] ORDER NO. E.77.IU.[illegible]

HISTORICAL • [illegible] • [illegible] • DESIGNED • [illegible] • [illegible] • PLUTONIUM • STRONTIUM • [illegible] PROCESSES • URANIUM • [illegible], POWER • [illegible] • [illegible] • [illegible] • CONTAMINATION • [illegible] • RADIOACTIVITY RELEASE • ENVIRONMENT • [illegible] • WATER POLLUTION • [illegible] • FOOD CHAIN • [illegible], SOMATIC • [illegible], [illegible] • OTHERWISE • RADIATION EFFECT • RADIATION EXPOSURE • DOSE • CARCINOGEN • MAN • TESTIS • INDUSTRY, NUCLEAR • BIOLOGICAL CONTROL • [illegible], DECOMPOSITION • [illegible] • NPIS

C77143
POWERS PS • KELLY MJ
RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN VIRTUALLY STIMULATED NATURAL GAS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
PAPER NO. [illegible]. PAPER PRESENTED AT THE 10TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 1[illegible], 1977 (ORNL-TM-[illegible])

TRITIUM AND KRYPTON-85 ARE THE PREDOMINANT RESIDUAL NON-NOBLE RADIONUCLIDES PRESENT IN NATURAL GAS PRODUCED FROM NUCLEARLY STIMULATED WELLS. SIMPLE COMPARISON OF CONCENTRATIONS OF THESE RADIONUCLIDES DOES NOT PROVIDE A GOOD INDICATION OF THE RELATIVE RADIOLOGICAL IMPORTANCE EVEN THOUGH A COMPARISON OF THEIR PRESENT-DAY, 0.2 PCI/CM-3; AND-85, 0.1 PCI/CM-3) SUGGESTS THAT EQUAL CONCENTRATIONS OF TRITIUM AND KRYPTON-85 ARE OF NEARLY EQUAL RADIOLOGICAL SIGNIFICANCE. IN DISCUSSING THE FAILURE OF USING CONCENTRATIONS OR DOSES TO MAKE THIS PARTICULAR COMPARISON, OTHER CONSIDERATIONS IS GIVEN TO EXPLAIN RADIONUCLIDES TO EXPLAIN DIFFERENCES IN TYPE OF RADIATION EMISSION, PHYSICAL AND CHEMICAL FORM, UPTAKE BY MAN, AND DIFFERENT TISSUE.

AVAILABILITY - U.S. ENERGY, ENVIRONMENTAL SCIENCES DIVISION, OAK RIDGE NATIONAL LABORATORY, P.O. BOX [illegible], OAK RIDGE, TENNESSEE [illegible]

KRYPTON • [illegible] • POPULATION EXPOSURE • RECONTAMINATION • BIOLOGICAL ASSISTANCE • GEAS • CONCENTRATION • EFFECT, GENETIC • RECONTAMINATION • EFFECT, SOMATIC • STIMULATION • RESEARCH, NATURAL • PHYSICOCHEMICAL FORM • NPIS

C77191
MOGHISSI AS • CARTER MW
TRITIUM
[illegible] PAGES, PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (ORNL)

"TRITIUM" IS BASED ON A SYMPOSIUM HELD FROM AUGUST 30 THROUGH SEPTEMBER 2, 1971, IN LAS VEGAS, NEVADA, AND SPONSORED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA, LAS VEGAS. THE ORGANIZERS ATTEMPTED TO COVER THE ENTIRE SUBJECT, ALTHOUGH PRIMARY EMPHASIS WAS PLACED ON THE ENVIRONMENTAL ASPECTS OF TRITIUM. THE BOOK IS DIVIDED INTO TEN CHAPTERS COVERING THE HISTORY, PRODUCTION, MEASUREMENT, BIOLOGICAL EFFECTS AND KINETICS, ENVIRONMENTAL ASPECTS, APPLICATIONS AND HEALTH PHYSICS OF TRITIUM.

CONTAINMENT • EFFLUENT • MEASUREMENT • [illegible] • HAZARD, RELATIVE • [illegible] TREATMENT • [illegible], WEAPONS • [illegible], POWER • HEALTH, ENVIRONMENTAL • NUCLEAR [illegible] • RADIOACTIVITY RELEASE • ENVIRONMENT • DATA COLLECTION • [illegible] • RADIATION EFFECT • BIOLOGICAL CONTROL • [illegible] CONSIDERATION • NPIS

C77199
GARDNER JF • APPLEBY A
CHEMICAL AND BIOLOGICAL EFFECTS OF TRITIUM
RUTGERS UNIVERSITY, NEW JERSEY
[illegible] PAGES, PP. 197-[illegible] OF "TRITIUM", PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (ORNL)

PRESENTS AND IS CONCERNED WITH TOPICS SUCH AS THE RADIATION CHEMISTRY OF WATER, SOMATIC AND TERATOGENIC EFFECTS, BIOLOGICAL EFFECTS, TRANSMUTATION AND TRITIUM DECAY, QUALITY FACTOR FOR TRITIUM RADIATION, RELATIVE BIOLOGICAL EFFECTIVENESS, TRITIUM OXIDE TRANSFER, TUMOR INCIDENCE, CHROMOSOMAL CHANGES, AND TRITIUM IN MAN.

DECAY HEAT • DRIED • WATER • BETA EMITTER • HIGH • INCIDENCE, MORTALITY • QUALITY ASSURANCE • PROPERTY, CHEMICAL • CHROMOSOME EFFECT • EFFECT, GENETIC • EFFECT, SOMATIC • RADIATION EFFECT • RADIATION EXPOSURE • EFFECT, DOSE RATE • FETUS • MAN • LINEAR ENERGY TRANSFER • PLACENTA • RBE • TUMOR • BIOLOGICAL CONTROL • OPHTHALMOLOGY • EFFECT, DOSE • NPIS

C77209
[illegible] WS • STEINER MW
THE DOSE TO MAN FROM ATMOSPHERIC KR-85
THE PENNSYLVANIA STATE UNIVERSITY

[illegible]
[illegible] PAGES, 3 TABLES, 4 FIGURES, 26 REFERENCES, HEALTH PHYSICS, [illegible], PP. [illegible] [illegible], 1979

THE CONTRIBUTION OF ATMOSPHERIC [illegible] TO HUMAN [illegible] DOSE IS PRESENTED. [illegible] IS UPDATED AND THE MAJOR DIMENSIONS OF THE PROBLEM DISCUSSED. [illegible], THE [illegible] FROM A [illegible] DOSE OF APPROXIMATELY 3.001 MREM/YR TO A WHOLE BODY DOSE OF APPROXIMATELY 3.0001 MREM/YR. THE SKIN DOSE IS COMPARABLE TO THE WHOLE BODY DOSE FROM NATURAL [illegible]. IF THE [illegible] PRACTICE OF DUMPING [illegible] INTO THE ATMOSPHERE IS NOT CONTINUED, THESE DOSES WILL INCREASE BY A FACTOR OF [illegible] IN THE NEXT DECADE OR TWO.

DOSE • [illegible] • OCEAN AND SEA • ATMOSPHERIC POLLUTION • DOSE CALCULATION, INTERNAL • DOSE MEASUREMENT, EXTERNAL • DOSE CALCULATION, EXTERNAL • DOSE MEASUREMENT, INTERNAL • GAMMA • SAFETY EVALUATION • [illegible] • COMPARISON • [illegible] IN PERSPECTIVE • SKIN • WHOLE BODY

[illegible]
CONDRON [illegible]
THEORETICAL RADIATION DOSE TO THE HUMAN SYSTEM FROM ASSIMILATED TRITIUM
[illegible]
6 PAGES, 2 TABLES, 2 FIGURES, 7 REFERENCES, HEALTH PHYSICS, [illegible], PP. [illegible] [illegible], 1979

A THEORETICAL MODEL FOR TRITIUM BEHAVIOR IN HOMO SAPIENS THAT, FOR TRITIUM WATER, THE ABSORBED ENERGY DEPOSITION PER UNIT WEIGHT OF BODY MEMBRANES IS ESSENTIALLY EQUIVALENT FOR ALL COMPONENTS OF THE HUMAN SYSTEM. THE MODEL IS BASED ON [illegible] THE ASSUMPTION THAT TRITIUM ENTERS THE BODY IN A MANNER TYPICAL OF HYDROGEN. IF ASSIMILATED TRITIUM BEHAVES THE SAME AS IMMEDIATE HYDROGEN, THE AMOUNT [illegible] OF TRITIUM PASSING THROUGH ANY BODY SUBSYSTEM VARIES DIRECTLY WITH THE HYDROGEN TURNOVER RATE, WHILE THE RESIDENCE TIME VARIES INVERSELY WITH TURNOVER RATE. THE SPECIFIC ENERGY DEPOSITION IN ANY SUBSYSTEM IS, THEREFORE, THE SAME AS THAT IN ANY OTHER SUBSYSTEM FOR TRITIUM ASSIMILATED IN A MANNER TYPICAL OF HYDROGEN. PATHWAY EFFECTS ASSOCIATED WITH INCORPORATION ENTRY OF TRITIUM IN ORGANIC MOLECULES STREAMS CAN BE SIGNIFICANT.

DEPOSITION • DOSE • HYDROGEN • ORGANIC MOLECULE PATHWAY • [illegible] • [illegible] • [illegible]

[illegible]
FISENBAUM [illegible]
HEALTH HAZARDS FROM RADIOACTIVE EMISSIONS
NEW YORK UNIVERSITY MEDICAL CENTER
29 PAGES, 6 TABLES, PAPER PRESENTED AT THE AMERICAN MEDICAL ASSOCIATIONS CONGRESS ON ENVIRONMENTAL HEALTH, APRIL 29-30, 1979, CHICAGO, ILLINOIS

IT IS CONCLUDED FROM THE OPERATING EXPERIENCE OF CIVILIAN POWER PLANTS THAT NUCLEAR POWER INVOLVES VERY MINIMAL AND INSIGNIFICANT RADIATION EXPOSURE OF THE PUBLIC. FROM THE POINT OF VIEW OF THOSE CONCERNED WITH THE PUBLIC HEALTH, NUCLEAR POWER IS A WELCOME ALTERNATIVE TO POWER GENERATED BY COMBUSTION OF FOSSIL FUELS. ENVIRONMENTAL RADIOACTIVITY SHOULD NOT BE LIMITATION ON THE DEVELOPMENT OF NUCLEAR ENERGY IN THE DECADES IMMEDIATELY AHEAD.

AVAILABILITY - MR. MORRIS FISENBAUM, NEW YORK UNIVERSITY MEDICAL CENTER, LABORATORY FOR ENVIRONMENTAL STUDIES, INSTITUTE OF ENVIRONMENTAL MEDICINE, NEW YORK, N.Y.

CESIUM • CODES AND STANDARDS • DOSE • EFFLUENT • IODINE • KRYPTON • MPC • OXYGEN, RELATIVE • PERSON • POPULATION EXPOSURE • PERSONNEL EXPOSURE, RADIATION • RADIOACTIVITY RELEASE • WHOLE BODY • [illegible], NUCLEAR • POWER PLANT, NUCLEAR • ENVIRONMENTAL PROTECTION AGENCY (EPA)

[illegible]
SCHIEFFERDECKER H
TRITIUM HEALTH PHYSICS
KARLSRUHE NUCLEAR RESEARCH CENTER, WEST GERMANY
43 PAGES, PP. 277-800 OF "TRITIUM", PUBLISHED BY MESSENGER GRAPHICS, PETERS, [illegible], NOV 1979 (BOOK)

PRESENTS TOPICS SUCH AS RADIOBIOASSAY AT KARLSRUHE NUCLEAR RESEARCH CENTER, CONTROL OF TRITIATED WATER VAPOR, ASSESSMENT OF SOME RADIOLOGICAL HAZARDS FROM TRITIUM, DESORPTION OF TRITIUM FROM TARGET SOURCES, CONTAINMENT OF TRITIUM, LOSS OF TRITIUM FROM CONVERT CERMET WASTE MATRICES, AND DETERMINATION OF TRITIUM LEAK RATES FROM WASTE-PROCESSING EQUIPMENT.

CONCRETE • CONTAINMENT • HEALTH PHYSICS TRAINING • MEASUREMENT • SOURCE, RADIATION • TEST, LEAK RATE • WATER • HAZARDS ANALYSIS • DESORPTION • [illegible] • RADIATION SAFETY AND CONTROL • RADIOLOGICAL ASSISTANCE • WATER VAPOR • CONTAINMENT LEAKAGE CENTER • KARLSRUHE • LEAK RATE • [illegible] • [illegible]

[illegible]
FISENBAUM [illegible]
FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS
NEW YORK UNIVERSITY MEDICAL CENTER, NEW YORK
37 PAGES, PP. 318-353 OF "ENVIRONMENTAL RADIOACTIVITY", PUBLISHED BY ACADEMIC PRESS, INC., 1979 (BOOK)

THE USE OF NUCLEAR WEAPONS PRODUCES RADIOACTIVE CONTAMINATION ON A SCALE THAT, WHEN COMPARED WITH THE EFFECTS OF BLAST AND FIRE, WOULD CREATE WORTHY PROBLEMS FOR WHICH AT PRESENT THERE IS NO PROMISSORY SOLUTION. MOREOVER, AS IS WELL KNOWN, THE PRACTICE TESTING OF NUCLEAR WEAPONS IS CAPABLE OF PRODUCING WIDESPREAD CONTAMINATION AND WAS THE SUBJECT OF INTENSE WORLDWIDE CONCERN BETWEEN 1954 AND THE SIGNING OF A TEST-BAN AGREEMENT IN 1963. THIS CHAPTER DISCUSSES THE SUBJECT OF NUCLEAR AND THERMONUCLEAR EXPLOSIONS IN GENERAL AND THEN REVIEWS THE PRINCIPAL RADIOLOGICAL

[illegible] [illegible]
CONSEQUENCES OF THE USE OF [illegible] WEAPONS IN WAR.

CESIUM + [illegible] + DEPOSITION + [illegible] + FISSION PRODUCT RELEASE + INGESTION + INHALATION + IODINE + PLUTONIUM + [illegible] + RUTHENIUM + STRONTIUM + URANIUM + [illegible] + ZIRCONIUM + RADIATION INJURY TREATMENT + ACCIDENT, HYPOTHETICAL + NUCLEAR DETONATIONS + DOSE CALCULATION, EXTERNAL + DECONTAMINATION + RADIOACTIVITY RELEASE + [illegible] + REGULATORY CONSIDERATIONS + NUCLEAR ATTACK + FORECAST + REACTOR, THERMONUCLEAR + CONCENTRATION + RADIATION EFFECT + RADIATION EXPOSURE + LIVESTOCK + SKIN + CLOUD + [illegible] CONCENTRATION + HOTS

[illegible]
[illegible]
ESTIMATES OF DOSE EQUIVALENTS FROM FIVE INDIVIDUALS WORKING WITH VARIOUS TRITIUM COMPOUNDS
U.S. ENVIRONMENTAL PROTECTION AGENCY
PAPER NO. [illegible], PAPER PRESENTED AT THE 19TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE [illegible], 1974 [illegible]

BIOASSAY SAMPLES WERE COLLECTED FROM FIVE INDIVIDUALS WORKING WITH TRITIUM OXIDE AND TRITIATED [illegible] COMPOUNDS. THE RESULTING ESTIMATE OF DOSE EQUIVALENCE IN THESE INDIVIDUALS INDICATES THE VARIATION IN [illegible] ONE OF WHICH IS ENCOUNTERED IN THE USE OF VARIOUS TRITIUM COMPOUNDS. THE PAPER DISCUSSES SOME PRACTICAL APPLICATION ASPECTS OF SAMPLING ENVIRONMENTS, CONCENTRATIONS AND ESTIMATING DOSE EQUIVALENCE WHEN USING TRITIUM [illegible] OR TRITIATED LUMINOUS COMPOUNDS. THE VALUES REPORTED INDICATE [illegible] CONCENTRATIONS OF TRITIUM IN BODY WATER.

AVAILABILITY - [illegible], ENVIRONMENTAL PROTECTION AGENCY, P.O. BOX 15027, LAS VEGAS, NEVADA 89114

DOSE + [illegible] + SAMPLING + CONTAMINATION + OCCUPATIONAL EXPOSURE, RADIATION + ENVIRONMENT + [illegible] + CONCENTRATION + [illegible] + HOTS

[illegible]
[illegible]
RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-[illegible], 18 PAGES, PAPER PRESENTED AT THE SYMPOSIUM ON ENVIRONMENTAL BEHAVIOR OF RADIONUCLIDES RELEASED IN THE NUCLEAR INDUSTRY, AIX-EN-PROVENCE, FRANCE, MAY 14, 1973

TRITIUM (HTO) AND KR-85 ARE EXPECTED TO CONTINUE AS PROMINENT COMPONENTS OF THE RADIOACTIVE RELEASES FROM NUCLEAR FACILITIES. SIMPLE COMPARISON OF AIR CONCENTRATIONS OF HTO AND KR-85 WITH THEIR RESPECTIVE MAXIMUM PERMISSIBLE CONCENTRATIONS DOES NOT PROVIDE A GOOD INDICATION OF THEIR RELATIVE RADIOLOGICAL IMPORTANCE. DETAILED CONSIDERATIONS FOR EACH RADIONUCLIDE EMPHASIZE DIFFERENCES WHICH INFLUENCE RADIOTOXICITY. DOSE ESTIMATES ARE PRESENTED, AND THE ASSOCIATED RISKS ARE COMPARED FOR EQUAL RADIONUCLIDE CONCENTRATIONS IN AIR. SOMATIC RISK [illegible] KR-85 AND GENETIC RISK [illegible] KR-85. FOR POPULATIONS IN CLOSE PROXIMITY TO THE FACILITY, HTO WILL PROBABLY BE THE MOST SIGNIFICANT DOSE CONTRIBUTOR IF NEARLY EQUAL QUANTITIES OF THE TWO RADIONUCLIDES ARE RELEASED. IT IS PREDICTED THAT KR-85 WILL CONTRIBUTE THE GREATER DOSE TO THE GENERAL POPULATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

KRYPTON + [illegible] + RADIATION EXPOSURE + CONTAMINATION + SOIL + RADIOACTIVITY RELEASE + WATER POLLUTION + CONCENTRATION + COMPARISON + [illegible] INDUSTRY, NUCLEAR

[illegible]
[illegible]
RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICES
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-SA-[illegible], [illegible] PAGES, JULY 1970

PRESENTS A MANUAL OF GOOD PRACTICES WHICH PROVIDES RADIATION PROTECTION GUIDANCE FOR WORKING WITH TRITIUM AND TRITIUM COMPOUNDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS + [illegible] + PROCEDURES AND MANUALS + REGULATIONS + RADIATION SAFETY AND CONTROL

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[illegible]
HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE
LAWRENCE LIVERMORE RADIATION LABORATORY, CALIFORNIA
UCRL-[illegible] + CONF-[illegible], [illegible] PAGES, FIGURES, JANUARY 15, 1969

BUILDING [illegible] PROVIDES A FACILITY FOR CHEMISTRY DEPARTMENT PERSONNEL AT LAWRENCE RADIATION LABORATORY TO PERFORM EXPERIMENTAL WORK WITH VARIOUS RADIOACTIVE LIGHT ISOTOPES AND GASES. AN IMPORTANT RADIOACTIVE ISOTOPE HANDLED IN THIS FACILITY IS TRITIUM. THE FACILITY IS DESIGNED TO SAFELY HANDLE UP TO A MEGACURIE OF TRITIUM. THIS PAPER DEALS PRIMARILY WITH THE FEATURES AND CONTROLS INCORPORATED THAT PERMIT LRL PERSONNEL TO SAFELY HANDLE THESE LARGE QUANTITIES OF TRITIUM. THE BUILDING STAFF INCLUDES TWELVE SENIOR RESEARCHERS, FIVE EXPERIMENTAL TECHNICIANS, SIX MECHANICAL/ELECTRONIC TECHNICIANS, AND ONE RADIATION SAFETY TECHNICIAN. ADDITIONAL RADIATION

[illegible]
SAFETY SUPPORT IS PROVIDED BY HEALTH PHYSICS ASSISTANCE AT THE [illegible] SITE DURING OPERATIONS TO SUPPORT THE CONTROLLED OPERATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. [illegible]

HEALTH PHYSICS TRAINING • [illegible] • [illegible] • [illegible] • OPERATION SAFETY AND CONTROL • [illegible]

[illegible]
DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS DIO [illegible]
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
PNE-RD-42 P. 25 PAGES. JUNE 12, 1971

ENVIRONMENTAL STATEMENTS ISSUED FOR GAS-STIMULATION PROJECTS RECENTLY ESTIMATED THE SURFACE CONCENTRATIONS AND DOSE TO INDIVIDUALS FOR TRITIUM AND KR-85 FROM VENTING OF THE GAS AND FOR NOBLE GASES AND RADIO-IODINE FOR THE POSSIBLE, BUT UNLIKELY, PRESSURE WELD DETONATION. THE PURPOSE OF THIS PAPER IS TO OBTAIN THE PROCEDURES USED BY LAWRENCE LIVERMORE LABORATORY IN ARRIVING AT CONCENTRATION AND DOSE ESTIMATES THAT WERE ORIGINALLY IN THE ENVIRONMENTAL STATEMENTS FOR DIO [illegible] AND [illegible] [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. [illegible]

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VIII Waste Management

VIII - WASTE MANAGEMENT

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UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
15 PAGES, 4 FIGURES, 1 TABLE, 7 REFERENCES- MAY 1964, [illegible] PAPER- PRESENTED AT THIRD U. N. INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, EIGHT RECOMMENDED 3, 1964- [illegible]

THE PRINCIPAL FEATURES OF THE THREE SIMILAR U.S. HEAVY WATER HIGH FLUX RESEARCH REACTORS, HIGH AND PLUTO AT HARWELL AND THE CORNELIAN NATIONALS TESTING REACTOR AND ORIGINALLY DESIGNED, [illegible] IS MADE OF THE HEALTH PHYSICS ARRANGEMENT TO DETECT AND CONTROL LEAKAGE OF RADIOACTIVE [illegible] FROM EITHER THE REACTOR OR EXPERIMENTS INTO THE ENVIRONMENT. [illegible] OF TRITIUM IS PARTICULARLY DISCUSSED.

[illegible], GENERAL PROPERTIES + [illegible], [illegible] + [illegible] WATER + [illegible] + [illegible] EXPERIMENT [illegible]

[illegible]
HEAVY WA
FISSION-PRODUCT TRITIUM IN FUEL-PROCESSING WASTE
HANFORD LABORATORIES
5 PAGES, 1 FIGURE, 1 TABLE- NUCLEAR SAFETY, [illegible]- [illegible] ISSUED 1961- [illegible]

TRITIUM IS A PRODUCT OF URANIUM FISSION AND IS PRESENT IN PROCESS SOLUTIONS. THE POSSIBILITY OF DECONTAMINATE WASTE OF TRITIUM PROVIDES THAT SAFETY OF DISPOSAL OF [illegible] ENVIRONMENTAL CONDITIONS. AT HANFORD AT 70 AS [illegible] THE TRITIUM IS DISCHARGED TO CRIBS AND PONDS- MOST OF THAT REMAINING IS RELEASED TO THE ATMOSPHERE OR STORED IN HIGH-LEVEL LIQUID WASTE. AT SAVANNAH RIVER ABOUT 24 G OF THE TRITIUM IS NOT CONVERTED TO TRITIATED WATER AND IS DISCHARGED FROM A 185 FT STACK. AT HANFORD ONLY ABOUT 1 G OF THE TRITIUM WAS RELEASED TO THE ATMOSPHERE AND 79 G OF THIS WAS THE TRITIUM. [illegible] OF TRITIUM FROM 5 THE PROPOSED- IT PROVIDES A BASIS FOR EVALUATING OF TRITIUM HAZARDS AND ASSISTS IN ESTABLISHING THE [illegible] OF GROUND WATER, WHICH IS USEFUL IN ASSESSING THE HAZARDS OF OTHER LONG-LIVED RADIONUCLIDES THAT MIGHT BE RELEASED TO THE GROUND.

[illegible] + GROUND WATER + [illegible], RADIONUCLIDE [illegible] + WASTE DISPOSAL, ATMOSPHERIC + WASTE DISPOSAL, TERRESTRIAL + WATER

[illegible]
[illegible] JR
MANAGEMENT OF FISSION PRODUCT TRITIUM IN FUEL PROCESSING WASTES
OAK RIDGE NATIONAL LABORATORY
15 PAGES- MAY 4, 1964, ORNL-TM-891- [illegible]

TRITIUM, A FISSION PRODUCT OF VERY LOW YIELD, HAS RECEIVED SPECIAL CONSIDERATION FROM THE STANDPOINT OF ITS MANAGEMENT IN WASTES FROM FUEL PROCESSING. IN THE CASE OF PRESENT [illegible] PLANTS, AT LEAST 90% OF THE TRITIUM IN THE [illegible] FUEL IS DISCHARGED TO THE ENVIRONMENT IN TRANSFER AQUEOUS WASTES. FUTURE PLANTS SITUATED [illegible] MAY BE RESTRICTED IN THE QUANTITY THAT CAN RELEASE TO THEIR IMMEDIATE ENVIRONS. IT WAS ESTIMATED THAT, UNDER REPRESENT OPERATIONS, RELATIVELY LARGE TRITIUM COULD BE RELEASED TO SURFACE STREAMS, BUT PLANTS PROCESSING FUEL AT RATES EQUIVALENT TO AS MUCH AS 100,000 THERMAL MEGAWATTS OF REACTOR POWER MIGHT DISCHARGE THE TRITIUM SAFELY TO THE ATMOSPHERE. LARGER PLANTS MUST CONSIDER CONCENTRATION OF THE TRITIUM BY INTERNAL RECYCLE OR EQUIVALENT STREAMS.

[illegible] + [illegible] + [illegible] + GROUND WATER + [illegible], RELATIVE + RIVER + [illegible], WASTE DISPOSAL + WASTE DISPOSAL, ATMOSPHERIC + WASTE DISPOSAL, TERRESTRIAL + [illegible] WATER, [illegible] + WASTE DISPOSAL, RIVER

[illegible]
[illegible] W. + [illegible] PJ
THE SAFE [illegible] OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS [illegible] INTO GLASS
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER
30 PAGES, 5 FIGURES, 7 TABLES, 8 REFERENCES- HEALTH PHYSICS, [illegible]- [illegible]

HIGH-LEVEL WASTE-FISSION-PRODUCT SOLUTION CONTAINING [illegible] WAS INCORPORATED INTO GLASS [illegible] THE [illegible] FOR 3 YEARS IN SAND [illegible] THE WATER-TABLE. THE EXPERIMENT HAS SHOWN THAT, EVEN IN SATURATED SOIL WITH LOW [illegible] CAPACITY, THE [illegible] OF DISPOSAL WAS SAFE AND THE RELEASE OF HAZARDOUS RADIONUCLIDES WAS WITHIN REASONABLY [illegible] LIMITS.

CESIUM + [illegible] + [illegible] + [illegible] + STRONTIUM + WASTE DISPOSAL, WASTE DISPOSAL + [illegible], RADIONUCLIDE [illegible] + [illegible] + WASTE DISPOSAL, TERRESTRIAL + GROUND WATER, [illegible] + GROUND WATER, PROPERTY + GROUND WATER, [illegible]

[illegible]
[illegible] + [illegible] FG
WASTE TREATMENT AND DISPOSAL QUARTERLY PROGRESS REPORT [illegible] JANUARY 1964
OAK RIDGE NATIONAL LABORATORY
199 PAGES, 26 TABLES, 39 FIGURES, 47 REFERENCES- AUGUST 1964, ORNL-TM-[illegible]- [illegible]

THIS REPORT IS THE THIRTEENTH IN A SERIES OF REPORTS ON PROGRESS IN THE [illegible] DEVELOPMENT PROGRAM, THE OBJECTIVE OF WHICH IS TO DEVELOP AND DEMONSTRATE ON A PILOT PLANT SCALE INTERMEDIATE PROCESSES

[illegible]

The treatment and ultimate disposal of radioactive wastes resulting from reactor operations and reactor fuel processing. Emphasis is on high- and low-activity liquid wastes. Low-activity wastes which are treated by scavenging and ion exchange processes are from separations. The waste streams of liquids which are combined with the high-activity wastes and are discharged to the environment in deep geologic formations. The high-activity wastes which are stored at various sites as solids and economic problems in dealing and radioactive decay and artificial cooling. Methods and the permanent disposal of high-activity wastes include conversion of the waste liquids to solids by evaporation and formation of a glass or ceramic. The solids which are stored in a safe mine. Another approach is the disposal of the liquid directly into sealed or sealed salt caverns. Long storage of high-temperature calcination of intermediate-activity wastes may be unfavorable because of their large volumes. Direct disposal into impermeable shale by hydrofracturing is under investigation. Environmental research on the fission gases, activated by the need and safe and realistic permissible limits of waste releases, is included in this program.

[illegible] • Effluent • Efficiency • Ground water • Mines • Salt, radioactive pollutant through • Storage • Surface water • Waste disposal, terrestrial • Waste treatment, fixation • Waste treatment, liquid • Waste disposal, gases • Waste source and type • Cement

[illegible]

[illegible]
Evaluation and emergency planning of hazards from accidents involving stores of radioactive materials
United States Atomic Energy Commission, Oak Ridge
[illegible] pages, [illegible] tables, [illegible] figures, [illegible] references- health physics, [illegible]- 829-832 (November 1964)

In formulating plans to deal with possible accidents at a nuclear research establishment relationships are needed between the quantities of radioactive materials held in buildings and hazards which might result if the materials were involved in fires, explosions or similar incidents. This paper considers these relationships. Comparisons between site hazards stores and active stores held enable the activities on a site to be classified in order of potential hazard. Consideration is also given to the contamination of air and crops in the case of accidents involving strontium-90, strontium-89, iodine-131 and cesium-137.

Incident, exposure • Radium • Cesium • Cesium • Iodine • Plutonium • Strontium • Strontium • Tellurium • Uranium • Radioactive • Dose calculation, internal • Radium • Hazards analysis • Accident • Dose calculation, external

[illegible]
Fission a
Waste disposal
Brookhaven National Laboratory
17 pages, 7 figures, 4 tables, 14 references- reactor fuel processing [illegible], Part IV, pp. 37-48 (October 1964-1965)

Review of recent papers and progress reports in waste disposal research and development are presented. Topic covered includes management of tritium, iodine exchange, compression of gases, and decrease in strontium.

Ruthenium • Strontium • Acidification • Waste treatment, fixation • Reactor fuel, reprocessing from waste • Gases • Ion exchange • Storage exchange

[illegible]
[illegible] of
[illegible] of Subsurface water disposal, National Reactor Testing Station, Idaho, Annual Progress Report, 1965

U. S. Department of the Interior, Geological Survey, Idaho Falls, Idaho
IDO-22066 [illegible], 220 pages, figures, tables, references- may 1966- [illegible], pp.39 ff

U. S. Geological Survey investigations and tests at the site are discussed and include regional geomorphology of site and adjacent areas, special studies related to waste disposal, hydrology of waste disposal, collection of basic records and the future scope of the program.

Fission • Geology • Ground water • Sites • Storage • Waste disposal • Ground water, nuclear [illegible] • Ground water, property • Soil, nuclear reference • Hydrology • Geology, geochemical • Geology, geochemical

[illegible]
[illegible] • [illegible] S
The maximum permissible activity contained in the effluent air from a nuclear plant, II
[illegible] [illegible] 7-8 [illegible], [illegible] pages, figures, tables, references- may 1965

The article presents a method of calculating the limits of the permissible amount of activity discharged from a nuclear plant. A distinction is made between continuous and short-term discharge. For particularly important radionuclides, the limits were calculated on the basis of the recommendations of the ICRP (Ground first publication- protection against II, 1959) and of the ICRU respectively.

Radium • Radon • Fission • Dose • Iodine • Uranium • Dose • Distribution • Strontium • Krypton • Argon • Stack • Air • Sewage

009027
RAMP W
TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1964
TRACERLAB
T PAGE- ATOMIC ENERGY CLEARING HOUSE 120170- VI (MARCH 21, 1966)

VARIOUS TRITIUM CONTAMINATED OBJECTS WERE DROPPED PACKED, AND PLACED IN WASTE DRUMS TO BE CEMENTED IN. BITHED DURING THE CEMENT POURING ON DISPOSING THEM A FLOATING OBJECT. TRITIUM MUST HAVE BEEN RELEASED.

WASTE DISPOSAL • OCCUPATIONAL EXPOSURE, MONITORING

010702
GROOF JR
HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING REPROCESSING OF THORIA-UO2 FUELS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-1 0. 19 PAGES, 3 FIGURES, 4 TABLES, 11 REFERENCES, SEP 1966, CESTI, $7.00 CY, $0.50 MF

HOT-CELL EXPERIMENTS WITH PROTOTYPE THORIA-UO2 BROED REACTOR FUEL SPECIMENS IRRADIATED TO 36,000 MWD/METRIC TON (TM • UI SHOWED THAT UP TO 0.2 PERCENT OF THE FISSION-PRODUCED TRITIUM AND 1 PERCENT OF THE KR-85 WERE RELEASED WHEN THE FUEL WAS SHEARED INTO SHORT LENGTHS. IN OUR APPARATUS, BETWEEN 0.2 PERCENT OF THE TRITIUM AND THE MAJORITY OF THE KRYPTON WERE RELEASED TO THE ATMOSPHERE WHEN THE FUEL WAS DISSOLVED IN HOT SOLVENT EXTRACTION FEED. THIS QUANTITY OF TRITIUM IS LESS THAN 0.4 PERCENT OF THE ESTIMATED 1200 CURIES OF H-3 THAT MAY BE SAFELY DISCHARGED TO THE ATMOSPHERE FROM A 0-TON-PER-DAY REPROCESSING PLANT.

FISSION GAS RELEASE • KRYPTON • TRITIUM • ATMOSPHERIC POLLUTION • WASTE DISPOSAL, ATMOSPHERIC • URANIUM DIOXIDE • CHEMICAL PLANT SAFETY • FUEL REPROCESSING

012711
SAVANNAH RP
TECHNICAL SPECIFICATIONS CHANGE 7, REVISIONS TO REMOVE SPECIFIC LIMITS ON TRITIUM WASTE DISPOSAL
FIRST ATOMIC SHIP TRANSPORT INC., NEW YORK
6 PAGES, OCTOBER 31, 1966, DOCKET NO. 50-238, PRO

PREVIOUSLY, TRITIUM WAS NOT MONITORED. NO TRITIUM-ANALYSIS EQUIPMENT IS CARRIED ON SHIP, SO CONCENTRATION CHANGES WILL BE ESTIMATED AS 1.2 TIMES 10E-4TH MICROCURIE PER MILLILITER PER 6-CONVERT-HOUR OF OPERATION, BASED ON A PRODUCTION RATE OF 0.010 CURIE PER MW-HRS. DISCHARGE LIMIT OF 100 CURIES OF TRITIUM PER MONTH SET. AT SEA, DISCHARGING THE MONTHLY LIMIT IN THE VOLUME DISPLACED IN THE SHIPS BASSEN, WITH NO FURTHER DILUTION, WOULD GIVE A FACTOR OF 10 BELOW THE MPC FOR DRINKING WATER.

REACTOR, MARITIME • NS SAVANNAH (PWR) • REACTOR, PWR • WASTE DISPOSAL, OCEAN • TECHNICAL SPECIFICATIONS

014061
N S SAVANNAH CHANGE 5 - MISC, ADMINISTRATIVE AND TESTING
DIVISION OF REACTOR LICENSING, UNITED STATES ATOMIC ENERGY COMMISSION
9 PAGES, FEBRUARY 5, 1967, DOCKET NO. 50-238

CHANGES BETWEEN ARF - (1) CHANGE IN ORGANIZATIONAL TITLES, (2) REVISING FOR TRITIUM MONITORING IN WASTE DISPOSAL, (3) LESS FREQUENT EVACUATION DRILLS, (4) CLEARLY DEFINING RESPONSIBILITY OF STAFF HEALTH PHYSICIST, (5) BETTER CHANGE IN ADM TO REQUIREMENTS OF RADIATION MONITORING DURING FILTER TESTS, AND (6) SLIGHTLY MORE STRINGENT IF A DROP TEST WITHIN 1 WEEK PRIOR SHOWED A FILTER FAILURE OR TOOK ON MORE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ADMINISTRATIVE CONTROL • REACTOR, MARITIME • NS SAVANNAH (PWR) • REACTOR, PWR • WASTE DISPOSAL • TEST, DROP FILTER • CONTAINMENT FILTERING SYSTEM • TECHNICAL SPECIFICATIONS • SAFETY EVALUATION • RADIATION MONITORS

014071
MOORE WB
FISSION PRODUCT TRITIUM IN FUEL REPROCESSING WASTES
HANFORD ATOMIC PRODUCTS OPERATION
HW-58-3981 0. 16 PAGES, 2 FIGURES, 22 REFERENCES, DECEMBER 16, 1957

FISSION-PRODUCT TRITIUM IS DISTRIBUTED THROUGHOUT THE VARIOUS LIQUID AND GASEOUS WASTE STREAMS FROM A FUEL-REPROCESSING PLANT. REPORT GIVES THE RESULTS OF TRITIUM-DISTRIBUTION STUDIES ON LIQUID AND GAS STREAMS AT HANFORD AND ICPP.

WASTE DISPOSAL, ATMOSPHERIC • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • IODINE 129 • HANFORD SITE • FUEL REPROCESSING

01[illegible]77
[illegible] JR + SCHMALZ RW
RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION, IDAHO
IDAHO OPERATIONS OFFICE, ARC, IDAHO FALLS
IDO-12040(SUPPL.1) 0, 17 PAGES, 0 FIGURES, 7 TABLES, AUGUST 1966

CONTAINS INFORMATION ABOUT THE QUANTITIES, CLASSIFICATION, AND DISPOSITION OF RADIOACTIVE WASTE ACCUMULATED DURING 1965. IT IS A SUPPLEMENT TO A PREVIOUS REPORT ISSUED IN APRIL 1965, WHICH INCLUDES INFORMATION FOR THE 10-YEAR PERIOD 1956-1964.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $1.00 COPY, $0.50 MICROFICHE

CESIUM + CHARTS + COSTS + DISTRIBUTION + STRONTIUM + URANIUM + WASTE DISPOSAL + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SOLID

01[illegible]14
[illegible] JP
TRITIUM REMOVAL FROM GASES
[illegible] LABORATORY, MONSANTO RESEARCH CORPORATION, MIAMISBURG, OHIO
MLM-1394 0, 16 PAGES, 4 FIGURES, 9 TABLES, 7 REFERENCES, MARCH 28, 1967

THE TRITIUM CONCENTRATION OF A GAS MIXTURE CONSISTING PRIMARILY OF HELIUM WAS REDUCED FROM 0.01 MOLE PERCENT TO 7 X 10 TO THE MINUS 12TH MOLE PERCENT. ADSORPTION EXPERIMENTS ON ACTIVATED CHARCOAL AT 77 K AND 4.2 K WERE CONDUCTED USING VARIOUS TRAPS, AND THE RESULTS COMPARED. ADSORPTION ON CHARCOAL AT 77 K, WITH YEARS OF LARGE SURFACE AREAS, WAS MOST EFFICIENT AND PRACTICAL. THE TRITIUM WAS THEN REMOVED FROM THE GAS ENTIRELY BY A CATALYST WHICH HAD BEEN CHEMOSORBED BY THE CHARCOAL. THIS WAS DONE BY USING A CATALYST, NICKELITE, HEATED TO 774 C, TO FORM TRITIATED WATER, WHICH WAS THEN ADSORBED ON A MOLECULAR SIEVE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $1.00 COPY, $0.50 MICROFICHE

ADSORPTION + WASTE TREATMENT, GAS + CHARCOAL + WASTE TREATMENT, EQUIPMENT

01[illegible]72
[illegible] IS - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.
4 PAGES, NATIONAL BUREAU OF STANDARDS REACTOR, FINAL SAFETY ANALYSIS REPORT, SUPPL. A, PAGES 15-1/15-4, REVISED 1, 1964, DOCKET NO. 50-184

DISCUSS THE PROVISIONS FOR TRITIUM CONTROL FOR BOTH ON-SITE AND OFF-SITE PERSONNEL DURING NORMAL OPERATION OR IN THE EVENT OF AN ACCIDENT, INCLUDING A HEAT-EXCHANGER TUBE-BUNDLE FAILURE WHICH CAUSES CONTAMINATION OF ALL PRIMARY WATER TO THE SECONDARY COOLING SYSTEM. IN THE EVENT IT IS NECESSARY TO ISOLATE THE MAIN HEAT EXCHANGER TO EFFECT TRITIUM CONTROL (AND FOR OTHER REASONS), DESCRIBE HOW CORE COOLING WOULD BE ACCOMPLISHED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ACCIDENT HEAT + REACTOR, HWR + REACTOR, RESEARCH + REPORT, SER + RESPONSE TO NRC QUESTION + COOLANT PURIFICATION SYSTEM + OPERATOR, TURNAG + HEAT EXCHANGERS

01[illegible]90
BLANCO RE + BLIZARD JC + ROBERTS JT
SOLIDIFYING WASTE DISPOSAL PROBLEM
OAK RIDGE NATIONAL LAB., TENN.
4 PAGES, 7 TABLES, 10 REFERENCES, NUCLEONICS 29(3), PAGE 48 THRU 51 AND PAGE 60, FEBRUARY 1971

BY THE YEAR 2000, U.S. NUCLEAR POWER PLANTS WILL HAVE ACCUMULATED OVER 5000 TONS OF FISSION PRODUCTS. SOLIDIFICATION OF LIQUID WASTE FROM FUEL REPROCESSING FOLLOWED BY STORAGE IN SALT MINES PROMISES A SAFE AND ECONOMICAL METHOD OF DISPOSAL. COST OF SOLIDIFICATION, SHIPPING 1000 MILES, AND ULTIMATE DISPOSAL IN SALT IS ESTIMATED AT LESS THAN 10 OF THE TOTAL COST OF 3 MILLS/KWH ON NUCLEAR POWER. OTHER ADVANTAGES OF THE PROPOSED METHOD INCLUDE LOW MOBILITY OF THE SOLID WASTE, LOW SURVEILLANCE REQUIREMENTS, LOW VOLUMETRY, AND SAFER HEAT REMOVAL.

WASTE DISPOSAL, ECONOMICS + WASTE TREATMENT, FIXATION + MINE + WASTE DISPOSAL, GAS + WASTE DISPOSAL, SOLID + WASTE TRANSPORTATION + WASTE MANAGEMENT + WASTE TREATMENT, ECONOMICS + WASTE DISPOSAL, SALT + VOLATILITY PROCESS

01[illegible]3
WASTE MANAGEMENT RESEARCH ABSTRACTS NO. 7
INTERNATIONAL ATOMIC ENERGY AGENCY
90 PAGES, 1966

ABSTRACTS FROM SEVEN NATIONS ARE INCLUDED IN THIS COMPILATION. GENERAL AREAS INCLUDE - GASEOUS WASTES TREATMENT AND DISPOSAL, LIQUID WASTES TREATMENT, SOLID WASTES TREATMENT, STORAGE AND DISCHARGE STUDIES, AND ECONOMIC STUDIES.

021911 UNCLASSIFIED
AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA

COBALT • IAEA • WASTE DISPOSAL • WASTE DISPOSAL, OCEAN • WASTE TREATMENT • WASTE TREATMENT, FIXATION • WASTE TREATMENT, LIQUID • LEAD • POLONIUM • WASTE DISPOSAL, RIVER • WASTE TREATMENT, GAS • ZINC • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE DISPOSAL, SOLID • WASTE TREATMENT, SOLID • WASTE MANAGEMENT • OCEANODISPOSAL • WASTE DISPOSAL, OCEANIC

021290
PLIOSEN JD
EARTH SCIENCES WASTE DISPOSAL INVESTIGATIONS, JULY--DECEMBER 1966
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-437 P., 17 PAGES, 2 FIGURES, 2 TABLES, REFERENCES, JUNE 14, 1967

EVALUATES GROUNDWATER CONTAMINATION RESULTING FROM DISPOSAL OF PLANT EFFLUENTS. THE EXTENT OF GROSS BETA AND TRITIUM CONTAMINATION IN GROUND WATER IS PRESENTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA., $1.00 COPY, $0.65 MICROFICHE

CESIUM • GROUND WATER • RUTHENIUM • STRONTIUM • WASTE DISPOSAL • WASTE DISPOSAL, TERRESTRIAL • GROSS ALPHA • GROSS BETA • GROUND WATER, NUCLIDE RECOVERY • WASTE DISPOSAL, LIQUID • BATTELLE NORTHWEST • RUTHENIUM • HANFORD SITE

021990
BLANCO DE • PARKER FL
WASTE TREATMENT AND DISPOSAL SEMIANNUAL PROGRESS REPORT, JULY-DECEMBER 1966
OAK RIDGE NATIONAL LAB., TENN.
ORNL-TM-1897 P., 190 PAGES, FIGURES, TABLES, REFERENCES, NOV. 1967

TOPICS COVERED IN THIS REPORT ARE - TREATMENT OF HIGH-LEVEL RADIOACTIVE WASTE, TREATMENT OF LOW- AND INTERMEDIATE-LEVEL RADIOACTIVE WASTE, ENGINEERING, ECONOMICS, AND SAFETY EVALUATIONS IN CONNECTION WITH POWER-REACTOR WASTE MANAGEMENT, SEPARATION OF RARE GASES FROM AIR USING PERMSELECTIVE MEMBRANES, FUEL-MELTER AND REACTOR PLANT DESIGN, DISPOSAL IN NATURAL SALT FORMATIONS, DISPOSAL BY HYDRAULIC FRACTURING, FATE OF RADIONUCLIDES IN TERRESTRIAL ENVIRONMENT, APPLICATION OF MINERAL EXCHANGE, SAFETY EVALUATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CESIUM • COBALT • GEOLOGY • RUTHENIUM • WASTE DISPOSAL • WASTE DISPOSAL, TERRESTRIAL • WASTE STORAGE • WASTE TREATMENT, FIXATION • WASTE TREATMENT, LIQUID • REACTOR, POWER • WASTE TREATMENT, SOLID • ORNL MEASUREMENT, EXTERNAL • WASTE MANAGEMENT • MINERAL EXCHANGE • WATER TREATMENT • EQUIPMENT • DECONTAMINATION • WASTE DISPOSAL, HYDRAULIC FRACTURING • WASTE DISPOSAL, SALT • GEOLOGY, SALT STRUCTURE • SAFETY EVALUATION • ORNL MECHANICS

022920
BLOMEKE JO • HARRINGTON FF
MANAGEMENT OF RADIOACTIVE WASTES AT NUCLEAR POWER STATIONS
OAK RIDGE NATIONAL LAB., TENN.
ORNL-4070 P., 101 PAGES, FIGURES, TABLES, 44 REFERENCES, JAN. 1968

AS A PRELIMINARY STEP IN ASSESSING WASTE-DISPOSAL PROPERTIES IN THE EVOLUTIONARY NUCLEAR POWER INDUSTRY, THE OPERATING EXPERIENCE IN WASTE MANAGEMENT AT THE PRESENT-DAY BIG ROCK POINT, MONTANA BAY, ELK RIVER, INDIAN POINT-1, AND YANKEE POWER STATIONS IS REVIEWED. SEE THESE PLANTS HAVE OPERATED WITHIN AUTHORIZED LIMITS AT COSTS ESTIMATED TO RANGE BETWEEN 2 AND 10% OF ANNUAL OPERATING COSTS. GASEOUS RELEASE RATES HAVE RANGED FROM AS LOW AS 10 TO THE MINIMUM MEASURABLE, AND LIQUID WASTES FROM 0.25MPC TO 0.02. TRITIUM RELEASES HAVE BEEN BELOW 10 PC ALLOWABLE IN ALL CASES. IT IS CONCLUDED THAT WASTE-MANAGEMENT PROCEDURES HAVE BEEN ADEQUATE AND THAT NO PROBLEMS ARE ANTICIPATED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

BIG ROCK POINT (BWR) • REACTOR, BWR • DRESDEN I (BWR) • ELK RIVER (BWR) • MONTANA BAY (BWR) • INDIAN POINT I (PWR) • REACTOR, PWR • WASTE DISPOSAL, AUTOMATIC • WASTE STORAGE (PWR) • WASTE DISPOSAL, REGULATIONS • REACTOR, POWER • WASTE DISPOSAL, RIVER • WASTE SOURCE AND TYPE • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE DISPOSAL, SOLID • WASTE MANAGEMENT • RADIONUCLIDE, INJURED • MONITORING EXPERIENCE

023797
MARKELOVSKY JR • VIESSELS WE • MONTESON JP • JENSEN RH
HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966
GEOLOGICAL SURVEY, IDAHO FALLS, IDAHO
IDO-22040 P., 99 PAGES, FIGURES, TABLES, REFERENCES, OCTOBER 1967

THIS ANNUAL REPORT DESCRIBES SPONSORED BY THE U.S. GEOLOGICAL SURVEY, SPONSORED BY THE USERDA, TO DETERMINE THE HYDROLOGIC EFFECTS OF DISPOSAL OF RADIOACTIVE WASTES AT THE GROUND OF THE NATIONAL REACTOR TESTING STATION. THE PROJECT HAS INCLUDED THE COLLECTION AND ANALYSIS OF GROUND AND SURFACE-WATER SAMPLES FOR RADIOLOGICAL AND CHEMICAL CHANGES. PROJECT HEAD DATA FOR LOCATION AND

[illegible]
[illegible]
[illegible]

AVAILABILITY - [illegible] FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22161
COPY, $0.[illegible] [illegible]

CESIUM • [illegible] • IODINE • [illegible] • [illegible] • STRONTIUM • WASTE DISPOSAL • WATER • ZIRCONIUM • [illegible]

[illegible]
[illegible]
[illegible] OF ACTIVITY RELEASE - WASTE MANAGEMENT AT NUCLEAR POWER STATIONS
[illegible] NATIONAL LAB., [illegible]
13 PAGES, 7 FIGURES, 1 TABLE, 20 REFERENCES, NUCLEAR SAFETY, [illegible], PAGE 299-[illegible], [illegible]

THE MANAGEMENT OF WASTES PRODUCED AT NUCLEAR POWER PLANTS MAY OFFER AN INCREASINGLY SIGNIFICANT PROBLEM IN AN ECONOMY THAT IS EXPECTED TO GROW IN SO YEARS ITS PRESENT SIZE WITHIN THE NEXT 15 YEARS. AS A PRELIMINARY STEP IN ASSESSING FUTURE IMPLICATIONS, REVIEWS WERE MADE OF THE OPERATING EXPERIENCE IN WASTE MANAGEMENT AT ARBITRARILY SELECTED NUCLEAR POWER STATIONS, ALL HAVE OPERATED WELL WITHIN THE LIMITS AUTHORIZED FOR RELEASE OF RADIOACTIVE WASTES TO THE ENVIRONMENT. THE CONCENTRATION OF TRITIUM IN THE RECENT ANALYSES GIVE EVIDENCE THAT 5 TO 20 CURIES HAS BEEN RELEASED ANNUALLY AT EACH OF THE BOILING-WATER-REACTOR STATIONS, AND ABOUT 500 AND 1000 CURIES HAVE BEEN DISCHARGED ANNUALLY AT TURKEY POINT AND YANKEE, RESPECTIVELY. IN ALL CASES, TRITIUM HAS BEEN RELEASED AT RATES LESS THAN 1% OF ITS LIMIT. IT IS CONCLUDED THAT WASTE-MANAGEMENT PRACTICES AT LIGHT-WATER POWER-REACTOR STATIONS HAVE BEEN QUITE ADEQUATE.

WASTE DISPOSAL, SOLID • WASTE MANAGEMENT • OPERATIONS SAFETY AND CONTROL • REACTOR POWER • RADIOACTIVITY RELEASE • ENVIRONMENT

[illegible]
[illegible] 7
RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS
[illegible] ATOMIC ENERGY COMMISSION, [illegible]
[illegible], 6 PAGES, 1 TABLE, APRIL 1968

THE HIGHLY RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS IS AT PRESENT IN GENERAL STORED IN LIQUID FORM IN STAINLESS STEEL CONTAINERS. IT SEEMS POSSIBLE TO FURTHER CONCENTRATE THE WASTES BY SOLIDIFICATION IN THE FORM OF GLASS, EVEN WITH AN ATOMIC POWER COMMERCIAL FUEL, WHICH IN EXCESS OF THE PRESENT TOTAL POWER PRODUCTION LEVEL, THE STORAGE FOR A THOUSAND YEARS IN NEW WELL DRY CONSTITUTE A SERIOUS SPACE-CONSUMING PROBLEM. THE QUESTIONS OF RUTHENIUM-106 AND TRITIUM ARE ALSO TOUCHED HERE. THESE DO NOT CONSTITUTE ANY SERIOUS PROBLEMS.

AVAILABILITY - USAEC REPOSITORY LIBRARIES IN THE U.S. AND ABROAD

[illegible] • WASTE STORAGE • WASTE TREATMENT, FIXATION • REACTOR POWER • [illegible]

[illegible]
[illegible]
[illegible] • [illegible] 71
RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES [illegible] 1 TO [illegible] 70-21
U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, WASHINGTON, D.C.
[illegible], [illegible] PAGES, [illegible] REFERENCES, [illegible] 1971

SUMMARIZES DISCHARGES THROUGH 1969 OF LIQUID AND GASEOUS RADIOACTIVE WASTES FROM NINE NUCLEAR POWER FACILITIES. IT ALSO INCLUDES A GENERAL DISCUSSION OF THE SOURCE, TYPES AND TOTALS OF LIQUID AND GASEOUS WASTES, THE ADMINISTRATIVE CONTROLS, AND THE OPERATING EXPERIENCE FOR THE NINE NUCLEAR POWER STATIONS INCLUDED. VARIOUS TABLES AND CHARTS SUMMARIZE THE CHARACTERISTICS OF THE FACILITIES AND THEIR DISCHARGES. THIS REPORT-UPDATES THE [illegible] UPDATES THE TABLES AND CHARTS THROUGH 1970. IT ALSO PROVIDES DATA FOR TWO ADDITIONAL [illegible] AND THREE ADDITIONAL NUCLEAR PLANTS - [illegible] (1969), IN CONNECTICUT (1968), NINE MILE POINT (1969), AND RYSTED FERRY (1969).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA, 22161

ADMINISTRATIVE CONTROL • [illegible] • REACTOR, POWER • WASTE SOURCE AND TYPE • REACTOR POWER • RADIOACTIVITY RELEASE • [illegible] • [illegible] • [illegible] • GAS • LIQUID • DATA COLLECTION • COMPARISON • [illegible] FORECAST • DISCHARGE

[illegible]
[illegible]
[illegible] OF
[illegible] WASTE DISPOSAL PROCEDURES AT THE SAVANNAH RIVER PLANT
SAVANNAH RIVER LABORATORY
[illegible] • [illegible] 7 •, 17 PAGES, [illegible] 69-[illegible] OF DISPOSAL OF RADIOACTIVE WASTES INTO THE GROUND, [illegible] TRANSFER SYMPOSIUM, VIENNA, AUSTRIA

SOLID RADIOACTIVE WASTE HAS BEEN BURIED AT THE SAVANNAH RIVER PLANT SINCE 1951. THE WASTE, CONSISTING OF EQUIPMENT AND MATERIAL CONTAMINATED WITH FISSION PRODUCTS, ACTIVATION PRODUCTS, AND TRANSURANIC ELEMENTS, HAS BEEN BURIED IN UNLINED TRENCHES BELOW THE WATER TABLE. A TOTAL OF 1,[illegible],000 CI OF FISSION AND ACTIVATION PRODUCTS, AND [illegible] CI OF TRANSURANIC ELEMENTS, HAVE BEEN BURIED THROUGH 1968. SEEPAGE RATES [illegible] 89,[illegible] METER PER CENTURY, AND EXPERIENCE

020830 [illegible]
INDICATES THAT THE USEFUL LIFE OF A BASIN IS GREATER THAN 10 YEARS.

DISPOSAL • MONITORING, LIQUID • OSCR, BARNWELL[illegible] • WASTE STORAGE • SAVANNAH RIVER PLANT • THERMAL CONSIDERATION • WASTE DISPOSAL, SOLID • WASTE TREATMENT, SOLID • WASTE TREATMENT, ECONOMICS • [illegible] • ION EXCHANGE • PRECIPITATION • RADIATION SAFETY AND CONTROL

020839
ELDRIDGE JD • WASHINGTON EF
WASTE MANAGEMENT AT NUCLEAR POWER STATIONS
10 PAGES. NUCLEAR SAFETY. 9. PAGES 250-260 (MAY-JUNE 1968)

THE MANAGEMENT OF WASTES PRODUCED AT NUCLEAR POWER PLANTS MAY BECOME AN INCREASINGLY SIGNIFICANT PROBLEM IN AN ECONOMY EXPECTED TO GROW TO 50 TIMES ITS PRESENT SIZE WITHIN THE NEXT 10 YEARS. AS PRELIMINARY STEP IN ASSESSING FUTURE IMPLICATIONS, STUDIES WERE MADE OF THE OPERATING EXPERIENCE IN WASTE MANAGEMENT AT THE ADDITIONALLY SELECTED PRESENT 1. BIG BEND [illegible], HUMBOLDT BAY, FLA RIVER, INDIAN POINT 1, AND YANKEE POWER STATIONS. WASTE-MANAGEMENT PRACTICES AT LIGHT-WATER POWER-OPERATING STATIONS HAVE BEEN QUITE ADEQUATE IN THE PAST, AND THAT THERE ARE NO FUTURE PROBLEMS ANTICIPATED IN THIS AREA THAT WILL NOT BE RESOLVED IN THE NORMAL COURSE OF AN EXPANDING INDUSTRIAL TECHNOLOGY.

WASTE • REACTOR, POWER • WASTE MANAGEMENT • MONITOR • OPERATION SAFETY AND CONTROL • OPERATING EXPERIENCE

031400
HOFFER RW • BOES II • PODHAVOST RC
REMOVAL OF CS-137 FROM REACTOR CONDENSATE WASTES
BATTELLE MEMORIAL INST., PACIFIC NORTHWEST LAB., WASH.
BNWL-879 0. 19 PAGES. 17 FIGURES. 7 TABLES. 9 REFERENCES, NOVEMBER 1969

CESIUM-137 IS REMOVABLE FROM ITS, SR, AND 147-P CONDENSATES BY ION EXCHANGE ON AN 900 COLUMNS. THE AN-900 COLUMNS HAVE CAPACITY OF PROCESSING 4000 BED [illegible] TO REGENERATION OF THE CS-137. A 1% NITRIC SOLUTION HAS EFFECTIVE FOR REGENERATING THE AN-900 COLUMNS. REGENERATION WAS ACCOMPLISHED IN 10 TO 20 COLUMN-VOLUMES AT 60 TO 70 F. ALTHOUGH CS-137 MAY BE REMOVED TO [illegible]-WATER LIMITS (1/10 MPCW) TEN MRD IT DOES NOT APPEAR LIKELY THAT ALL THE RADIONUCLIDES IN ITS CONDENSATE CAN BE ECONOMICALLY REDUCED TO THIS LEVEL. WHILE THE MOST RESSIVE PRODUCTS SUCH AS PU-106 CAN BE REMOVED WITH STRONG BASE AND STRONG ACID ION EXCHANGE RESINS, NO PRACTICAL METHOD EXISTS FOR REMOVING THE TRITIUM. A DF THE ABOUT 10 IS REQUIRED TO MEET THE DRINKING WATER LIMIT IN ITS CONDENSATE FOR BOTH PU-106 AND H-3.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY. $0.65 MICROFICHE

RESIDUE • WASTE TREATMENT, LIQUID • WASTE MANAGEMENT • DECONTAMINATION • ION EXCHANGE • EXPERIMENT • DOUBLE DEMINERALIZING

039171
RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION - IDAHO OPERATIONS OFFICE
ANDERSON OPERATIONS OFF
IDO-17040. SUPPL. 4 0. 19 PAGES. 4 FIGURES. 11 TABLES, APRIL 1, 1969

THE INFORMATION IN THIS REPORT INCLUDES DATA ON RADIOACTIVE WASTE ASSOCIATED WITH REACTOR OPERATIONS OR RESEARCH STUDIES AT THE NATIONAL REACTOR TESTING STATION DURING 1968. THE RADIOACTIVE WASTES ARE IDENTIFIED ACCORDING TO QUANTITY, PHYSICAL FORM, NUCLIDE CONTENT, AND THE INSTALLATION OR AREA ORIGINATING THE WASTE. RADIOACTIVE WASTE DATA FOR THE YEARS 1954 THROUGH 1967 ARE ALSO GIVEN IN SUMMARY FORM. A MORE DETAILED PRESENTATION OF DISPOSAL DATA FOR YEARS PRIOR TO 1968 IS AVAILABLE IN REPORTS IDO-17040 AND IDO-17040 SUPPLEMENTS NO. 1, NO. 2, AND NO. 3.

CESIUM • [illegible] • [illegible] • [illegible] 1 AND 2 [illegible] • IODINE • GAS • RUTHENIUM • STRONTIUM • CHROMIUM • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE DISPOSAL, SOLID • WASTE MANAGEMENT • FUEL RODS • REACTOR • [illegible] REPROCESSING

099191
LOW-TEMPERATURE ADSORPTION STUDIES FOR THE D,T REACTOR
GENERAL ATOMIC
GA-7937 0. 30 PAGES. 4 FIGURES. 3 TABLES. 8 REFERENCES, JUNE 27, 1967

LABORATORY EXPERIMENTAL DATA ON ADSORPTION AT LIQUID-NITROGEN TEMPERATURE FOR THE D,T REACTOR PROJECT IS DESCRIBED. DATA ON THE DYNAMIC AND EQUILIBRIUM ADSORPTION OF NE, TRITIUM, AND CO ON ACTIVATED CARBON AT -196 C ARE GIVEN. IN ADDITION, EXPERIMENTS ON THE EFFECT OF HIGH CO IMPURITY LEVELS ON THE ADSORPTION OF NE ARE REPORTED. THE RESULTS INDICATE THAT THE LIQUID ISOTHERM MODEL IS AN EXPLICIT REPRESENTATION OF PURE AND MIXED GAS ADSORPTION ON ACTIVATED CARBON.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY. $0.65 MICROFICHE

ADSORPTION • REACTOR • [illegible] • [illegible] • [illegible] • GAS

[illegible]
[illegible]
[illegible] PROBLEMS ASSOCIATED WITH THE INCREASING MIXED-UP OF FUTURE FUELS
[illegible] FOR REPROCESSING, NORTSWORP
NFS-[illegible] 6, 13 PAGES, 7 TABLES, 30 REFERENCES, DECEMBER 1969

DISCUSSES IN GENERAL TERMS CONSIDERATIONS OF INCREASING MIXING ON REPROCESSING. PROBLEMS FORESEEN INCLUDE TRANSPORT, MECHANICAL DISASSEMBLY, SOLVENT DAMAGE. THESE RESULT FROM HIGH FISSION-PRODUCT CONCENTRATIONS WITH CORRESPONDING AMOUNTS OF VOLATILE IODINE AND TRITIUM.

AVAILABILITY - NFS REPOSITORY LIBRARIES IN THE U.S. AND ABROAD

NFS (1) MIXED (2) FUELS (3) RADIATION DAMAGE (4) GERMANY (5) NOX GAS (6) SOLVENT EXTRACTION PROCESS (7) FUEL REPROCESSING

[illegible]
[illegible]
TREATMENT AND FINAL STORAGE OF RADIOACTIVE RESIDUES
[illegible] PAGES, BETRIEBSTECHNIK-ATOMTECHNIK, 18(8/9), PP. 441-447 (AUGUST-SEPTEMBER 1971) (IN GERMAN)

REVIEWS REVIEW OF SAFETY WITH RESPECT TO OPERATIONS CONCERNING CONTAINMENT, TREATMENT, HANDLING, STORAGE, AND DISPOSAL OF RADIOACTIVE WASTES.

FISSION (1) DECONTAMINATION (2) EFFLUENT (3) STORAGE (4) WASTE HANDLING (5) WASTE STORAGE (6) WASTE TREATMENT (7) WASTE MANAGEMENT (8) INCINERATION (9) WASTE DISPOSAL, SOLID

[illegible]
LETTER, NRS TO DIVISION OF MATERIAL LICENSING REQUESTING CONSIDERATION OF CONSTRUCTION APPLICATION
NUCLEAR FUEL SERVICES
1 PAGE, LETTER - NRS TO DIVISION OF MATERIALS LICENSING - JANUARY 21, 1970, NRDOCT 50-201

REPORTS IS TO DRILL A DEEP DISPOSAL WELL FOR DISPOSAL OF LOW-LEVEL WASTE WHICH RADIOACTIVITY IS MAD TRITIUM WITH AN EXPECTED SIGNIFICANT INCREASE FROM THE PLANNED PLANT EXPANSION. ATTACHED IS SPECIFICATIONS FOR CONSTRUCTION OF THE WELL AND WELL TEST DATA ON A SIMILAR WELL RECENTLY COMPLETED IN THE WESTERN NEW YORK AREA.

AVAILABILITY - NRC

WASTE DISPOSAL, TERRESTRIAL (1) RECONSTRUCTING PROBLEM PROCESS (2) WASTE DISPOSAL, LIQUID (3) WASTE DISPOSAL, MEMORY (4) NRC (5) SOLVENT EXTRACTION PROCESS (6) FUEL REPROCESSING

[illegible]
RAMSTOR ED
ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RAMSTOR
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 16(8), PP. 29-30 (FEBRUARY 7, 1970)

CONTAINS REVIEWS A SUMMARY PRESENTATION OF POTENTIAL EFFECTS OF TRITIUM RELEASES. HE POINTS OUT THAT MORE STUDIES SHOULD BE DONE FUEL REPROCESSING PLANTS, ALTHOUGH RELEASES TO WATER INTERCEPTED WAS FOR HIGHLY SIGNIFICANT. PASSING THE AEC ACCEPTS THE LINEAR-DOSE-RESPONSE, RELATIONSHIPS, AND MAXIMUM-PERMISSIBLE-CONCENTRATION CONCEPTS. THEN HE HAS REASONS TO SHOW POTENTIAL PROBABLY UNFAVORABLE EFFECTS EXCEED AND TRUE. HE DIVERTS PASTS OUR TO VARIOUS RADIATION SOURCES PROCESSING. IN ADDITION HE STATES HIS CONSIDERED ACCEPTABLE GENERATE DOSE FROM TRITIUM. FROM THESE HE DEVELOPS HIS THESIS, WHERE, MORATION MUST BE PREPARED TO ACCEPT CERTAIN RISKS, AND THE AEC WHICH SEEMS ALSO IS IT ADDRESS PROPER TO THEIR RESPONSIBILITIES FOR TREATING THE WHOLE RANGE OF ENVIRONMENTAL PROBLEMS. DECISIONS MADE NOW CAN INFLUENCE GENERATIONS TO COME FOR CENTURIES.

EQUIPMENT (1) TRITIUM (2) PAPERS AND STATEMENTS (3) CONGRESSIONAL ACTIVITY (4) AEC (5) REPORTING (6) STRONTIUM (7) REACTOR, POWER (8) ICRP (9) NCRP (10) RADIOACTIVITY RELEASE (11) WATER POLLUTION (12) FUEL REPROCESSING (13) SOLVENT FILTERS I (14) (15) DATA COLLECTION (16) BOOK CHAPTER (17) AQUATIC ORGANISM (18) EFFECT, GENETIC (19) STANDARDS AI (20) INDUSTRY, NUCLEAR (21) BIOLOGICAL CONTROL (22) REPORT (23) ECONOMIC/ECONOMICS CONSIDERATION

[illegible]
[illegible]
IN THE UTILITIES
1 PAGE, NUCLEONICS NEWS, 28 (8 SEPTEMBER 9, 1970)

COOK COUNTY SANITARY DISTRICT MAY FILE SUIT AGAINST ELECTRIC MICHIGAN NUCLEAR POWER STATION. ITS CONTENTION IS THAT ON WASTE ON THE LAKE MICHIGAN ARE NO CHANGE WHATSOEVER IN THE TEMPERATURE. IT REQUIRES TO CHANGE AND TRITIUM INJECTION PLUS THREAT OF RADIOACTIVE LEAKAGE, IT SEES PLANT DISCHARGE AS A THREAT TO CHICAGO WATER SUPPLY. [illegible] PERSEPTIV METAL SUPPL.

REACTOR, POWER (1) WATER POLLUTION (2) THERMAL POLLUTION (3) COOK I (4) (5) COOK I (6) (7) DISCHARGE, MANAGEMENT (8) ELECTRICITY (9) REPORT (10) CONSERVATION, STATE

044106
TRITIUM RELEASE AT CALVERT CLIFFS
BALTIMORE GAS AND ELECTRIC COMPANY
1 PAGE. PUBLIC INFORMATION BROCHURE. 1969

A PUBLIC-INFORMATION BROCHURE CONCERNING TRITIUM RELEASE AT CALVERT CLIFFS. THEY ARE BUILDING A $84.4 MILLION PROCESSING SYSTEM THAT WILL HAVE REMOVAL EFFICIENCY OF 99.9999 PERCENT FOR MOST IMPURITIES, 99 PERCENT EFFICIENCY FOR REMOVING RADIOACTIVE IMPURITIES, EXCEPT TRITIUM. FOOD-CHAIN DISPOSAL ARGUMENTS BUT EXAMPLES GIVEN OF INSIGNIFICANCE AND NUMERICAL VALUES ARE ILLUSTRATIVE.

*ECOLOGY * REACTOR, POWER * RADIATION, PUBLIC EDUCATION * RADIOACTIVITY RELEASE * WATER POLLUTION * CALVERT CLIFFS 1 (PWR) * ENVIRONMENTAL CONTROL MEASURE * FOOD CHAIN * N-POWER, SAFETY OF * PROCEDURE * SUPERVISION, UTILITY

044650
METHOD FOR REDUCTION OF TRITIUM VAPOR CONCENTRATION
U.S. ATOMIC ENERGY COMMISSION
RHE-70-9 *. 2 PAGES. MAY 17, 1970

THROUGH LEAKAGE IN COMPONENTS OF THE PRIMARY SYSTEM (VALVE STEMS, ETC.), TRITIUM VAPOR IS INTRODUCED INTO THE ATMOSPHERE OF THE CONTAINMENT BUILDING. BY ADDING CLEAN, LOW-PRESSURE STEAM (200 LB/HR) INTO THE CIRCULATING AIR STREAM, SATURATING IT, MOISTURE AND TRITIUM WERE THEN REMOVED BY CONDENSATION ON COOLING COILS. TRITIUM CONCENTRATION WAS REDUCED BY A FACTOR OF 4. INJECTION STARTED 24 HR BEFORE A PLANNED ENTRY INTO CONTAINMENT.

AVAILABILITY - DUDLEY THOMPSON, USAEC, DIVISION OF REACTOR LICENSING, WASHINGTON, D.C. 20545

*AIR CLEANING * CONTAINMENT * REACTOR, PWR * CONFERENCES AND MANUALS * * TAN * DECONTAMINATION * CONTAMINATION * REDUCTION * OPERATING EXPERIENCE

044674
JENKINS RL
BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
CONF-690309 *. 11 PAGES. PP. 197-47 OF THE PROCEEDINGS OF A SYMPOSIUM ON BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE, LIVERMORE, CALIFORNIA, MARCH 5-7, 1969

THE RELEASES OF RADIONUCLIDES FROM REACTORS AND THE ENVIRONMENTAL EFFECTS OF THESE RELEASES HAVE BEEN STUDIED SINCE THE EARLY 1940S. CONTROLS BASED ON THE KNOWLEDGE GAINED FROM THESE STUDIES HAVE BEEN ADEQUATE TO MAINTAIN THE RADIATION EXPOSURE OF THE PUBLIC WELL WITHIN ACCEPTABLE LIMITS. THE SIGNIFICANT PATHWAYS OF EXPOSURE HAVE BEEN IDENTIFIED. OVER THE YEARS IMPROVED METHODS OF WASTE TREATMENT AND CONTAINMENT TECHNOLOGY FOR REACTORS HAVE EVOLVED TO THE POINT WHERE RELEASE OF WASTE HEAT FROM POWER REACTORS NOW APPEAR TO BE RECEIVING MORE PUBLIC ATTENTION THAN THE RELEASE OF RADIONUCLIDES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIOMEDICAL * ECOLOGY * FALLOUT * WASTE TREATMENT * CONTAINMENT B AND D * SAVANNAH RIVER PLANT * CHALK RIVER * RADIOISOTOPE * ENVIRONMENT * HANFORD SITE * REACTOR, PRODUCTION * REPROCESSING TRANSFER

044916
REDUCTION OF TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED AREAS
THEODORE R. SCHRADER, INC.
2 PAGES. LETTER - THEODORE A. SCHRADER, INC. TO DIVISION OF COMPLIANCE (REG) - MARCH 19, 1970

1969 AVERAGE CONCENTRATION RELEASED TO UNRESTRICTED AREAS WAS 0.01 X 10E-4(M) MICROCURIE/CC WHICH IS 4 TIMES MPC (10). RUNNING STACK FAN CONTINUOUSLY NOW TO GET AN ADDITIONAL DILUTION FACTOR OF 4.7. VARIOUS MEASUREMENTS ARE BEING MADE TO STUDY THE DIFFUSION OF TRITIUM AFTER IT LEAVES THE STACK. A MODIFICATION TO THE STACK IS PROPOSED TO INCREASE DILUTION FACTOR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (99 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE * CONCENTRATION, MAXIMUM * DIFFUSION * BYPRODUCT MATERIAL * VENTILATION SYSTEM * STACK * AIR * WASTE DISPOSAL, GAS * EQUIPMENT DESIGN * OPERATING EXPERIENCE * NFDF SITE

044977
MCBRIDE JA
INDUSTRIAL FUEL REPROCESSING AND THE ENVIRONMENT
AEC, DIVISION OF MATERIALS LICENSING
22 PAGES. 4 FIGURES, 10 REFERENCES. PAPER PRESENTED AT THE PUBLIC HEALTH WORKSHOP ON RADIATION AND WASTE ENVIRONMENT, BUCK HILL FALLS, PA., APRIL 19-22, 1970

DISCUSSES THE SIGNIFICANCE OF FUEL REPROCESSING, THE VARIOUS ASPECTS OF RADIATION SAFETY AND CONTROL, TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS, AND THE REGULATIONS AND LICENSING OF OPERATORS.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 140 UNION AVENUE, NEW YORK, NEW YORK 10017

064077
CODES AND STANDARDS • KRYPTON • REGULATION • SITING, CHEMICAL PROCESS PLANT • TRANSPORTATION AND HANDLING •
WASTE STORAGE • CONTAINMENT INTEGRITY • ACCIDENT, HYPOTHETICAL • MONITOR, ENVIRONMENTAL • WASTE DISPOSAL,
SOLID • OPERATION SAFETY AND CONTROL • ORNL • OPERATING LICENSE PROCESS • FUEL REPROCESSING

065609
WESTINGHOUSE OFFERS SYSTEMS FOR ESSENTIALLY ZERO RELEASE OF RADWASTE
1 PAGE, NUCLEAR INDUSTRY, P. 40 (MAY 1970)

THE COMPANY HAS ANNOUNCED THAT IT IS OFFERING A NEW RADWASTE SYSTEM THAT WILL ADD ABOUT $1/KW TO THE COST OF A NEW PLANT. THE SYSTEM WILL ENABLE KRYPTON AND TRITIUM TO BE RETAINED FOR LONG TIMES AND EITHER STORED ON-SITE OR SHIPPED OFF PERIODICALLY. THE QUANTITY INVOLVED YEARLY IS ENOUGH TO BE CONTAINED IN 5 NORMAL-SIZED OXYGEN TANKS SUCH AS USED BY WELDERS. DISCHARGE OF NUCLIDE GASES WILL OCCUR ONLY WHEN THE CONTAINMENT STRUCTURE IS VENTILATED ONCE A YEAR DURING REFUELING, AND THESE WILL BE BARELY DETECTABLE ABOVE NATURAL BACKGROUND. RELEASE OF TRITIUM WILL BE COMPLETELY ELIMINATED DURING NORMAL OPERATIONS (REMOVED AS TRITIUM OXIDE), AND OFF-SITE DISPOSAL REQUIRED 1/7 TIMES DURING PLANTS LIFETIME. SYSTEM WILL BE INSTALLED IN THE 2 ZION UNITS.

FISSION PRODUCT RELEASE • KRYPTON • ATMOSPHERIC POLLUTION • REACTOR, POWER • RADIOACTIVITY RELEASE •
ENVIRONMENT • FISSION PRODUCT OPERATION • ZION 1 (PWR) • EQUIPMENT DEVELOPMENT • INDUSTRY, NUCLEAR

065018
NERMIND DISCUSSES FUEL REPROCESSING
ATOMIC INDUSTRIAL FORUM, INC.
1 PAGE, INFO ISSUE NO. 77 (SUPPLEMENT), P. 5 (MAY 1970)

THE DIR. OF REG DIV. OF MATERIALS LICENSING DISCUSSES THE CONCERN TO ENVIRONMENTALISTS OF INCREASING NUMBER OF REPROCESSING PLANTS, BECAUSE THESE REPRESENT ONLY OPERATIONS IN NUCLEAR-INDUSTRY CYCLE WHERE FISSION PRODUCTS ARE VISIBLE. KRYPTON AND TRITIUM MERIT MOST ATTENTION. LOCAL EXPOSURE FROM HIGH-CAPACITY PLANTS MAY DICTATE A REQUIREMENT TO SEPARATE THEM FROM PLANT EFFLUENT (E.G., NFS PLANT, W. VALLEY, N.Y.). AEC FEELS IT IS PRACTICAL TO ACHIEVE A REDUCTION IN PRESENT EFFLUENT LEVELS. HE CITES 50-MD BUILDUP IN A PERSON EATING FISH, AND CS-137 FROM EATING DEER (WITH FROM ENVIRONS OF PLANT). THE REACTOR COMMITTEE FOR SCIENTIFIC INFORMATION REPORTED EXCESSIVE STRONTIUM RELEASED IN NFS EFFLUENT. BASED ON NFS AND N.Y. DEPT. OF HEALTH DATA, AEC INVESTIGATED AND FOUND WITHIN LIMITS. HE DESCRIBED PLANNED REPROCESSING PLANTS BY GE AND ALLIED CHEMICAL AND THEIR PLANS FOR EFFLUENT CONTROL

CODES AND STANDARDS • EAC • FISSION PRODUCT RELEASE • KRYPTON • RADIOACTIVITY RELEASE • NFS • FUEL
REPROCESSING • RADIONUCLIDE UPTAKE • ANIMAL, FISH • CONCENTRATION • MAMMAL • MAN • INDUSTRY, NUCLEAR •
ORGANIZATION, CITIZEN • SPOKESMAN, AEC

064665
SELECTED ITEMS OF INTEREST
CENTRE D'ETUDES NUCLEAIRES, FONTENAY-AUX-ROSES (FRANCE)
ANL-TRANS-70 0. 15 PAGES, TRANSLATION OF CEA-N-1140, NOVEMBER 1969

THIS TRANSLATION IS CONCERNED WITH CONCENTRATION OF EFFLUENTS. TOPICS ARE - CONCENTRATION OF EFFLUENTS BY ION EXCHANGE, RESEARCH WITH EXCHANGERS, USE OF ORGANIC RESINS AND INORGANIC EXCHANGERS FOR TREATMENT OF EFFLUENTS FROM CEN/S, FRANCE, UP-2, STUDY OF PULSED-EVAPORATION TECHNIQUES, PILOT PLANT OF TRITIATED EFFLUENTS (6 LITERS/HR) AND CELL FOR 40 LITERS/HR).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00
COPY, $0.65 MICROFICHE

COBALT • REPORT, OPERATIONS • CHEMICAL KINETICS • ION EXCHANGE • TEST, BENCH • RESEARCH CONTRACT

047098
VON WEYDEN HJ
RUN-UP TIME OF THE RADIOACTIVE GASEOUS WASTEWATER IN THE OFF-GAS SYSTEM DELAY SECTION
TECHNISCHE HOGESCHOOL, DELFT (NETHERLANDS)
AEC-TR-7097 0. 29 PAGES, TRANSLATION OF A GERMAN REPORT, DECEMBER 2, 1966

TO PREVENT CONTAMINATION OF THE ENVIRONMENT, ANY RADIOACTIVE GASES FORMED ARE PASSED THROUGH A DELAY SECTION IN WHICH THE RADIOACTIVE ISOTOPES DECAY. A CERTAIN MINIMUM DELAY TIME IS NECESSARY IN ORDER TO INSURE A VALID CALCULATION OF THE RADIOACTIVITY DISPOSITION IN THE ENVIRONMENT. THE DELAY SECTION USED FOR THE MEASUREMENTS WAS SHORTER THAN THAT ALLOWED AND REQUIRED FOR THE EXPERIMENT. A CALCULATION PERFORMED USING A LAMINAR FLOW AS THE STARTING POINT GIVES A DELAY TIME WHICH IS IN AGREEMENT WITH THE RESULTS OBTAINED. INASMUCH AS THE FLOW CONDITIONS ARE UNKNOWN, THE RESULTS CAN BE EXPLAINED FAIRLY GRAPHLY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00
COPY, $0.65 MICROFICHE

NITROGEN • KRYPTON • OXYGEN • XENON • ARGON • NITROGEN • STACK • FLOW, LAMINAR • OFF GAS

047256 (CONTINUED)
STORMS CP
A REVIEW OF THE LITERATURE OF 1968 ON WASTEWATER AND WATERPOLLUTION CONTROL - INDUSTRIAL WASTE, RADIOACTIVE
20 PAGES. JOURNAL OF THE WATER POLLUTION CONTROL FEDERATION. VOL.41. PG. 1279-1291 (JUNE 1969)

THE FOLLOWING TOPICS RELATING TO RADIOACTIVE INDUSTRIAL WASTE WATER TREATMENT DISPOSAL WERE REVIEWED WITH 167 REFERENCES - U RECOVERY, WASTE WATER TREATMENT BY PRECIPITATION OF RADIONUCLIDES, SOLVENT EXTRACTION, ION EXCHANGE, ADSORPTION, UPTAKE ON NATURAL MATERIALS, ELECTRODIALYSIS, FIXATION, GROUND DISPOSAL, DISPOSAL IN THE MEDITERRANEAN SEAFORMS, DIFFUSI, UPTAKE ON SEDIMENTS, MONITORING, AND ANALYSIS.

ADSORPTION • BIBLIOGRAPHY • DECONTAMINATION • STRONTIUM • WASTE TREATMENT, LIQUID • REACTOR, POWER • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • ION EXCHANGE • RADIOCHEMICAL PROCESSING • RADIOISOTOPE • FUEL REPROCESSING • FUEL CONVERSION • CORE CONVERSION • FUEL ELEMENTS

047299
STIGAEL GE
EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN
NUS CORPORATION
NUS-TM-5-60 P. 17 PAGES. 1967

DISCUSSES THE QUESTION OF THE CAPACITY OF LAKE MICHIGAN TO RECEIVE AND ADEQUATELY DILUTE THE WASTES RELEASED TO IT. THE FIRST CONCERN IS THE LOCAL EFFECTS. THE SECOND IS A CONCERN OF THE TOTAL ASSIMILATIVE CAPACITY OF THE LAKE WITH A FUTURE OUTLOOK OF ADDED INJECTIONS. THE THIRD CONCERNS THE DILUTION OF A FEW PERCENT OF NPC EFFLU. DISCHARGE A SECOND PLANT STUD AND CONSIDER MILES AWAY.

AVAILABILITY - NUS CORPORATION, 1730 M. STREET, N.W., WASHINGTON, D.C. 20036

CESIUM • DILUTION • FALLOUT • NPPC • STRONTIUM • WASTE DISPOSAL • DISPERSION • WATER POLLUTION • DECONTAMINATION • SYSTEM CAPACITY • ASSIMILATION • LAKE MICHIGAN

049267
DEICHERT SO
GEOLOGY PLAYS AN IMPORTANT ROLE IN RADIOACTIVE WASTE MANAGEMENT
E.I. DUPONT DE NEMOURS AND COMPANY, AIKEN, S.C.
6 PAGES. MINING ENGINEERING, VOL. 20, PG 98-101 (SEPTEMBER 1968)

THE PROGRAM FOR MANAGEMENT OF GASEOUS, LIQUID, AND SOLID WASTES AT THE SAVANNAH RIVER PLANT IS DISCUSSED. KNOWLEDGE OF THE CHARACTERISTICS OF THE WASTES AND THE ENVIRONMENT ARE NECESSARY FOR SAFE GROUND DISPOSAL. FAVORABLE ENVIRONMENTAL PARAMETERS INCLUDE A DEEP WATER TABLE WITH LONG FLOW PATH AND ION CONTENT TO THE STREAM AND SOIL WITH HIGH ION EXCHANGE CAPACITY AND MINERALS TO ION PERMEABILITY. REDUCTION OF TRITIUM IS ACHIEVED BY GROUND WATER DILUTION. REDUCTION OF SR-90 IS ACHIEVED LARGELY BY GROUND WATER DILUTION BUT PARTIALLY BY SOIL ADSORPTION. ALL OTHER RADIONUCLIDES ARE READILY ADSORBED BY THE SOIL.

GEOLOGY • STRONTIUM • WASTE DISPOSAL • SAVANNAH RIVER PLANT • WASTE MANAGEMENT • CHEMICALS

049268
THOMPSON TJ
AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS
1 PAGE. NUCLEAR INDUSTRY, PG 19 (JUNE 1970)

COMMISSIONER THOMPSON QUESTIONED INDUSTRY'S CAPABILITY TO BUILD N-POWER REACTORS WITH ZERO EFFLUENT AND THE ADVISABILITY OF BUILDING THEM. HE PROPOSED THESE REMARKS AT THE S. INTERSTATE NUCLEAR BOARD BRIEFING FOR STATE AND LOCAL OFFICIALS. IT IS UNDERSTOOD THAT HIS VIEWS DIFFER FROM THOSE OF HIS FELLOW COMMISSIONERS. HE SAYS IT IS MISLEADING TO THE PUBLIC TO SAY NO EVEN IMPLY ZERO RELEASE. THE TRITIUM WILL BE HELD AND RECIRCULATED UNTIL IT DECAYS UP TO SOME EQUILIBRIUM VALUE (20 YRS). THEN IT STILL HAS TO GO INTO THE ENVIRONMENT. MINOR RELEASES OCCUR FROM TIME TO TIME BUT IN THE LONG RUN DOESN'T TO BE INSIGNIFICANTLY OFFSET THAN THE RELEASE OF A LARGER QUANTITY OF TRITIATED WATER.

FISSION PRODUCT RELEASE • REACTOR, POWER • WASTE MANAGEMENT • RADIATION EFFECT • INDUSTRY, NUCLEAR • DISPERSION, AEC • THOMPSON TJ

049657
PARMELIS B
PROGRESS REPORT ON THE MAIN STUDIES UP TO JANUARY 1, 1969
CENTRE D'ETUDES DE NUCLEAIRES, FONTENAY-AUX-ROSES, FRANCE
CEA-R-1266 P. 40 PAGES. 1970 (IN FRENCH)

THIS REPORT REVIEWS CERTAIN RESEARCH WHICH HAS BEEN CARRIED OUT IN 1968 IN THE LABORATORIES OF THE DEGASSIS AND FINES GROUP. IN THE FIELD OF DEGASSIS, PROGRESS HAS BEEN MADE IN DEVELOPING, CAPTURE, AND CONSERVATION PROCESSES BOTH FROM THE FUNDAMENTAL POINT OF VIEW AND FROM THE POINT OF VIEW OF APPLICATIONS. IN THE RADIOACTIVE CONTAMINATION OF BUILDINGS AND IN NON-RADIOACTIVE ATMOSPHERIC POLLUTION. IN THE FIELD OF FISSION GASES AND DEGASSIS, A MORE COMPLETE STUDY HAS BEEN MADE OF THE EFFECTS OF RADIATION ON THE TRAPPING-CONTAINING PROPERTIES LIKELY TO BE FOUND. THE APPLICATION TO THE TRAPPING OF THESE PRODUCTS HAS BEEN EXAMINED.

[illegible]
AVAILABILITY - USAEC DOCUMENT LIBRARIES IN THE U.S. AND ABROAD

[illegible] • [illegible] • FISSION GAS RELEASE • FISSION PRODUCT, [illegible] • TESTING • [illegible] PROPERTIES •
[illegible] • [illegible] • [illegible] • [illegible] • FILTERS

[illegible]
[illegible] JR
[illegible] OF SOLID RADIOACTIVE WASTE DURING A TEN-YEAR PERIOD.
[illegible] P.

WASTE DISPOSAL • WATER • SOIL • [illegible] • SOLID • TRANSPORT

[illegible]
[illegible] JR
[illegible] OF RADIOACTIVE WASTE DISPOSAL IN THE [illegible] AREA, NATIONAL REACTOR TESTING STATION, IDAHO.
U. S. [illegible], [illegible], PAPERS AND PAGES [illegible] 1967

[illegible] • TESTING • WASTE DISPOSAL • WATER • [illegible] • REACTOR • SOIL • [illegible]

[illegible]
US [illegible] SURVEY
[illegible] OF WASTE DISPOSAL. NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT, 1967.
IDO-[illegible] P.

TESTING • WASTE DISPOSAL • WATER • [illegible] • REACTOR • SOIL • TRANSPORT • [illegible]

[illegible]
[illegible] R
RADIOACTIVE WASTES FROM [illegible] REACTORS.
SCIENCE [illegible] PAGES [illegible] 1968

[illegible] • WASTE DISPOSAL • REACTOR • PARTICIPATION

[illegible]
[illegible] OF
STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF [illegible] AND ENVIRONMENTAL PROTECTION
[illegible] PAGES, FIGURES, TABLES. STATEMENT PRESENTED AT THE AEC [illegible] HEARINGS ON [illegible] FROM LIGHT WATER
[illegible] POWER REACTORS, JANUARY 29, 1972

DISCUSSES THE OPERATING EXPERIENCE OF MAJOR LIGHT-WATER-COOLED REACTORS WITH RESPECT TO DISCHARGES OF RADIOACTIVE MATERIALS IN LIQUID AND GASEOUS EFFLUENTS, INCLUDING THE COMPOSITION AND QUANTITIES OF WASTES RELEASED AND THE RESULTING DOSES TO PEOPLE AT THE BOUNDARY AND ELSEWHERE IN THE SURROUNDINGS.

AVAILABILITY - [illegible], ASST. DIR., USAEC DIVISION OF RADIOLOGICAL AND ENVIRONMENTAL PROTECTION, WASHINGTON, D. C.

[illegible] • [illegible] • WATER, [illegible] • OPERATING EXPERIENCE SUMMARY • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • [illegible] • [illegible] MEASUREMENT, EXPERIMENT • DOSE CALCULATION, EXPERIMENT • RADIOACTIVITY RELEASE • CONCENTRATION

[illegible]
NEW DESIGN SET IN NUCLEAR PLANT
THE NEW YORK TIMES, NEW YORK, MAY 10, 1970

[illegible]-WISE ANNOUNCES DEVELOPMENT OF A N-POWER PLANT DESIGN THAT WILL ELIMINATE ANY DISCHARGE OF RADIOACTIVITY TO ENVIRONMENT UNDER NORMAL OPERATING CONDITIONS. DESIGN COMPLETELY ELIMINATES RELEASE OF TRITIUM, CONFINING IT WITHIN THE SYSTEM AND RECOVERS FOR PROCESSING ONLY ONCE OR TWICE DURING 40-YR LIFE OF THE N-PLANT. THE SYSTEM WILL BE INSTALLED AT BOTH 1.1-MWE ZION PLANTS TO ELIMINATE NUCLEAR DISCHARGES INTO LAKE MICHIGAN.

ECONOMICS • FISSION PRODUCT RELEASE • OPERATION, POWER • ZION 1 (PWR) • ENVIRONMENTAL CONTROL MEASURE • LAKE MICHIGAN • INDUSTRY, NUCLEAR

[illegible]
[illegible] R
HEAT PIPES FOR RECOVERY OF TRITIUM IN THERMONUCLEAR REACTOR BLANKETS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA
UCRL-[illegible] P., P PAGES, MARCH 18, 1970

CONTROLLED THERMONUCLEAR REACTORS, USING DEUTERIUM-TRITIUM A FUEL FOR THE FUSION REACTION,

050007 [illegible]

[illegible] A MEANS OF SEPARATING TRITIUM SO THAT FUELS CONTAMINITY IS MINIMIZED. THIS PAPER SUGGESTS A UNIQUE WAY FOR SATISFYING THE TRITIUM. IT IS PROPOSED THAT HEAT PIPES USING SODIUM AS A WORK-FLUID OF USED AS TRITIUM TRANSPORTERS IN THE BLANKET STRUCTURE OF A FUSION REACTOR. THE TRITIUM PRODUCED IN THE LITHIUM MODERATOR OF THE BLANKET WHICH IS PASSED THROUGH THE HEAT PIPE THAT WILL [illegible] BETWEEN THE HEAT-PIPE WALL TO AN ACCESSIBLE [illegible] OUTSIDE THE BLANKET. BY DIFFUSION THROUGH THE PIPE WALL IN A VACUUM ENVIRONMENT FOR THE SYSTEM TIME, THE TRITIUM WOULD BE [illegible] OUTSIDE THE HEAT-PIPE WALL AND THEN COMPRESSED [illegible] RE-CYCLING.

CONTROL SYSTEM • COOLED GAS • HEAT-PIPE FABRICATION SYSTEM • HEAT PIPE • [illegible]

050008
DUBOIS FL
STATUS OF RADIOACTIVE WASTE DISPOSAL IN U.S.A.
VANDERBILT UNIVERSITY, NASHVILLE, TN
20 PAGES. JOURNAL OF THE SANITARY ENGINEERING DIVISION, PROCEEDINGS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS. VOL. 95, PG. 479-494 (JUNE 1969)

THE MANAGEMENT OF RADIOACTIVE WASTES HAS NOT BECOME TO BE A DETERRENT TO A NUCLEAR POWER ECONOMY. THE MAJOR PROBLEMS REMAINING ARE METHODS FOR THE DISPOSAL OF NOBLE GASES AND TRITIUM, DEVELOPMENT OF FUEL REPROCESSING METHODS, AND UNDERSTANDING OF THE MOVEMENTS OF RADIONUCLIDES IN THE ENVIRONMENT. THE EFFECTS OF RELEASES OF RADIOACTIVE MATERIALS WERE REVIEWED, AND A COMPARISON OF THESE EFFECTS WITH SIMILAR EFFECTS PRODUCED BY NATURAL CAUSES, ARE ALSO CONSIDERED. THE ESTIMATED AVERAGE RADIATION EXPOSURES TO THE GONADS TO THE U.S. IN 1965 WAS 100.7 MREM, AND ABOUT 1 PERCENT TO THIS DOSE WAS DUE TO THE NUCLEAR INDUSTRY. RADIOACTIVE WASTES ARE NOT AT PRESENT, AND DO NOT APPEAR TO BE IN THE FUTURE, A DETERRENT TO A NUCLEAR-POWER ECONOMY, AND CANCERS AND GENETIC DEATHS DUE TO A NUCLEAR-POWER ECONOMY ARE SMALL IN COMPARISON TO CANCERS AND GENETIC DEATHS DUE TO NATURAL CAUSES.

ECONOMICS • EFFLUENT • WASTE DISPOSAL • WASTE MANAGEMENT • ENVIRONMENT • UNITED STATES • FUEL REPROCESSING • GAS • EFFECT • COMPARISON

050009
LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLICATION 70-7 • 50 PAGES, 19 FIGURES, 29 TABLES, NOV. MAR 1970

LIQUID WASTE EFFLUENTS FROM NUCLEAR FUEL SERVICES WERE STUDIED DURING A SIX-MONTH PERIOD MAY THROUGH OCTOBER 1969. CONCENTRATIONS AND AMOUNTS OF INDIVIDUAL RADIONUCLIDES DISCHARGED FROM THE PLANT WERE MEASURED AND THE AMOUNTS OF SEDIMENTATION OF INDIVIDUAL RADIONUCLIDES IN THE LAGOON SYSTEM WERE ESTIMATED. TRITIUM, RUTHENIUM-106, STRONTIUM-90, CESIUM-137 AND CESIUM-134 WERE THE PRINCIPAL RADIONUCLIDES DISCHARGED TO THE ENVIRONMENT DURING THIS PERIOD. DURING JUNE AND NOVEMBER 1969 STREAMBANKS SAMPLING WAS CARRIED OUT AT THE POINT OF DISCHARGE OF THE WASTE AND SEVERAL LOCATIONS ON THE DOWNSTREAM AND CATTARAUGUS CREEKS. TRITIUM, RUTHENIUM-106, AND STRONTIUM-90 WERE THE RADIONUCLIDES PRESENT IN THE HIGHEST CONCENTRATIONS IN THE CREEK STREAMS DURING THESE PERIODS. STREAM DILUTION AND ADSORPTION FACTORS WERE CALCULATED FOR INDIVIDUAL RADIONUCLIDES AT VARIOUS LOCATIONS ALONG THE STREAM SYSTEM. A COMPARISON OF THE CONCENTRATIONS OF THE RADIONUCLIDES IN CATTARAUGUS CREEK WITH TECFR70 DISCHARGE CONCENTRATIONS LIMITS. ALL RADIONUCLIDES WERE WELL BELOW CONCENTRATION LIMITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM • MEASUREMENT • RUTHENIUM • STRONTIUM • REGULATION, AEC • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • NFS • FUEL REPROCESSING • MONITORING PROGRAM, ENVIRONMENTAL • CONCENTRATION • SEDIMENT

061944
MOELLER DD • GOLDIN AS
ENVIRONMENTAL PROTECTION FOR NUCLEAR APPLICATIONS
HARVARD SCHOOL OF PUBLIC HEALTH
13 PAGES. JOURNAL OF THE SANITARY ENGINEERING DIVISION, ASCE, VOL. 95, PG. 473-485 (JUNE 1969)

CURRENT RECOMMENDATIONS ARE SUMMARIZED ON ENVIRONMENTAL RADIATION PROTECTION, AND SOME AREAS MOST URGENTLY IN NEED OF FURTHER RESEARCH OF EVALUATION. THE CUMULATIVE AMOUNT OF A FEW FISSION PRODUCTS FROM THE ENTIRE NUCLEAR INDUSTRY IN THE FUTURE IS ALSO ESTIMATED. OF THE PRODUCTS GENERATED IN NUCLEAR FISSION, THOSE ARE DISCHARGED TO THE ENVIRONMENT IN WHOLE OR IN PART, AND ARE THEREFORE OF PARTICULAR SIGNIFICANCE IN TERMS OF ENVIRONMENTAL PROTECTION. THESE INCLUDE I-131, KR-85, AND TRITIUM. BARRIERS AVAILABLE TO THE ENVIRONMENTAL ENGINEER FOR PREVENTING THE RELEASE OF RADIOACTIVE MATERIALS FROM A REACTOR INSTALLATION ARE CITED. REACTOR CONTAINMENT DESIGN IS REVIEWED. AS ARE CLEANUP PROCEDURES TO BE USED AFTER AN ACCIDENT. CLEAN-UP TECHNIQUES, IN USE OR UNDER DEVELOPMENT, INCLUDE WATER SPRAYS, AIR FILTRATION AND RECIRCULATION, AND FOAM ENCAPSULATION. ENVIRONMENTAL SURVEILLANCE UNDER NORMAL AND ACCIDENT CONDITIONS IS DISCUSSED.

CODES AND STANDARDS • CONTAINMENT DESIGN • DECONTAMINATION • GUIDE • IODINE • REACTOR • EMERGENCY PROCEDURE • RADIOACTIVITY RELEASE • ENVIRONMENT • SURVEILLANCE PROGRAM • MONITOR, AREA

062004
DELTER WG
RECENT DEVELOPMENTS IN THE U.S. LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT PROGRAM - AN OVERVIEW FOR THE 1970S

[illegible]
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
SM-137/01 • STI/PUB-304 • CONF-700907 •. 77 PAGES, 4 FIGURES, 4 TABLES, 26 REFERENCES, PAPER PRESENTED AT THE IAEA SYMPOSIUM ON MANAGEMENT OF LOW- AND INTERMEDIATE-LEVEL RADIOACTIVE WASTES, AIX-EN-PROVENCE, FRANCE, SEPTEMBER 7-11, 1970

SUMMARIZES SOME OF THE MORE RECENT U.S. EXPERIENCE IN POWER-REACTOR WASTE MANAGEMENT AND ALSO PROVIDES DEVELOPMENTS WHICH HAVE OCCURRED SINCE THE 1969 SYMPOSIUM IN THE AREAS OF LAND BURIAL, DEEP WELL INJECTION, AND SEA DISPOSAL, AS THEY RELATE TO RECENT TRENDS IN WASTE MANAGEMENT POLICY.

NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

IAEA • LIQUID • PRODUCTION • WASTE DISPOSAL • GAS • WASTE MANAGEMENT • ENVIRONMENT • THERMAL POLLUTION • POPULATION DISPERSE • POLLUTION

[illegible]
[illegible]
EUROPEAN GOALS IN RADIOACTIVE WASTE MANAGEMENT
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
SM-137/07 • STI/PUB-304 • CONF-700907 •. 11 PAGES, 1 REFERENCES, PAPER PRESENTED AT THE IAEA SYMPOSIUM ON MANAGEMENT OF LOW- AND INTERMEDIATE-LEVEL RADIOACTIVE WASTES, AIX-EN-PROVENCE, FRANCE, SEPTEMBER 7-11, 1970

PREVIOUS POSSIBLE REDUCTIONS OF RADIOACTIVE WASTE DISCHARGED TO THE ENVIRONMENT. GIVES A FEW VALUES FOR THE QUANTITY OF RADIOACTIVE MATERIALS PRODUCED AND HOW THE VARIOUS DISPOSAL POLICIES APPLY. ECONOMICS OF WASTE DISPOSAL AND DISCUSSION.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

REFERENCES • IAEA • WASTE DISPOSAL • EUROPE • WASTE MANAGEMENT • FUEL REPROCESSING • R AND D PROGRAM

[illegible]
SMITH JR • REPT OF
NUCLEAR PLANT ENVIRONMENTAL REPORT
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
17 PAGES, 4 FIGURES, 4 TABLES, 4 REFERENCES, PAPER PRESENTED AT THE AMERICAN POWER CONFERENCE, CHICAGO, ILLINOIS, APRIL 20-22, 1971

CONCLUSIONS - A PRESENTABLE OFFSITE PROJECTION FOR NUCLEAR POWER PLANTS IS OF THE ORDER OF 5 MILLIREM PER YEAR TO ANY ACTUAL NEIGHBOR, AND THAT SATISFIES THE OBJECTIVE OF AS-LOW-AS-PRACTICABLE. AUGMENTED SYSTEMS HAVE BEEN DEVELOPED AND ARE AVAILABLE FOR FURTHER REDUCTION OF RADIONUCLIDES IN EFFLUENTS. STARTUP PROBLEMS IN EFFLUENT CONTROL HAVE BEEN AN CHEMICAL PROCESS STARTUP NATURE, AND SATISFACTORY SOLUTIONS ARE BEING APPLIED. PAST HAVE SHOWN EFFLUENT CONTROL WITH A HIGH DEGREE OF COMPLIANCE WITH LICENSED PERMISSIBLE RATES.

REACTOR, NUC • NPP • OPERATION, NPP • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • POPULATION EXPOSURE • WASTE MANAGEMENT

[illegible]
WAGNER JF
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-1468 VOL. 2, PT. 2 •. 100 PAGES, MARCH 1971

A2 RESEARCH TOPICS ARE REPORTED. A SMALL BUT IMPORTANT PART OF THE TOTAL EFFORT IS IN PROGRAMS CONCERNED WITH THE ARID LANDS ECOLOGY RESERVE FROM WHICH THE LONG RANGE OBJECTIVE IS TO STUDY THE EFFECT OF ENVIRONMENTAL MODIFICATIONS BY WELDFIRE, IRRIGATION, GRAZING, MEDICINAL APPLICATIONS, ETC.). REPORTS ARE DESCRIBED TO PRIMARY CONSERVATION-ORIENTED GROUPS TO GAIN A BETTER UNDERSTANDING OF ARES LONG INTEREST AND SUPPORT IN ECOLOGY. SEVERAL ELEMENTS OF THE SIMULATION OF THE LICHEN-CARIBOU-ESKIMO FOOD CHAIN ARE BEING DEFINED. EFFORTS ARE CONTINUING IN REACTOR SITING PROBLEMS INCLUDING FOLLOW TO FISH BETA SKIN THERMAL EFFECTS AND FROM DETRITAL HAZARDS ASSOCIATED WITH CHRONIC RADIOACTIVITY DISCHARGE. LONG-TERM STUDIES OF CANADA GOOSE POPULATIONS ON THE COLUMBIA RIVER ARE REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM • FISH • WASTE DISPOSAL • ZINC • RIVER, COLUMBIA • BATTELLE NORTHWEST • ECOSYSTEM, GRASSLAND • RESPIRATION RATE • SOIL PROPERTY, IN SITU • THERMAL POLLUTION • POPULATION OF WATER • ECOSYSTEM, AQUATIC • FOOD CHAIN • ECOSYSTEM • RADIATION EFFECT • ECOSYSTEM, ARCTIC • ECOSYSTEM, DESERT • RESEARCH, GOVERNMENT • PLANT, SPRING

[illegible]
AEC LOWERING PLANT RADIOACTIVE EMISSIONS CEILING 8 MILLIREMS
1 PAGE, NUCLEONICS WEEK, 12(23), PAGE 9, JUNE 10, 1971

THE AEC HAS AT LAST PUT A NUMBER TO ITS AS LOW AS PRACTICABLE CRITERION FOR POWER-REACTOR RADIOACTIVITY EMISSION - 5 MREM A YEAR AT THE SITE BOUNDARY. THIS IS A HUNDREDFOLD REDUCTION IN THE PRESENTLY PERMITTED MAXIMUM EMISSION RATE. A PLANT OPERATING AT 5 MREM WOULD EXPOSE THE

[illegible]

[illegible] TOTAL POPULATION TO 1 MREM A YEAR OR LESS, ABOUT 1% OF BACKGROUND RADIATION. [illegible], THE TOTAL-POPULATION EXPOSURE LIMIT HAS BEEN SET AT 170 MREM. APC STATEMENTS THAT THE PROPOSED GUIDES DO NOT INVALIDATE THE 500-MREM AND 170-MREM LIMITS PROMULGATED BY U.S. AND INTERNATIONAL REPORTS AND ESTABLISHED BY THE FEDERAL FEDERAL RADIATION COUNCIL. THESE WILL STILL STAND, BUT SINCE REACTOR-TECHNOLOGY ADVANCES MEAN 1 MREM AT SITE BOUNDARY QUITE PRACTICABLE THAN THE LIMIT WILL BE SET AT THAT DIGURE. THE NEW GUIDES, WHICH WILL GO INTO EFFECT IN ABOUT 60 DAYS, MAKE NO THE IMMEDIATE EFFECT OF INVALIDATING OR HAMPERING ALMOST PLANS TO MODIFY SEE PLANTS IN OPERATION OR UNDER CONSTRUCTION IN ORDER TO REDUCE RADIOACTIVITY EMISSIONS. THESE ARE MEANWHILE GAS, THE THREE EMISSIONS AND THE BODY CITIES WASTE.

[illegible] • AEC • REGULATION, AEC • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • POPULATION EXPOSURE • WASTE MANAGEMENT • RADIELD, RADIOACTIVE

[illegible]

ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL QUALITY
100 PAGES. COUNCIL ON ENVIRONMENTAL QUALITY, AUGUST 1970

REPORT DESCRIBES CONDITIONS OF OUR ENVIRONMENT, DEVELOPED TRENDS, PROBLEMS, ACTIONS TAKEN NOW, AND OPPORTUNITIES FOR THE FUTURE. COUNCIL ASSESS PRESENT INSUFFICIENCY OF ENVIRONMENTAL QUALITY INDICATORS OF SYSTEMS. NOTED THAT THIS REPORT IS INCOMPLETE AND CAN ONLY BRING TOGETHER PROBLEMS AND ISSUES. OF PARTICULAR INTEREST TO NUCLEAR COMMUNITY IS SECTION ON RADIATION, I.E., EFFECTS OF RADIATION, SOURCES OF RADIATION, REACTOR-SAFETY RECORD, RADIOACTIVE WASTE STORAGE AND DISPOSAL, STANDARDS FOR PROTECTION AGAINST RADIATION, AND WHAT NEEDS TO BE DONE -- [illegible] RESEARCH ON EFFECTS OF LOW-LEVEL DOSES AND CUMULATIVE EFFECT, [illegible] PROBLEMS ARISING FROM MEDICAL USES AND FROM CONSUMER PRODUCTS, [illegible] CONTROL POPULATION AND CONTROL OF RELEASES FROM REACTORS, UNDERGROUND TESTING, AND TRANSPORTATION, STORAGE, AND DISPOSAL OF RADIOACTIVE WASTES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

CODES AND STANDARDS • POLLUTION • ENERGY • REGULATION, STATE • WASTE [illegible] • ELECTRIC POWER • RADIO • WASTE MANAGEMENT • RADIATION SAFETY AND CONTROL • ENVIRONMENT • FUEL REPROCESSING • SURVEY • DATA COLLECTION • EFFECT, GENETIC • POLLUTION • RADIATION EFFECT • RADIATION EXPOSURE • AGENCY, FEDERAL • N-POWER, SAFETY OF • SUPERVISION, FEDERAL

[illegible]

PUBLIC ACCEPTANCE NO PROBLEM IN UNITED KINGDOM
2 PAGES. NUCLEAR NEWS, 13(4), PAGE 29-30, APRIL 1970

THE PUBLIC IN U.K. SEEMS TO TAKE A MORE PRAGMATIC APPROACH TO N-POWER. THERE IS NO FEAR AND CRY ABOUT THERMAL EFFECTS OR RADIATION RELEASES. THEY VIEW GROWING POWER REQUIREMENTS VERY SERIOUSLY. UKAEA DOES NOT HAVE MULTIPLE ROLE OF DEVELOPING, PROMOTING, AND REGULATING N-POWER. IN ESTABLISHING A NEW POWER SITE, BRITISH APPEAR TO MAKE MORE EFFORT TO INFORM LOCAL COMMUNITY. WRITER DISCUSSES REGULATION OF GASEOUS AND LIQUID DISCHARGES FROM N-PLANTS, I.E., ALL LIQUID ACTIVITY HELD IN SHIELD-WELLED TANKS, THEN SLOWLY BLEN INTO OCEAN. SEVERAL YEARS AGO, HOWE WINTER DESTROYED SYSTEM DUE. ONLY DEBS TO SURVIVE WERE THOSE DAMAGED BY BRAMWELL N-PLANT. DEAD LOBSTERS WERE WASHED OVER DANGERESS STATION. NOW LOCAL WOMEN REPORTS INCREASED BIRD POPULATION AND PRESENCE OF 4 NEW SPECIES. TRANSPLANTED IS ONLY N-PLANT SITUATED AND CARED BY ARTIFICIAL LAKE. ONLY NOTICEABLE EFFECT TO DATE IS LONGER AND FASTER GROWTH OF TROUT.

ADMINISTRATIVE CONTROL • ENVIRON • OCEAN AND SEA • SITING, REACTOR • UNITED KINGDOM • BRITAIN • OPERATION, POWER • EMERGENCY PROCEDURE • RADIOACTIVITY RELEASE • ENVIRONMENT • THERMAL POLLUTION • INTERNATIONAL • AQUATIC ORGANISM • MOLLUSC • ANIMAL, BIRD • WASTE HEAT, WATER • INDUSTRY, UTILITY • PUBLIC OPINION

[illegible]

SPEECH BY CLARENCE F. LARSON, COMMISSIONER, USAEC
70 PAGES. FIGURES, TABLES, HEARINGS BEFORE JCAE COMM. ON ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER, (DECEMBER 30, 1969)

A COMPREHENSIVE SUMMARY OF THE ACTIVITIES OF THE AEC IN ENVIRONMENTAL STUDIES IS PRESENTED BY THE SPEAKER. CONCERNING SOMATIC EFFECTS, HE REMARKS THAT AT PRESENT, IT IS NOT CLEAR WHETHER SOME OBSERVED LATE EFFECTS OF RADIATION HAVE A THRESHOLD DOSE FOR PRODUCTION. HE DETAILS SOMATIC AND GENETIC EFFECTS, DROSOPHILA AND MOUSE EXPERIMENTS, TRITIUM AND OXYGEN BIOLOGICAL-HALF-LIVES, NATURAL PRODUCTION AND CONCENTRATION OF POWER, DNA MECHANISM, AND HUMAN EXPOSURE TO NOBLE GASES. RADIOACTIVE-EFFLUENT-CONTROL RESEARCH AND DEVELOPMENT ARE REVIEWED. THESE INCLUDE DESCRIPTIONS OF THE MANY PROCESSES EXAMINED AND USED IN RECOVERING AND TREATING NUCLIDES FROM PROCESSING WASTE STREAMS. RADIOACTIVE GAS CONTROL MEASURES ARE ALSO CONSIDERED. THE RATE OF MEASURED NUCLIDIC DISCHARGES INTO STREAMS IS COMPARED, AS ARE THE VARIOUS METHODS OF DISPOSING OF THE WASTES BY SUCH METHODS AS HYDRAULIC FRACTURING -- AND DISPOSAL OF RADIOACTIVE GASES INTO SALTS AND UNDERGROUND FORMATIONS. OTHER TOPICS EVALUATED AND DISCUSSED IN DETAIL CONCERN METEOROLOGICAL AND THERMAL EFFECTS STUDIES.

CESIUM • COBALT • FISSION PRODUCT RELEASE • GEOLOGY • RUTHENIUM • STRONTIUM • ZINC • POPULATION EXPOSURE • WASTE MANAGEMENT • HYDROLOGY • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • METEOROLOGY • THERMAL POLLUTION • CALVERT CLIFFS 1 (PWR) • DATA COLLECTION • EFFECT, GENETIC • EFFECT, SOMATIC • RADIATION EFFECT • AGENCY, AEC • CHESAPEAKE BAY • N-POWER, SAFETY OF • RESPONSIBILITY, AEC

[illegible]
NEWS RELEASES, [illegible]
[illegible] COMMISSION, WASHINGTON, D.C.
[illegible], AUGUST 24, 1971

THE FOLLOWING NEWS ITEMS WERE RELEASED BY THE [illegible] WEEKS 2, NO. 34, DATED AUG. 24, 1971. NO. S-130 - AEC AND NEW YORK STATE TO COORDINATE [illegible] FOR ENVIRONMENTAL [illegible]. S-131 - AEC TO ESTABLISH [illegible] TO [illegible]. S-140 - [illegible] TO [illegible] AND [illegible] TO THE COLUMBIA UNIVERSITY [illegible] LICENSING [illegible]. S-141 - AEC AND [illegible] TO COORDINATE [illegible] FOR ENVIRONMENTAL [illegible] MONITORING. S-147 - AEC EXTENDS DATE FOR [illegible] CONCERNING [illegible] OF TECHNOLOGY. S-149 - [illegible] STUDY AND [illegible] GRANTS.

AVAILABILITY - AEC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. [illegible] -- [illegible] CHARGE $7.00)

[illegible] • LICENSE STATUS • REGULATION • [illegible] • [illegible], POWER • [illegible], ENVIRONMENTAL • REGULATION, AEC • LICENSE APPLICATION • RADIATION SAFETY AND CONTROL • OPERATING LICENSE PROCESS • [illegible] FACILITY

[illegible]
[illegible] JR
ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS
4 PAGES, J. PUBL. HEAL. ENG., 17, PAGE S-12, [illegible], 1971

RADIATION EFFECTS FROM IN A REGION CONTAINING NUCLEAR PLANTS AND 17-ERA CENSUS TO COUNTER LOCATIONS ARE STILL QUITE NEGLIGIBLE. INFORMATION ON THE [illegible] RELATED TO LIQUID AND GASEOUS EFFLUENTS [illegible] OF COLLECTION TO ASSESS THE FUTURE ENVIRONMENTAL [illegible]. ALTHOUGH THERE IS NO SAFETY [illegible] FROM [illegible] PLANTS, THE [illegible] OF [illegible] AND POSITIVE SAMPLE OF REPORTED [illegible] THAT [illegible] THE [illegible].

[illegible] • REACTOR, PWR • [illegible] TO PROSPECTIVE • WASTE DISPOSAL, ATMOSPHERIC • [illegible] • WASTE DISPOSAL, RIVER • [illegible] WATER • [illegible] FORECAST

[illegible]
LINDSTROM JP • [illegible] JWR
RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM A NUCLEAR FUEL REPROCESSING PLANT
7 PAGES, [illegible], PAGE [illegible], 1971

THE NUCLEAR FUEL SERVICES FUEL REPROCESSING PLANT HAS BEEN IN OPERATION SINCE 1966 AND HAS [illegible] RADIOACTIVE WASTE DISCHARGES RELATED TO THIS TYPE OF FACILITY. THE LARGE QUANTITIES OF RADIOACTIVITY [illegible] MUST BE CONTROLLED BY A NUCLEAR FUEL REPROCESSING PLANT [illegible] DISCHARGE-AND-DILUTION AS A SATISFACTORY METHOD OF DISPOSING OF RADIOACTIVE [illegible] WHICH CONTAMINATE THROUGH THE ENVIRONMENTAL [illegible]. [illegible] SUCH AS STRONTIUM-90, RUTHENIUM-106, CESIUM-137, CESIUM-134, COBALT-60, TRITIUM, AND RUTHENIUM-106 HAVE BEEN FOUND IN ENVIRONMENTAL [illegible]. THESE INDICATE THAT PATHWAYS TO THE PUBLIC DO EXIST AS A RESULT OF OPERATION OF THE FACILITY. HOWEVER, STUDIES TO DATE HAVE INDICATED THAT TYPICAL [illegible] DOSES IN THE VICINITY OF [illegible] ARE NOT SIGNIFICANTLY DIFFERENT FROM DOSES RECEIVED IN OTHER PORTIONS OF THE STATE.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

CESIUM • COBALT • [illegible] • RUTHENIUM • STRONTIUM • WASTE DISPOSAL • [illegible] EXPOSURE • [illegible] PATHWAY • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • [illegible] • [illegible] • [illegible] REPROCESSING • [illegible] • DISCHARGE

[illegible]
[illegible] TD
[illegible] AND [illegible] INFORMATION ON EFFECTS OF COASTAL OPERATIONS
SCRIPPS INSTITUTION OF OCEANOGRAPHY, LA JOLLA, CALIFORNIA
SIO-[illegible], 16 PAGES, MARCH 15, 1971

GIVES AN EXAMPLE OF THE LIMITED AND SOMEWHAT BIASED INFORMATION THAT HAS BEEN PRESENTED TO A WATER-QUALITY-CONTROL AGENCY BY A TYPICAL PRESSTOP-MINED POWER COMPANY. PRESENT REGULATIONS MAKE IT NECESSARY ONLY TO MINIMIZE CONSTRUE THE ACTIVITY DISCHARGED--SUFFICIENT TO AVOID EXCEEDING STANDARDS, HOWEVER INADEQUATE FOR DESCRIBING ENVIRONMENTAL DAMAGE. A BRIEF INSPECTION SHOWS THAT AT LEAST ONE NUCLEAR ARM ACCUMULATED IN AT LEAST TWO SPECIES. A SIMPLE CALCULATION SUGGESTS THAT THE MORE LARGER AMOUNTS OF TRITIUM COMING FROM THIS PLANT PROBABLY HAS ALREADY REACHED LARGE AREAS OF THE COASTAL OCEAN MEASURABLY. IN FACT, THIS REPRODUCTIVE TAG MEAN: OF [illegible] TO INDICATE WHO THE OCEAN DISPOSES OF OTHER COASTAL POLLUTIONS. THESE ACTIVITIES CERTAINLY MUST NOW BE TAKEN INTO CONSIDERATION AS BACKGROUNDS--BY SCIENTISTS AT LEAST.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] AND STANDARDS • DEVELOPMENT • [illegible], PWR • WASTE DISPOSAL, OCEAN • [illegible] • MONITOR, ENVIRONMENTAL • REGULATION, AEC • REACTOR POWER • RADIOACTIVITY RELEASE • RADIOISOTOPE • [illegible] POWERED • REGULATION, FEDERAL • [illegible] • OCEAN, PACIFIC

[illegible]
LOGAN PP • [illegible] JR
PWR PLANT LIQUID-RELEASE PATHWAYS SYSTEM DESIGN

072814 [illegible]
DECHEM CORPORATION
12 PAGES, 3 FIGURES, 2 TABLES, PAPER PRESENTED AT THE AMERICAN CHEM CONFERENCE, 167TH NATIONAL MEETING, CHICAGO, ILLINOIS, APRIL 16-20, 1972

THE RADWASTE SYSTEM DESIGN BRIEFLY DESCRIBED ILLUSTRATES A BASIC APPROACH WHICH REASONABLY APPEARS TO BE WELL SUITABLE FOR PLANT OPERATION. IT OFFERS A RELATIVELY SIMPLE SEQUENCE OF SELECTED PROCESSES TO REDUCE COSTS AND TO PROVIDE RELIABLE PERFORMANCE WITH LOW MAINTENANCE EXPOSURE TO OPERATING PERSONNEL. NOT IT INCLUDES PROVEN CAPABILITY WHICH AND FLEXIBILITY TO ALLOW FOR POSSIBLE NON-DESIGN SYSTEM OPERATING CONDITIONS. AND IT IS BELIEVED CAPABLE OF ACHIEVING WASTE-FREE OPERATION EXCEPTED ONE-SIXTH TO APPROXIMATELY 1% OF NORMAL BACKGROUND. THIS DESIGN CAN BE READILY ADJUSTED TO SATISFY THE PARTICULAR REQUIREMENTS OF A SPECIFIC SITE, ONE TYPE, AROUND PLANTS OPERATING PARTICULARLY.

AVAILABILITY - J. E. WATERHOUSE, PROJECT ENGINEER, DECHEM CORPORATION, SAN FRANCISCO, CALIFORNIA

DESIGN CRITERIA • REACTOR, PWR • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE DISPOSAL, SOLID • WASTE MANAGEMENT • WASTE TREATMENT, EQUIPMENT

072816
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE
EUROPEAN NUCLEAR ENERGY AGENCY, PARIS
120 PAGES, PARIS, EUROPEAN NUCLEAR ENERGY AGENCY, 1971

THE PRINCIPLES AND PRACTICES APPLIED TO RADIOACTIVE WASTE MANAGEMENT IN WESTERN EUROPE ARE DESCRIBED. THE ORIGIN AND DIFFERENT TYPES OF RADIOACTIVE WASTES ARE DISCUSSED, AND DATA ON THE PRODUCTION OF GASEOUS, LIQUID, AND SOLID RADIOACTIVE WASTES IN WESTERN EUROPE DURING 1970 ARE PRESENTED. THE GENERAL SAFETY, TECHNICAL, AND ECONOMIC ASPECTS OF WASTE MANAGEMENT ARE REVIEWED. SPECIFIC TREATMENT AND STORAGE PRACTICES AT VARIOUS EUROPEAN NUCLEAR FACILITIES AND THE OUTSTANDING WASTE MANAGEMENT PROBLEMS, NOTABLY SAFE MANAGEMENT OF STORAGE OF HIGH-LEVEL LIQUID WASTES AND THE CONTROL OF GAS AND TRITIUM RELEASES TO THE ATMOSPHERE, ARE DISCUSSED.

REPORTS • SAFETY REVIEW • WASTE DISPOSAL • WASTE STORAGE • WASTE REMOVAL, EQUIPMENT • WASTE MANAGEMENT • RADIATION SAFETY AND CONTROL • GAS • LIQUID • SOLID • PROCESSING

072817
HAMILTON W
ESTIMATION OF TRITIUM DISCHARGES INTO LIQ-STREAMS
EUROPEAN FUEL AND CHEMICAL PROCESSING OF IRRADIATED FUEL, MOL, BELGIUM
EURFNR(MOL)-TR-267 • NP-10797 •, 17 PAGES, NOVEMBER 1970

THE TRITIUM TRANSFERRED AS LIQ TO THE FCM WASTE TREATMENT STATION AND DISCHARGED TO THE NPL WATER DURING THE PERIOD JANUARY 1969 - JULY 1970 WAS COMPARED WITH THE CALCULATED AMOUNT OF H-3 PRODUCED BY FISSION. THE DISCHARGES ARE DEFINED AS AND ARE OF THE CALCULATED QUANTITIES. IF SOURCES OF H-3 PRODUCTION OTHER THAN FISSION ARE NEGLECTED AND A PRODUCTION RATE OF 1% IS ASSUMED FROM FISSION OF U-235 AND 27 NEUTRONS FROM FISSION OF PU-240 IS ASSUMED. THE TIME DELAY BETWEEN FUEL DISSOLUTION AND ARRIVAL OF THE TRITIUM IN THE WASTE DOES NOT EXCEED 3 MONTHS.

FUEL REPROCESSING • REPROCESSING • WASTE TREATMENT, LIQUID • PRIMARY REPROCESSING

072900
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE
EUROPEAN NUCLEAR ENERGY AGENCY
120 PAGES, 9 FIGURES, 4 TABLES, SEPTEMBER 1971

A SIMPLIFIED GENERAL REVIEW OF PRACTICES APPLIED TO MANAGEMENT OF RADIOACTIVE WASTES IN WESTERN EUROPE. BUT THE COMPLEXITY AND THE MAGNITUDE OF THE PROBLEM IS INDICATED BY HOW PROVED MANAGEABLE AND AT A VERY HIGH STANDARD OF SAFETY FOR THE PERSONNEL AND THE ENVIRONMENT, MEANS ARE PROVIDED WHEREBY PUBLIC-HEALTH AUTHORITIES MAY REGULATE, IN THE PUBLIC INTEREST, RADIOACTIVE WASTE MANAGEMENT. THE WHOLE SCOPE OF WASTE-MANAGEMENT PRACTICES ARE DISCUSSED AND ENCOURAGEMENT GIVEN FOR PERIODIC REVIEW TO MAINTAIN THE HIGH STANDARDS OF ENVIRONMENTAL AND PUBLIC PROTECTION.

AVAILABILITY - EUROPEAN NUCLEAR ENERGY AGENCY

ADMINISTRATIVE CONTROL • CODES AND STANDARDS • ELEMENTS AND ISOTOPES • REVIEW • REGULATION • WASTE DISPOSAL • WASTE STORAGE • WASTE TREATMENT • OTHER • REACTOR, OTHER • WASTE MANAGEMENT • ICRP • RADIOISOTOPE • FUEL REPROCESSING

072700
THOMAS D • RICHARDS JR • WINGER JR
ENVIRONMENTAL PROTECTION DURING FUEL PROCESSING
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-720427-9 •, 11 PAGES, FROM THE 72ND NATIONAL MEETING OF THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, ST. LOUIS, MISSOURI, MAY 21, 1972

THE REQUIRED REMOVAL OF PARTICULATE ACTIVITY FROM GASEOUS AND LIQUID EFFLUENTS CAN PROBABLY BE OBTAINED BY USE OF EXISTING TECHNOLOGY, PARTICULARLY IF THE VOLUME OF GASEOUS AND LIQUID EFFLUENTS ARE SUBSTANTIALLY REDUCED. THE MOST CHALLENGING TECHNICAL PROBLEMS ARISE IN THE

[illegible] DEVELOPMENT OF SYSTEMS FOR THE REMOVAL AND CONTROL OF THE VOLATILE FISSION PRODUCTS. IN PARTICULAR I, KR-85, AND H-3. IT IS IN THE AREA OF VOLATILE-FISSION-PRODUCT CONTROL THAT MUCH MORE WORK IS STILL NEEDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • TRITIUM • REMOVAL • REPROCESSING • REPORT • REPRODUCTION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • [illegible] • NUCLEAR REPROCESSING • CAS • [illegible] • NUCL. [illegible]

[illegible]

MANAGEMENT OF SPENT REPROCESSING WASTES IN JAPAN

[illegible]

CONF-771107 --. 19 PAGES, 4 FIGURES. PAPER PRESENTED AT THE SYMPOSIUM ON THE MANAGEMENT OF RADIOACTIVE WASTES FROM FUEL REPROCESSING, HELD IN PARIS, NOVEMBER 27-DECEMBER 1, 1977

PRESENTS PLANS FOR PRIMARY RADIOACTIVE LIQUID WASTE SMALL TREATMENT FACILITIES, A DESCRIPTION OF PRELIMINARY AND THE FIRST FIVE YEARS AND THE PRELIMINARY OF LONG-TERM STORAGE FACILITIES FOR REPROCESSING. WE FIND THE TREATMENT OF RUTHENIUM AND TRITIUM ADDING FROM FUEL REPROCESSING IN THE ONE PLANT. [illegible] SPECIFICATION OF HIGH CONTAINER WITH LONG-TERM STORAGE AS SPECIFICS ARE ALSO REPORTED AND LEADING TO START IN THE NEAR FUTURE. PROFESSIONAL REPRESENTATIVES OF THE AUTHOR [illegible] ARE ALSO PRESENTED.

AVAILABILITY - [illegible], INC., P.O. BOX 633, NEW YORK, N.Y. 10016

REPORTS • WASTE STORAGE • WASTE TREATMENT, LIQUID • WASTE TREATMENT, GAS • WASTE TREATMENT, SOLID • HIGH RADIATION • WASTE MANAGEMENT • JAPAN • FUEL REPROCESSING • R AND D PROGRAM • SPAIN

[illegible]

THE RUTHENIUM INVESTIGATIONS OF SOME LONG-LIVED FISSION PRODUCT NUCLIDES DISCHARGED TO THE ENVIRONMENT IN FUEL REPROCESSING WASTES

NATIONAL RADIOLOGICAL PROTECTION BOARD, HARWELL, ENGLAND

CONF-771107 --. 19 PAGES, 4 FIGURES. PAPER PRESENTED AT THE SYMPOSIUM ON THE MANAGEMENT OF RADIOACTIVE WASTES FROM FUEL REPROCESSING, HELD IN PARIS, NOVEMBER 27-DECEMBER 1, 1977

CURRENT REPROCESSING PRACTICE LEADS TO THE DISCHARGE TO THE ENVIRONMENT OF VIRTUALLY ALL THE RUTHENIUM AND TRITIUM, AND A LARGE FRACTION OF THE IODINE-129, PRESENT AS FISSION PRODUCTS IN SPENT FUEL. AS NUCLEAR POWER PROGRAMMES EXPAND THE GLOBAL INVENTORY OF THESE LONG-LIVED NUCLIDES IS INCREASING. THE RADIOLOGICAL SIGNIFICANCE OF THESE DISCHARGES IS ASSESSED IN TERMS OF RADIATION EXPOSURE OF VARIOUS POPULATION GROUPS BEYOND THE NEAR FIELD REGIONS. THE RESULTS OF THIS ASSESSMENT SHOW THAT RUTHENIUM-106 WILL GIVE HIGHER DOSE-RATES THAN TRITIUM OR IODINE-129, BUT THAT ON CONSERVATIVE RADIOLOGICAL PROTECTION CRITERIA THESE DO NOT JUSTIFY TAKING ACTION TO REMOVE RUTHENIUM-106 FROM REPROCESSING PLANT EFFLUENTS BEFORE THE 21ST CENTURY.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

RECONNAISSANCE • DEVELOPMENT • IODINE • RUTHENIUM • WASTE DISPOSAL • CONTAMINATION EXPOSURE • WASTE MANAGEMENT • PARTICIPATE ASSISTANCE • SAFETY EVALUATION • FUEL REPROCESSING • FORECAST • DISCHARGE

[illegible]

[illegible] • [illegible] • [illegible] • [illegible]

OFF-GAS TREATMENT AND RUTHENIUM DISPOSAL IN MEDIA-FUEL ELEMENT REPROCESSING

[illegible], INSTITUT FUR CHEMISCHE TECHNOLOGIE, JULICH, GERMANY

CONF-771107 --. 19 PAGES, 4 TABLES. PAPER PRESENTED AT THE SYMPOSIUM ON THE MANAGEMENT OF RADIOACTIVE WASTES FROM FUEL REPROCESSING, HELD IN PARIS, NOVEMBER 27-DECEMBER 1, 1977

RUTHENIUM, TRITIUM, AND IODINE ARE SEPARATED FROM DISSOLVED OFF-GAS BY CO2-LIQUIFICATION AND RECTIFICATION AT BELOW TEMPERATURE. RUTHENIUM IS CONCENTRATED IN THE LIQUID NITRIC FRACTION, WHILE TRITIUM AND IODINE ARE CONCENTRATED IN THE NITRIC DILUTE FRACTION (SCRUB-PROCESS). THE DISSOLVED OFF-GAS IS DECONTAMINATED BY A CONTINUOUS PROCESS. BASED ON CAPITAL AND REPORT, THE DISPOSAL OF REPROCESSED RUTHENIUM CONTAINED IN STEEL CYLINDERS BY BURIALS IN THE DEEP SEA IS PREFERRED TO THE LONG TERM INTERMEDIATE NUCLEAR STORAGE.

AVAILABILITY - UNIPUB, INC., P.O. BOX 633, NEW YORK, N.Y. 10016

IODINE • RUTHENIUM • WASTE DISPOSAL • WASTE DISPOSAL, OCEAN • WASTE TREATMENT • WASTE TREATMENT, ECONOMICS • OFF GAS • SAFETY EVALUATION

[illegible]

DEEP-WELL DISPOSAL OF TRITIUM CONTAINING LIQUID EFFLUENTS

GESELLSCHAFT FUR STRAHLENSCHUTZ, KARLSRUHE

CONF-771107 --. 19 PAGES, 8 FIGURES, PAPER PRESENTED AT THE SYMPOSIUM ON THE MANAGEMENT OF RADIOACTIVE WASTES FROM FUEL REPROCESSING, HELD IN PARIS, NOVEMBER 27-DECEMBER 1, 1977

AT THE KARLSRUHE NUCLEAR RESEARCH CENTER DEEP-WELL INJECTION OF TRITIUM-CONTAINING EFFLUENTS INTO ISOLATED DEPLETED OIL POSITIONS OF THE DEEP UNDERGROUND IS BEING STUDIED AS AN APPROACH OF TRITIUM

[illegible]

DISPOSAL, WHICH DOES NOT LEAD TO A POLLUTION OF THE ENVIRONMENT. THE CAPACITY OF THE [illegible] IN THE VICINITY OF THE CENTER. THE [illegible] AND SUMMARY [illegible] OF THE [illegible] WELL. THE CONTROL AND SURVEILLANCE PROVISIONS ARE DESCRIBED TOGETHER WITH THE ESSENTIAL SAFETY CONSIDERATIONS AND THE ANTICIPATED OPERATION CONDITIONS.

AVAILABILITY - UNKNOWN. INF., P.O. BOX 699, NEW YORK, N.Y. 10010

CONTAINMENT, UNDERGROUND • DISPOSAL • ENERGY • SITING, WASTE DISPOSAL • WASTE MANAGEMENT • ECONOMY • SAFETY EVALUATION • WASTE REPROCESSING • GAS • LIQUID • WASTE DISPOSAL, DEEP WELL

[illegible]

[illegible]
REDUCTION OF TRITIUM IN EFFLUENT STACK EMISSIONS AT PINELLAS PLANT
GENERAL ELECTRIC COMPANY, ST. PETERSBURG, FLORIDA
CONF-771010 --. 10 PAGES, 1 FIGURE, PP. [illegible], PAPER PRESENTED AT THE 1977 ANNUAL MEETING [illegible], HELD IN NEW ORLEANS, TENN, ON OCTOBER 24, 1977

REDUCTION OF TRITIUM IN EFFLUENT STACK EMISSIONS AT THE PINELLAS PLANT IS ACCOMPLISHED BY A PROCESS CHANGE AND THE OPERATION OF A MODERNIZED MONITORING-CONTROL SYSTEM. THE MONITORING-CONTROL SYSTEM IN USE AT PINELLAS IS DESCRIBED. IT IS SUGGESTED THAT SIMILAR SYSTEMS, PROPERLY DESIGNED, COULD EFFECT SIMILAR REDUCTIONS AT OTHER LOCATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT • WASTE TREATMENT • STACK • WASTE MANAGEMENT

[illegible]

[illegible]
SOME ASPECTS OF THE RELEASE OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA
CHALK RIVER NUCLEAR LABORATORIES, ONTARIO
AECL-[illegible] --. [illegible] PAGES, 7 FIGURES, 16 TABLES, [illegible] REFERENCES, [illegible]

EIGHT PAPERS ARE TABLES ARE INCLUDED. SOME OF WHICH ARE PUBLISHED PREVIOUSLY. TOPICS INCLUDE NUCLEAR WASTES, RADIOACTIVE [illegible], [illegible] LIQUIDS, AND [illegible] OF RADIOACTIVITY RELEASED FROM A REACTOR DURING [illegible]. THE [illegible] USED TO REDUCE HEAVY-WATER LOSSES DURING [illegible] CATALYTIC RADIOISOTOPES. [illegible] SIGNIFICANT DIFFERENCE BETWEEN HEAVY WATER AND [illegible] WATER, AND PROVIDE IDEAS TO THE RELEASE OF WHOLE-GAS RADIOISOTOPES. [illegible] IS DESIGNED TO [illegible] ENTRY.

CANADA • [illegible] • [illegible] • [illegible] • WHOLE GAS • RELEASE RATE • WASTE TREATMENT • CRITICAL [illegible] PATHWAY • ENVIRONMENT • [illegible] LEAKAGE CONTROL • THERMAL POLLUTION • ASSESSMENT • [illegible] • [illegible] • [illegible]

[illegible]

[illegible]
LIQUID WASTE MANAGEMENT AT THE NEVADA TEST SITE FOR 1973
[illegible] NUCLEAR CORPORATION • BELTAN CHEMICAL CORPORATION
8 PAGES, 4 FIGURES, 4 TABLES, 5 REFERENCES, NUCLEAR ENGINEERING, ANNUAL, PP. [illegible] (1973)

[illegible] RADIOACTIVE-WASTE-DISPOSAL PROBLEMS AT THE NATIONAL REACTOR TESTING STATION'S TEST REACTOR AREA. PROBLEMS ENCOUNTERED IN THE OPERATION OF THE WASTE SYSTEM ARE DESCRIBED. SOLUTIONS TO THESE PROBLEMS ARE PROPOSED CHANGES IN THE SYSTEM ARE DISCUSSED HERE.

CESIUM • [illegible] • [illegible] • STRONTIUM • WASTE TREATMENT • [illegible] WATER, [illegible] • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • REACTOR TEST FACILITY • [illegible], [illegible] • [illegible] • [illegible]

[illegible]

[illegible]
SUMMARY OF RADIOLOGICAL ASPECTS IN THE PROTECTION OF MAN AND HIS ENVIRONMENT
COMMISSION OF THE EUROPEAN COMMUNITIES, LUXEMBOURG (EUROPE)
17 PAGES, 1 TABLE, NUCLEAR SAFETY, 19(4), PP. [illegible] (1978)

THE SYMPOSIA PAPERS ESSENTIALLY ADDRESS THE WASTE ASPECTS AND WASTE AND LIFE AND CHARACTERIZATION POLICY. SOME OF THE QUESTIONS RAISED AT A [illegible] PAPER DISCUSSING ARE PRESENTED - EFFECTS FROM TRITIUM PRODUCED BY FAST REACTORS, ACCIDENTS AND PARAMETERS WITH ASPECT RADIOMETRIC UPTAKE, THE FROM REPRESENTING RADIOLOGICAL CAPACITY INCLUDES NUCLEAR FACTORS, THE FROM VERTICAL PROBABILITY ONES NOT ACCURATE AND MULTIPLE SOURCES AND EFFECTS FROM OTHER PREDICTIONS, AND EXTENSION OF THE EURATOM TREATY TO RADIOACTIVE POLLUTANTS. ANSWERS TO MANY OF THESE QUESTIONS REQUIRE FURTHER WORK IN RADIOLOGICAL PROTECTION FOR A HUMAN ORIGIN, ALSO IN ANALYSIS OF HAZARDS IN CONNECTION WITH NUCLEAR WASTE DISPOSAL AND ENVIRONMENTAL CONTAMINATION BY TRITIUM AND THE [illegible] POLLUTANTS.

ECOLOGY • EURATOM • WHOLE GAS • ATMOSPHERIC POLLUTION • WASTE DISPOSAL • CRITICAL [illegible] PATHWAY • ENVIRONMENT • WATER POLLUTION • FORECAST • MAINTENANCE [illegible] • [illegible] • ECOSYSTEM, AQUATIC • [illegible] • POLLUTION • ECOSYSTEM, MARINE • ECOSYSTEM, [illegible] • SYSTEM ANALYSIS • MODEL, DETERMINISTIC • ECOSYSTEM, ESTUARINE • ORGANIZATION, INTERNATIONAL

[illegible]

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[illegible]
[illegible] PAGES, [illegible]. [illegible]. NO. [illegible] [illegible] 1979

[illegible]

[illegible] • [illegible] • [illegible] • [illegible] • WASTE DISPOSAL • WASTE STORAGE • [illegible] • [illegible] • [illegible] • [illegible] GAS • [illegible] PROCESS • FUEL REPROCESSING • [illegible], NUCLEAR • [illegible] PLANT, NUCLEAR

[illegible]
[illegible]
CONFIGURATION OF ENVIRONMENTAL RADIATION EXPOSURES AND POPULATION DOSES FOR AN [illegible] FROM A NUCLEAR FUEL REPROCESSING PLANT
U.S. ENVIRONMENTAL PROTECTION AGENCY
[illegible] PAGES, 17 TABLES, 6 FIGURES, 11 REFERENCES, [illegible] DATE AND NUMBER, [illegible], NO. [illegible] FEBRUARY 1979

[illegible]

[illegible] • [illegible] • [illegible] • [

[illegible]

[illegible]

[illegible]

[illegible]

AVAILABILITY - [illegible]

[illegible]

00767? [illegible]

[illegible] - A PROCESS FOR SEPARATING [illegible], KRYPTON AND TRITIUM FROM THE COMBUSTION WASTE GASES IN THE REPROCESSING OF HIGH TEMPERATURE FUEL ELEMENTS
KERNFORSCHUNGSANLAGE JULICH GMBH
[illegible] 5 PAGES, 7 TABLES, 197?

DESCRIBES THE METHOD WHICH WAS SUCCESSFULLY TESTED UNDER LABORATORY CONDITIONS. EXPERIMENTAL RESULTS ARE GIVEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] + KRYPTON + WASTE TREATMENT, GAS + GERMANY + FISSION PRODUCT RETENTION + FUEL REPROCESSING + [illegible]

00767? [illegible]
[illegible]
TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES
ALLIED CHEMICAL, NATIONAL REACTOR TESTING STATION
ICP-1061 V. 10 PAGES, ? TABLES, 4 FIGURES, 8 REFERENCES, JANUARY 1976

TRITIUM WHICH IS PRODUCED FROM TERNARY FISSION IN NUCLEAR REACTORS WILL BE DILUTED AND DISCHARGED

PAGE 0111-6

000179 [illegible]

[illegible] THE AQUEOUS STREAMS IN THE FUEL REPROCESSING PLANTS. THE RANGES OF TRITIUM CONCENTRATIONS EXPECTED IN THE REPROCESSING PLANT STREAMS FOR DIFFERENT REACTOR TYPES ARE EXAMINED. THE REQUIREMENTS FOR TRITIUM CONTROL INCLUDING RECYCLE AND ISOTOPIC SEPARATION ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

KEYWORDS • FISSION GAS RELEASE • REACTOR, HEAVY WATER • URANIUM AND SALT • SURFACE WATER • WASTE DISPOSAL • WASTE MANAGEMENT • REACTOR, LWR • FUEL REPROCESSING • REACTOR, BWR • REACTOR, LMFBR • JACOBS

000179
JACOBS LL • RYAN JR
THE TECHNOLOGY OF TRITIUM FIXATION AND STORAGE
BATTELLE PACIFIC NORTHWEST LABORATORIES
BNWL-1907 P. 96 PAGES, 46 REFERENCES, JANUARY 10, 1976

THE TECHNOLOGY OF FIXATION OF TRITIUM IN A SOLID FORM WAS EXAMINED. IT WAS CONCLUDED THAT THE BULK OF THE TRITIUM PRODUCED IN THE FUEL CYCLE WOULD BE IN THE FUELS REPROCESSING PLANT, AND WITH CURRENT REPROCESSING PRACTICE, WOULD BE AS A VERY LARGE VOLUME OF LOW-LEVEL TRITIATED WATER. ALTERNATIVE PRACTICE WITH PRODUCT NOBLE GAS VOLUMES. CRITERIA WERE ESTABLISHED FOR REPRESENTING THE VERY WIDE POSSIBLE RANGE OF TRITIUM FIXATION METHODS AND THE NEEDS OF VARIOUS CLASSES OF TRITIUM CONSUMERS ARE DISCUSSED. CURRENT TRITIUM FIXATION TECHNOLOGY AND FIXATION RESEARCH WAS REVIEWED. FLOWS, PROPULSION ENERGY, AND WATERINGS ALL APPEAR TO HAVE MERIT, DEPENDING ON THE NATURE SPECIFICALLY DESIRED OF UTILIZATION OF THE TRITIUM WASTE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

KEYWORDS • WASTE TREATMENT, FIXATION • WASTE DISPOSAL, SOLID • WASTE MANAGEMENT • HYDROGEN • SOIL • JACOBS

000197
ENVIRONMENTAL RADIATION DOSE CONSTRAINTS: AN APPLICATION TO THE NUCLEAR POWER INDUSTRY
U.S. ENVIRONMENTAL PROTECTION AGENCY
EPA-520/4-77-007 P. 76 PAGES, FIGURES, REFERENCES, FEBRUARY 1976

THE CONCEPT OF ENVIRONMENTAL DOSE CONSTRAINT IS DEVELOPED AND ILLUSTRATED BY APPLICATION TO PROJECTED RELEASES OF SELECTED RADIONUCLIDES FROM THE NUCLEAR POWER INDUSTRY OVER THE NEXT 50 YEARS. THE CONCEPT FACILITATES THE TOTAL PROJECTED RADIATION DOSE TO POPULATIONS COMMITTED BY THE INADVERTENT RELEASE OF LONG-LIVED RADIONUCLIDES TO THE ENVIRONMENT, AND PROVIDES A BASIS FOR ESTIMATING THE TOTAL POTENTIAL CONSEQUENCES ON PUBLIC HEALTH OF SUCH ENVIRONMENTAL RELEASES. BECAUSE OF THE DIFFICULTY OF MAKING PROJECTIONS OF RADIONUCLIDE TRANSPORT AND THE BASIS OF PRESENT KNOWLEDGE, THESE POTENTIAL CONSEQUENCES HAVE BEEN CALCULATED ONLY FOR THE FIRST 100-YR PERIOD FOLLOWING RELEASE. THE PARTICULAR RADIONUCLIDES CONSIDERED ARE TRITIUM, KRYPTON-85, IODINE-129, AND THE ACTINIDES.

AVAILABILITY - U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, CRITERIA AND STANDARDS DIVISION, WASHINGTON, D.C. 20460

KEYWORD • REVIEW • SURVEY, RADIATION • OPERATIONAL EXPOSURE • RADIOACTIVITY RELEASE • ENVIRONMENT • ACTINIDE • CONSTRUCTIONMENT • RADIATION EXPOSURE • INDUSTRY, NUCLEAR • JACOBS

000211
FARIAS M
TRITIUM ABSORPTION FACILITY
7 PAGES, 3 FIGURES, REFERENCES, 16171, PP. 43-8 FEBRUARY 1976

THIS PAPER DESCRIBES A FACILITY FOR THE TOTAL EXTRACTION OF TRITIUM FROM AIR AND WASTE GASES. THE FACILITY WORKS ON THE BASIS OF HYDROGEN ABSORPTION. THE SYSTEM IS SO CONSTRUCTED THAT IT CAN PICK POSSIBLY WELL TRITIUM CONTAMINATION IN THE FORM OF DUST, VAPOUR AND GAS. EXPERIMENTAL MEASUREMENTS HAVE SHOWN THAT TRITIUM CAN BE EXTRACTED FROM AIR DOWN TO A RESIDUAL CONCENTRATION OF 10-A CFM PURER.

ABSORPTION • WASTE TREATMENT, GAS • ABSORPTION, RADIOISOTOPE

000403
BOBRACK JW • GRAY JH • CARR WH
FISSION PRODUCT GAS RETENTION PROCESS AND EQUIPMENT DESIGN STUDY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4990 P. 40 PAGES, 8 FIGURES, 40 REFERENCES, MAY 1976

THE STATUS OF FISSION GAS RETENTION SYSTEMS OF POTENTIAL APPLICATION TO A FUEL REPROCESSING PLANT WAS REVIEWED. TWO PROCESSES CURRENTLY UNDER DEVELOPMENT AT OAK RIDGE NATIONAL LABORATORY AND THE OAK RIDGE GASEOUS DIFFUSION PLANT WERE EVALUATED TO DETERMINE THEIR APPLICABILITY TO THE HYPOTHETICAL NUCLEAR FUEL PLANT. THESE PROCESSES ARE CRYOGENIC ADSORPTION AND ROTATION RECOVERY AND VOLATILIZATION AND TRITIUM RECOVERY. FLOWSHEETS AND ADAPTATIONS OF THESE PROCESSES TO THE HYPO WERE DEVELOPED AND COST ESTIMATES PREPARED FOR INSTALLATION OF THE FACILITIES. THE ESTIMATES WERE $1.8 TIMES $1 FOR ROTATION RECOVERY AND $16.2 TIMES $1 FOR TRITIUM RECOVERY. THESE COSTS ARE EXCLUSIVE OF STORAGE CHARGES. NEITHER PROCESS IS SUFFICIENTLY DEVELOPED AT THIS TIME FOR COMMERCIAL REPROCESSING PLANT INSTALLATION.

002499 (CONTINUED)
AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO NTIS TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FISSION PRODUCT, GRAVITY • KRYPTON • NOBLE GAS • FISSION PRODUCT RETENTION • FUEL REPROCESSING • JACOBS

002496
WILSON WF • MOELLER JC • IRVING EB • WATSON CD
REMOTE FUEL REPROCESSING QUARTERLY REPORT FOR PERIOD ENDING DECEMBER 31, 1973
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4480 P. 69 PAGES, TABLES, FIGURES, JUNE 1974

VOLATILIZATION OF IRRADIATED UO2 FUEL IN A MINIATURE ROTARY VOLATILIZER REMOVED UP TO 99.9% OF THE TRITIUM IN THE FUEL. A TURBULENT DISSOLVER WAS FOUND TO BE VERY EFFECTIVE IN WASHING SIMULATED FUEL RESIDUE FROM CHOPPED CLADDING. DEVELOPMENT OF THE IMPROVED PROCESS WAS CONTINUED WITH A SERIES OF RUNS MADE IN A FIVE-PLATE BUBBLE-CAP TOWER 7.6 CM IN DIAMETER. STAGE DECONTAMINATION FACTORS AVERAGED APPROXIMATELY 4 FOR CHYE AT AN AIR RATE OF 90 LITERS/MIN. THE KRYPTON REMOVAL PILOT PLANT AT BARNWELL REPROCESSED PAST THE INITIAL SHAKEDOWN OPERATION STAGE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO NTIS TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TRITIUM • KRYPTON • RUTHENIUM • URANIUM DIOXIDE • FISSION PRODUCT TRANSPORT • PLUTONIUM NITRIDE • ORGANIC IODIDE • WASHOUT • FUEL REPROCESSING • R AND D PROGRAM • NITRATE • RETENTION • JACOBS

002494
TURNER DP • JOY DS • HOPPINGSTON FF
EFFLUENT CONTROL IN FUEL REPROCESSING PLANTS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4999 P. 21 PAGES, TABLES, FIGURES, 9 REFERENCES, MARCH 1976

SUMMARIZES A STUDY OF HOW EXTRAPOLATIONS OF CURRENT AND DEVELOPING TECHNOLOGY MIGHT BE APPLIED TO THE TASK OF REMOVING RADIOACTIVE EFFLUENTS FROM FUTURE FUEL REPROCESSING PLANTS TO YEAR 2000. THE STUDY HAS INDICATED THAT VERY SIGNIFICANT REDUCTIONS OF EFFLUENTS CAN BE ACHIEVED BY INTEGRATING ADVANCED EFFLUENT CONTROL SYSTEMS WITH NEW CONCEPTS OF CONTAINMENT AND VENTILATION THAT WOULD REDUCE NOT INFLEAKAGE OR AIR IN THE PROCESS ENCLOSURES AND PROVIDE FOR EXTENSIVE RECYCLE OF GASES AND LIQUIDS. IF NOT PLANT EFFLUENT FLOW RATES CAN BE THUS REDUCED AND IF THE HIGHLY EFFICIENT FISSION PRODUCT REMOVAL SYSTEMS, UNDER DEVELOPMENT, DO IN FACT BECOME AVAILABLE, IT SHOULD BE POSSIBLE TO REDUCE THE DISCHARGE OF ACTIVITY TO THE ENVIRONMENT IN FUTURE PLANTS BY FROM TO SIX ORDERS OF MAGNITUDE. OVERALL PLANT RETENTION FACTORS IN THE ORDER OF 10E8 TO 10E9 FOR IODINE, 10E3 TO 10E4 FOR TRITIUM AND KRYPTON, AND 10E5 TO 10E6 FOR PARTICULATES APPEAR POSSIBLE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO NTIS TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

EFFLUENT • IODINE • KRYPTON • PARTICLE • VENTILATION SYSTEM • CONTAINMENT • CONTAINMENT LEAKAGE CONTROL • REDUCTION • FUEL REPROCESSING • JACOBS

002570
STEINDLER MJ • LEVITZ NM • TREUTMAN LE • GRABOW TJ • KUELLER BJ • WEBSTER MS • BURRIS L
CHEMICAL ENGINEERING DIVISION WASTE MANAGEMENT PROGRAMS QUARTERLY REPORT, OCTOBER-DECEMBER 1973
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8007 P. 41 PAGES, 7 TABLES, 3 FIGURES, 144 REFERENCES, FEBRUARY 1974

METAL-COMPACTION METHODS HAVE BEEN REVIEWED AND INFORMATION ON THE IRRADIATION-INDUCED PROPERTY CHANGES OF ZIRCALOY SURVEYED AS PART OF A STUDY ON THE HANDLING OF FUEL CLADDING HULLS. INFORMATION ORIGINATING FROM ARC-SITE VISITS AND FROM A REVIEW OF THE OPEN LITERATURE CONCERNING DECONTAMINATION OF PLUTONIUM-CONTAMINATED MATERIALS IS PRESENTED. THE TECHNICAL AND ECONOMIC FEASIBILITY OF ADAPTING REVERSE OSMOSIS TO THE CONCENTRATION OF TRITIUM FROM TRITIATED FUEL REPROCESSING WASTES WAS BRIEFLY EVALUATED. TECHNICAL FEASIBILITY WAS ASSUMED FROM LITERATURE REPORTS OF A DIFFERENCE OF ABOUT 1% IN THE SELF-DIFFUSION COEFFICIENTS OF THE AND H2O, AND POSSIBLY GREATER DIFFERENCES IN TRANSPORT RATES IN SOLUTION-DIFFUSION MEMBRANES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION • CLADDING • NOBLE GAS • WASTE STORAGE • WASTE MANAGEMENT • ZIRCALOY • R AND D PROGRAM • FUEL, NUCLEAR • JACOBS

004095
GATES WM
RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION
U.S. DEPT. OF HEALTH, EDUCATION, AND WELFARE; BUREAU OF RADIOLOGICAL HEALTH
BRH/DES 70-1 P. 29 PAGES, 7 TABLES, 43 REFERENCES, JANUARY 1970

WHILE NUCLEAR POWER REACTORS CONTAIN LARGE INVENTORIES OF RADIOACTIVE MATERIALS, THE EFFLUENT DISCHARGE DATA INDICATE THAT THEY DISCHARGE ONLY SMALL QUANTITIES OF RADIOACTIVE WASTES IN COMPARISON TO THEIR LICENSED LIMITS UNDER NORMAL OPERATING CONDITIONS. THIS SITUATION IS A RESULT OF CAREFUL WASTE MANAGEMENT PRACTICE, ENGINEERED SAFEGUARDS, AND PROPER OPERATING

PAGE 0111-76

[illegible]

PROCESSES. THEY TRITIUM AND IODINE GASES BY WAY DERIVED TO CONVENTIONAL WASTE TREATMENT PROCESSES AND THEREFORE ARE USUALLY THE ONLY CONTAMINANTS THAT ARE DISCHARGED IN ANY SIGNIFICANT QUANTITIES. THESE CONTAMINANTS MUST BEING DISCHARGED, HOWEVER, AT RATES WELL BELOW THOSE SPECIFIED BY THE AEC.

AVAILABILITY - U.S. DEPT. OF HEALTH, EDUCATION, AND WELFARE. PUBLIC HEALTH SERVICE. ENVIRONMENTAL CONTROL ADMINISTRATION. BUREAU OF CONTAMINATION HEALTH, CINCINNATI, OHIO 45267

KEYS: DEVELOPMENT • FISSION PRODUCT RELEASE • NOBLE GAS • WASTE MANAGEMENT • NUCLEAR POWER PLANT, NUCLEAR • JACOBS

[illegible]

[illegible]
TRITIUM CONTROL TECHNOLOGY
[illegible]
[illegible] p. [illegible] PAGES, FEBRUARY 1973

THE PURPOSE OF THIS REPORT IS TO ASSEMBLE IN ONE WORKLESSLIFED CONFIGURATION PROTOTYPE AIR CONTROLLED AND PRIVATE INDUSTRY OPERATING EXPERIENCE WITH TRITIUM CONTAINMENT AND HANDLING, MONITORING, TRANSFER AND REMOVAL, AND STORAGE AND DISPOSAL SYSTEMS. THIS REPORT EMPHASIZES THE CAPABILITIES AND LIMITATIONS OF EXISTING TECHNOLOGY AND INDICATES TRITIUM CONTROL SYSTEMS AND DATA NOT DISCUSSED FURTHER IN PROPOSED RESEARCH AND DEVELOPMENT PROGRAMS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

WASTE HANDLING • WASTE STORAGE • WASTE DISPOSAL, GAS • MONITORING SYSTEM, RADIATION • OPERATING EXPERIENCE • JACOBS

[illegible]

[illegible]
QUARTERLY PROGRESS REPORT - STUDIES ON MANAGEMENT OF SELECTED WASTES, JANUARY THROUGH MARCH 1976
BATTELLE PACIFIC NORTHWEST LABORATORIES
BNWL-1927 p. 44 PAGES, 16 TABLES, 7 FIGURES, 4 REFERENCES, APRIL 1976

A LITERATURE REVIEW OF ADDITIVE, WATER SALT, AND WET FLUE DECONTAMINATION PROCESSES HAS INDICATED THAT WASTE STREAM MINIMIZATION, EASE OF OPERATION, AND DECONTAMINATION EFFICIENCY CAN PROBABLY BE ACHIEVED BY A MODIFIED ACUREX DECONTAMINATION PROCESS SELECTED BY BELVING. THE REUSE OF METAL FROM DECONTAMINATION WORK OF POSSIBLE ADDED LONG CYCLING TIMES BUT ECONOMICS ARE NOT EVALUATED. EQUIPMENT DESIGNS FOR THE SCRUBING STUDIES ON PYROLYSIS OF WASTES HAS FABRICATED AND INSTALLED DURING THE REPORTING PERIOD. SOLVENT EXTRACTION STUDIES ON TRITIUM HAVE SHOWN THAT COMPETITIVE FACTORS MEGATE MANY OF THE SEPARATION WHICH MIGHT BE EXPECTED. A FEW STUDIES ARE CONTINUING USING STRONGLY BASIC SOLVENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION • WASTE TREATMENT • ZIRCONIUM • STEEL, STAINLESS • FISSION PRODUCT, SEPARATION FROM WASTE • LEACHING • SOLVENTS • JACOBS

[illegible]

[illegible]
LASER W • HARPER-WEYDER W
[illegible]: A PROCESS FOR THE SEPARATION OF ARGONOLS, KRYPTON, AND TRITIUM FROM NUCLEAR OFF-GAS IN NTO-FUEL REPROCESSING
[illegible]
[illegible] p. 10 PAGES, 7 FIGURES, 7 REFERENCES, AUGUST 19, 1976

THE ABOUT-PROCESS CONSISTS OF THE FOLLOWING PROTECT STEPS: AEROSOL REMOVAL BY AN ELECTROSTATIC SEPARATOR FOLLOWED BY MEDIA FILTERS, MINIMIZATION OF CO WITH O2 OR REACTION OF EXCESS O2 WITH CO, RESPECTIVELY, PROCESSING, SCRUBBING AMMONIA LIQUEFACTION, SEPARATION OF KRYPTON BY DISTILLATION, SEPARATION OF TRITIATED WATER AND IODINE BY ADSORPTION OR CHEMICAL REACTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEPOSIT • GRAPHITE • KRYPTON • CARBON DIOXIDE • CONVERTING • OFF GAS • FUEL REPROCESSING • REACTOR, HTGR

[illegible]

[illegible]
QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING FEBRUARY 29, 1976 HTGR BASE PROGRAM
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
GA-A13701A p. 200 PAGES, FIGURES, MARCH 29, 1976

THE SHOW DEPOSITION WORK INCLUDES STUDIES ON BASIC FISSION-PRODUCT DISTRIBUTION MECHANISMS, RECYCLE FUEL STUDIES INCLUDING DESIGNING AND TESTING OF RECYCLE TEST ELEMENTS AND FABRICATION OF HEAD-END REPROCESSING METHODS FOR PART OF A NATIONAL RECYCLE PLAN AND OF A RECYCLE FUEL PLANT, AND PHYSICS AND FUEL MANAGEMENT STUDIES. MATERIALS STUDIES INCLUDE IRRADIATION AND ANALYSIS OF FUEL PARTICLES IN CAPSULES TO EVALUATE FUEL SYSTEMS, AND BASIC STUDIES ON CONTROL MATERIALS AND ON CARBON AND GRAPHITE. PROPRIETARY PROCEDURES AND RESULTS ARE DISCUSSED BUT, WHERE APPROPRIATE, THE DATA ARE PRESENTED IN TABLES, GRAPHS, AND PHOTOGRAPHS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]
CESIUM • CESIUM • CARRIER PARTICLE • DEPOSITION • COMPOSITE • STEAM • STORAGE • FISSION PRODUCT TRANSPORT • FISSION PRODUCT DETENTION • REACTOR, HTGR • FUEL DEFECTS

[illegible]
SHORT TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS
WESTINGHOUSE ELECTRIC CORP., PA.
WCAP-[illegible] v. 707 PAGES, JUNE 11, 1976

THIS IS A COMPILATION OF OPERATING PLANT DATA THROUGH JUNE 1975 WHICH IS APPLICABLE TO THE EVALUATION OF GAS RADWASTE TREATMENT SYSTEMS AND THE CALCULATION OF RADIOACTIVE EFFLUENT SOURCE TERMS. CONCENTRATIONS OF FISSION AND CORROSION PRODUCTS IN THE RCS, IODINE SPECIATION FACTOR, POTENTIAL TO SECONDARY STEAM DATES, AND TRITIUM RELEASE DATA FROM OPERATING WESTINGHOUSE PWR'S ARE PRESENTED. AN EXPANDED I-131 CONCENTRATION MODEL HAS BEEN DEVELOPED WHICH IS COMPARED TO A PREVIOUS MODEL AND THE INPUTED FUEL DEFECT MODEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, NON CENTS/PAGE -- MINIMUM CHARGE $2.000

WESTINGHOUSE • SPECIFICATION • FISSION PRODUCT, TRITIUM • CONCENTRATION, PWR • RELEASE RATE • WASTE TREATMENT • ANALYTICAL MODEL • EFFECTIVE CHARGE • CORROSION • FISSION PRODUCT ACTIVITY, GROSS • OPERATING EXPERIENCE • CONTAMINATION SOURCE, INTERNAL • WESTINGHOUSE

[illegible]
[illegible]
METHOD OF AND FILTER FOR REMOVING TRITIUM FROM INERT GASES
U.S. PATENT [illegible], [illegible] v. NOVEMBER 17, 1976

THIS PATENT DISCLOSES AN A FILTER FOR REMOVING TRITIUM FROM AN INERT GAS AND A METHOD OF USING THE SAME COMPRISING CONTACT TRITIUM CONTAIN WITH METAL CONTACTED BY SAID GAS.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

UNITED STATES • PATENT • METHODS

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A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED TOPICS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH HAS REFERRED TO IT.

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IX Results of Environmental Monitoring

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IX - RESULTS OF ENVIRONMENTAL MONITORING

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ENVIRONMENTAL MONITORING SEMI-ANNUAL REPORT- JANUARY THROUGH JUNE, 1984
[illegible] DEFENSE CORPORATION, [illegible], OHIO
[illegible] PAGES, 3 TABLES- SEPTEMBER 11, 1984, [illegible]- ORS

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE FIXED TOWER SUBMERGED [illegible] LABORATORY, [illegible], OHIO, DURING THE FIRST HALF OF 1984 IS REPORTED. THE CONCENTRATION OF [illegible] AND TRITIUM IN THE GREAT MIAMI RIVER WAS WITHIN THE MAXIMUM PERMISSIBLE LEVEL RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THE CONCENTRATION OF [illegible] AND PLUTONIUM IN THE ENVIRONMENTAL AIR WAS [illegible] WITHIN THE MAXIMUM PERMISSIBLE LEVEL RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THERE WAS NO DETECTABLE CONCENTRATION OF TRITIUM IN THE ENVIRONMENTAL AIR DURING THIS PERIOD.

[illegible] • FALLOUT • MONITOR, LIQUID • PLUTONIUM • OHIO • SURVEY, ENVIRONMENT • WASTE DISPOSAL, ATMOSPHERIC • MONITOR, AIR • [illegible] • SURFACE WATER, NUCLEAR DETONATION • WASTE DISPOSAL, OHIO • POPULATION EXPOSURE

[illegible]
FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, ROBERT A. TAFT SANITARY ENGINEERING CENTER
[illegible] PAGES, [illegible] FIGURES, 7 TABLES- 1960, SEW-TR [illegible]- ORS

THIS REPORT ON WATER-BORNE RADIONUCLIDES DESCRIBES PROGRESS MADE IN FIVE SPECIFIC AREAS OF STUDY DURING THE SECOND YEAR OF THE PROJECT, CONTINUING THE REPORT FROM MAY 1, 1959 TO JUNE 30, 1960. THE AREAS CONSIDERED INCLUDE INSTRUMENTATION, TRITIUM, STRONTIUM AND RADIUM WATERS, RADIOIC DATA, AND THE FATE OF RADIOACTIVE MATERIALS IN THE WATER ENVIRONMENT. DESCRIBED ARE SOME CHANGES MADE IN EXISTING COUNTING EQUIPMENT TO INCREASE SENSITIVITY, PROGRESS MADE TO IMPROVE TRITIUM ANALYSES, IMPROVEMENTS IN ANALYSIS OF RADIONUCLIDES IN SEA WATER, METHODS USED TO IDENTIFY RADIONUCLIDES ASSOCIATED WITH ALGAE, AND THE DEVELOPMENT OF SYSTEM SAMPLING DEVICES. RESULTS OF ANALYSES OF SAMPLES COLLECTED IN RAIN, SOUTHERN OHIO, AND CHESAPEAKE BAY ARE REPORTED.

CONTAMINATION • CESIUM • FERRITE • MONITOR, LIQUID • STRONTIUM • SURVEY, ENVIRONMENT • SURFACE WATER, NUCLEAR DETONATION • SURFACE WATER, SUSPENDED MATERIAL • RADIATION MONITORS

[illegible]
RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 3
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
[illegible] PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, [illegible]- [illegible] [illegible]- GPO

DATA ARE PRESENTED ON FISSION PRODUCT RADIOACTIVITY IN SAMPLES OF AIRBORNE PARTICULATES, PRECIPITATION, AND SURFACE WATER COLLECTED AT VARIOUS LOCATIONS THROUGHOUT THE U. S., CANADA, AND WESTERN EUROPE 1963. DATA ARE INCLUDED ON THE DAILY CONCENTRATION OF MILK, APPLES, LETTUCE, ETC., AND WHITE BREAD BY SR-90 AND OXIGEN THROUGHOUT THE U. S.- THE SR-90 CONTENT OF THE DIET IN SELECTED AREAS- AND THE SR-90 ACTIVITY IN U. S. BEEF AND GREAT BEAR LAKE 1960 THROUGH 1963. RESULTS ARE INCLUDED FROM A SURVEY OF SR-90 CONTENT IN THE DIET IN THE UNITED STATES OVER 1960 THROUGH 1961. RESULTS ARE INCLUDED FROM THE ANALYSIS OF MILK SAMPLES COLLECTED THROUGHOUT THE U. S. AND CANADA DURING 1961 AND 1962 AND FISSION PRODUCT ACTIVITY WITH PARTICIPATION IN THE CONTENT OF SR-89, SR-90, AND I-131. ENVIRONMENTAL LEVELS OF RADIOACTIVITY DURING 1961 AND 1962 ARE REPORTED FOR THE FIVE NATIONAL PRODUCTION CENTER, PORTAGE, OHIO, AND THE HANFORD LABORATORY, RICHLAND, WASH. DATA ARE SUMMARIZED ON NUCLEAR DETONATIONS REPORTED DURING FEB. 1963.

[illegible] • CARBON • CESIUM • FERRITE • FALLOUT • STRONTIUM • MONITOR, LIQUID • WEATHER • STRONTIUM • ATMOSPHERIC CIRCULATION • SURVEY, ENVIRONMENT • WASTE DISPOSAL, ATMOSPHERIC • ZIRCONIUM • AGRICULTURE • MONITOR, AIR • MONITOR, SOIL • PRECIPITATION • SURFACE WATER, NUCLEAR DETONATION • SURVEY, USAMS • WASTE DISPOSAL, OHIO • MILK • MILITARY MEDICINE • DOW MATERIALS PRODUCTION CENTER • GROSS BETA • GROSS DATA • HANFORD LABORATORY • NUCLEAR DETONATION • SURFACE WATER, DISPOSAL MEDIA • [illegible] • FOOD

[illegible]
RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 4
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
[illegible] PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, [illegible]- [illegible] [illegible]- GPO

DATA ARE PRESENTED ON THE RADIOACTIVITY IN SAMPLES OF AIRBORNE PARTICULATES, PRECIPITATION, AND SURFACE WATERS COLLECTED THROUGHOUT THE U. S. AND OTHER LOCATIONS DURING 1962 AND 1963. DATA ARE INCLUDED ON THE CONTENT OF SR-89, SR-90, AND I-131 IN MILK SAMPLES FROM VARIOUS LOCATIONS. THE ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT HANFORD NATIONAL LABORATORY AND THE PORTSMOUTH GASEOUS DIFFUSION PLANT DURING 1962, AND THE SUPPLEMENTARY AIRBORNE STATIONS DURING THE SECOND HALF OF 1961 AND THE FIRST HALF OF 1962. RESULTS ARE REPORTED FROM A SURVEY OF RADIOACTIVITY TRAPPED BY LUMINOUS DIAL WATCHES. DAILY AND MONTHLY REPORTING WAS DISCONTINUED DURING APRIL 1963. CHARACTERISTICS OF THE DETECTORS ARE SUMMARIZED.

[illegible] • CARBON • CESIUM • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible], LIQUID • [illegible] • PLUTONIUM • [illegible] • [illegible] • [illegible] • [illegible] • SURVEY, ENVIRONMENT • TRITIUM • MONITOR • WASTE DISPOSAL, ATMOSPHERIC • [illegible] • ZIRCONIUM • AGRICULTURE • MONITOR, AIR • MONITOR, SOIL • SURFACE WATER, NUCLEAR DETONATION • SURVEY, USAMS • WASTE DISPOSAL, OHIO • MILK • [illegible] • GROSS BETA • GROSS DATA • NUCLEAR DETONATION • [illegible] PLANT • [illegible] • SURFACE WATER, DISPOSAL MEDIA

[illegible]
[illegible] HEALTH DATA, VOLUME [illegible], NUMBER [illegible]
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
[illegible] PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, [illegible]- [illegible] [illegible] [illegible]- CPB

DATA ARE PRESENTED ON FISSION PRODUCT RADIOACTIVITY IN SAMPLES OF SURFACE AIR, PRECIPITATION, SURFACE WATERS, WATER SUPPLIES, AND MILK COLLECTED THROUGHOUT THE U. S. AND CANADA AND OTHER SELECTED SITES DURING 1962 AND 1963. AN ANALYSIS WAS MADE OF THE SR-90/CA RATIO IN PRESENT AND ANNUAL DIETS AT NEW YORK CITY, CHICAGO, AND SAN FRANCISCO DETROIT AREA, AND WASHINGTON, 1962. DATA ARE INCLUDED ON ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT THE SAVANNAH RIVER PLANT DURING 1962. RESULTS ARE REPORTED FROM WHOLE-BODY MEASUREMENTS OF CS 137 IN MEN MADE AT LONGMONT, COLORADO.

RADIUM • CALCIUM • STRONTIUM • MILLIKAN • [illegible] • [illegible], LIQUID • [illegible] • DISTRIBUTION • SURVEY, ENVIRONMENT • WASTE DISPOSAL, ATMOSPHERIC • [illegible] • ACCIDENTAL • MEDICAL, ADM • MEDICAL, VALID • SURFACE WATER, WHILE OCCURRENCE • [illegible], [illegible] • WASTE DISPOSAL, [illegible] • [illegible] • [illegible] MODEL • [illegible], [illegible] • CROSS SECTION • CROSS DATA • CROSS COMMA • [illegible] • SAVANNAH RIVER PLANT • SURFACE WATER, DISPOSAL [illegible] • [illegible], [illegible] MILK • [illegible] • CONCENTRATION • AQUATIC ORGANISM • [illegible]

[illegible]
[illegible] HEALTH DATA, VOLUME [illegible], NUMBER [illegible]
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
[illegible] PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, [illegible]- [illegible]-[illegible] [illegible] [illegible]- CPB

DATA ARE SUMMARIZED ON FISSION PRODUCT RADIOACTIVITY DUE TO FALLOUT IN SAMPLES OF AIRBORNE PARTICULATES AND PRECIPITATION COLLECTED THROUGHOUT THE U. S., CANADA, MEXICO, CENTRAL AMERICA, AND ALONG THE NORTH WESTERN ARTERIAL HIGHWAY, 1963. DATA ARE INCLUDED ON THE CONTENT OF SR 90, SR 89, AND CS 137 IN MILK SAMPLES COLLECTED THROUGHOUT THE U. S. DURING 1961, 1962, AND 1963. THE RADIOACTIVITY IN SURFACE WATERS IN 1963. THE RADIOACTIVITY OF DRIFTS SAMPLED DURING 1963- AND I 131 IN POST-WATER MEDIA PARTICLES- ON ANALYTICAL QUALITY CONTROL TECHNIQUES- AND ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT THE SPENT-FUEL ATOMIC POWER STATION FROM JUNE 1962 TO JULY 1963. ONE LOW-INTERMEDIATE-YIELD UNDERGROUND NUCLEAR DETONATION AT THE NEVADA TEST SITE WAS REPORTED DURING FEBRUARY 1964. SEPARATE ABSTRACTS WERE PREPARED FOR THE REVIEWS OF THIS REPORT.

RADIUM • CALCIUM • STRONTIUM • MILLIKAN • [illegible] • [illegible], LIQUID • [illegible] • SUPERVISORY [illegible] • DISTRIBUTION • SURVEY, ENVIRONMENT • WASTE DISPOSAL, ATMOSPHERIC • [illegible] • ACCIDENTAL • MEDICAL, ADM • MEDICAL, VALID • [illegible] • DISTRIBUTION • [illegible], NUCLEAR DETONATION • [illegible], [illegible] • WASTE DETONATION, [illegible] • [illegible] • [illegible] MODEL • CROSS SECTION • CROSS DATA • CROSS COMMA • NEVADA TEST SITE • [illegible] DISTRIBUTION • [illegible], DISTRIBUTION • [illegible]

[illegible]
[illegible] HEALTH DATA, VOLUME [illegible], NUMBER [illegible]
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
[illegible] PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, [illegible]- [illegible]-[illegible] [illegible] [illegible]- CPB

DATA ARE PRESENTED ON THE RADIOACTIVITY DUE TO FALLOUT IN SAMPLES OF AIR, PRECIPITATION, MILK, FOODS, AND SURFACE WATER COLLECTED THROUGHOUT [illegible] 1964 AT VARIOUS LOCATIONS THROUGHOUT NORTH AND SOUTH AMERICA. ENVIRONMENTAL LEVELS OF RADIOACTIVITY DURING THE CALDERA [illegible] 1963 ARE REPORTED FOR BATTELLE MEMORIAL LABORATORY AND THE SAVANNAH RIVER PLANT AND FROM DETROIT, ITALY TO NORTH [illegible] AND THE NEVADA TEST SITE. DATA ARE PRESENTED ON SR 90 IN SURFACE WATERS OF THE UNITED STATES DURING 1960-1963, ON RADIONUCLIDES DETECTED IN THE COLORADO RIVER DURING JANUARY 1963-JULY 1963, AND THE CROSS-FLOWER ANALYSIS OF RADIONUCLIDES IN MILK. THE LOW-YIELD UNDERGROUND NUCLEAR TESTS AT THE NEVADA TEST SITE DURING JULY 1964 WERE CONDUCTED BY THE ATOMIC ENERGY COMMISSION.

RADIUM • CALCIUM • STRONTIUM • MILLIKAN • [illegible] • MILLIKAN • [illegible] • [illegible], LIQUID • [illegible] • [illegible] • [illegible] • DISTRIBUTION • SURVEY, ENVIRONMENT • [illegible] • WASTE DISPOSAL, ATMOSPHERIC • [illegible] • ACCIDENTAL • MEDICAL, ADM • MEDICAL, VALID • [illegible] • DETECTION • [illegible] • [illegible] • [illegible], ADM • MEDICAL, VALID • [illegible] • DETECTION • [illegible] WATER, NUCLEAR DETONATION • [illegible], [illegible] • WASTE DISPOSAL, [illegible] • [illegible] • [illegible] • CROSS SECTION • CROSS DATA • CROSS COMMA • NEVADA TEST SITE • [illegible] DISTRIBUTION • [illegible], CALIFORNIA • [illegible], SOUTHERN • SAVANNAH RIVER PLANT • [illegible] WATER, DISTRIBUTION [illegible] • [illegible] WATER, SEDIMENT • CONCENTRATION • AQUATIC ORGANISM • [illegible] • CALIFORNIA

[illegible]
[illegible] HEALTH DATA, VOLUME [illegible], NUMBER [illegible]
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
[illegible] PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, [illegible]- [illegible]-[illegible] [illegible] [illegible]- CPB

DATA ARE PRESENTED ON THE RADIOACTIVITY DUE TO THE FALLOUT FISSION PRODUCTS IN SAMPLES OF AIR COLLECTED THROUGHOUT NORTH AND SOUTH AMERICA DURING MAY 1965, SAMPLES OF MILK COLLECTED THROUGHOUT THE U.S. AND CANADA DURING MAY 1964, AND SAMPLES OF SURFACE WATERS AND DRINKING WATERS COLLECTED THROUGHOUT THE U.S. DURING MARCH 1964. DATA ARE INCLUDED ON THE DAILY AND MONTHLY CONCENTRATIONS AND INTAKES OF SR 90 AND CS 137 BY INDIVIDUALS LIVING IN NEW YORK, SAN FRANCISCO, AND CHICAGO DURING MAY, AND OCT, 1963, AND THE ENVIRONMENTAL RADIOACTIVITY DURING 1963 AT ARMOUR'S INSTRUMENTATION, CANOGA PARK, CALIFORNIA, NATIONAL REACTOR TESTING STATION, IDAHO FALLS, IDAHO, AND THE DUQUESNE DEPARTMENT OF ENERGY, ST. PETERSBURG, FLA. THE STATUS AS STAFF RADIOBIOLOGIST CONTAMINATED ACTIVITIES IS DEFINED. THREE UNDERGROUND NUCLEAR TESTS AT THE NEVADA TEST SITE DURING AUGUST 1964 WERE CONDUCTED.

RADIUM • CALCIUM • STRONTIUM • MILLIKAN • [illegible] • [illegible], LIQUID • WATER • [illegible] • DISTRIBUTION • SURVEY, ENVIRONMENT • WASTE DISPOSAL, ATMOSPHERIC • [illegible] • [illegible], ADM • [illegible], VALID • [illegible] • [illegible] WATER, NUCLEAR DETONATION • [illegible], [illegible] • WASTE DISPOSAL, [illegible] • [illegible] TECHNIQUE • AT •

[illegible]

[illegible]

[illegible]

007047 UNCLASSIFIED

THE VARIOUS SECTIONS OF THIS REPORT RELATE TO THE ACTIVITIES AND INTERESTS OF THE BIOLOGY AND HEALTH PHYSICS DIVISION AND THE MEDICAL DIVISION OF ORNL AND TO MEDICAL RESEARCH UNDERWAY IN THE HEALTH AND SAFETY BRANCH OF UNGE. THE MATERIAL IS PRESENTED IN A HIGHLY CONDENSED AND GENERALIZED FORM, DETAIL HAS BEEN DELIBERATELY OMITTED.

ECOLOGY • POLLUTION • DOSIMETRY • RADIATION DAMAGE • SURVEY, ENVIRONMENT • GROUND WATER, NUCLIDE OCCURRENCE • POPULATION EXPOSURE • ORGANIZATION PROTECTION, ORGANIZATION • METEOROLOGICAL SUPPORT • WASTE MANAGEMENT • PERSONNEL EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL • VEGETATION • CONCENTRATION • AQUATIC ORGANISM

007097
WOFFORD DJ
STATUS REPORT NO. 5 ON CLINCH RIVER STUDY
OAK RIDGE NATIONAL LABORATORY
149 PAGES, 20 FIGURES, 19 TABLES- OCTOBER 1969, ORNL-3721- CFSTI

THE FOUR STATUS REPORTS PREVIOUSLY ISSUED HAVE BEEN BASED PRIMARILY ON PROGRESS REPORTS SUBMITTED AT MEETINGS OF THE CLINCH RIVER STUDY STEERING COMMITTEE. THIS FIFTH STATUS REPORT IS MAINLY A SUMMARY OF THE STUDY FROM APRIL 26, 1967 TO DECEMBER 4, 1969. DURING THIS PERIOD THE STEERING COMMITTEE MET TWICE, IN FEBRUARY AND DECEMBER 1969, AND RECEIVED THE PROGRESS REPORTS UPON WHICH THIS REPORT IS LARGELY BASED.

CALCIUM • CESIUM • COBALT • DILUTION • EFFLUENT • PARTICLE SIZE • PHYTOPLANKTON • STRONTIUM • SURVEY, ENVIRONMENT • TRACER, FLUORESCENT • MANGANESE 54 • SAMPLING • SURFACE WATER, NUCLIDE OCCURRENCE • ANALYTICAL TECHNIQUE • GROSS GAMMA • HYDRODYNAMIC ANALYSIS • ORNL • OHIO, CLINCH • SURFACE WATER, SEDIMENT • THERMAL CONSIDERATION • HAZARDS ANALYSIS • HYDROLOGY • ION EXCHANGE • RIVER, TENNESSEE • DISPERSION • CONCENTRATION • AQUATIC ORGANISM

007122
BAUER DJ
CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER, 1964
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
29 PAGES- 1966, HW-84540- CFSTI

THE CONCENTRATION OF RADIONUCLIDES DETECTED IN GROUND WATER SAMPLES COLLECTED DURING 1963 AND 1964 FROM OVER 500 MONITORING WELLS AT BATTELLE NORTHWEST ARE REPORTED. IN ADDITION, GROSS BETA RESULTS OF WATER SAMPLES TAKEN FROM CONFINED AQUIFERS ARE PRESENTED AND THE RESULTS OF SPECIAL TRITIUM ANALYSES ARE REPORTED.

GEOLOGY • GROUND WATER • MONITOR, LIQUID • WASTE DISPOSAL • GROSS BETA • GROUND WATER, NUCLIDE OCCURRENCE • GROUND WATER, TRACER • BATTELLE NORTHWEST

007630
BLOCH S • BATHEN BL • RUSSIAN R • BINDERER CL • SCHWARZLEMBERG V
INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
90 PAGES- MAY 23, 1969, UCRL-14110, CFSTI, $2.00 PP, $0.50 MF

BOTH SUBJECT AND AUTHOR INDEXES ARE GIVEN FOR THE FIRST 19 QUARTERLY REPORTS (THROUGH DECEMBER 1968) OF THE HAZARDS CONTROL DEPARTMENT OF LAWRENCE RADIATION LABORATORY, LIVERMORE. THE SUBJECT INDEX IS CROSS-REFERENCED TO SERVE THE INTERESTS OF READERS IN VARIOUS DISCIPLINES WITHIN THE FIELD OF HEALTH AND SAFETY. A TOTAL OF 279 REFERENCES ARE INDEXED.

AIR CLEANING • BERYLLIUM • COUNTER • DECONTAMINATION • DEUTERIUM • DOSIMETRY • FALLOUT • GLOVE BOX • IODINE • MERCURY • MONITOR, STACK • PLUTONIUM • URANIUM • WASTE DISPOSAL • MONITOR, AIR • SAMPLING • INSTRUMENT CALIBRATION • COUNTER, WHOLE BODY • HAZARDS ANALYSIS • MONITOR • REACTOR • SHIELDING • X-RAY • SPECTROMETRY, GAMMA • INSTRUMENTS, MISC. • FILTERS

007667
ADAMS PF
ENVIRONMENTAL MONITORING REPORT- JULY - DECEMBER, 1964 AND 1964 SUMMARY
MOUND LABORATORY, MIAMISBURG, OHIO
19 PAGES, 5 TABLES- MARCH 26, 1969, MLM-1741- CFSTI

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, IS PRESENTED FOR THE SECOND HALF OF 1964 AND A SUMMARY IS PRESENTED FOR THE ENTIRE YEAR. THE CONCENTRATIONS OF TRITIUM IN THE GREAT MIAMI RIVER WAS WITHIN THE MAXIMUM PERMISSIBLE CONCENTRATION RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THE AVERAGE CONCENTRATION OF POLONIUM RELEASED DID NOT EXCEED THE MAXIMUM PERMISSIBLE CONTINUOUS CONCENTRATION. THE CONCENTRATION OF POLONIUM AND PLUTONIUM IN THE ENVIRONMENTAL AIR WAS WITHIN THE MAXIMUM PERMISSIBLE LEVEL RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THERE WAS NO DETECTABLE CONCENTRATION OF TRITIUM IN THE ENVIRONMENTAL AIR DURING THIS PERIOD.

MPC • PLUTONIUM • SURVEY, ENVIRONMENT • POLONIUM • SAMPLING • SURFACE WATER, NUCLIDE OCCURRENCE • AIR • MONITOR, ENVIRONMENTAL • MOUND LABORATORY

000090
ADAMS PC
ENVIRONMENTAL MONITORING REPORT- JANUARY-JUNE 1965
MOUND LABORATORY, MONSANTO RESEARCH CORPORATION
36 PAGES, 3 FIGURES, 3 TABLES- JULY 16, 1965. MLM-1279- CFSTI. $1.00 CY. $0.50 MF

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO IS PRESENTED FOR THE FIRST HALF OF 1965. THE CONCENTRATION OF RADIONUCLIDES FROM MOUND LABORATORY IN THE GREAT MIAMI RIVER WAS WITHIN THE MAXIMUM PERMISSIBLE CONCENTRATION RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THE CONCENTRATION OF RADIONUCLIDES IN THE ENVIRONMENTAL AIR WAS ALSO WITHIN THE MAXIMUM PERMISSIBLE LEVEL RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS.

MONITOR, STACK • PARTICLE • SURVEY, ENVIRONMENT • MONITOR, AIR • POLONIUM • SAMPLING • SURFACE WATER, NUCLIDE OCCURRENCE • GROSS ALPHA • MOUND LABORATORY

000175
MATHEWS MW
PROJECT GNOME. ISOTOPE PROGRAM - FINAL REPORT
LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA
123 PAGES, TABLES, FIGURES- AUGUST 2, 1965. PNE-1029- CFSTI- $4.00

THIS REPORT DISCUSSES THE DISTRIBUTION AND THE DISPOSITION OF A NUMBER OF NUCLIDES FOLLOWING A NUCLEAR DETONATION IN A SALT MINING AS WELL AS THE MEANS BY WHICH THESE NUCLIDES MIGHT BE RECOVERED.

ECONOMICS • GEOLOGY • MOLYBDENUM • PLUTONIUM • THORIUM • URANIUM • ACTIVATION PRODUCT • POLONIUM • SAMPLING • GROSS BETA • GROSS GAMMA • GROUND WATER, NUCLIDE OCCURRENCE • NUCLEAR DETONATION • AMERICIUM • CURIUM • ISOTOPIC FRACTIONATION • RADIOLYTIC GAS • THORIUM

000306
BROBINSKI JC • LAGATTA DP • GOLDIN AS • TERRILL JG
ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM
U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE, WINCHESTER, MASSACHUSETTS
15 PAGES, 8 FIGURES, 4 TABLES, 15 REFERENCES- HEALTH PHYSICS 11(5)- 989-999 (MAY 1965)

THE LEVELS OF CARBON-14 AND HYDROGEN-3 (TRITIUM) IN VARIOUS TYPES OF ENVIRONMENTAL SAMPLES COLLECTED OVER THE PERIOD JANUARY 1963 TO APRIL 1964 HAVE BEEN MEASURED AT THE NORTHEASTERN RADIOLOGICAL HEALTH LABORATORY. SAMPLE TYPES HAVE INCLUDED COMPOSITE FOODS (TOTAL DIETS), INDIVIDUAL FOOD ITEMS, ATMOSPHERIC CARBON DIOXIDE, AND HUMAN AND ANIMAL ORGANS, TISSUES AND FLUIDS.

•CARBON • SURVEY, ENVIRONMENT • •SAMPLING • RADIOCHEMICAL ANALYSIS • CONCENTRATION • MAN • FOOD

000499
ENVIRONMENTAL RADIOACTIVITY AT ARGONNE NATIONAL LABORATORY
ARGONNE NATIONAL LABORATORY
TID-21756 •. 70 PAGES, 2 FIGURES, 12 TABLES- DECEMBER 1964

DATA ON ENVIRONMENTAL RADIOACTIVITY AT ARGONNE DURING THE SECOND HALF OF 1964 ARE PRESENTED TOGETHER WITH A SUMMARY OF THE INFORMATION GIVEN EARLIER FOR THE FIRST HALF OF THE YEAR.

BARIUM • CERIUM • CESIUM • COBALT • FALLOUT • IODINE • NIOBIUM • PLUTONIUM • RUTHENIUM • STRONTIUM • SURVEY, ENVIRONMENT • THORIUM • URANIUM • ZIRCONIUM • MONITOR, AIR • SURFACE WATER, NUCLIDE OCCURRENCE • AIR • BRL • MILK • GROSS ALPHA • GROSS BETA • GROSS GAMMA • PROTACTINIUM • ANTIMONY • LANTHANUM

000606
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
21 PAGES, MARCH 1964

ACTIVITIES FOR MARCH 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

CADMIUM • CESIUM • DEPOSITION • DOSIMETRY • FALLOUT • INHALATION • PARTICLE SIZE • PLUTONIUM • RAINOUT • STRONTIUM • SURVEY, ENVIRONMENT • URANIUM • ZIRCONIUM • MANGANESE • MONITOR, AIR • PROMETHIUM • SAMPLING • AIR • GROSS GAMMA • INSTRUMENT CALIBRATION • IRON • RADON • YTTRIUM • ANTIMONY • INSTRUMENT, COMPONENT • RADIATION MONITORS

000911
RAFTER TA
REPORT ON THE WORK OF THE INSTITUTE OF NUCLEAR SCIENCES, MARCH 1, 1961 - FEBRUARY 28, 1962
INSTITUTE OF NUCLEAR SCIENCES, LOWER HUTT, NEW ZEALAND

009911 MODIFIED
NP-10925 • A.E.C.-87 •. 117 PAGES, MARCH 1962, DEP/MB

REPORT COVERS THE WORK OF THE INSTITUTE OF NUCLEAR SCIENCES FOR THE PERIOD MARCH 1961 TO FEBRUARY 1962. RESEARCH WORK INCLUDES STUDIES ON RADIOACTIVE FALLOUT, C-13/C-12 AGE VARIATIONS, TRITIUM MEASUREMENTS, AND THE REPORTING OF C-14 RESULTS.

CARBON • FALLOUT • HYDROLOGY • NEW ZEALAND • NEPOLOGY, GEOCHEMICAL • ACCELERATOR

012787
MARTENS DB • SCHUBERT BL
ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION
IDAHO OPERATIONS OFFICE, U.S. ATOMIC ENERGY COMMISSION, IDAHO FALLS
TID-12063 • CONF-641100-1 •. 44 PAGES, 4 FIGURES, AUGUST 1965, PRESENTED AT SYMPOSIUM ON ISOTOPE TECHNIQUES, URBANA, ILLINOIS, CFSTI $2.00 CY, $0.50 MF

INFORMATION ON THE CONCENTRATION OF TRITIUM IN WASTE, PRECIPITATION, AND SURFACE AND GROUND WATER AT THE NATIONAL REACTOR TESTING STATION AND SURROUNDING AREAS IS PRESENTED. IT IS SHOWN THAT THE PRESENT CONCENTRATION OF TRITIUM IN THE ENVIRONMENTAL WATER IS ABOUT 100 TIMES PRE-HYDROGEN-BOMB LEVELS. WAYS OPERATIONS HAVE NOT ADVERSELY CONTRIBUTED TO THIS CONTAMINATION EXCEPT IN THE CASE OF GROUND WATER WHICH SEEPED FROM THE CHEMICAL PROCESSING PLANT. T-TRITIATED WATER PRODUCING FROM THE IDAHO CHEMICAL PROCESSING PLANT HAS AFFECTED BOTH THE GROUND-WATER GRADIENT OVER AN AREA OF ABOUT 75 SQUARE MILES. THE TRITIUM CONCENTRATION IN GROUND WATER DECREASES EXPONENTIALLY WITH DISTANCE FROM THE POINT OF INJECTION. AN EMPIRICAL EQUATION HAS BEEN DERIVED WHICH DESCRIBES THIS FUNCTION.

WASTE • RAINOUT • WASTE DISPOSAL, TERRESTRIAL • SURFACE WATER, NUCLIDE OCCURRENCE • GROUND WATER, NUCLIDE OCCURRENCE • WASTE DISPOSAL, LIQUID • HYDROLOGY • HYDROLOGY, RATE OF MOVEMENT

012792
THAYER LL • PAYNE RD • CAMERON JF
TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
CONF-704 •. 29 PAGES, 13 FIGURES, 9 TABLES, 9 REFERENCES, PAGES 660-674 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GAITHERSBURG, MD., NOVEMBER 1964, CFSTI $6.50 CY.

TRITIUM LEVELS ROSE FROM AN AVERAGE BASE OF 40 TRITIUM UNITS (T.U.) FOR CONTINENTAL SITES IN THE NORTHERN HEMISPHERE TO AVERAGE PEAKS OF 2000 T.U. IN 1962 AND 4000 TO 5000 IN 1963. INDIVIDUAL PEAKS WERE HIGHER, REACHING 10,000 IN NORTHERN CANADA. LEVELS IN PRECIPITATION WERE LOWER IN 1964. THE PEAK YEAR APPEARS TO HAVE BEEN 1963. THE RATE OF DECREASE FROM 1963 TO 1964 IS LESS THAN THE COMPARABLE PERIOD 1959 TO 1961, POSSIBLY REFLECTING THE HIGHER ALTITUDES INVOLVED IN THE LAST TESTING. TRITIUM AND SR-90 DEPOSITION VALUES OVER THE GLOBE SHOW INTERESTING CONSISTENCIES THAT MAY PERMIT THE ESTIMATION OF TRITIUM CONCENTRATION FOR UNSAMPLED AREAS. THE HTO/SR-90 RATIO INCREASES TOWARD THE HIGH MID-LATITUDES IN THE NORTHERN HEMISPHERE. THE SOUTHERN-HEMISPHERE PRECIPITATION AVERAGED ONLY 15 T.U. IN 1963 COMPARED TO SEVERAL THOUSAND TRITIUM UNITS FOR THE NORTHERN HEMISPHERE. IT IS ESTIMATED THAT IN 1962 AND 1963 THE DEPOSITION OF TRITIUM HAD BEEN APPROXIMATELY 46 AND 96 KG, RESPECTIVE. IF WATER IN NET OCEANIC EXCHANGE WAS INCLUDED IN THE CALCULATION. THIS WOULD LEAVE EITHER 124 AND 77 KG IN THE STRATOSPHERE BASED ON THE ASSUMPTION OF A 140-KG PRODUCTION IN 1962 AND 1963.

ATMOSPHERIC CIRCULATION, GLOBAL • FALLOUT • RAINOUT • STRATOSPHERE • STRONTIUM

013945
ADAMS RF • ANDERSON HF
ENVIRONMENTAL MONITORING REPORT, JULY-DECEMBER 1965 AND 1966 SUMMARY
BATTELLE LABORATORY, WEASTSBURG, OHIO
BMI-1999 •. 19 PAGES, 5 TABLES, FEBRUARY 28, 1966

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING BATTELLE LABORATORY, WEASTSBURG, OHIO IS PRESENTED FOR THE SECOND HALF OF 1965 AND A SUMMARY IS PRESENTED FOR THE ENTIRE YEAR. THE CONCENTRATION OF RADIONUCLIDES FROM BATTELLE LABORATORY IN THE GREAT MIAMI RIVER AND IN THE ENVIRONMENTAL AIR WAS WITHIN THE RADIOACTIVITY CONCENTRATION GUIDES RECOMMENDED BY THE FEDERAL RADIATION COUNCIL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $1.00 CY, $0.50 MF

POLLUTION • OTHER PROGRAM • SURVEY, ENVIRONMENT • OHIO RIVER • SAMPLING • SURFACE WATER, NUCLIDE OCCURRENCE • AIR • BATTELLE LABORATORY

013947
AUTTLER HV
TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
TECHNICAL UNIVERSITY OF MUNICH
5 PAGES, 7 FIGURES, 12 REFERENCES, NUCLEAR INSTRUMENTS AND METHODS 37(2), PAGES 200-02, (DECEMBER 1965)

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN COMBINED WITH ETHYLENE TO YIELD ETHANE. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN ANSCHARP-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION.

013947 <CONTINUED>

A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND BELOW, AND MAINLY BACKGROUND ABOVE ABOUT 15 KEV. WITH A GEOMETRIC VOLUME OF THE CENTRAL TRITIUM COUNTER OF 7.0 LITERS, THE ANTICOINCIDENCE BACKGROUND IS 7.76 PLUS-OR-MINUS 0.07 CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TU HAS A SAMPLE COUNTING RATE OF 1.97 CPM WHEN THE STRONT PRESSURE IS 750 MM HG. DETAILS ABOUT BACKGROUND TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY AND LONG-TIMES STABILITY ARE GIVEN. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM SOME TWO MAIN RIVER TAKING BETWEEN 1961 AND 1964 SHOW PROMINENT MAXIMA IN THE SUMMER, ABOUT TWO MONTHS LATER AND A FACTOR 4 SMALLER THAN THE MAIN MAXIMA. WINTER MINIMA DEPEND BY A FACTOR OF 2.

COUNTER • #SURFACE WATER, NUCLIDE OCCURRENCE • #ANALYTICAL TECHNIQUE • GERMANY

013610

EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JANUARY THROUGH JUNE 1966

E. I. DU PONT DE NEMOURS AND COMPANY, SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA

DPST-66-30-2 ., 17 PAGES, AUGUST 1966

THIS REPORT, FOR THE PERIOD JANUARY 1 THROUGH JUNE 30, 1966, PRESENTS THE RESULTS OF THE ENVIRONMENTAL MONITORING PROGRAM FOR THE ATMOSPHERE, VEGETATION AND FOOD, AND WATER. THE QUANTITY OF RADIOACTIVE WASTE RELEASED BY THE SAVANNAH RIVER PLANT TO ITS FRESHWATER WAS, FOR THE MOST PART, TOO SMALL TO BE DISTINGUISHED FROM NATURAL BACKGROUND RADIATION OR WAS OBSCURED BY WORLDWIDE FALLOUT FROM NUCLEAR WEAPONS TESTING. FALLOUT FROM THE CHINESE NUCLEAR TEST ON MAY 9, 1966, WAS DETECTED AT SRP.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151 $1.00 CY $0.50 MF

CESIUM • FALLOUT • STRONTIUM • #SURVEY, ENVIRONMENT • #SURFACE WATER, NUCLIDE OCCURRENCE • AIR • #FLOW • #RIVER, SAVANNAH • #SAVANNAH RIVER PLANT • GAMMA • VEGETATION • CONCENTRATION • AQUATIC ORGANISM • FOOD

013775

STATUS AND PROGRESS REPORT

HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE

10 PAGES FEBRUARY 1965

ACTIVITIES FOR FEBRUARY 1965 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM • CADMIUM • CERIUM • CESIUM • DEPOSITION • DOSIMETRY • #FALLOUT • INHALATION • PARTICLE SIZE • PLUTONIUM • RAINOUT • STRONTIUM • SURVEY, ENVIRONMENT • URANIUM • ZIRCONIUM • #MANGANESE • #WINTER, AIR • PROMETHIUM • SAMPLING • AIR • GROSS GAMMA • INSTRUMENT CALIBRATION • IODINE • RADON • YTTRIUM • ANTIMONY • INSTRUMENT, COMPONENT • RADIATION MONITORS

013776

STATUS AND PROGRESS REPORT

HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE

19 PAGES, OCTOBER 1964

ACTIVITIES FOR OCTOBER 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM • CADMIUM • CERIUM • CESIUM • DEPOSITION • DOSIMETRY • #FALLOUT • INHALATION • PARTICLE SIZE • PLUTONIUM • RAINOUT • STRONTIUM • SURVEY, ENVIRONMENT • URANIUM • ZIRCONIUM • #MANGANESE • #WINTER, AIR • PROMETHIUM • SAMPLING • AIR • GROSS GAMMA • INSTRUMENT CALIBRATION • IODINE • RADON • YTTRIUM • ANTIMONY • INSTRUMENT, COMPONENT • RADIATION MONITORS

013777

STATUS AND PROGRESS REPORT

HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE

22 PAGES, JULY 1964

ACTIVITIES FOR JULY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM • CADMIUM • CERIUM • CESIUM • DEPOSITION • DOSIMETRY • #FALLOUT • INHALATION • PARTICLE SIZE • PLUTONIUM • RAINOUT • STRONTIUM • SURVEY, ENVIRONMENT • URANIUM • ZIRCONIUM • #MANGANESE • #WINTER, AIR • PROMETHIUM • SAMPLING • AIR • GROSS GAMMA • INSTRUMENT CALIBRATION • IODINE • RADON • YTTRIUM • ANTIMONY • INSTRUMENT, COMPONENT • RADIATION MONITORS

013779
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
19 PAGES, JUNE 1964

ACTIVITIES FOR JUNE 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

RADIUM • CADMIUM • CERIUM • CESIUM • DEPOSITION • DOSIMETRY • HEALTHY • INHALATION • PARTICLE SIZE • PLUTONIUM • RATIONS • STRONTIUM • SURVEY, ENVIRONMENT • URANIUM • ZIRCONIUM • MANGANESE • MONITOR, AIR • PERMEATION • SAMPLING • AIR • GROSS GAMMA • INSTRUMENT CALIBRATION • IODINE • RADON • YTTRIUM • ANTIMONY • INSTRUMENT, COMPONENT • RADIATION MONITORS

013778
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY USAEC, NEW YORK OPERATIONS OFFICE
20 PAGES, MAY 1964

ACTIVITIES FOR MAY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATION OFFICE

RADIUM • CADMIUM • CERIUM • CESIUM • DEPOSITION • DOSIMETRY • HEALTHY • INHALATION • PARTICLE SIZE • PLUTONIUM • RATIONS • STRONTIUM • SURVEY, ENVIRONMENT • URANIUM • ZIRCONIUM • MANGANESE • MONITOR, AIR • PERMEATION • SAMPLING • AIR • GROSS GAMMA • INSTRUMENT CALIBRATION • IODINE • RADON • YTTRIUM • ANTIMONY • INSTRUMENT, COMPONENT • RADIATION MONITORS

013780
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY USAEC, NEW YORK OPERATIONS OFFICE
24 PAGES, APRIL 1964

ACTIVITIES FOR APRIL 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATION OFFICE

RADIUM • CADMIUM • CERIUM • CESIUM • DEPOSITION • DOSIMETRY • HEALTHY • INHALATION • PARTICLE SIZE • PLUTONIUM • RATIONS • STRONTIUM • SURVEY, ENVIRONMENT • URANIUM • ZIRCONIUM • MANGANESE • MONITOR, AIR • PERMEATION • SAMPLING • AIR • GROSS GAMMA • INSTRUMENT CALIBRATION • IODINE • RADON • YTTRIUM • ANTIMONY • INSTRUMENT, COMPONENT • RADIATION MONITORS

013781
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
20 PAGES, MARCH 1964

ACTIVITIES FOR MARCH 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

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013782
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
19 PAGES, FEBRUARY 1964

ACTIVITIES FOR FEBRUARY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

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019702 (CONTINUED)
INSTRUMENT, COMPONENT • RADIATION MONITORS

019703
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
19 PAGES, JANUARY 1964

ACTIVITIES FOR JANUARY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM • CADMIUM • CERIUM • CESIUM • DEMONSTRATION • DEPOSITION • ENVIRONMENT • FALLOUT • INVESTIGATION • PARTICLE SIZE • PLUTONIUM • RADIUM • STRONTIUM • SURVEY, ENVIRONMENT • URANIUM • ZIRCONIUM • MONITORS • WEATHER, AIR • PRODUCTION • SAMPLING • AIR • GAMMA GAMMA • INSTRUMENT CALIBRATION • IONS • RADIUM • YTTRIUM • ANTIMONY • INSTRUMENT, COMPONENT • RADIATION MONITORS

019704
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
23 PAGES, DECEMBER 1963

ACTIVITIES FOR DECEMBER 1963 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

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019705
BUTLER JW • FARZINE R • WOMELSDORF D
TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
INSTITUT FUR TECHNISCHE ATOMPHYSIK DER TECHNISCHEN HOCHSCHULE DARMSTADT
CONF-650852 • GRPLIN-AFD-CONF-65-190 •, 16 PAGES, 7 FIGURES, 12 REFERENCES, PAGES 471-486, PRESENTED AT INTERNATIONAL RADIOCARBON AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN REACTED WITH ETHYLENE TO YIELD ETHANE. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN ANTICOINCIDENCE-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION. A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND BELOW, AND MAINLY BACKGROUND ABOVE ABOUT 10 KEV. WITH A GEOMETRIC VOLUME OF THE CENTRAL TRITIUM COUNTER OF 2.0 LITERS, THE ANTICOINCIDENCE BACKGROUND IS 2.76 PLUS OR MINUS 0.09 CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TU HAS A SAMPLING COUNTING RATE OF 1.97 CPM WHEN THE ETHANE PRESSURE IS 760 MM HG. DETAILS ABOUT BACKGROUND, TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY, AND LONG-TIME STABILITY ARE GIVEN. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM RHINE AND MAIN RIVER YARDS BETWEEN 1961 AND 1964 SHOW PRONOUNCED MAXIMA IN THE SUMMER, ABOUT TWO MONTHS LATER AND A FACTOR 5 SMALLER THAN THE RAIN MAXIMA. WINTER MINIMA DIFFER BY A FACTOR OF 2.

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COUNTER • SURFACE WATER, NUCLIDE OCCURRENCE • ANALYTICAL TECHNIQUE • GERMANY

019707
FERGUSSON GJ
RADIOCARBON AND TRITIUM IN THE UPPER TROPOSPHERE
UNIV. OF JOHNSTON LAB., INF., BALTIMORE
CONF-650852 • GRPLIN-AFD-CONF-65-190 •, 16 PAGES, 6 FIGURES, 7 TABLES, 7 REFERENCES, PAGES 529-540, PRESENTED AT INTERNATIONAL RADIOCARBON AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

A NUMBER OF MEASUREMENTS HAVE BEEN MADE OF C-14 CONCENTRATION IN THE UPPER TROPOSPHERE BY COLLECTION OF CARBON DIOXIDE WITH MOLECULAR SIEVE SAMPLERS. SAMPLES HAVE BEEN COLLECTED FROM 19 DEGREES N TO 40 N AND FROM 30,000 TO 49,000 FEET ALTITUDE. THESE MEASUREMENTS HAVE SHOWN C-14 ACTIVITIES UP TO TEN TIMES THE PRE-BOMB GROUND LEVEL ACTIVITY. THE OBSERVED ACTIVITY DECREASES RAPIDLY WITH DECREASING LATITUDE AND ALTITUDE. STRONG STRATIFICATION HAS BEEN EVIDENT IN SOME SETS OF MEASUREMENTS. A SERIES OF MEASUREMENTS DURING SPRING 1963, WHEN C-14 LEVELS IN THE UPPER TROPOSPHERE WERE HIGH, YIELDED A T/C-14 RATIO OF 0.40 PLUS OR MINUS 0.12. THIS RESULT IS IN CLOSE AGREEMENT WITH THE STRATOSPHERIC DATA OF NOSEKIAN FOR THE 1957-58 PERIOD, AND IMPLIES THAT THE CHANGING RATIO OF FUSION TO FISSION DEVICES HAS NOT BEEN ACCOMPANIED BY A SIGNIFICANT CHANGE IN THE RATIO OF T TO C-14 PRODUCTION. THE ANNUAL ADDITION OF C-14 TO THE TROPOSPHERE IS EASILY COMPUTED FROM GROUND LEVEL C-14 MEASUREMENTS. THUS FROM THE T/C-14 RATIO OF NATURAL EXPOSING THE TROPOSPHERE THE ANNUAL INPUT OF TRITIUM CAN BE COMPUTED MORE PRECISELY THAN FROM SURFACE TRITIUM MEASUREMENTS, AND SO CAN AID UNDERSTANDING OF THE TRITIUM CYCLE.

[illegible]
AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $0.50 PY

TRITIUM • OSMETIC • ATMOSPHERIC

[illegible]
CONFERENCE 0 • PREPRINT 1 • LEGISLATION 2
[illegible] TRITIUM AND CARBON-14 MEASUREMENTS IN ATMOSPHERIC MOISTURE
CONF-690907 • CONF-690-CONF-69-190 •. 10 PAGES, 4 FIGURES, PAGES 569-579, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASH., JUNE 7-11, 1969

[illegible] AND PRESENTED FOR TRITIUM CONCENTRATIONS IN ATMOSPHERIC HYDROGEN SAMPLES DATING BACK TO 1961.

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DISTRIBUTION • HYDROGEN • ANALYTICAL TECHNIQUE

[illegible]
[illegible] • SPELLSCHEID JR
TRITIUM MEASUREMENTS IN SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES
UNIVERSITY OF THE WITWATERSRAND, SOUTH AFRICA
CONF-690907 • CONF-690-CONF-69-190 •. 12 PAGES, 4 FIGURES, PAGES 690-670, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1969

DATA ARE PRESENTED ON THE TRITIUM CONTENT OF SOME SUBTERRANEAN WATERS OF SOUTH AFRICA. A THERMAL DIFFUSION SYSTEM WAS USED FOR ENRICHMENT OF TRITIUM. COUNTING IS DONE WITH A GAS PROPORTIONAL COUNTER.

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COUNTER • ANALYTICAL TECHNIQUE • ACIDIFIED WATER, NUCLEAR RECONNAISSANCE • SOUTH AFRICA

[illegible]
[illegible] OF • SHEEHAN WF
PERIODICAL [illegible] REPORT- JANUARY-JUNE 1966
HANFORD LABORATORY, RICHLAND, WASH.
HW-1954 •. 77 PAGES, 3 FIGURES, 9 TABLES, SEPTEMBER 1, 1966

THE CONCENTRATION OF RADIOACTIVE MATERIALS COLLECTED IN THE SURROUNDINGS OF HANFORD LABORATORY, RICHLAND, WASH., IS PRESENTED FOR THE FIRST HALF OF 1966. THE CONCENTRATION OF RADIONUCLIDES FROM HANFORD LABORATORY IN THE GREAT RIVER OTHER THAN IN THE AIR WAS WITHIN THE STANDARDS SPECIFIED BY THE ATOMIC ENERGY COMMISSION.

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[illegible], STACK • PLUTONIUM • [illegible], ENVIRONMENT • [illegible], AIR • [illegible] • SAMPLING • SURFACE WATER, NUCLEAR RECONNAISSANCE • AIR • HANFORD LABORATORY

[illegible]
[illegible] JR • PSSIG TM
[illegible] OF RADIOLOGICAL CONDITIONS IN THE VICINITY OF HANFORD FOR 1969
NORTHWEST-NORTHWEST, RICHLAND, WASHINGTON
BNWL-11A •. 90 PAGES, 23 FIGURES, 7 TABLES, 13 REFERENCES, NOVEMBER 11, 1969

THE EVALUATION OF DEBRIS OBTAINED FROM THE HANFORD ENVIRONMENTAL SURVEILLANCE PROGRAM FOR 1969 INDICATES THAT MOST OF THE ENVIRONMENTAL RADIATION DOSE RECEIVED BY THE MAJORITY LIVING IN THE NEIGHBORHOOD OF THE HANFORD PROJECT WAS DUE TO NATURAL SOURCES AND WORLD-WIDE FALLOUT RATHER THAN TO HANFORD OPERATIONS. OF THE LOW-LEVEL WASTES THAT WERE RELEASED TO THE ENVIRONMENT, NEUTRON-INDUCED RADIONUCLIDES PROVED TO BE DETECTED CONTAINING WATER DISCHARGED TO THE COLUMBIA RIVER CONTRIBUTED MOST TO THE SUMMED DOSE TO THE GENERAL POPULATION DUE TO DRINKING THE WATER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $1.00 COPY, $0.65 MICROFICHE

[illegible] • [illegible] • [illegible] • INGESTION • [illegible] • [illegible] • [illegible] • STRONTIUM • [illegible], ENVIRONMENT • WASTE DISPOSAL, TRANSPORTATION • [illegible] • [illegible] • [illegible] • CHROMIUM • COPPER • [illegible] • [illegible] • HIGH FLUX • SAMPLING • SURFACE WATER, NUCLEAR RECONNAISSANCE • IODINE • AIR • MILK • DOSE CALCULATION, INTERNAL • WATER, DRINKING • CROSS DATA • [illegible], COLUMBIA • WASTE DISPOSAL, LIQUID • POPULATION EXPOSURE • DOSE CALCULATION, EXTERNAL • NORTHWEST NORTHWEST • HANFORD, DATE OF REPORT • NATURAL • CONCENTRATION

016029
FLE RIVER REACTOR SYSTEM MONITORING DATA
RURAL COOPERATIVE POWER ASSOCIATION
CDO-051-32 ●. 81 PAGES. 10 FIGURES. SEPTEMBER 1966

OWLR OF REPORT IS DATA ON WATERBORNE AND AIRBORNE ACTIVITY LEVELS IN PLANT LOCATION AND SYSTEMS. TRITIUM REACHES EQUILIBRIUM ABOUT 3 MONTHS AFTER A CYCLE STARTUP, BUT ONLY 1/10TH OF THAT EXPECTED. TRITIUM IN COOLANT IS RELATED TO CROD BURSTS, INDICATING THAT CROD IS A MAJOR MECHANISM. REACTOR-OFFGAS SYSTEM (SCRUBBER, FILTER, ETC.) WAS TESTED OUT.

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REACTOR, GAS ● FLE RIVER (BWR) ● REPORT, OPERATIONS ANALYSIS ● NOF GAS ● MONITORING SYSTEM, RADIATION ● SURVEILLANCE PROGRAM

016070
ANDERSON HF ● SHEFFMAN HF
ENVIRONMENTAL MONITORING REPORT. JULY-DECEMBER 1966 AND 1966 SUMMARY
MOUND LAB., MIAMISBURG, OHIO
MLM-1391 ●. 23 PAGES. 7 TABLES. FEBRUARY 10, 1967

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, IS PRESENTED FOR THE SECOND HALF OF 1966, AND A SUMMARY IS PRESENTED FOR THE YEAR. THE CONCENTRATION OF RADIONUCLIDES FROM MOUND LAB. IN THE GREAT MIAMI RIVER AND IN THE ENVIRONMENTAL AIR WAS WITHIN THE STANDARDS SPECIFIED BY THE AEC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

PLUTONIUM ● SURVEY, ENVIRONMENT ● MONITED, AIR ● POLONIUM ● SAMPLING ● STACK ● SURFACE WATER, NUCLIDE OCCURRENCE ● AIR ● MOUND LABORATORY

020042
ATHAVALE VN ● LAL D ● RAMA
MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90
TATA INST. OF FUNDAMENTAL RESEARCH, BOMBAY
31 PAGES. 10 FIGURES. 6 TABLES. 17 REFERENCES. PROC. INDIAN ACAD. SCI., SECT A65, PAGE 73-103. (FEBRUARY 1967)

THE CONCENTRATIONS OF TRITIUM WERE DETERMINED IN WET PRECIPITATIONS OCCURRING OVER THE INDIAN SUBCONTINENT DURING 1961 TO 1964. THE TRITIUM CONCENTRATIONS VARIED SIGNIFICANTLY DURING THE PERIOD OF OBSERVATION. HIGHEST CONCENTRATIONS WERE OBSERVED DURING 1963. THE TRITIUM AND STRONTIUM DATA FOR THE INLAND, COASTAL, AND ISLAND STATIONS WERE ANALYZED TO EVALUATE THE IMPORTANCE OF REEVAPORATION OF TRITIUM FROM CONTINENTS AND THE MOLECULAR EXCHANGE OF ATMOSPHERIC TRITIUM WITH OCEANIC WATER.

FALLOUT ● RAINOUT ● STRONTIUM ● INDIA ● PRECIPITATION

022001
ANDERSON HF ● SHEFFMAN HF
ENVIRONMENTAL MONITORING REPORT. JANUARY-JUNE 1967
MOUND LAB., MIAMISBURG, OHIO
MLM-1429 ●. 37 PAGES. TABLES. FIGURES. JULY 17, 1967

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, IS PRESENTED FOR THE FIRST HALF OF 1967. THE AVERAGE CONCENTRATION OF RADIONUCLIDES FROM MOUND LABORATORY IN THE GREAT MIAMI RIVER AND IN THE ENVIRONMENTAL AIR (AVERAGE OF ALL ZONES) WAS WITHIN THE STANDARDS SET BY THE AEC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA $3.00 COPY, $0.65 MICROFICHE

AEROSOL ● PLUTONIUM ● RIVER ● WATER ● POLONIUM ● AIR ● MOUND LABORATORY ● RADIOISOTOPE ● ENVIRONMENT ● MONITORING PROGRAM, ENVIRONMENTAL

022013
DATA - SECTION IV. OTHER DATA
US PUBLIC HEALTH SERVICE
10 PAGES. 7 TABLES. 4 FIGURES. RADIOLOGICAL HEALTH DATA AND REPORTS (111), PAGES 666-675 (NOVEMBER 1967)

THIS SECTION CONTAINS REPORT ON SR-90 IN HUMAN VERTEBRAE COLLECTED IN 1966 IN NEW YORK CITY AND IN SAN FRANCISCO. REPORTS ENVIRONMENTAL SURVEYS FOR THREE SITES OF THE LAWRENCE RADIATION LABORATORY (JULY-DECEMBER 1966) AND OF MOUND LABORATORY (JULY-DECEMBER AND ANNUAL SUMMARY 1966). THE USAEC REPORTED UNDERGROUND NUCLEAR TESTS AT THE NEVADA TEST SITE ON OCTOBER 18, 1967, AND ON OCTOBER 25. IN ADDITION THE AEC REPORTED SEISMIC DATA ON OCTOBER 17 AND OCTOBER 23, 1967, INDICATING SOVIET NUCLEAR TESTS IN SIBERIA.

[illegible]
[illegible] • [illegible] • [illegible] • [illegible] LABORATORY • [illegible] • [illegible] PROGRAM, ENVIRONMENTAL • [illegible]
PROGRAM • [illegible] • [illegible]

[illegible]
[illegible]
[illegible] ESTIMATES FROM [illegible] TRITIUM [illegible]
SAVANNAH RIVER LAB., [illegible], S. C.
1 PAGE. ABSTRACT IN HEALTH PHYSICS 13, PAGE 931, (1967). PAPER PRESENTED AT THE TWELFTH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, WASHINGTON, D. C., JUNE 18-22, 1967

WHOLE-BODY IRRADIATIONS ARE CHRONICALLY EXPOSED TO TRITIUM FROM NUCLEAR WEAPONS TESTS AND RELEASES FROM NUCLEAR FACILITIES. ESTIMATES OF THE RADIATION DOSE FROM ASSIMILATION OF TRITIUM OXIDE, THE PRIMARY FORM OF ENVIRONMENTAL TRITIUM, ARE BASED ON THE ASSUMPTION THAT TRITIUM REMAINS IN BODY WATER JUSTE RECEIVED. ANALYSES OF DEED TISSUES, HOWEVER, INDICATE THAT CHRONIC EXPOSURE TO TRITIUM CAUSES SIGNIFICANT LABELING OF ORGANIC MOLECULES. THE DEGREE OF LABELING WAS DETERMINED FROM TRITIUM ASSAYS OF SEVEN TISSUES (HEART, LIVER, KIDNEYS, SPLEEN, BRAIN, MUSCLE AND FAT) FROM FIFTY-TWO DEED HARVESTED ON THE SAVANNAH RIVER PLANT SITE. IN MOST TISSUES, THE TRITIUM-HYDROGEN RATIOS IN BODY WATER AND IN THE WATER OF CRYSTALLIZATION OF DEED TISSUES WERE THE SAME. THIS INCORPORATION OF TRITIUM IN THE ORGANIC COMPONENT OF DEED TISSUES RESULTS IN DOSES UP TO 1.5 TIMES HIGHER THAN ESTIMATED IF ONLY THE TRITIUM IN BODY WATER IS CONSIDERED.

DOSE CALCULATION, INTERNAL • SAVANNAH RIVER PLANT • ANIMAL • CONCENTRATION

[illegible]
[illegible] OF • SAVANNAH RIVER
ENVIRONMENTAL MONITORING REPORT - JULY 1967 AND 1967 SUMMARY
HANFORD LABORATORIES, RICHLAND, WASH.
HW-[illegible], [illegible] PAGES, 9 FIGURES, 11 TABLES, JANUARY 15, 1968

THE CONCENTRATION OF RADIOACTIVE MATERIALS RECEIVED IN THE ENVIRONMENT SURROUNDING HANFORD LABORATORY, RICHLAND, WASH. IS PRESENTED FOR THE SECOND HALF OF 1967, AND A SUMMARY IS PRESENTED FOR THE ENTIRE YEAR. THE AVERAGE CONCENTRATION OF RADIONUCLIDES FROM HANFORD LABORATORY IN THE GREAT BEND RIVER AND IN THE ENVIRONMENTAL AIR (AVERAGE OF ALL ZONES) WAS WITHIN THE STANDARDS SPECIFIED BY THE USAEC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

AIRBORNE RELEASE • [illegible] • [illegible] • [illegible], ENVIRONMENTAL • CONTAMINATION • RADIATION SAFETY AND CONTROL

[illegible]
WILLARD JT
PROGRESS ADVANCING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE
U.S. ATOMIC ENERGY COMMISSION
15 PAGES, 12 FIGURES, 2 TABLES, 17 REFERENCES, PAGES [illegible], FROM COLLOQUE INTERNATIONAL SUR LA POLLUTION RADIOACTIVE DES MILIEUX CAUSEE PAR LES RADIOELEMENTS GAZEUX MEDIAS. ROME I, SAFAT NOVEMBER 17-18, 1967

RADIONUCLIDES CAN BE INTRODUCED INTO THE UPPER TROPOSPHERE, STRATOSPHERE, MESOSPHERE, AND HIGHER LAYERS OF THE ATMOSPHERE BY BOTH PEACEFUL AND MILITARY USES OF NUCLEAR ENERGY. EXAMPLES OF PEACEFUL USES WHICH MIGHT RELEASE RADIOACTIVITY INTO THESE REGIONS ARE PROPULSION SYSTEMS AND ARBITRARY POWER SUPPLIES FOR OUTER-SPACE VEHICLES. THE PREDICTION AND THEREFORE CONTROL OF THE DISTRIBUTION AND FALLOUT OF SUCH CONTAMINANTS PRESENTS A NUMBER OF NOVEL SCIENTIFIC PROBLEMS. AN OUTLINE IS GIVEN OF THE USAEC COORDINATED PROGRAMS OF SAMPLING-DEVICE DEVELOPMENT, ANALYTICAL METHODS DEVELOPMENT, SAMPLE COLLECTION AND ANALYSIS, AND METEOROLOGICAL EVALUATION OF DATA.

AVAILABILITY - PRESSES UNIVERSITAIRES DE FRANCE, 108, BOULEVARD SAINT-GERMAIN, PARIS, VI, FRANCE

AEROSOL • CADMIUM • CARBON • CESIUM • CESIUM • ATMOSPHERIC DIFFUSION, CLIMATOLOGY • ATMOSPHERIC DIFFUSION, GLOBAL • FALLOUT • KRYPTON • ATMOSPHERIC STABILITY • SODIUM • STRATOSPHERE • STRONTIUM • SAMPLING • AIRCRAFT • COSMIC RADIATION • TUNGSTEN • RADIOACTIVITY RELEASE • MESOSPHERE • RUBIDIUM • TROPOSPHERE • AGENCY, AEC

[illegible]
WRIGHTSET AA • PORTER CR
TRITIUM IN SURFACE WATERS OF THE UNITED STATES, 1966
SOUTHEASTERN RADIOLOGICAL HEALTH LAB., MONTGOMERY, ALA.
3 PAGES, 1 TABLE, 2 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 8(7), PAGES 337-339 (JULY 1967)

DURING 1966, A TRITIUM SAMPLING NETWORK WAS ESTABLISHED BY THE PUBLIC HEALTH SERVICE TO MEASURE THE LEVELS AND CONSEQUENTLY TO DETERMINE THE PUBLIC HEALTH SIGNIFICANCE OF TRITIUM IN SURFACE WATERS OF THE U.S. ANALYTICAL PROCEDURES ARE DESCRIBED. DATA FOR THE SAMPLES OBTAINED ARE PRESENTED. A MEANS FOR ESTIMATING THE RADIATION DOSE RESULTING FROM TRITIUM IN THE BODY IS DEVELOPED.

SAMPLING • SURFACE WATER, NUCLIDE OCCURRENCE • RADIATION SAFETY AND CONTROL • BIBLIOGRAPHICAL ASSISTANCE • UNITED STATES

027910
[illegible] JE • [illegible] AW • [illegible] JJ • [illegible] WE
INITIATED MOISTURE IN THE ATMOSPHERE SURROUNDING A NUCLEAR FUEL REPROCESSING PLANT
NEW YORK STATE HEALTH DEPARTMENT
6 PAGES, 2 FIGURES, 0 TABLES, 11 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 01?1, PAGES 561-566 (JULY 1960)

A NEW WIDE-AREA SAMPLING TECHNIQUE WAS USED TO COLLECT MORE THAN 100 INITIATED MOISTURE SAMPLES OVER A 2-HOUR PERIOD FROM SEVEN SAMPLING LINES DOWNWIND FROM A FUEL REPROCESSING PLANT. THE HIGHEST TRITIUM LEVEL RECORDED WAS 20,400 PCI/LITER. THE DATA ARE PRESENTED NOT TO INDICATE THEIR RADIOLOGIC VALUE AS FOR THEIR VALUE TO PUBLIC HEALTH AGENCIES CONTEMPLATING RADIOLOGICAL SURVEILLANCE AROUND NUCLEAR FACILITIES.

AVAILABILITY - U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, NATIONAL CENTER FOR RADIOLOGICAL HEALTH

ATMOSPHERIC DIFFUSION • SAMPLING • RADIOLOGICAL ASSISTANCE • FUEL REPROCESSING • SURVEILLANCE PROGRAM

027977
COURLEY PC
CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS
SAVANNAH RIVER LABORATORY
DPSPU-60-30-19 • CONF-600807-1 •. 19 PAGES, TABLES, MAY 1960, FROM 13TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

IN HEAVY-WATER-MODERATED REACTORS, TRITIUM IS FORMED AS NEUTRONS ARE ABSORBED BY THE HEAVY WATER. HAZARDS FROM TRITIUM RELEASED TO PERSONNEL DURING MAINTENANCE OPERATIONS ARE MINIMIZED BY PROPER JOB EVALUATION AND SELECTION OF CORRECT PROTECTIVE EQUIPMENT. AT SAVANNAH RIVER PLANT, BASIC INFORMATION HAS BEEN DEVELOPED TO FACILITATE THIS PROCESS. DATA IS GIVEN RELATIVE TO BUILDUP OF TRITIUM IN MODERATOR, AIRBORNE CONCENTRATION OF TRITIUM, CONCENTRATION OF TRITIUM IN SPILLED MODERATOR AND WATER, ASSIMILATION OF TRITIUM BY PERSONNEL THROUGH INHALATION AND BODY CONTACT, AND DOSE RECEIVED BY URINE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

[illegible] • INHALATION • ANALYTICAL TECHNIQUE • HAZARDS ANALYSIS • RADIATION SAFETY AND CONTROL • SORPTION • MONITORING SYSTEM, RADIATION • CONCENTRATION • RECEPTION, URINE • [illegible]

020116
PRYOR DR • THATCHER LL • CAMERON JF • FLORKOWSKI T
THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
IAEA-3102-1 •. 119 PAGES, MAY 1967

THE RESEARCH CONTRACT WAS IN EFFECT BETWEEN THE U.S. ATOMIC ENERGY COMMISSION AND THE AGENCY FROM 1 JANUARY 1963 TO 31 DECEMBER 1964. THE AIM OF THE PROJECT MAY BE DEFINED BROADLY AS THE DEVELOPMENT OF PRACTICAL METHODS FOR THE ANALYSIS OF ENVIRONMENTAL LEVELS OF TRITIUM IN NATURAL WATERS, AND, THROUGH THE JOINT PROGRAMME OF PRECIPITATION SAMPLING THROUGHOUT THE WORLD CARRIED OUT BY THE AGENCY IN COLLABORATION WITH WMO, THE PROVISION OF AN OVERALL PICTURE OF THE GLOBAL OCCURRENCE OF TRITIUM IN PRECIPITATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

HYDROGEN • IAEA • OXYGEN • STRATOSPHERE • WATER • PRECIPITATION • METEOROLOGY • MONITORING PROGRAM, ENVIRONMENTAL

029905
SECTION II - WATER - RADIOLOGICAL HEALTH DATA REPORTS
0 PAGES, FIGURES, TABLES, REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 0110?, PAGES 561-569 (OCTOBER 1960)

THE PUBLIC HEALTH SERVICE, THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, AND OTHER FEDERAL, STATE, AND LOCAL AGENCIES OPERATE EXTENSIVE WATER QUALITY SAMPLING AND ANALYSIS PROGRAMS FOR SURFACE, GROUND, AND TREATED WATER. MOST PROGRAMS INCLUDE DETERMINATION OF GROSS BETA AND GROSS ALPHA RADIOACTIVITY AND SPECIFIC RADIONUCLIDES.

FRC • RIVER • SAMPLING • SURFACE WATER, NUCLIDE OCCURRENCE • ANALYTICAL TECHNIQUE • WATER, DRINKING • RADIATION PROTECTION, ORGANIZATION • WATER POLLUTION • SURVEILLANCE PROGRAM

030940
SECTION II, WATER
RAD. HEALTH DATA AND REPORTS, VOL 01113, NOV., 1960, P.649

THE PUBLIC HEALTH SERVICE, THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION AND OTHER FEDERAL, STATE, AND LOCAL AGENCIES OPERATE EXTENSIVE WATER-QUALITY SAMPLING AND ANALYSIS PROGRAMS FOR SURFACE, GROUND, AND TREATED WATER. MOST OF THESE PROGRAMS INCLUDE DETERMINATIONS OF GROSS BETA,

[illegible]
CARBON DIOXIDE, AND CARBONATE PARTICULATES.

[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible] WATER, NUCLEAR RECEIVERS • ANALYTICAL TECHNIQUES • [illegible] WATER, MONITORING • CARBON DATA • WATER POLLUTION • [illegible] PROGRAM

[illegible]
[illegible]
[illegible] SURVEILLANCE DATA FROM THREE PRODUCTION WELLS
[illegible] ENERGY RESEARCH [illegible], LAS VEGAS, NEVADA
[illegible] • [illegible] P., [illegible] PAGES, [illegible] TABLES, FEBRUARY [illegible]

SUMMARIZES MOST OF THE SIGNIFICANT RADIOMETRIC "SURVEILLANCE" DATA GENERATED DURING THE PRODUCTION TESTS OF NEVADA [illegible], A NUCLEAR GAS STIMULATION EXPERIMENT, CONDUCTED SEPTEMBER 10, 1969, IN [illegible] CALDERA. [illegible] INCLUDES DATA ON THE RADIOMETRICAL AND CHEMICAL QUALITY OF THE PRODUCED GAS DURING THE TESTS, AND ESTIMATES OF THE [illegible] OF [illegible], GAS, AND TRITIUM RELEASED TO THE ATMOSPHERE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CHEMICAL • [illegible] • [illegible] • [illegible], LIQUID • [illegible], AIR • [illegible], GAS • [illegible] INFORMATION • [illegible], RADIOACTIVE • RADIOACTIVITY RELEASE • [illegible] PROGRAM • [illegible], DATA • [illegible] • [illegible] • ESTIMATION • [illegible] OF [illegible] • [illegible] USE

[illegible]
ENVIRONMENTAL RESEARCH BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30, 1969
ATOMIC ENERGY COMMISSION LTD., CHALK RIVER ONTARIO
AECL-3100 P., 17 PAGES, 9 REFERENCES, PP. 19-26, NOVEMBER 1969

[illegible] OF [illegible] LIQUID DISPOSAL DATA AND DEVELOPMENTS CONTINUED AND A SURVEY SUMMARY GIVEN. STUDIES ARE REPORTED ON RATE OF RESIDUAL DEPOSITS IN AQUATIC COMMUNITIES. RESULTS OF TRITIUM AND [illegible] IN [illegible], [illegible], AND RIVER WATERS IS REPORTED. [illegible] MONITORING OF THE STACK AND [illegible] DISCHARGE CONTINUED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

CESIUM • [illegible] • ATMOSPHERIC DISPERSION • [illegible] • [illegible] • SPACE • [illegible], ENVIRONMENTAL • SURVEY, [illegible] • WASTE DISPOSAL, LIQUID • [illegible] • [illegible] • RADIOCHEMISTRY • [illegible] • AQUATIC ORGANISMS

[illegible]
HEALTH PHYSICS BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30, 1969
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER ONTARIO
AECL-3100 P., 17 PAGES, PP. 27-36, NOVEMBER 1969

REPORTS PROGRESS IN DETECTING INSTRUMENTS INCLUDING TRITIUM, IODINE, [illegible]. SOME DETAIL IS GIVEN ON ALPHA AIR MONITORING, INSTRUMENT DEVELOPMENT AND CORBET-GO, URANIUM AND REACTOR PROBE LEVEL DETECTORS. NOISE DATA ARE REPORTED ON WAVE LEVELS AT PERCH LAKE, RADIATION HAZARDS FROM X-RAY SOURCES, DEVELOPMENT OF LOW [illegible], AND ROUTINE DOSE AND FIELD MONITORING.

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CORBET • [illegible] • [illegible] • ALPHA EMITTER • [illegible] • RADIATION SAFETY AND CONTROL • REACTOR POWER • X-RAY • NEUTRON • GAMMA EMITTER • RADIATION HAZARDS

[illegible]
SURVEY OF ENVIRONMENTAL RADIOACTIVITY
RURAL COOPERATIVE POWER ASSOCIATION
CPA-[illegible]-77 P., 19 PAGES, FIGURES, TABLES, APRIL 1969

DEALS WITH SURVEILLANCE PROGRAMS BY THE MINNESOTA DEPT. OF HEALTH AND THE RURAL COOPERATIVE POWER ASSOCIATION, RED RIVER, MINN. RESULTS ARE REPORTED FOR GROSS BETA DEAD PERIODS AND THE GENERAL TRENDS OF RADIOACTIVITY IN PRECIPITATION, SURFACE WATERS, AND AIR DURING THE PERIOD 1961 THROUGH 1968. THE CONTRIBUTIONS OF COSMOGENIC ISOTOPES ARE GIVEN.

[illegible] • [illegible] • POTASSIUM • RED RIVER (RIVER) • [illegible] • PARTICLE • RIVER • STRONTIUM • SURFACE WATER, NUCLEAR RECEIVERS • SURVEY, USPHS • AIR • [illegible] • WATER, MONITORING • GROSS BETA • PRECIPITATION • SURVEILLANCE PROGRAM

[illegible]
[illegible]
TRITIUM IN NEW YORK STATE WATERS, 1969
5 PAGES, 3 FIG., 3 TAB., 2 REF., PAGES 93 THRU 97 OF RADIOLOGICAL HEALTH DATA AND REPORTS, [illegible] (MARCH 1969)

THE STATES MAJOR RIVERS, COVERS, AND LAKES WERE SAMPLED TO SEE WHAT VARIATIONS IN TRITIUM CONTENT

090090 <CONTINUED>
OCCURRED THROUGHOUT THE STUDY. SINCE MOST TRITIUM IN THE ATMOSPHERE FROM NUCLEAR WEAPONS PRODUCTS DECAYS THE SURFACE WATERS BY PRECIPITATION, AND WOULD EXPECT THAT DEEPER WATER, SUCH AS IN CRATERS AND STREAMS (MADE UP OF RECENT PRECIPITATION RUNOFF) MAY BE MIXED IN VARIOUS TIMES LONGER. DEEP LAKES THAT CONTAIN OLDER WATER, THUS MAINTAINING GREATER DILUTION.

DILUTION • FALLOUT • WATER • TRITIUM • SURFACE WATER, NUCLEAR DECLARATION • NUCLEAR DETONATION • PRECIPITATION • WASHOUT • STRONTIUM/CESIUM RATIOS • PLANT

090600
MEYERS JD
ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JANUARY THROUGH JUNE 1971
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-4691 •, 66 PAGES, FIGURES, TABLES, 19 REFERENCES, JUNE 1971

DETAILS OF PROGRAMS DESIGNED TO MONITOR RADIATION LEVELS IN THE LABORATORY PATHWAYS, INCLUDING THE ATMOSPHERE, LOCAL SURFACE AND GROUND WATERS, SEDIMENTS, AND SOILS ARE PRESENTED. THESE MEASUREMENTS ARE USED TO MAKE ESTIMATES OF THE DOSE CONSTRAINTS DUE TO PLUTONIUM AND TRITIUM CONCENTRATIONS IN AIR. APPENDICES DESCRIBE THE ORGANIZATIONS OF THE LABORATORY SITE; THE PROGRAMS ASSOCIATED WITH VARIOUS LABORATORY TECHNICAL AREAS; GEOLOGIC, CLIMATOLOGIC, AND PEDOLOGIC CHARACTERISTICS OF THE LOS ALAMOS AREA; AND LABORATORY PROCEDURES USED FOR ANALYSIS OF SAMPLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECOLOGY • GEOLOGY • GROUND WATER • MEASUREMENT • PLUTONIUM • SURFACE WATER • SITE CLIMATOLOGY • AIR • ANALYTICAL TECHNIQUE • MONITOR, ENVIRONMENTAL • MAPS • MONITOR • SOIL • MONITOR, DATA • CONTAMINATION • SEDIMENT

090700
RADIOLOGICAL HEALTH DATA
U.S. PUBLIC HEALTH SERVICE
270 PAGES, RADIOLOGICAL HEALTH DATA AND REPORT, [0101], (JUNE 1969)

PERSONS DATA ON MILK AND FOOD, WATER, AIR AND DEPOSITION, BIOLOGICAL MATERIALS AND OTHER MEDIA.

BARIUM • CESIUM • DEPOSITION • IODINE • PARTICLE • STRONTIUM • WATER • SAMPLING • SURVEY, USPHS • MILK • ANALYTICAL TECHNIQUE • MILK • DIETARY MODEL • MONITOR, ENVIRONMENTAL • GAMMA DOSE • GAMMA DATA • GAMMA GAMMA • WASTE MANAGEMENT • PRECIPITATION • ENVIRONMENT • SURVEILLANCE PROGRAM • ANIMAL • CONTAMINATION • FOOD

090721
DEMAN DW
RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1968
BATTELLE NORTHWEST
BNWL-1047 •, 20 PAGES, 3 FIGURES, 5 TABLES, 6 REFERENCES, MAY 1969

REPORT EVALUATES THE STATUS OF GROUND-WATER CONTAMINATION RESULTING FROM DISPOSAL OF PLANT EFFLUENTS. CONCENTRATIONS OF RUTHENIUM AND TRITIUM IN AREA IS GIVEN. CONTAMINATION IN CONFINED GROUND WATER IS REPORTED.

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EFFLUENT • HPC • RUTHENIUM • GROUND WATER, NUCLEAR REFERENCE • WASTE DISPOSAL, LIQUID • CONTAMINATION • HANFORD SITE

090797
PORTER RS • SPEAR WG
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION
BATTELLE NORTHWEST, RICHLAND, WASHINGTON
BNWL-1051(PT. 3) •, 48 PAGES, 3 FIGURES, 1 TABLE, JULY 1969

DISCUSSES INSTRUMENTS USED IN VARIOUS MONITORING METHODS AND TECHNIQUES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

BIOMEDICAL • COUNTER • SOLID STATE DEVICE • RADON • RADIATION SAFETY AND CONTROL • BATTELLE NORTHWEST • RADIOBIOLOGY • INSTRUMENTS, MISC.

090804
ANDERSON HF • SHEEHAN WF
ENVIRONMENTAL MONITORING REPORT - JANUARY-JUNE 1969
MOUND LABORATORY, OHIO
MLM-1819 •, 61 PAGES, 4 FIGURES, AUGUST 21, 1969

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AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22161 $1.00 COPY, $0.65 MICROFICHE

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AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

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[illegible] C-14, [illegible] TRITIUM [illegible]

[illegible]

[illegible]

[illegible] C-14 [illegible] TRITIUM [illegible]

AVAILABILITY - [illegible]

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[illegible] • PRECIPITATION • [illegible]

[illegible]
WATSON GD
THE ENVIRONMENTAL MONITORING PROGRAMME AT THE A.A.E.C. RESEARCH ESTABLISHMENT, LUCAS HEIGHTS
AUSTRALIAN ATOMIC ENERGY COMMISSION, SYDNEY, AUSTRALIA
[illegible] P. 10 PAGES, 7 FIGURES, 1 TABLE, [illegible] REFERENCES, FROM THE FOURTH UNITED NATIONS INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, SEPTEMBER 6-16, 1971

DESCRIBES THE EVOLUTION OF EFFLUENT DISCHARGE CONTROLS, AND THE ASSOCIATED ENVIRONMENTAL MONITORING, AT THE AUSTRALIAN ATOMIC ENERGY COMMISSION'S RESEARCH ESTABLISHMENT NEAR SYDNEY, OVER THE PAST TEN YEARS. ITS MAJOR RESEARCH FACILITY IS A 10 MW (TH) HEAVY WATER MODERATED AND COOLED MATERIALS TESTING REACTOR, WHICH IS ALSO USED FOR EXTENSIVE RADIOISOTOPE PRODUCTION. THE POSSIBLE SOURCES OF ENVIRONMENTAL CONTAMINATION ARE ATMOSPHERIC, FROM ISOTOPE PRODUCTION FACILITIES AND REACTOR TRITIUM, ESTUARINE FROM THE DISCHARGE OF LOW-LEVEL LIQUID EFFLUENT TO A TIDAL STREAM, AND LEACHING FROM A BURIAL GROUND FOR LOW-LEVEL SOLID WASTES. DISCHARGE AUTHORISATIONS DERIVE FROM CRITICAL GROUP STUDIES, WITH OYSTER CONSUMPTION THE MOST SIGNIFICANT PATHWAY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

CODES AND STANDARDS • EFFLUENT • REACTOR, HWR • REGULATION • RIVER • WASTE DISPOSAL, TERRESTRIAL • AUSTRALIA • MONITOR, ENVIRONMENTAL • CRITICAL NUCLIDE PATHWAY • CONTAMINATION • RADIATION SAFETY AND CONTROL • FOOD CHAIN • AQUATIC ORGANISM • LEACHING

[illegible]
[illegible] AA • PORTER CR
TRITIUM CONCENTRATION IN PRECIPITATION, 1967-1969
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
6 PAGES, 3 FIGURES, 2 TABLES, 0 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(3), PG 137-[illegible] (MARCH 1970)

DISCUSSES A SURVEILLANCE PROGRAM TO DETERMINE THE AMOUNT OF TRITIUM IN RAIN.

•SAMPLING • MONITOR, BACKGROUND • •PRECIPITATION • SURVEILLANCE PROGRAM • DATA COLLECTION • •CONCENTRATION

044097
ESSINGTON EH • FENSKE PH • NORK WE
RADIOACTIVITY IN WATER - PROJECT MILROW
ISOTOPES, INC., PALO ALTO, CALIFORNIA
NVO-1229-139 P. 45 PAGES, MARCH 1970

DISCUSSES POST-MILROW EVENT CONDITIONS AT AMCHITKA RELATIVE TO EXPLOSION-PRODUCED RADIOACTIVITY IN WATER. EXPLOSION EFFECTS WHICH ARE RELATED TO MODIFICATION OF THE HYDROLOGIC SYSTEM ARE - (1)

044032 NCSR:INWFTO
FORMATION OF A RUBBLE CHIMNEY AND COLLAPSE SINK. (2) FORMATION OF WATER SPOUTS ON THE ISLAND AND IN THE OCEAN DURING THE SEISMIC PHASE, (3) CREATION OF LINEATIONS IN THE OCEAN POSSIBLY RELATED TO FAULT AND FRACTURE SYSTEMS DURING THE SEISMIC PHASE, (4) FORMATION OF A LONG OPEN FRACTURE ABOUT 100 METERS FROM GROUND ZERO THAT ACTED AS A DRAIN FOR SURFACE WATER.

AVAILABILITY -- NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DILUTION • OCEAN AND SEA • OPINIONS • SEISMOLOGY • SOIL, RADIONUCLIDE MOVEMENT THROUGH • SURFACE WATER • MONITOR, BACKGROUND • HYDROLOGY • TRANSPORT THEORY • MODEL TESTING • SURVEILLANCE PROGRAM

049909
MAGNESSI AA • LYON DJ
TRITIUM CONCENTRATIONS IN FOOD, 1967-1968
SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY • SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY
4 PAGES, 2 FIGURES, 4 TABLES, 0 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(5), PG 233-236 (MAY 1970)

TRITIUM CONCENTRATIONS WERE DETERMINED IN FOOD SAMPLES OBTAINED FROM SEVERAL CHILDREN'S HOMES IN THE UNITED STATES. THE AVERAGE CONCENTRATIONS OF TRITIUM IN FOOD INDICATE A DECREASING TREND FROM 1967 TO 1968. THE AVERAGE DOSE EQUIVALENT FROM TRITIUM IN FOOD WAS CALCULATED TO BE 0.00 MREM FOR 1967 AND 0.09 MREM FOR 1968.

DOSE • DIETARY HABIT • UNITED STATES • CONCENTRATION • FOOD CHAIN • MAN • FOOD

049974
RADIOLOGICAL HEALTH DATA
36 PAGES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(7), PG 399-400 (JULY 1970)

REPORTS SURVEILLANCE DATA ON MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA CONCERNED WITH ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT ATOMIC ENERGY COMMISSION INSTALLATIONS.

DEPOSITION • ELEMENTS AND ISOTOPES • PARTICLE • STRONTIUM • WATER • SURFACE WATER, MULTIPLE OCCURRENCE • MILK • DIETARY HABIT • WATER, DRINKING • CONCENTRATION, AREA • FISSION PRODUCT, AIRBORNE • PRECIPITATION • SURVEILLANCE PROGRAM • CONCENTRATION • AGENCY, AEC • FOOD

051277
IAEA
TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1
WP/17/1 • WP/17/2 • WP/17/3 • WP/17/4 • WP/17/5 • WP/17/1-5 • WP/17/6 •.

OCEAN AND SEA • RIVER • WATER • SAMPLING • PRECIPITATION • CONCENTRATION

051297
ASHLEY G
EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JULY THROUGH DECEMBER 1969.
DPSPU-66-30-1 • DPSPU-66-30-2 • DPSPU-69-30-1 • DPST-66-30-2 • DPST-66-30-1 • DPST-66-30-2 •.

CERIUM • CESIUM • COBALT • RIVER • RUTHENIUM • STRONTIUM • ZIRCONIUM • THORIUM • MANGANESE • NEPTUNIUM • SAVANNAH RIVER PLANT • RADIOISOTOPE • ENVIRONMENT • EFFECT • TRANSPORT • PLANT • FOOD INTAKE

051305
REICHART SO
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.
JOURNAL OF GEOPHYSICAL RESEARCH 69 PAGES 4969-4976 1967

GROUND WATER • RIVER • WASTE DISPOSAL • SAVANNAH RIVER PLANT • RADIOISOTOPE • TRANSPORT • PLANT

051441
TAYLOR FR
TRITIUM MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF THE TRITIUM LABORATORY. INSTITUTE OF NUCLEAR SCIENCES, NEW ZEALAND.
195-0-74 •.

CARBON • MEASUREMENT • OCEAN AND SEA • WATER • PRECIPITATION • NEW ZEALAND • REVIEW

052906
STERRETT AR
HASP. SECOND SPECIAL REPORT ON HIGH ALTITUDE SAMPLING PROGRAM.
NASA-599-8 •.

BARIUM • BERYLLIUM • CARBON • CERIUM • CESIUM • ATMOSPHERIC DIFFUSION, CLIMATOLOGY • STRONTIUM • ATMOSPHERIC CIRCULATION • LEAD • SAMPLING • TUNGSTEN • RHODIUM • HIGH • RADIONUCLIDE TRANSFER • TRANSPORT

053221
HAMILTON-NUCLEAR S
VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.
VUF-1014 o.

GROUND WATER • TRANSPORT

053240
TAKAMSHI T
MEASUREMENT OF TRITIUM IN RAIN, CITY WATER, GROUND WATER AND HOT SPRINGS.
JOURNAL OF THE SCIENTIFIC RESEARCH INSTITUTE/TOKYO 59 PAGES 49-51 1965

MEASUREMENT • WATER • PRECIPITATION

053272
HOWARDA JJ
WESTERN TRITIUM AT SEDAN CRATER. PART II. SOIL AND FLUFFS STUDIES.
UCRL-50300 o.

PLOWSHARE • SOIL • CANAL

054496
BROWN RM
TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1969).
STI/DOC/10/73 o.

CANADA • SITING • PRECIPITATION

054496
TAYLOR CB
TRITIUM IN SOUTHERN HEMISPHERE PRECIPITATION (1953-1966).
STI/DOC/10/73 o.

PRECIPITATION

059073
MULLINS JW • STEIN JL
EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA • SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY
9 PAGES, 3 FIGURES, 1 TABLE, 6 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 13(2), PP. 59-67 (FEBRUARY 1972)

TO ESTABLISH A BASELINE FOR ENVIRONMENTAL TRITIUM A STUDY WAS CONDUCTED TO MEASURE CURRENT LEVELS OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES. DATA ARE REPORTED FOR TRITIUM CONCENTRATIONS IN SURFACE AND GROUND WATERS DURING APRIL 1968-DECEMBER 1969. THE CONCENTRATION OF TRITIUM WAS UNDETECTABLE IN MOST GROUND-WATER SAMPLES, WHILE OTHER SAMPLES CONTAINED AS MUCH AS 2.6 PCI/LITER. SURFACE WATER SAMPLES RANGED FROM UNDETECTABLE TO 3.0 PCI/LITER. POSSIBLE REASONS FOR THE RANGE OF RESULTS, SUCH AS ALTITUDE AND LATITUDE EFFECTS, ARE DISCUSSED.

SAMPLING, HIGH ALTITUDE • ANALYTICAL TECHNIQUE • MONITOR, ENVIRONMENTAL • GROUND WATER, NUCLIDE OCCURRENCE • MONITOR, GROUND SURFACE • UNITED STATES • SURVEILLANCE PROGRAM • CONCENTRATION

059139
ENVIRONMENTAL SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION TEST PHASE
BUREAU OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND
SUMM-1008 o. JUNE 1970

ENVIRONMENTAL SAMPLES COLLECTED WITHIN 10 MILES OF GASBUGGY CONTAINED H-3 RELEASED DURING PRODUCTION TESTING. SEVERAL SAMPLES HAD C-14 COUNTS, TO 3 TIMES BACKGROUND. EXCEPT FOR KR-85 IN 2 AERIAL SAMPLES, NO CONTAMINATION BY OTHER ISOTOPES WAS DETECTED. THE HIGHEST COUNTS OF H-3 IN AN AIR SAMPLE WAS 0.9 PERCENT OF THE MPC. SOIL AND VEGETATION COUNTS OF H-3 WAS HIGHEST IN NOV. 1968, AND WAS AT BACKGROUND BY OCT. 1969.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON • KRYPTON • PLOWSHARE • SURVEY, ENVIRONMENT • SOIL • PRODUCTION UPTAKE • BIOACCUMULATION/TURNOVER • PLANT

061190
ROGNISSTOGA • LYON RJ
TRITIUM CONCENTRATIONS IN FOOD, 1967-1969

050100 [illegible]
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY • SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY
4 PAGES, RADIOLOGICAL HEALTH DATA AND REPORTS, VOL. 11, PG. 233-236 (19700227210)

THE US PUBLIC HEALTH SERVICE MONITORS TRITIUM IN RAIN, SURFACE WATERS, FOOD AND DRINK. TOTAL INGESTED INTAKES OF CHILDREN FROM SEVERAL CHILDREN'S HOMES, INCLUDING SOFT DRINKS BUT EXCLUDING TAP WATER WERE ANALYZED FOR TRITIUM, AND [illegible] PICOCURIES OF WATER OF CONSUMPTION TABULATED FOR TAMPA, NEW ORLEANS, LITTLE ROCK, LOUISVILLE, ALBUQUERQUE, CHARLESTON, COLUMBIA AND AUSTIN. AVERAGE TRITIUM CONCENTRATIONS IN FOOD RANGED FROM 0.36 PICOCURIES PER LITER AT LITTLE ROCK (DOSE FACTOR [illegible] 0.06 MREM TO 0.71 AT LOUISVILLE (0.12 MREM) IN 1967. THE CORRESPONDING FIGURES FOR 1968 BEING 0.13 AND 0.07 AT LITTLE ROCK, AND 0.26 AND 0.04 AT LOUISVILLE. ASSUMING A STANDARD MAN OF 70 KG WITH A HYDROGEN BODY WATER CONTENT OF 7 KG, DRINKING-WATER NOT INCLUDED, WITH A QUALITY FACTOR OF 1.7 FOR TRITIUM, AND THAT TRITIUM CONTENT OF THE BODY IS IN EQUILIBRATION WITH THAT IN THE FOOD. FOR CHILDREN DOSE CALCULATION, SEE HOCHSSLE AND LIEBERMAN, RADIOL HEALTH DATA REPTS 11, 227 (1970)

INGESTION • DIETARY HABIT • DOSE CALCULATION, INTERNAL • UNITED STATES • RADIONUCLIDE UPTAKE • PHYSIOLOGY/METABOLISM • INHALATION • MAN • PERIOD INTAKE • BODY BURDEN

050543
SUMMARY OF
MEASUREMENTS OF BOMB PRODUCED RADIOCARBONS IN THE SURFACE AND SUBSURFACE WATER OF THE PACIFIC OCEAN.
SCRIPPS INSTITUTION OF OCEANOGRAPHY, LA JOLLA, CALIFORNIA
UCSD-34-P-1A3-X-1 •, 17 PAGE, MARCH 1, 1970

REPORTS PROGRESS DURING THE YEAR 1970 OF THE LA JOLLA PROGRAM FOR MONITORING THE CARBON-14 CONTENT OF SURFACE SEAWATER IN THE PACIFIC OCEAN. ADDITIONAL PLANS OF SAMPLING AND THE MOVING OF THE LABORATORY ARE ALSO REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

RADIOCARBON • COUNTER • DATA ANALYSIS • SURVEILLANCE PROGRAM • CONCENTRATION • OCEAN, PACIFIC

050741
HULL AP • GILMORTIN JT
1966 ENVIRONMENTAL MONITORING RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN NATIONAL LABORATORY
• BNL-50194 •, 32 PAGES, 20 FIGURES, 32 TABLES, 29 REFERENCES, SEPTEMBER 1969

MEASUREMENTS OF NATURAL BACKGROUND RADIATION LEVELS AND OF INCREMENTS ATTRIBUTABLE TO LABORATORY OPERATIONS OBTAINED ON SITE AND IN THE VICINITY OF BROOKHAVEN NATIONAL LABORATORY DURING 1966 ARE SUMMARIZED IN THIS REPORT. THESE INCREMENTS INCLUDE CONTRIBUTIONS FROM THE GASEOUS AND PARTICULATE EFFLUENTS FROM THE STACK SERVING THE BROOKHAVEN GRAPHITE RESEARCH REACTOR AND THE HIGH FLUX BEAM RESEARCH REACTOR, FROM MULTICURIE FIELD GAMMA SOURCES, AND FROM THE DISCHARGE OF LOW-LEVEL LIQUID WASTES FROM THE LABORATORY'S SANITARY WASTE TREATMENT PLANT INTO THE HEADWATERS OF THE PECONIC RIVER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM • COBALT • EFFLUENT • IODINE • PARTICLE • STRONTIUM • WASTE TREATMENT • STACK • MILK • POND • MONITOR, ENVIRONMENTAL • GROSS BETA • GROSS GAMMA • MONITOR, BACKGROUND • REACTOR • GAS • OFF SITE • CONCENTRATION

057399
WEEKS JA • FARNSWORTH RH • STEWART GL
TRITIUM IN STREAMS IN THE UNITED STATES, 1961-1968
WATER RESOURCES DIVISION, U.S. GEOLOGICAL SURVEY • ENVIRONMENTAL SCIENCES SERVICES ADMINISTRATION, MARYLAND • UNIVERSITY OF MASSACHUSETTS
19 PAGES, 20 TABLES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(9), PG 421-439 (SEPTEMBER 1970)

AS PART OF ITS PROGRAM OF WATER RESOURCES INVESTIGATIONS, THE U.S. GEOLOGICAL SURVEY HAS BEEN ANALYZING THE TRITIUM CONTENT OF STREAM WATER SINCE THE EARLY 1960S. THE RESULTS FOR 20 STREAMS IN THE CONTERMINOUS UNITED STATES AND ALASKA ARE TABULATED ALONG WITH RELEVANT STREAM DISCHARGE DATA. THE DATA SHOW THE EFFECT ON STREAM TRITIUM CONCENTRATION CAUSED PRIMARILY BY THERMONUCLEAR DETONATIONS, AND ALSO SEASONAL, LATITUDINAL, AND CONTINENTAL EFFECTS.

RESURFACE WATER, NUCLEAR DETONATION • HYDROLOGY • UNITED STATES • ALASKA • SURVEY

059959
PROJECT GASRUGGY OFF-SITE RADIOLOGICAL SAFETY REPORT GR-70 PHASE I PROGRAM
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
SWRHL-109-R •, 20 PAGES, JULY 1970

THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY PROVIDED OFF-SITE RADIOLOGICAL SURVEILLANCE FOR THE GASRUGGY-1 DRILL (RG-70) - PHASE I PROGRAM. THIS SURVEILLANCE WAS THE CONTINUATION OF THE PREVIOUS OFF-SITE SURVEILLANCE PROGRAM FOR GASRUGGY, AND CONSISTED OF - OPERATING A DAILY AIR SAMPLING NETWORK, PLACING THERMOLUMINESCENT DOSIMETERS IN A NETWORK AROUND THE SITE, MONITORING FOR RADIOACTIVITY, TAKING SPECIAL AIR SAMPLES DURING FLARING OPERATIONS, COLLECTING WATER, VEGETATION, AND SOIL SAMPLES AFTER COMPLETION OF TESTING OPERATIONS. THE ONLY RADIOACTIVITY ABOVE BACKGROUND LEVELS DETECTED OFF-SITE WAS IN SPECIAL AIR SAMPLES. THESE SAMPLES CONTAINED

050899 *CONTINUED*
TRITIUM CONCENTRATIONS ABOVE BACKGROUND; THE CONCENTRATIONS FOUND PRESENTED NO HAZARD TO ANY PEOPLE OR LIVESTOCK LIVING IN THE OFF-SITE AREA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PLUTONIUM * WATER * SAMPLING * AIR * MONITOR, ENVIRONMENTAL * SOIL * SURVEILLANCE PROGRAM * DEAD * OFF SITE * VEGETATION * CONCENTRATION

060609
AN ECOLOGICAL APPROACH
UNIVERSITY OF FLORIDA, GAINESVILLE
29 PAGES, 4 FIGURES, 2 TABLES, QUARTERLY PROGRESS REPORT, AUGUST 1 - OCTOBER 31, 1970

PREOPERATIONAL INVESTIGATION OF THE LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE CRYSTAL RIVER NUCLEAR POWER PLANT. PROGRESS IS REPORTED IN MARINE AND TERRESTRIAL SAMPLING, CS-137 IN THE FLORIDA DRESSPRESS, THERMOLUMINESCENT DOSIMETRY, AIRBORNE PARTICULATE ACTIVITY, TOTAL DEPOSITION SAMPLER, TRITIUM NETWORK, AND EVALUATION OF SPANISH MOSS AS A BIOLOGICAL SAMPLER FOR AIRBORNE ACTIVITY.

AVAILABILITY - ENVIRONMENTAL ENGINEERING, UNIVERSITY OF FLORIDA, GAINESVILLE, FLORIDA 32601

CESIUM * MONITOR * ZIRCONIUM * SURFACE WATER, NUCLIDE ACCUMULATION * FISSION PRODUCT, AIRBORNE * ECOSYSTEM, GRASSLAND * RADIONUCLIDE UPTAKE * ANIMAL, INVERTEBRATE * BIOACCUMULATION/TRANSFER * FOOD CHAIN * PLANT, SPERMATOPHYTE * MARINE ORGANISM * MAMMAL * PLANT, ALGAE/FUNGI * ECOSYSTEM, MARINE * ANIMAL, AMPHIBIAN * ANIMAL, REPTILE * ANIMAL, BIRD * PLANT, MOSS/FERN

061130
BASSON JE * VANAS D * VLEGGAAR CM * VANDERWESTHUIZEN
RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE
11 PAGES, SOUTH AFRICAN JOURNAL OF SCIENCE, 66(7), PP. 214-225

MEASUREMENTS SINCE 1969 WITH SPECIAL ATTENTION TO 1966-67 SHOWED THE FRENCH NUCLEAR TESTS DID NOT PRODUCE A HAZARDOUS INCREASE. ANALYSES OF AIRBORNE FALLOUT, SR-90 IN MILK, CS-137 IN BONE, TRANSIT TIME AND AGE ANALYSIS, THE RATIO OF CE-144/CS-137 INDICATED FALLOUT DEP. AND SHOWED FALLOUT TOWARDS THE END OF 1966. INCREASES IN CUMULATIVE SR-90 DEPOSITION AND H-3 IN RAIN WERE ATTRIBUTABLE TO INTERHEMISPHERIC MIXING. THE AVERAGE ANSF RATE FOR THE POPULATION WAS CALCD. TO BE 0.4 MRAD/YEAR TO GONADS AND 3.3 TO THE BONE MARROW. ICA TA-10119 RU

CESIUM * CESIUM * FALLOUT * STRONTIUM * DOSE CALCULATION, INTERNAL * POPULATION EXPOSURE * *SOUTH AFRICA * RADIONUCLIDE UPTAKE * BIOACCUMULATION/TRANSFER * BONE, MARROW * TESTIS

061400
ENVIRONMENTAL MONITORING REPORT - JANUARY-JUNE 1970
MOUND LABORATORY, MIAMISBURG, OHIO
MLM-1784 P. 36 PAGES, JANUARY 29, 1971

THE AVERAGE CONCENTRATIONS OF POLONIUM-210, PLUTONIUM-238 AND TRITIUM DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, ARE PRESENTED FOR THE FIRST HALF OF 1970. THE AVERAGE CONCENTRATIONS OF THESE RADIOISOTOPES IN THE GREAT MIAMI RIVER AND AT THE AIR SAMPLING STATIONS WERE WELL WITHIN THE STRINGENT STANDARDS ADOPTED BY THE ATOMIC ENERGY COMMISSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PLUTONIUM * RIVER * *POLONIUM * AIR * *MONITOR, ENVIRONMENTAL * *MOUND LABORATORY * REGULATION, AEC * *CONCENTRATION

061936
VINOGRADOV AP * DEVIATS AL * DOBROVA EI
THE CURRENT TRITIUM CONTENTS OF NATURAL WATERS
INSTITUTE OF GEOCHEMISTRY AND ANALYTICAL CHEMISTRY, MOSCOW
15 PAGES, GEOCHEMISTRY INTERNATIONAL, VOL. 5, 957-966 (1968)

TRITIUM ANALYSES WERE MADE ON A NUMBER OF WATER AND PLANT SAMPLES COLLECTED PRIMARILY DURING 1966 TO 1968 IN THE WESTERN USSR. THE ANALYSES WERE MADE BY GAS-PROPORTIONAL COUNTER. THE COUNTERS WERE STEEL OR COPPER IN CONVENTIONAL STEEL SHIELDS WITH A RING OF GEIGER GUARD COUNTERS IN ANTICOINCIDENCE WITH THE MAIN COUNTER. RESULTS ARE GIVEN.

*WATER * ANALYTICAL TECHNIQUE * USSR * *MONITORING PROGRAM, ENVIRONMENTAL * *CONCENTRATION

062755
ESSIG TH
RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JANUARY-JUNE 1970
BATTELLE-NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-1539 P. 23 PAGES, DECEMBER 1970

REPORTS EVALUATION OF THE STATUS OF GROUNDWATER CONTAMINATION RESULTING FROM DISPOSAL OF HANFORD

002299 [illegible]
PLANT EFFLUENTS. THE DATA WERE COLLECTED DURING THE EARLY SIX MONTHS OF 1970.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM • FALLOUT • GROUND WATER • MONITORING • STRONTIUM • WASTE DISPOSAL • CHEMICAL • WATER, DRINKING • CROSS DATA • [illegible] SIZE • [illegible], AREA • NITRATE • [illegible]

004210
ENVIRONMENTAL MONITORING REPORT - JULY-DECEMBER 1969 AND 1970 SUMMARY
BATTELLE LABORATORY, RICHLAND, OHIO
NLM-1704 0, 91 PAGES, 0 TABLES, 14 FIGURES, APRIL 15, 1971

THE AVERAGE CONCENTRATIONS OF SR-239, SR-240, AND TRITIUM DETECTED IN THE ENVIRONMENT SURROUNDING BATTELLE LABORATORY, RICHLAND, OHIO, ARE PRESENTED FOR THE SECOND HALF OF 1970 AND FOR THE PRIOR YEAR. THE AVERAGE CONCENTRATIONS OF THESE RADIONUCLIDES IN THE GREAT MIAMI RIVER AND THE AIR SAMPLING STATIONS WERE WELL WITHIN THE STRINGENT STANDARDS ADOPTED BY THE USAEC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS • PLUTONIUM • RIVER • STRONTIUM • RADIATION • SAMPLING • MONITOR, ENVIRONMENTAL • BATTELLE LABORATORY • REGULATION, AEC • WATER POLLUTION • CONCENTRATION

004276
SURVEILLANCE DATA FOR MILK AND FOOD, WATER, AIR AND PRECIPITATION, AND OTHER DATA
BUREAU OF RADIOLOGICAL HEALTH, MARYLAND
40 PAGES, 0 FIGURES, TABLES, REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORT, 12(5), PP. 293-301, MAY 1971

REPORTS SURVEILLANCE DATA FROM THE U.S., CANADA, PAN AMERICA, AND OTHER LOCATIONS. ALSO INCLUDES ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT BROOKHAVEN NATIONAL LABORATORY AND THE LAWRENCE RADIATION LABORATORY.

CANADA • CONCENTRATION • ELEMENTS AND ISOTOPES • FALLOUT • FOOD • WATER • SURFACE WATER, NUCLIDE RECONNAISSANCE • MILK • ORE • MILK • DIETARY INTAKE • GROUND WATER, NUCLIDE RECONNAISSANCE • LOS • PRECIPITATION • RADIOLOGICAL ASSISTANCE • SURVEILLANCE PROGRAM • DATA COLLECTION • CONCENTRATION • AGENCY, AEC • [illegible]

004740
DEWING DF • ALEXANDRESCU F.
CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT
E.I. DU PONT DE NEMOURS & COMPANY, • SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA
7 PAGES, 10 REFERENCES, 3 TABLES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24, PAGE 278-283, 1963, (FEB)

OF ASSIF NO. 04740. TRITIUM IS PRODUCED AS AN UNWANTED BYPRODUCT FROM NEUTRON IMPACT ON D2O IN THE REACTORS, AND FORMS IT IMPURITIES. [illegible] OF NEUTRONS TO ASSIMILATE I OUT OF HYD VS ATD ACTIVITY IN OUT OF MOVIE GIVEN FOR DIFFERENT TYPES OF WATER AND SUIT PROTECTION. STACK MONITORS GIVE CONTINUOUS RECORD OF 91 CONCENTRATIONS. TRITIUM EXPOSURE RECORD AT SAVANNAH AS FOLLOWS - YEAR, NO. OF ASSAYS, NO UPTAKE BETWEEN 0.37 AND 1.0 MCI, NO UPTAKE GREATER THAN 1.0 MCI - 1954, 2190, -, 0 - 1955, 2310, -, 2 - 1956, 2310, -, 19 - 1957, 4000, -, 69 - 1958, 3450, 307, 33 - 1959, 2500, 196, 27 - 1960, 2720, 457, 79 - 1961, 2400, 491, 73. AT PRIMARY NO EXCESS GREATER THAN 20 UCI/L IN 79 CASES THE BIOL HALF-LIFE AVERAGED 10 DAYS. MAX AVERAGE WEEKLY EXCESS OF NO IN MILK FROM 3 LOCAL DAIRIES AND 2 FARMS WAS 7 X 10 EXP -41 MCI/ML. MAX AVERAGE WEEKLY EXCESS IN DRINKING WATER WAS 195 OF LIMIT SUGGESTED BY ICRP FOR LONG OPERATIONS. AVERAGE AIR EXCESS WAS 0.4 MCI/ML X 10 EXP -01, WITH WEEKLY MAX OF 4.0, AND ESTIMATED AVERAGED 10 X 10 EXP -01 WITH WEEKLY MAX OF 100. OF NOTE NOS. 04707, 04713, 04720 FOR OTHER SAVANNAH RIVER DATA ON TRITIUM.

NPRR • CHIEF • WATER • AIR • MILK • MONITOR, ENVIRONMENTAL • SAVANNAH RIVER PLANT • PROBABILITY EXPOSURE • OCCUPATIONAL EXPOSURE, RADIATION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • DEGREE(TIME, WORK • MAN • NATURE • EXPOSURE, RECREATION

004795
DROSHNSKI JC • LAGATTA DP • COLDIN AS • TERRILL JG
ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM
NORTHEASTERN RADIOLOGICAL HEALTH LABORATORY, DIVISION OF RADIOLOGICAL HEALTH, PUBLIC HEALTH SERVICE, WINCHESTER, MASSACHUSETTS
11 PAGES, 8 FIGURES, 6 TABLES, 39 REFERENCES, HEALTH PHYSICS, VOL. 11, PP. 989-995 (1965)(SEPT)

1962 METHOD USED AS BENCH-MARK FOR ASSESSING C14 LEVELS ISSUED OF HIGH YIELD NUCLEAR TESTING, PRE-1962 BASELINE ESTIMATED AT 14 +-1 D/MINUTE OF C IN BIOSPHERE, ASSIF NO. 04704. REPORTED (1962) REPORTED AND INCREASE OVER BACKGROUND (73 D/MINUTE C) AS OF 1958. ASSUMING CESSATION OF ALL TESTING IN WORLD, SEVERAL FORMULATES WILL BE PROJECTED FOR ENVIRONMENTAL LEVELS TO BE SEEN TO PRE-1962 BACKGROUND, WHICH MAY OR MAY NOT BE OF GENETIC SIGNIFICANCE TO THE HUMAN RACE AND OTHER LIVING SYSTEMS. NO LEVELS ARE MORE VARIABLE MEAN C14, SAVANNAH (1963) REPORTING 3 TO 30 PCI/L AS PRE-1962 NO LEVEL IN WATERS AND WINES, BIOSPHERE INCREASING TO 300 TO 50,000 PCI/L THEREFORE, TRITIUM IN ATMOSPHERIC HYDROGEN GAS INCREASING FROM 470 PCI/GM OF HYDROGEN IN 1964 TO 20,000 IN 1962 (ASSIF NO. 04703). FOR 3, SEIDEL CLAIMED THAT MUTATIONS EXPECTED FROM C14 OVER ALL TIME (THOUSANDS OF YRS) WILL BE GREATER THAN FROM ANY OTHER CONTAMINANTS, BUT WITH FEWER MUTATIONS PER GENERATION. VARIOUS FOR BIOL HALF-LIFE OF C14 HAVE BEEN FROM 10 TO 100 DAYS, EXCLUDING OF THE 58 LONG-TERM COMPONENT IN BONE. BECAUSE OF SHORTER PHYSICAL HALF-LIFE, NO NOT CONSIDERED AS

[illegible]

[illegible]

[illegible]

[illegible]
[illegible]
ENVIRONMENTAL SURVEILLANCE OF THE CRYSTAL RIVER NUCLEAR POWER PLANT
UNIVERSITY OF FLORIDA, ENVIRONMENTAL ENGINEERING, GAINESVILLE, FLORIDA
QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING JANUARY 31, [illegible]

[illegible]

AVAILABILITY - [illegible], UNIVERSITY OF FLORIDA, GAINESVILLE, FLORIDA

[illegible]

[illegible]
[illegible]
AN ECOLOGICAL APPROACH TO ENVIRONMENTAL SURVEILLANCE
FLORIDA UNIVERSITY, GAINESVILLE
[illegible] PAGES, [illegible] FIGURES, [illegible] REFERENCES. PROCEEDINGS OF THE FIFTH ANNUAL HEALTH PHYSICS SOCIETY MIDYEAR TOPICAL SYMPOSIUM, HEALTH PHYSICS ASPECTS OF NUCLEAR FACILITY SITING, VOL. [illegible], NOVEMBER [illegible], 1970

[illegible] THE CRYSTAL RIVER NUCLEAR PLANT [illegible] TO PROVIDE RECOMMENDATIONS [illegible] IN THE DESIGN AND OPERATION OF POWER PLANTS. [illegible]

AVAILABILITY - [illegible], PUBLICATIONS CHAIRMAN, P. O. BOX [illegible], IDAHO FALLS, IDAHO [illegible]

[illegible]

[illegible]
[illegible] + PATTERSON [illegible]
MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT
7 PAGES. AMERICAN NUCLEAR SOCIETY TRANSACTIONS, [illegible], PAGE [illegible], (JUNE [illegible])

DETAILS THE VARIOUS METHODS OF MONITORING FOR TRITIUM IN ITS VARIOUS FORMS. POINTS OUT THE DIFFICULTIES OF CONTINUOUS MONITORING AND LOW TRITIUM [illegible] CONCENTRATIONS. THE SAVANNAH RIVER PLANT IS A PRODUCER OF TRITIUM, AND CONSEQUENTLY THE MONITORING OF TRITIUM IN GASES, LIQUIDS, AND OTHER ENVIRONMENTAL [illegible] STARTUP IN THE [illegible].

MONITOR, LIQUID + MONITOR, STACK + MONITOR, AIR + MONITOR, GAS + MONITOR, ENVIRONMENTAL + SAVANNAH RIVER PLANT + RADIATION MONITORS

[illegible]
[illegible]
SEMIANNUAL REPORT OF ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY - JANUARY THROUGH JUNE 197[illegible]
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-[illegible] PAGES, [illegible] REFERENCES, [illegible] TABLES, [illegible] FIGURES, AUGUST 12, 197[illegible]

AN ENVIRONMENTAL SURVEILLANCE PROGRAM WAS CONDUCTED WITHIN THE LIVERMORE VALLEY AND SITE [illegible] AREAS TO DETERMINE THE EFFECT OF LABORATORY OPERATIONS ON THE SURROUNDING ENVIRONMENT. ANALYSES FOR GROSS RADIOACTIVITY AND FOR SPECIFIC RADIONUCLIDES OF INTEREST IN A VARIETY OF ENVIRONMENTAL SAMPLES WERE PERFORMED. RESULTS ARE [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

[illegible]
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION.

[illegible]
PROGRESS REPORT JAN. 1 TO MAR. 31
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-3961 p. 44 PAGES, 1971

[illegible] A NON-WORK TECHNICAL SUMMARY ON SPECIFIC ASPECTS AT LONG RANGE. 200-300 WORK SUMMARIES ON PROJECTS IN THE SERVICES, BIOLOGY INFORMATICS AND MOLECULAR BIOLOGY, GENETICS AND PROPAGATIONS, THE PROPAGATION RESEARCH INCORPORATES CHANGES IN VERTEBRATES, SOMATIC, AND GENETIC [illegible] IN HUMAN PROPAGATIONS. 40-100 WORK SUMMARIES IN THE SERVICES, ENVIRONMENTAL RESEARCH INCLUDES [illegible] AND RELEVANT MONITORING, DOSIMETRY, DOSIMETRIC STUDIES OF THE C-14 TECHNIQUE, RADIATION PROTECTION OF WASTE WATER, LOW LEVEL COMPTONS AND HEALTH PHYSICS (PLASTIC FILM-FISSION PRODUCT WEIGHT DETERMINATION, NUCLEAR DETECTION EFFICIENCY, THERMOLUMINESCENCE DOSIMETRY, TRITIUM MONITORING, RADIATION INSTRUMENT DEVELOPMENTS).

OPTIMUM • DETERMINATION • EFFICIENCY • STRONTIUM • WASTE TREATMENT • BRAIN • DOSIMETRY, THERMOLUMINESCENCE • DISTRIBUTION COEFFICIENT • CHALK RIVER • MONITORING PROGRAM, ENVIRONMENTAL • PLASTICS • LAKE • RADIONUCLIDE UPTAKE • ANIMAL, FISH • DISCRIMINATION/TECHNIQUE • REPRODUCTION, AQUATIC • PHYSIOLOGY/METABOLISM • EFFECT, GENETIC • EFFECT, SOMATIC • RADIATION DOSIMETRY, CHEMICAL • TRACE ELEMENT • MAN • RADIATION MONITORING

[illegible]
[illegible]
[illegible] RADIOBIOLOGICAL PROGRAM PROGRESS REPORT, JULY 1970 TO APRIL 1971
UNIVERSITY OF WASHINGTON, LABORATORY OF RADIATION BIOLOGY, SEATTLE
WOO-70-11 p. JULY 1971

ORGANISMS, WATER, AND AIR SAMPLES WERE ANALYZED FOR RADIONUCLIDES TO DETERMINE WHETHER THERE HAD BEEN ANY DEFECTS AFTER UNDERGROUND NUCLEAR TESTS. EXCEPTING TRITIUM (1400 T.U. IN PONDS AND TEST WELLS) OUT SHORT-LIVED SO-4A, WHICH CAMED AS FROM A NUCLEAR-POWERED VESSEL, THE RADIONUCLIDES DETECTED WERE FROM WORLDWIDE FALLOUT. IN FISH, SR-90 WAS AS GREAT AS 197 PCI/G DRY WEIGHT FOR THE PERIOD OF SPECIFIC ACTIVITY, AND OTHER RADIONUCLIDES (EXCEPTING S-40) WERE LESS THAN 9 PCI/G DRY WEIGHT. IN SEDIMENTS, CS-137 WAS 70 PCI/G DRY WEIGHT. IN DESERTED PLANTS, ZN/MN-65 WAS 12 PCI/G DRY WEIGHT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT • DRINKING WATER, WORTING DEPENDENCE • FISSION PRODUCT, AIRBORNE • RADIONUCLIDE UPTAKE • ANIMAL, FISH • DISCRIMINATION/TECHNIQUE • FOOD CHAIN • RADIONUCLIDE TRANSFER • AQUATIC ORGANISM • PLANT, ALGAE/FUNGI • CONTAMINATION FACTOR • OCEAN, PACIFIC

[illegible]
SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER
RIVER COOPERATIVE DRINKING ASSOCIATION • MINNESOTA DEPARTMENT OF HEALTH
COO-1451-04 p. 61 PAGES, JUNE 1971, DOCKET [illegible], TYPE--MOD, MOD--A.E., AE--SET • LUNDY

THIS REPORT COVERS THE FISCAL YEAR 1970 AND INCLUDES DISCUSSION OF RESULTS AND SURVEY METHODS AND DATA FOR AIR, SURFACE WATER, PRECIPITATION, MILK, AND SPECIAL SECTION FOR TRITIUM IN SURFACE WATER. ONE RADIATION IN AIR WERE FOUND IN 1961 FROM NUCLEAR WEAPON TESTING AND HAVE DIMINISHED SINCE THEN AND REMAINED RELATIVELY STABLE SINCE 1969. CESIUM 137 AND STRONTIUM 90 FOUND IN MILK IN 1966 THEN DECLINED AND STABILIZED.

AVAILABILITY - NTIS PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

RADIATION, AND • CESIUM • ELK RIVER (MN) • STRONTIUM • SURVEY, ENVIRONMENT • MILK • RADIATION SAFETY AND CONTROL • MONITORING PROGRAM, ENVIRONMENTAL

[illegible]
WYBER JS • TINNEY JR • GUDIKSEN PH
HEALTH PHYSICS ASPECTS OF THE TRITIUM RELEASE
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-73910 p. 16 PAGES, JULY 16, 1971

ON AUGUST 6, 1970, 200,000 CI OF TRITIUM GAS WAS ACCIDENTALLY RELEASED THROUGH AN EXHAUST STACK AT THE LAWRENCE RADIATION LABORATORY, IN LIVERMORE, CALIFORNIA. SOON AFTER THE RELEASE, EMERGENCY-REFERENCE PERSONNEL SURVEYED THE SITE WITH PORTABLE TRITIUM AIR MONITORS AND AN EXTENSIVE ENVIRONMENTAL SAMPLING WAS STARTED. THE RESULTS FROM THE SAMPLING PROGRAM INDICATE THAT NO SIGNIFICANT EXPOSURE TO MAN- OR NON-SITE INDIVIDUALS RESULTED FROM THE RELEASE. ALL ENVIRONMENTAL SAMPLES OF WATER, MILK, AND URINE EXHIBITED NORMAL BACKGROUND LEVELS OF TRITIUM.

AVAILABILITY - D.S. NTIS, LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA

EFFICIENT • ACCIDENT, MONITOR • EXAMINING • STACK • ACCIDENT, RADIOISOTOPE • MONITOR, ENVIRONMENTAL • DOSE CALCULATION, EXTERNAL • RADIOACTIVITY RELEASE • DECONTAMINATION

[illegible]
[illegible] TM
RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1970
BATTELLE NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-1477 p. 19 PAGES, SEPTEMBER 1971

000587

AN EVALUATION OF RU-106-106 AND H-3 CONCENTRATIONS MEASURED IN THE UNCONFINED GROUNDWATER DURING THE SECOND HALF OF 1970 SHOWS THAT THE TRENDS OF REPORTABLE CONCENTRATIONS EXTEND TO AN EASTERLY TO SOUTHEASTERLY DIRECTION FROM 700-F AREA, AS OBSERVED IN THE PAST. FOR THE EIGHT YEAR, H-3 CONCENTRATIONS WERE MEASURED OVER A GEOGRAPHICALLY EXTENSIVE AREA IN THE VICINITY OF THE 100 AREAS. THE FEW LOCATIONS FOR WHICH AVERAGE CALCULATED CONCENTRATIONS EXCEEDED THE CONCENTRATION GUIDE (CG) FOR RU-106 WERE ALL WITHIN FIVE 700-F TO 700-H AREAS. WATER FROM ONLY ONE 600 AREA WELL LOCATED OUTSIDE LIMITED AREA FENCES (WELL-600-35-700) INDICATED A H-3 CONCENTRATION GREATER THAN THE CONCENTRATION GUIDE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MONITOR, LIQUID • RUTHENIUM • SOIL, CONTAMINATED WATERWAY THROUGH • GROUND WATER, NUCLIDE OCCURRENCE • RADIOLOGICAL ASSISTANCE • CONTAMINATION SITE • SAFETY EVALUATION • SURVEILLANCE PROGRAM • MONITOR, AREA • CONCENTRATION • TRANSPORT

000590

HOUSTON CA

CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH PROJECT NO. 70-41

ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES

AECL-4074 •, 19 PAGES, PP. 70-41, DECEMBER 1971

THE TOPICS REPORTED INCLUDE - MONITORING, RELEASE OF TRITIUM TO THE OTTAWA RIVER (1.5-16 CI/DAY), AND GAMMA SPECTROSCOPY OF NEUTRON-CAPTURE PRODUCTS IN RIVER WATER. CA/SR METABOLISM IN FISH WAS STUDIED BY DOUBLE TRACERS (SR-85/CA-47), AND EQUIPMENT WAS INSTALLED FOR SEPARATING PESTICIDE CONTAMINATION. SEDIMENT CORES WERE ANALYZED FOR TOTAL AND EXCHANGEABLE FORMS OF STABLE AND RADIOSTRONTIUM. ANALYTICAL TECHNIQUE REPORTED INCLUDES CONCENTRATION OF WATER FOR TRACE-ELEMENT ANALYSIS, NEUTRON ACTIVATION ANALYSIS, LOW-BACKGROUND DATA COUNTING. TRITIUM AND NEUTRON TRACERS WERE USED IN STUDIES OF THE WATER BALANCE OF LAKES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVATION • CALCIUM • CESIUM • COBALT • RUTHENIUM • RIVER • STRONTIUM • SURVEY, ENVIRONMENT • TRACER, RADIOACTIVE • WATERWAYS • RIVER, OTTAWA • SURFACE WATER, NUCLIDE OCCURRENCE • ANALYTICAL TECHNIQUE • CHALK RIVER • NEUTRON • SCANDIUM • LAKE • AECL • CONTAMINATING SYSTEM • ANIMAL, FISH • DISCHARGE ARTIFICIAL/EXPERIMENTAL • ECOSYSTEM, AQUATIC • PHYSIOLOGY/METABOLISM • PESTICIDE

070007

SPENCER DW • BREWER PC

ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS

WOODS HOLE OCEANOGRAPHIC INSTITUTION, MASS.

80 PAGES, FIGURES, TABLES, REFERENCES, CPC COST, OFU. SMITH STATE SCI., 1: 489-78 (SEPTEMBER 1971)

THE ANALYTICAL CHEMISTRY INVOLVED IN THE DETERMINATION OF THE MAJOR IONS, TRACE ELEMENTS, NUTRIENTS, DISSOLVED GASES, AND RADIONUCLIDES PRESENT IN SEAWATER IS DISCUSSED. PARTICULAR ATTENTION IS PAID TO RECENT DEVELOPMENTS AND TO THE TECHNIQUES THAT ARE ACTIVELY IN USE IN OCEANOGRAPHIC LABORATORIES. SEAWATER SAMPLING AND STORAGE METHODS ARE REVIEWED, AND VALUES OF THE TRACE ELEMENTS AND RADIONUCLIDES THAT HAVE BEEN REPORTED IN THE OCEAN ARE GIVEN.

CADMIUM • CESIUM • ELEMENTS AND ISOTOPES • MEASUREMENT • OCEAN AND SEA • STRONTIUM • THORIUM • URANIUM • SEAWATER WATER, NUCLIDE OCCURRENCE • ANALYTICAL TECHNIQUE • BIOGEOCHEMICAL ANALYSIS • CONCENTRATION • INORGANIC

070297

BRIGHT DF • WELFORD GA

APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA ASSAY

U. S. ATOMIC ENERGY COMMISSION, NEW YORK, N.Y.

STI/PUB-280 • CONF-710708 • IAEA-SM-148-3 •, 3 PAGES, 3 TABLES, 2 FIGURES, 5 REFERENCES, PP. 393-399, DECEMBER 12, 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT SALZBURG, AUSTRIA, JULY 5-9, 1971

TOTAL BETA AND ALPHA MEASUREMENTS HAVE BEEN PERFORMED. SEMI-TRANSPARENT, BY LIQUID SCINTILLATION SPECTROMETRY. THE BETA MEASUREMENT CLASSIFIES THE ISOTOPES BY ENERGY DISCRIMINATION INTO TWO CATEGORIES - LOW ENERGY (H-3, C-14 AND FISSION PRODUCTS OR ACTIVATION PRODUCTS OF MEDIUM-TO-HIGH ENERGY. THE ALPHA MEASUREMENT IS PERFORMED BY BATCH TECHNIQUES SINCE THE ALPHA SPECTRUM IS LOCATED IN THE MEDIUM TO HIGH ENERGY BETA SPECTRUM REGION. THEREFORE, THE MEASUREMENT PROVIDES THE FOLLOWING INFORMATION FOR AN ENVIRONMENTAL SAMPLE - (1) RELATIVE CONTRIBUTION OF TRITIUM AND OTHER LOW ENERGY EMITTERS TO THE TOTAL BETA SPECTRUM; (2) CONTRIBUTION OF FISSION AND ACTIVATION PRODUCTS TO THE TOTAL BETA SPECTRUM; AND (3) TOTAL ALPHA ENERGY BETA AND 0.1 DPM/ML FOR ALPHA. A DESCRIPTION OF OUR EXPERIMENTAL RESULTS, DATA PROCESSING, APPLICATION TO ENVIRONMENTAL MONITORING AND COMPARISON OF THIS TECHNIQUE TO EXISTING METHODS IS GIVEN.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

IAEA • MONITOR, ENVIRONMENT • DATA PROCESSING • ANALYTICAL TECHNIQUE • MONITOR, ENVIRONMENTAL • SPECTROMETRY, ALPHA • SPECTROMETRY, BETA • ENERGY LEVEL • COMPARISON • RADIATION MONITORS

070244 [illegible]
[illegible] JJ • [illegible] DE • [illegible] LD • [illegible] G
SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
STI/PUB-299 • [illegible] • [illegible] • 70 PAGES, 10 FIGURES, 2 TABLES, 16 REFERENCES, PP. 907-916,
[illegible] 17, 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT NORDERNEY, GERMANY, JULY 5-9, 1971

RAPID METHODS OF SAMPLING AND QUANTITATING AIRBORNE TRITIATED WATER, RADIOACTIVE PARTICULATES AND A WIDE RANGE OF ENVIRONMENTAL SAMPLES HAVE BEEN REVIEWED TO DOCUMENT THE RELEASES OF RADIOACTIVITY ASSOCIATED WITH USES OF NUCLEAR EXPLOSIVES, REACTOR OPERATION AND BASIC RADIOECOLOGICAL STUDIES. THE TYPES OF ATMOSPHERIC WATER SAMPLERS HAVE BEEN USED IN ENVIRONMENTAL STUDIES CONDUCTED IN REMOTE FIELD OPERATIONS. A SIMPLE COLD-TRAP SAMPLER OF SEVERAL DESIGNS CONTAINING FITTED LN OR DRY ICE HAS BEEN USED IN LABORATORY STUDIES AND FIELD STUDIES. A MORE COMPLEX SAMPLER WHICH MAY OPERATE BY ATTACHED USING A COLUMN OF MAGNESIUM PERCHLORATE OR MOLECULAR SIEVE HAS ALSO BEEN USED. A SAMPLING AND ANALYTICAL SYSTEM FOR DETERMINING AIR CONCENTRATIONS OF RADIOACTIVE PARTICULATES HAS BEEN USED SUCCESSFULLY IN SEVERAL TYPES OF RADIOECOLOGICAL STUDIES ASSOCIATED WITH NUCLEAR CRATERING EXPERIMENTS, MONITORING OF NORDEIDE AND CLOSE-IN FALL-OUT DEPOSITION, AND REACTOR STUDIES. DETAILS ARE GIVEN FOR THE SAMPLING PROGRAM AND THE ANALYTICAL PROCEDURES.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N. Y. 10016

DEPOSITION • FALLOUT • DATA • MEASUREMENT • MONITOR, EMERGENCY • ATMOSPHERIC POLLUTION • SAMPLING • ANALYTICAL TECHNIQUE • MONITOR, ENVIRONMENTAL • NUCLEAR DETONATION • PARTICLE, RADIOACTIVE • SPECTROMETRY, GAMMA • CONCENTRATION

070424
CLASSIFIED
ENVIRONMENTAL ANALYSIS OF WATER FROM SELECTED STREAMS AND PRECIPITATION COLLECTED IMMEDIATELY BEFORE AND AFTER THE SECOND PROJECTILE-TEST FLOATING, PROJECT DUELSTON
GEOLOGICAL SURVEY, DENVER, COLORADO
USGS-474-177 • [illegible] • 10 PAGES, 1971

THE U.S. GEOLOGICAL SURVEY ESTABLISHED A WATER-SAMPLING NETWORK IN CENTRAL AND WESTERN COLORADO TO SAMPLE THE HYDROLOGIC ENVIRONMENT BEFORE, DURING, AND AFTER THE VARIOUS PHASES OF PROJECT DUELSTON. PROJECT DUELSTON IS AN EXPERIMENT DESIGNED TO STIMULATE PRODUCTION OF NATURAL GAS BY DETONATING OF A NUCLEAR DEVICE IN THE GAS-PRODUCING ROCK. THE PROJECT IS SPONSORED BY THE AUSTRAL OIL COMPANY, USAEC, AND THE U.S. DEPT. OF THE INTERIOR. THIS IS ONE OF A SERIES OF REPORTS THAT PRESENT THE DATA OBTAINED BY ANALYSIS OF SAMPLES COLLECTED FROM THE NETWORK STATIONS. ALL THE PRECIPITATION SAMPLES ARE PARTIALLY ANALYZED FOR TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ASSESSING • NUCLEAR DETONATION • ENVIRONMENTAL ANALYSIS • RADIOACTIVITY RELEASE • GAS • STIMULATION

[illegible]
RADIATION DATA
[illegible] PAGES, FIGURES, TABLES, REFERENCES, RADIATION DATA AND REPORTS, 13(6), PP. 199-267 (APRIL 1972)

REPORTS DATA PROVIDED BY FEDERAL, STATE, AND FOREIGN ENVIRONMENTAL AGENCIES AND OTHER COOPERATING ORGANIZATIONS. DATA REPORTED IS ACCUMULATED FROM SURVEILLANCE PROGRAMS CONDUCTED AROUND[illegible] ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT U.S. ATOMIC ENERGY COMMISSION INSTALLATIONS.

DEPOSITION • DISTRIBUTION • STRONTIUM • SAMPLING • ANALYTICAL TECHNIQUE • MONITOR, ENVIRONMENTAL • NEVADA TEST SITE • PLUTONIUM PLANT • RADIATION SAFETY AND CONTROL • SURVEILLANCE PROGRAM • DATA COLLECTION • CONCENTRATION

[illegible]
[illegible] CC • [illegible] WR
ENVIRONMENTAL MONITORING REPORT - JULY-DECEMBER 1971 AND 1971 SUMMARY
OTHER LABORATORY, WESTERN RESEARCH CORPORATION, [illegible], OHIO
WRC-1972 • [illegible] PAGES, 3 FIGURES, 14 TABLES, 4 REFERENCES, MAY 1972

THE ENVIRONMENT SURVEILLANCE OTHER LABORATORY HAS MONITORED AND REPORTED ON FOR THE SECOND HALF OF 1971 AND FOR THE ENTIRE YEAR. SAMPLES ANALYZED AND REPORTED ON INCLUDE AIR, WATER, FOODSTUFFS, SOIL, AND MILK. FOR RADIOACTIVE SPECIES THE AVERAGE CONCENTRATIONS OF PROTOCOL-TRI, PLUTONIUM-239, AND TRITIUM REMAIN WELL WITHIN THE STRINGENT STANDARDS ADOPTED BY THE AEC AND THE ENVIRONMENTAL PROTECTION AGENCY. DATA CONCERNING NONRADIOACTIVE SPECIES IN AIR AND WATER ARE PRESENTED FOR THE EIGHT YEAR. DATA FOR THESE INDICATE THAT LABORATORY OPERATIONS HAVE NEGLIGIBLE EFFECT ON THE ENVIRONMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] AND STANDARDS • PLUTONIUM • WATER • MONITOR, [illegible] • [illegible] • DATA • MONITOR, ENVIRONMENTAL • OTHER LABORATORY • MONITOR, [illegible] • RADIATION SAFETY AND CONTROL • [illegible] • MONITOR, TELEMETRY • MONITOR, DATA • CONCENTRATION • OTHER

072749
RADIATION DATA
47 PAGES, RADIATION DATA AND REPORTS, 1971, PP. 299-[illegible] (MAY 1972)

REPORTS DATA PROVIDED BY FEDERAL, STATE, AND PRIVATE ENVIRONMENTAL AGENCIES AND OTHER COOPERATING ORGANIZATIONS. DATA REPORTED IS ACCUMULATED FROM SURVEILLANCE PROGRAMS CONCERNING RADIONUCLIDE CONCENTRATIONS IN MILK AND FOOD, WATER, AIR AND PRECIPITATION, AND OTHER DATA AS STATIONS IN HUMAN DOSE AND ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT NUCLEAR INSTALLATIONS.

DEPOSITION • FALLOUT • IODINE • SAMPLING • SEAWATER, WATER, NUCLIDE RECONNAISSANCE • DATA • ANALYTICAL TECHNIQUES • AIR • MILK • MAN • DRINKING WATER • WATER, MONITORING • CONTROL DATA • NEVADA TEST SITE • NUCLEAR DETONATIONS • SURVEILLANCE PROGRAM • TEST SITE • DATA COLLECTION • MEASUREMENT • ENVIRONMENTAL • AGENCY, ARC • ORNL • ENVIRONMENTAL PROTECTION AGENCY (EPA)

072591
CASTAGNOLA DF
TRITIUM ANOMALIES ON AMCHITKA ISLAND, ALASKA. PART II
TELEDYNE ISOTOPES, LAS VEGAS, NEVADA
NVOO-1230-111REPT.21 P., 29 PAGES, 4 FIGURES, 3 TABLES, SEPTEMBER 1969

FOLLOWING THE LONG SHOT EVENT ON AMCHITKA ISLAND, ALASKA, SENSITIVE RADIOCHEMICAL SURVEILLANCE REPORTS DETECTED ANOMALOUS CONCENTRATIONS OF TRITIUM, RADIOIODINE, AND RADIOSTRONTIUM IN SURFACE WATER AND SPIT-GAS SAMPLES COLLECTED IN THE VICINITY OF GROUND ZERO. ANOMALOUS TRITIUM LEVELS RANGED FROM SEVERAL HUNDRED TO SEVERAL THOUSAND TRITIUM UNITS ABOVE NATURAL BACKGROUND. ANOMALOUS RADIOSTRONTIUM LEVELS RANGED FROM SEVERAL HUNDRED TO SEVERAL THOUSAND TIMES NATURAL BACKGROUND. THE MOST REASONABLE SOURCE OF ANOMALIES WAS THE NUCLEAR EXPLOSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAMINANT, INVESTIGATION • OTHERS • SURVEYING • DEPOSITION • OTHERS • SEAWATER, DRINKING WATER • NUCLEAR DETONATION • NUCLEAR DETONATION • SOIL, NUCLIDE RECONNAISSANCE • SURVEILLANCE PROGRAM • DETONATIONS

072904
TRITIUM HG
STUDY OF TRITIATED METHANES AND ITS COMPONENTS IN THE ENVIRONMENT
MIAMI UNIVERSITY, RESEARCH SCHOOL OF MARINE AND ATMOSPHERIC SCIENCES, FLORIDA
[illegible]-[illegible]-72[illegible] P., 76 PAGES, MAR 15, 1972

IN ADDITION TO THE REGULAR CONTAMINANT-LEVEL STATIONS FOR ATMOSPHERIC HT AND HTO IN MIAMI AND BAHAMAS, A THIRD STATION WAS ESTABLISHED AT THE MAUNA LOA OBSERVATORY, ISLAND OF HAWAII. ROUTINE SAMPLING AND ANALYSIS OF THE SAMPLES FROM ALL THREE CONTAMINANT STATIONS ON A THREE-WEEKLY BASIS HAVE BEEN CONTINUED. DATA UP TO THE END OF 1971 ARE AVAILABLE. A LONGITUDINAL PROFILE FROM THE U.S. TO AN ARCTIC SHIP WAS COLLECTED. A SECOND ARC CRUISE WAS ATTEMPTED. SAMPLED, WAS BUILT AND USE VERTICAL PROFILES IN THE NEAR SAMPLING BEFORE CRUISES. A SAMPLING SYSTEM FOR THE 90-LITER AIRCRAFT IS PRESENTLY UNDER CONSTRUCTION.

MONITORING, AIR • SAMPLING • AIRCRAFT • ANALYTICAL TECHNIQUE • MONITORING, ENVIRONMENTAL • MONITORING, CONTAMINANT SURFACE • MONITORING SYSTEM, MONITORING • MONITORING PROFILE

073450
BURTSCHER RH • LIVINGSTON CL • CATHOLICS C • BRYSON LD
ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY, JANUARY THROUGH DECEMBER, 1971
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-51767 P., 47 PAGES, JUNE 16, 1972

AN ENVIRONMENTAL SURVEILLANCE PROGRAM IS CONTINUING IN THE LIVERMORE VALLEY AND SITE NOW APPEARS TO DETERMINE TO WHAT EXTENT, IF ANY, THE LAWRENCE LIVERMORE LABORATORY HAS CONTRIBUTED TO THE LEVELS OF RADIOACTIVITY IN THE SURROUNDING ENVIRONMENT. THE RESULTS OF ANALYSES FOR GAMMA RADIOACTIVITY AND FOR SPECIFIC RADIONUCLIDES OF INTEREST IN A VARIETY OF ENVIRONMENTAL SAMPLES ARE PRESENTED IN THE REPORT. ENVIRONMENTAL LEVELS OF RADIOACTIVITY WERE BELOW THE CONTAMINATION GUIDE LEVELS IN ARC MANUAL CHAPTER 2576.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MONITOR • SAMPLING • PLUTONIUM • URANIUM • WATER • AIR • MILK • MONITORING, ENVIRONMENTAL • RESULT • DETONATION • OTHERS

073929
CASTAGNOLA DC
TRITIUM ANOMALIES ON AMCHITKA ISLAND, ALASKA. PART I
TELEDYNE ISOTOPES, PALO ALTO, CALIFORNIA
NVOO-1230-111REPT. 11 P., 41 PAGES, JULY 1969

THE LONG SHOT EVENT OCCURRED AT AMCHITKA ISLAND, ALASKA, ON OCTOBER 29, 1965. THE EVENT INVOLVED THE DETONATION OF AN ON-SITE NUCLEAR DEVICE 2300 FEET UNDERGROUND. TRITIUM RESULTING FROM THE LONG SHOT EXPLOSION WAS DETECTED IN SEVERAL SAMPLES OF WATER IN THE VICINITY OF LONG SHOT SURFACE GROUND ZERO SEVERAL MONTHS TO YEARS AFTER THE DETONATION. THE MAX CONTENT IN THESE SAMPLES

[illegible]
[illegible] SEVERAL THOUSAND TRITIUM UNITS ABOVE THE [illegible] CONTENT IN WATER SAMPLED FAR FROM THE TEST SITE. HOWEVER, THE LEVELS OF [illegible] CONTAMINATION IN SURFACE WATER WERE WELL BELOW THE CONCENTRATION GUIDE OF [illegible] MICROCURIE PER MILLILITER OF WATER SET BY THE USAEC AS A STANDARD FOR RADIATION PROTECTION FOR CONTINUOUS EXPOSURE TO AN UNCONTROLLED AREA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SITES • TESTING • WATER • SAMPLING • NUCLEAR DETONATION • CONTAMINATION, ABC • RADIATION SAFETY AND CONTROL • CONTAMINATION • AGENCY, ABC

[illegible]
ESSINGTON PH • CASTAGNOLA EJ
INTERIM SUMMARY OF TRITIUM DATA AND SITE [illegible], AMCHITKA ISLAND, ALASKA JULY 1, 1969 THRU JUNE 30, 1970
REYNOLDS ELECTRICAL & ENG CO, LAS VEGAS, CALIFORNIA
NVO-1230-157 p., 40 PAGES, JUNE 30, 1970

SEVERAL SITES ON AMCHITKA ISLAND, ALASKA, WERE USED BY THE USAEC FOR UNDERGROUND NUCLEAR TESTING AND ARE UNDER CONSIDERATION FOR SUCH USE. THE RESULTS ARE PRESENTED OF TRITIUM DETERMINATIONS AND OTHER HYDROLOGIC INFORMATION OBTAINED FROM ANALYSES MADE DURING THE PERIOD JULY 1, 1969, TO JUNE 30, 1970. THE ENVIRONMENTAL WATER SAMPLES COLLECTED IN THE VICINITY OF THESE SITES. SINCE INITIAL SAMPLING IN 1969, SEVERAL SAMPLING PROGRAMS HAVE BEEN EXPANDED TO INCLUDE THE IMMEDIATE VICINITIES OF LONG SHOT AND MILROW SITES WHERE UNDERGROUND NUCLEAR TESTS OCCURRED ON OCTOBER 29, 1965, AND OCTOBER 2, 1969, RESPECTIVELY. AN EXTENSIVE SAMPLING AND ANALYTIC PROGRAM HAS BEGUN SHORTLY AFTER THE MILROW EVENT TO PROVIDE INFORMATION FOR EVALUATING ITS RADIOLOGICAL EFFECTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ALASKA • OFFSHORE • SAMPLING • ANALYTICAL TECHNIQUE • NUCLEAR DETONATION • HYDROLOGY • MONITOR, NUCLEAR DETONATION • ALASKA • CONCENTRATION • RADIATION EFFECT

[illegible]
WHEELESS AA • CARTER MW • LIEBERMAN R
PARTICIPATORY PROGRAM BY THE INSTITUTIONAL TOTAL DIET SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES COLLECTED DURING 1966-1968
ENVIRONMENTAL PROTECTION AGENCY • GEORGIA INSTITUTE OF TECHNOLOGY • EASTERN ENVIRONMENTAL RESEARCH FACILITY, ATLANTA
IA PAGE, 10 TABLES, 1 FIGURE, 9 REFERENCES, RADIATION DATA AND REPORTS, 10(3), PP. 139-144 (MARCH 1969)

IN JANUARY 1966, A PARTICIPATORY PROGRAM WAS ADDED TO THE INSTITUTIONAL TOTAL DIET SAMPLING NETWORK PROGRAM. THE COMPILING AND ANALYSIS PROCEDURES ARE DESCRIBED AND THE DATA FOR 1966 THROUGH 1968 ARE PRESENTED.

TESTING • STRONTIUM • DATA PROCESSING • SAMPLING • ANALYTICAL TECHNIQUE • CRITICAL NUCLIDE • DIETARY HABIT • DIGESTS, RADIATION • CONTROL PATTERN PATHWAY • DATA COLLECTION • INTERPRETATION • EFFECT, AGE • SECRETION, MILK • CESIUM NUCLIDE • EFFECT, SEX • GROWTH

[illegible]
CONTRERAS PH • MEADOWS JW • HENRY RD
ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY - 1972 ANNUAL REPORT
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-51337 p., 64 PAGES, 24 TABLES, 11 FIGURES, 9 REFERENCES, MARCH 7, 1973

THE LAWRENCE LIVERMORE LABORATORY CONTINUOUSLY MONITORS THE LEVELS OF RADIOACTIVITY WITHIN THE LIVERMORE VALLEY AND SITE 300. RESULTS OF ANALYSES PERFORMED DURING 1972 FOR GROSS RADIOACTIVITY AND FOR SPECIFIC RADIOISOTOPES OF INTEREST IN A VARIETY OF ENVIRONMENTAL SAMPLES ARE REPORTED IN THIS REPORT. IN ALL CASES, THE LEVELS OF RADIOACTIVITY WERE BELOW THE CONCENTRATION-GUIDE VALUES IN AEC MANUAL CHAPTER 0524.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FREEMONT • GUIDE • FALLOUT • MEASUREMENT • PLUTONIUM • ORGANIZATION • ATMOSPHERIC POLLUTION • URANIUM • WATER • SAMPLING • ANALYTICAL TECHNIQUE • OXIDE • SPECTROMETRY, THERMOLUMINESCENCE • MONITOR, ENVIRONMENTAL • CONTAMINATION • DEFECTIVE PRODUCT, AIRBORNE • WELL • SPECTROMETRY, GAMMA • OBSERVATION • CONFIGURATION

[illegible]
[illegible] PG • [illegible]
[illegible] ENVIRONMENTAL MONITORING REPORT: CALENDAR YEAR 1972
[illegible] LABORATORY, [illegible], [illegible]
[illegible]-7570., 37 PAGES, 10 TABLES, 9 FIGURES, 6 REFERENCES, MARCH 15, 1973

THE ENVIRONMENTAL MONITORING PROGRAM LABORATORY WAS MAINTAINED AND OPERATED ON FOR CALENDAR YEAR 1972. SAMPLES ANALYZED AND REPORTED ON INCLUDED AIR, WATER, FOODSTUFFS, SOIL AND SILT. THE RADIOACTIVE SPECIES, THE AVERAGE CONCENTRATIONS OF STRONTIUM-90, PLUTONIUM-239 AND TRITIUM DETECTED WERE ONLY WITHIN THE STRINGENT STANDARDS ADOPTED BY THE ATOMIC ENERGY COMMISSION AND THE ENVIRONMENTAL PROTECTION AGENCY. DATA CONCERNING RADIOACTIVE SPECIES IN AIR AND WATER ARE ALSO PRESENTED. DATA FROM THESE INDICATE THAT HOWARD LABORATORY OPERATIONS HAVE NEGLIGIBLE EFFECT ON THE ENVIRONMENT.

074591 (CONTINUED)
MEASUREMENT • MONITOR, GENERAL PRACTICE • PLUTONIUM • WATER • DAIP • MONITOR, ENVIRONMENTAL MONITOR
LABORATORY • REGULATION, NRC • STATE • CONCENTRATION • OTHER

074599
KIPP KL
RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DEC., 1971
BATTELLE PACIFIC NORTHWEST LABORATORIES
BNWL-1488 P. 32 PAGES, FIGURES, JANUARY 1972

GROUNDWATER CONCENTRATION DATA FOR THREE SOURCE ZONES ARE PRESENTED. ALL GROUNDWATER SAMPLES REPORTED WERE TAKEN BY THE RADIATION MONITORING SECTION AND WERE ANALYZED BY THE TECHNICAL ANALYSIS SECTION OF BATTELLE-NORTHWEST AS PART OF THE HANFORD ENVIRONMENTAL SURVEILLANCE PROGRAM CONDUCTED BY THE ENVIRONMENTAL EVALUATIONS SECTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

RUTHENIUM • HANFORD WATER, BASELINE REFERENCE • PLUTONIUM • HANFORD SITE • MONITOR, AREA • CONCENTRATION

079059
SCHROEDER LJ • BALLANCE WC
RADIOCHEMICAL MONITORING OF WATER AFTER THE CANNIKIN EVENT, AMCHITKA ISLAND, ALASKA, JULY 1972
GEOLOGICAL SURVEY, COLORADO
USGS-474-166 P. 19 PAGES, MARCH 1973

THE U.S. GEOLOGICAL SURVEY COLLECTED WATER SAMPLES FROM AMCHITKA ISLAND, ALASKA, DURING JULY 1972. TRITIUM DETERMINATIONS WERE MADE ON ALL SAMPLES COLLECTED AND GROSS ALPHA AND GROSS BETA/GAMMA DETERMINATIONS WERE MADE ON 41 SAMPLES. THE GROSS ALPHA AND GROSS BETA DETERMINATIONS WERE COMPARED WITH PREVIOUSLY DETERMINED RANGES FOR FRESH WATERS ON AMCHITKA ISLAND SINCE 1967 PERIODS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

RECHARGE • TESTING • WATER • SAMPLING • GROSS ALPHA • GROSS BETA • GROSS GAMMA • NUCLEAR DETONATION •
RADIOCHEMICAL ANALYSIS • RADIOACTIVITY RELEASE • ALASKA

074605
HERCOS JE
ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY
LOS ALAMOS SCIENTIFIC LABORATORY
LA-5106 P. 56 PAGES, 91 PAGES, 22 FIGURES, 29 REFERENCES, MARCH 1973

THE ENVIRONMENTAL MONITORING PROGRAM IN EFFECT FOR CALENDAR YEAR 1972 IS DESCRIBED. RESULTS ARE GIVEN OF ROUTINE MONITORING OF RADIATION LEVELS AND LEVELS OF RADIOACTIVE AND NONRADIOACTIVE CONTAMINANTS IN THE LABORATORY ENVIRONS, INCLUDING THE ATMOSPHERE, THE LOS ALAMOS WATER SUPPLY, LOCAL SURFACE AND GROUND WATER, SEDIMENTS, AND SOILS. CONCENTRATIONS AND LEVELS ARE COMPARED WITH APPLICABLE GUIDE VALUES AND WITH RESULTS OBTAINED AT OTHER LOCATIONS AND LOCALLY DURING OTHER REPORTING PERIODS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ORGANOTRY • DEFFLUENT • ENERGY • MEASUREMENT • PLUTONIUM • STRONTIUM • WASTE DISPOSAL • SITE CLIMATOLOGY •
MONITOR, ENVIRONMENTAL • GROSS ALPHA • GROSS BETA • PLASMA • SOIL • METEOROLOGY • MONITOR, AREA • OCAS •
PLUTONIUM • ASPHALTS • SEDIMENT

074609
RADIATION DATA
99 PAGES, FIGURES, TABLES, RADIATION DATA AND REPORTS, 14(4), PP. 237-272 (APRIL 1973)

REPORTS DATA PROVIDED BY FEDERAL, STATE, FOREIGN GOVERNMENTAL AGENCIES, AND OTHER COOPERATING ORGANIZATIONS. DATA REPORTED IS ACCUMULATED FROM SURVEILLANCE PROGRAMS CONCERNING RADIONUCLIDE CONCENTRATIONS OF MILK, FOOD, WATER, AND AIR AND DEPOSITION. ALSO GIVEN ARE ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT SOME ATOMIC ENERGY COMMISSION INSTALLATIONS. SOME OF THE MORE IMPORTANT RADIOISOTOPES OF CONCERN ARE STRONTIUM, CESIUM, IODINE, RADIUM, COBALT, TRITIUM, CARBON, AND PLUTONIUM.

RADIUM • CARBON • CESIUM • DEPOSITION • FALLOUT • IODINE • STRONTIUM • WATER • SAMPLING • AIR • ANALYTICAL
TECHNIQUE • MILK • NUCLEAR PLANTS • SURVEILLANCE PROGRAM • DATA COLLECTION • CONCENTRATION • RADIATION
EXPOSURE • FOOD • ENVIRONMENTAL PROTECTION AGENCY (EPA)

079912
ROBERTS LA • WINTER W
TRITIUM CONTAMINATION OF THE ENVIRONMENT
GESELLSCHAFT FÜR STRAHLEN- UND UMWELTFORSCHUNG MBH, MÜNCHEN, BUNDESREPUBLIK STRAHLENSCHUTZ UND SICHERHEIT
16 PAGES, 6 TABLES, 16 REFERENCES, PRESENTED AT THE COMMISSION OF THE EUROPEAN COMMUNITIES INTERNATIONAL SYMPOSIUM ON RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1971

MEASUREMENT WITHOUT WATER CONCENTRATING IS RECOMMENDED AND DESCRIBED (THE INSITU-GM COUNTER).

075512 [illegible]

INTERNAL SCINTILLANTS. SINCE TRITIUM IN AIR IS LARGELY IN THE FORM OF TRITIATED WATER, IN THIS CASE SAMPLING BY COLLECTION IN A COLD FINGER IS RECOMMENDED. THE AUTHORS' RESULTS FOR SURFACE-, GROUND-, AND RAINWATER ARE COMPARED WITH THOSE OF OTHERS. CONCENTRATIONS RANGED FROM 0.4-1.4 PCI/ML, AND THE AVERAGE DOSE TO MAN WAS ABOUT 0.1 MREM/YEAR. ALTHOUGH THE AIR MONITORS IN CERTAIN HANFORD LABORATORIES REACHED GREATER THAN 1 PCI/ML, THE MAXIMUM DOSE FROM THIS SOURCE WAS ABOUT 0.07 MREM/YEAR. MOST OF THE DOSE IS FROM WORLD WIDE CONTAMINATION FROM NUCLEAR TESTING.)

AVAILABILITY - OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES. P.O.B. 1003. LUXEMBOURG 1

CONTAINMENT INSTRUMENTATION • MONITORS, LIQUID • RADIOACTIVITY, RELATIVE • MONITOR, SAMPLING • SAMPLING • SURFACE WATER, NUCLIDE OCCURRENCE • ANALYTICAL TECHNIQUE • DOSE CALCULATION, INTERNAL • GROUND WATER, NUCLIDE OCCURRENCE • SYSTEM DESCRIPTION • SURVEY, RADIATION • CRITICAL NUCLIDE PATHWAY • ENVIRONMENT • BACKGROUND • CONTAINMENT LEAK MONITOR • RADIONUCLIDE UPTAKE • RADIONUCLIDE TRANSFER • EXPOSURE, BACKGROUND

075302

[illegible] B • CANTILLON G

DENSITIES IN RIVERS OF RADIOACTIVITY AND RADIONUCLIDES IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS

BELG. DEPARTMENT OF RADIOPHYSICS • INSTITUTE OF HEALTH, BRUSSELS

17 PAGES, 8 TABLES, 2 REFERENCES, PRESENTED AT THE COMMISSION OF THE COMMUNITIES INTERNATIONAL SYMPOSIUM ON RADIOECOLOGY, APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1971

DURING PERIODS OF EFFLUENT RELEASE FROM THE BROKEWS NUCLEAR POWERPLANT, DOWNSTREAM EFFECTS WERE STUDIED. TRITIATED-WATER CONCENTRATION IN RIVER WATER REACHED ABOUT 1500 PICOCURIES/LITER; CO AND MN PARTICULATES, ABOUT 10 PICOCURIES/LITER. FIELD AND LABORATORY STUDIES GAVE FIXATION OF MN AND CO BY SEDIMENTS OF FROM 0.7 TO 78. CO AND MN CONCENTRATION FACTORS FOR SEDIMENT FOR SUSPENSIONS WERE AS HIGH AS ABOUT 30,000; FOR A SPECIES OF AQUATIC MOSS, ABOUT 600.

AVAILABILITY - OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES. P.O.B. 1003. LUXEMBOURG 1

EFFLUENT • MANGANESE • WASTE DISPOSAL, RIVER • ANALYTICAL TECHNIQUE • CRITICAL NUCLIDE PATHWAY • RADIONUCLIDE UPTAKE • BIOACCUMULATION/TOXICITY • RADIONUCLIDE TRANSFER • AQUATIC ORGANISM • SEDIMENT • LABORATORY EXPERIMENT • FIELD EXPERIMENT • CONCENTRATION FACTOR • PLANT, MOSS/FERN

075199

[illegible] • [illegible] • [illegible]

RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA

[illegible] ISOTOPES, INC.

NVO-1230-139 P., 46 PAGES, 8 TABLES, 3 FIGURES, 1 REFERENCE, SEPTEMBER 1971

A 1969-1970 SURVEILLANCE PROGRAM OF TRANSPORT OF RADIOACTIVITY THROUGH GROUND WATER FROM THE SITES OF UNDERGROUND NUCLEAR DETONATIONS IS DESCRIBED, AND IT IS RECOMMENDED THAT ONCE-A-YEAR SAMPLING CONTINUE. IN A RELATED STUDY, DISTRIBUTION COEFFICIENTS (CGAMS RADIONUCLIDE IN ONE GRAM OF MINERAL FOR/GRAMS RADIONUCLIDE IN ONE ML OF ASSOCIATED GROUND WATER) WERE DETERMINED BY ADDING RADIONUCLIDES TO ENVIRONMENTAL SAMPLES. DISTRIBUTION COEFFICIENTS RANGED FROM 30 TO 2000 FOR CA-45; 75 TO 2500 FOR SR-85; AND 70 TO 4000 FOR CS-137.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SOIL, RADIONUCLIDE MOVEMENT THROUGH • GROUND WATER, NUCLIDE OCCURRENCE • GROUND WATER, PROPERTY • GROUND WATER, TOXICITY • NEVADA TEST SITE • MONITOR, UNDERGROUND • CRITICAL NUCLIDE PATHWAY • ION EXCHANGE • RADIOCHEMICAL ANALYSIS • SPECTRUM • HYDROLOGY, RATE OF MOVEMENT • SOIL PROPERTY, IN SITU • SURVEILLANCE PROGRAM • RADIONUCLIDE UPTAKE • RADIONUCLIDE TRANSFER • SEDIMENT • DISTRIBUTION

075060

[illegible] JR

ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JULY THROUGH DECEMBER 1971

LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO

LA-4970 P., 58 PAGES, TABLES, FIGURES, REFERENCES, JULY 1972

THE ENVIRONMENTAL MONITORING PROGRAM IN EFFECT AT THE LOS ALAMOS SCIENTIFIC LABORATORY OF THE UNIVERSITY OF CALIFORNIA FOR THE LAST HALF OF CALENDAR YEAR 1971 IS DESCRIBED. RESULTS OF PROGRAMS DESIGNED TO MONITOR RADIATION LEVELS IN THE LABORATORY ENVIRONS, INCLUDING THE ATMOSPHERE, LOCAL SURFACE AND GROUND WATERS, SEDIMENTS AND SOILS ARE PRESENTED. THESE MEASUREMENTS ARE USED TO MAKE ESTIMATES OF THE DOSE COMMITMENTS DUE TO PLUTONIUM AND TRITIUM CONCENTRATIONS IN ATM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • [illegible] • AIR • MONITOR, ENVIRONMENTAL • GROUND WATER, NUCLIDE OCCURRENCE • SURVEY, RADIATION • DOSE MEASUREMENT, EXTERNAL • [illegible] • MONITOR, GROUND SURFACE • SOIL • SURVEILLANCE PROGRAM • MONITOR, AREA • CONCENTRATION • SEDIMENT

074499

[illegible] RD

ENVIRONMENTAL RADIOACTIVITY MEASUREMENT PROGRAM NEAR A FUELS REPROCESSING PLANT

N.Y. STATE DEPT. OF ENVIRONMENTAL CONSERVATION

7 PAGES, 4 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 15(1), PP. 564-565, FROM THE 1972 ANNUAL

070433 UNCLASSIFIED
MEETING, LAS VEGAS, NEVADA, JUNE 18-22, 1972

EXTENSIVE MEASUREMENTS OF RADIOACTIVE MATERIALS HAVE BEEN MADE IN THE VICINITY OF THE NUCLEAR FUELS SERVICES REPROCESSING PLANT AS PART OF NEW YORK STATE'S ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM. MEASUREMENTS OF GROSS BETA RATES AND RADIOACTIVITY CONCENTRATIONS IN AIR, MILK, WATER, AND FISH WERE STARTED TWO YEARS PRIOR TO PLANT STARTUP. RADIOACTIVITY CONCENTRATIONS AND GAMMA DOSE RATES WERE TYPICAL OF RADIOACTIVITY CONCENTRATIONS FOUND IN OTHER PARTS OF THE STATE. FURTHER, AND PRESENTLY UNKNOWN DOSES DUE TO I-129, C-14, AND HO MAY BE SIGNIFICANT. BECAUSE OF THE RECENT STARTUP OF A LOW-LEVEL LIQUID WASTE TREATMENT PLANT, DOSES DUE TO C-14 AND CS137 IN VECTORS ASSOCIATED WITH THE STREAM SYSTEM EXPECTED RECEIVED AS THE CONCENTRATION OF THESE ISOTOPES IS REDUCED.

AVAILABILITY - ROBERT D. ANDERSON, NEW YORK STATE, DEPT. OF ENVIRONMENTAL CONSERVATION, 50 WOLF ROAD, ALBANY, N.Y. 12201

CESIUM • IODINE • KRYPTON • MEASUREMENT • STRONTIUM • WATER • MILK • VEGETATION, BACKGROUND • GAMMA RADIATION • DOSE • NUCLEAR REPROCESSING • SURVEILLANCE PROGRAM • VEGETATION, AIRBORNE • ANIMAL, FISH • CONCENTRATION

070440
SCHMIDT RJ
ENVIRONMENTAL RADIOACTIVITY IN ILLINOIS, 1970
ENVIRONMENTAL PROTECTION AGENCY
90 PAGES, 30 TABLES, 9 FIGURES, 46 REFERENCES, RADIATION DATA AND REPORTS, 13(11), PP. 909-919 (NOVEMBER 1972)

THE CONTRIBUTION OF RADIOACTIVITY TO THE ILLINOIS ENVIRONMENT DURING 1970 RESULTING FROM THE OPERATION OF NUCLEAR POWER PLANTS AND FROM OTHER MAJOR NATURAL AND HUMAN SOURCES IS PRESENTED. THE ENVIRONMENTAL SURVEILLANCE PROGRAMS OF THE DRESDEN, QUAD-CITIES, AND ZION NUCLEAR STATIONS ARE DESCRIBED. DRESDEN UNIT 1 RADIOACTIVE GASEOUS AND LIQUID RELEASES FOR THE PAST 11 YEARS, AND DRESDEN UNIT 2 DISCHARGES FOR 1970 ARE SUMMARIZED. ON THE BASIS OF DATA GATHERED DURING 1970, IT IS CONCLUDED THAT THE EFFECT OF NUCLEAR POWER PLANT OPERATIONS ON THE RADIOACTIVITY LEVEL OF MOST ENVIRONMENTAL MEDIA WAS HIGHLY DISTINGUISHABLE FROM THE NATURAL AND FALLOUT RADIOACTIVITY.

CESIUM • DRESDEN 1 (USA) • EFFLUENT • KRYPTON • NOBLE GAS • STRONTIUM • OBSERVED, ENVIRONMENT • STATION • REACTOR, POWER • MONITOR, ENVIRONMENTAL • OBSERVED, RADIATION • MONITOR, BACKGROUND • DRESDEN 2 (USA) • QUAD CITIES 1 (USA) • SURVEILLANCE PROGRAM • ZION 1 (USA) • ZION 2 (USA) • QUAD CITIES 2 (USA)

070444
MANSON CA • COWPER C
ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972
ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER
AECL-4271 0, 37 PAGES, 3 FIGURES, SEPTEMBER 1972

EFFLUENTS AND NEARBY NATURAL WATERS WERE MONITORED FOR RADIONUCLIDES. A METHOD FOR DETERMINATION OF LOW LEVELS OF STABLE COBALT WAS DEVELOPED. STUDIES WERE INITIATED ON RADIOACTIVE AND STABLE SR IN LAKE SEDIMENT, ON THE TRITIUM INPUT TO A LAKE VIA GROUND WATER, AND ON THE ROLE OF TRITIUM DEPOSITION BY SPIT ON THE EVAPORATION OF TRITIATED WATER FROM ECOSYSTEMS. UPTAKE OF PHOSPHATE AND FERRIC IONS BY AQUATIC PLANTS OCCURRED THROUGH THE ROOTS, EVEN IN FLOATING SPECIES WITH SUBMERGED ABSORBENT LEAVES. MONITORING METHODS WERE DEVELOPED FOR T AND I IN AIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM • COBALT • IODINE • MONITOR, LIQUID • STRONTIUM • TRACER, RADIOACTIVE • SURFACE WATER, NUCLINE OCCURRENCE • GROUND WATER, NUCLIDE OCCURRENCE • IODINE • PHOSPHATE • SOIL, NUCLINE OCCURRENCE • CRITICAL NUCLIDE PATHWAY • CHALK RIVER • REFERENCES • WATER POLLUTION • MONITORING PROGRAM, ENVIRONMENTAL • LAKE • RADIONUCLIDE UPTAKE • ECOSYSTEM, AQUATIC • RADIONUCLIDE TRANSFER • SEDIMENT • INSECT • • OPERATION MONITORS • INSTRUMENTS, MISC.

070017
HARDY EP
FALLOUT PROGRAM QUARTERLY SUMMARY REPORT
U.S. ATOMIC ENERGY COMMISSION, HEALTH AND SAFETY LABORATORY
HASL-248 0, 175 PAGES, FIGURES, JANUARY 1, 1971

THIS REPORT PRESENTS CURRENT DATA FROM THE HASL FALLOUT PROGRAM, THE NATIONAL RADIATION LABORATORY IN NEW ZEALAND, AND THE EUROPEAN JOINT NUCLEAR RESEARCH CENTER AT ISPRA, ITALY. THE INITIAL SECTION CONSISTS OF INTERPRETIVE REPORTS ON STRONTIUM-90 FALLOUT OVER THE ATLANTIC, FALLOUT TRITIUM AND NOBLE GAS CONTENT, AND QUALITY CONTROL ANALYSES OF SURFACE AIR, FALLOUT, DIET, AND OTHER ANALYSES DURING 1971. SUBSEQUENT SECTIONS INCLUDE TABULATIONS OF RADIONUCLIDE LEVELS IN FALLOUT, SURFACE AIR, STRATOSPHERIC AIR, MILK, AND TAP WATER. A BIBLIOGRAPHY OF RECENT PUBLICATIONS RELATED TO RADIONUCLIDE STUDIES, IS ALSO PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ELEMENTS AND ISOTOPES • FALLOUT • MEASUREMENT • STRONTIUM • WATER • ANALYTICAL TECHNIQUE • MILK • DIETARY INTAKE • ITALY • RADIOCHEMICAL ANALYSIS • NEW ZEALAND • UNITED STATES • SURVEILLANCE PROGRAM • DATA COLLECTION • CONCENTRATION • OCEAN, ATLANTIC • NOBLE • MAN

[illegible]
ENVIRONMENTAL MONITORING REPORT: PERIOD COVERING MAY 1, 1972 - JULY 31, 1972
[illegible] INSTRUMENT CORPORATION, SANTA FE, NEW MEXICO
[illegible]-79 p, 22 PAGES, 1972

THE RADIOLOGICAL MONITORING PROGRAM FOR PROJECT [illegible] WAS INITIATED IN MAY 1971. THE PROGRAM WILL CONTINUE INDEFINITELY UNTIL SUCH TIME AS THERE IS NO FURTHER NEED FOR RADIOLOGICAL MONITORING. THE DETERMINATION OF BACKGROUND RADIATION AND ENVIRONMENTAL RADIOACTIVITY LEVELS IS INTENDED TO SERVE THE FOLLOWING PURPOSES - (A) TO YIELD AVERAGE VALUES FOR RADIATION LEVELS AND CONCENTRATIONS OF RADIOACTIVE MATERIAL IN VARIOUS MEDIA IN THE ENVIRONMENT; (B) TO IDENTIFY BACKGROUND SAMPLE LOCATIONS; (C) TO DETERMINE SEASONAL VARIATIONS; (D) TO INDICATE THE RANGE OF VALUES THAT SHOULD BE CONSIDERED BACKGROUND; (E) TO PROBE-TEST THE ENVIRONMENTAL MONITORING EQUIPMENT AND METHODS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

STRONTIUM • [illegible] • [illegible] WATER, NUCLIDE DECOMPOSITION • [illegible] • WATER, MONITORING • MONITOR, ENVIRONMENTAL • [illegible] DATA • MONITOR, [illegible] • [illegible] • RADIATION MONITORS

[illegible]
RADIATION DATA
[illegible] PAGES, FIGURES, TABLES, RADIATION DATA AND REPORTS, 1[illegible], PP. 17-97 (JANUARY 1971)

REPORTS DATA PROVIDED BY FEDERAL, STATE, AND FOREIGN GOVERNMENTAL AGENCIES AND OTHER COOPERATING ORGANIZATIONS. DATA REPORTED IS ACCUMULATED FROM SURVEILLANCE PROGRAMS CONCERNING RADIONUCLIDE CONCENTRATIONS OF MILK, FOOD, WATER, AIR AND DEPOSITION. ALSO, GAMMA AND NEUTRON LEVELS OF RADIOACTIVITY AT SOME ATOMIC ENERGY COMMISSION INSTALLATIONS. SOME OF THE MORE IMPORTANT RADIOISOTOPES OF CONCERN ARE STRONTIUM, CESIUM, IODINE, RADIUM, CARBON, TRITIUM, XENON, AND KRYPTON. CONCENTRATIONS OF THESE ARE GIVEN FOR VARIOUS MEDIA.

STRONTIUM • CESIUM • DEPOSITION • FREQUENCY • ELEMENTS AND ISOTOPES • IODINE • PLUTONIUM • STRONTIUM • ATMOSPHERIC PRODUCTION • SAMPLING • MILK • WATER, DRINKING • POPULATION EXPOSURE • WATER POLLUTION • SURVEILLANCE PROGRAM • DATA COLLECTION • CONTAMINATION • SOIL CHAIN • [illegible] • MAN • AGENCY, AEC • FOOD • ENVIRONMENTAL PROTECTION AGENCY (EPA)

[illegible]
[illegible] • [illegible]
OFF-SITE RADIOLOGICAL SAFETY PROGRAM FOR PROJECT [illegible] RE-ENTRY PORTION OF PHASE III
NATIONAL ENVIRONMENTAL RESEARCH CENTER, LAS VEGAS
NERC-LV-539-14 p, 241 PAGES, FIGURES, TABLES, REFERENCES, NOVEMBER 1972

PRESENTS THE OPERATIONAL PROCEDURES AND RESULTS OF THE OFF-SITE RADIOLOGICAL SURVEILLANCE ACTIVITIES CONDUCTED BY THE NATIONAL ENVIRONMENTAL RESEARCH CENTER-LAS VEGAS FROM APRIL 1970 TO OCT. 3, 1970, DURING THE RE-ENTRY PHASE OF THE PROJECT [illegible] PRODUCTION TESTING PROGRAM. NO RELEASE OF RADIOACTIVITY OCCURRED DURING RE-ENTRY OPERATIONS; HOWEVER, GAS FLARING PRIOR AUGUST RELEASED NATURAL GAS CONTAINING SOME RADIOACTIVITY TO THE ATMOSPHERE. THE ONLY ACTIVITY DETECTED IN THE OFF-SITE AREA WAS TRITIUM IN ATMOSPHERIC MOISTURE SAMPLES COLLECTED BY THE DEPTH, IMMEDIATELY LOCATING NEAR THE TEST WELL DURING A FLARING OPERATION

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLOWSHARE • [illegible], ENVIRONMENT • TESTING • ATMOSPHERIC POLLUTION • [illegible], RADIATION • [illegible] • RADIOACTIVITY RELEASE • SURVEILLANCE PROGRAM • [illegible] • [illegible] SITE

[illegible]
[illegible]
[illegible] TRITIUM DATA FOR STS [illegible], AMCHITKA ISLAND, ALASKA, JULY 1, 1970 THROUGH JUNE 30, 1971
NATIONAL [illegible], LAS VEGAS
NVO-[illegible] p, 75 PAGES, SEPTEMBER 1971

RESULTS OF TRITIUM ANALYSES FOR THE PERIOD OF JULY 1, 1970 THROUGH JUNE 30, 1971, ARE TABULATED. THESE DATA ALONG WITH SUMMARIES OF DATA REPORTED IN PRIOR YEARS ARE USED TO DETERMINE IF REPOSITORY-PRODUCED RADIOACTIVITY HAS BEEN DEPOSITED IN ENVIRONMENTAL WATERS BY THE MILROW EVENT EXECUTED OCT. 2, 1969.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEPOSITION • OCEAN AND SEA • [illegible] INFORMATION • [illegible], NUCLIDE DECOMPOSITION • WATER POLLUTION • ALASKA • [illegible]

[illegible]
[illegible]
AMCHITKA RADIOECOLOGICAL PROGRAM PROGRESS REPORT, MAY 1971 TO FEBRUARY 1972
UNIVERSITY OF WASHINGTON, SEATTLE
NVO-[illegible] p, 97 PAGES, 19 TABLES, 5 FIGURES, 4 REFERENCES, OCTOBER 1972

NO RELEASE OF RADIOACTIVITY AS A RESULT OF THE CANNIKIN TEST WAS FOUND, ALTHOUGH RADIOACTIVITY FROM UNDERGROUND FALLOUT WAS DETECTED BY GAMMA SPECTROMETRY OF INDICATOR ORGANISMS ESPECIALLY IN THE INTERTIDAL ZONE, WHERE AND BIGGER PLANTS IN THE STREAMS, AND LICHENS. THE ONLY ANOMALOUS

[illegible]

RADIONUCLIDES PRESENT BY MILLIPORE-FILTER SAMPLING OF PARTICULATES AT INTERVAL AND PRESSURIZED STATIONS WAS PERFORMED. THE SENSITIVITY WAS ABOUT 0.001 PICOCURIE/LITER IN THOUSAND-GALLON SAMPLES TAKEN BY A DIRECT GAMMA PROBE WITH A MULTICHANNEL COUNTER. [illegible] IN GROUND SAMPLES FROM THE 1971 BRISTOL-BAY PACK FALLS WITHIN THE BONES AND FISH MUSCLE SAMPLES IN 1969-1970. TRITIUM LEVELS IN SEAWEED AND MARINE INVERTEBRATES (KING CRAB, STONE CRAB, SCALLOPS, SHRIMP) WERE COMPARABLE FOR THE DESERTED REGION TO OTHER ALASKAN AREAS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAMINATION • NEPTUNIUM • OCEAN AND SEA • ZIRCONIUM • FILTER, MILLIPORE • SAMPLING • SURFACE WATER, DECOMPOSITION MATERIAL • ANALYTICAL TECHNIQUE • CONTROL MONITOR PATHWAY • SPECTROMETRY, GAMMA • ALASKA • RADIONUCLIDE WATER • BOTANY, INVERTEBRATE • MARINE, FISH • ECOSYSTEM, AQUATIC • FOOD CHAIN • AQUATIC ORGANISM • PLANT, SPERMATOPHYTE • MARINE ORGANISM • PLANT, ALGAE/FUNGI • ECOSYSTEM, MARINE • PLANT, MONOCOTYL • ECOSYSTEM, ESTUARINE

[illegible]
OCHIAI T • KAWASAKI M
TRITIUM IN THE GROUNDWATER IN JAPAN
AGRICULTURAL ENGINEERING RESEARCH STATION, HIRATSUKA, JAPAN
7 PAGES, [illegible], 16(3), PP. 299-301 (MARCH 1977)

THE FOLLOWING METHODS FOR MEASURING TRITIUM ARE DISCUSSED - MEASUREMENTS BY LIQUID SCINTILLATION OF WATER SAMPLES; MEASUREMENT OF GAS SAMPLES BY A GAS PROPORTIONAL COUNTER; AND MEASUREMENT OF GAS SAMPLES BY AN IONIZATION CHAMBER. THE MERITS AND DEMERITS OF THE METHODS ARE DISCUSSED.

DEPTHED WATER • MEASUREMENT - WATER • SAMPLING • DEPTHED WATER, BASELINE OBSERVATION • GAS • DECONTAMINATION

040717
COTHRAN JA • GRIFFIN WD • TOMIANELLO EJ
[illegible] OF ATMOSPHERIC TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT
U.S. ENVIRONMENTAL PROTECTION AGENCY
REPORT 73-1 P., 20 PAGES, 11 TABLES, 2 FIGURES, 15 REFERENCES, FEBRUARY 1973

A STUDY WAS CONDUCTED AT NUCLEAR FUEL SERVICES, INC. (NFS) TO (A) CHARACTERIZE THE STACK TRITIUM EFFLUENT IN THE GASEOUS AND WATER VAPOR GROUPS, DURING NORMAL PLANT OPERATIONS, (B) DETERMINE THE WEEKLY AVERAGE TRITIUM AIR CONCENTRATIONS AT FIVE SELECTED SITES AROUND THE PLANT OVER A 6-MONTH PERIOD, (C) EVALUATE METHODS USED FOR SAMPLING AT THE STACK AND IN THE ENVIRONMENT, AND (D) ESTIMATE THE DOSE TO THE POPULATION IN THE IMMEDIATE VICINITY OF THE PLANT FROM TRITIUM STACK EFFLUENTS. DATA FROM THE FIVE AIR SAMPLING STATIONS AROUND THE SITE INDICATE THAT THE PLANT CONTRIBUTION TO THE ATMOSPHERE IS SMALL.

AVAILABILITY - U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, FIELD OPERATIONS DIVISION, WASHINGTON, D.C. 20460

DOSE • EFFLUENT • ATMOSPHERIC POLLUTION • MONITOR, AIR • MONITOR, GAS • MONITOR, SAMPLING • STACK • CONTAMINATION EXPOSURE • RADIOACTIVITY RELEASE • WATER VAPOR • NUCLEAR REPROCESSING • GAS • CONCENTRATION

[illegible]
GARTON CJ • MOR-E RE • HARRIS SD
RADIATION DOSES FROM HYPOTHETICAL EXPOSURES TO BRISTOL GAS
CONF-770816-9 P., 18 PAGES, PAPER PRESENTED AT THE 17TH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, HELD IN LAS VEGAS, NEVADA, ON JUNE 12, 1977

PRODUCTION TESTING OF THE BRISTOL WELL, THE SECOND NATURAL GAS WELL DEVELOPED BY USE OF NUCLEAR EXPLOSIVES, WAS COMPLETED IN APRIL 1971. THIS STUDY EXAMINED THE HYPOTHETICAL SITUATION THAT WOULD HAVE OCCURRED IF THE NOW, CARBON DIOXIDE-RICH GAS PRELIMINARY PRESENT IN THE WELL HAD BEEN DISTRIBUTED AT A RATE OF 1 MILLION FT3/DAY AND DISTRIBUTED BY THE GAS COMPANIES TO SMALL COMMUNITIES IN THE AREA NEAR THE WELL. TRITIUM AND KR-85 ARE THE DOMINANT RADIONUCLIDES PRESENT IN THE GAS FROM THE BRISTOL WELL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • KRYPTON • DIFFUSION • NUCLEAR DETONATION • DOMESTIC EXPOSURE • DOSE CALCULATION, PATHWAY • CONTAMINATION • GAS • CONSUMER PRODUCT • ABSORPTION • DISTRIBUTION • DESTINATION, NATURE

041077
PERRY JA • EVANS DR
TRITIUM MONITORING IN THE ARCTIC VILLAGES
U.S. ENVIRONMENTAL PROTECTION AGENCY, LAS VEGAS, NEVADA
3 PAGES, 2 TABLES, 1 FIGURES, 4 REFERENCES, RADIATION DATA AND REPORTS, 16(4), PP. 271-273 (MAY 1975)

DURING A ROUTINE VISIT TO MEASURE CESIUM-137 BURDENS IN RESIDENTS OF TWO ALASKAN VILLAGES, DRINKING WATER AND URINE SAMPLES WERE COLLECTED AND SUBSEQUENTLY ANALYZED FOR TRITIUM BY THE NATIONAL ENVIRONMENTAL RESEARCH CENTER-LAS VEGAS. THE MEAN CONCENTRATIONS AT NOATAK, ALASKA, WERE 1700 PCI/LITER AND 1500 PCI/LITER FOR TRITIUM IN DRINKING WATER AND URINE, RESPECTIVELY. AT KIANA, THE MEAN TRITIUM CONCENTRATION IN DRINKING WATER WAS 2400 PCI/LITER, AND THE MEAN TRITIUM CONCENTRATION IN URINE WAS 1000 PCI/LITER.

[illegible]
[illegible] • [illegible] • [illegible] • [illegible] • [illegible] • [illegible]

[illegible]
[illegible]
[illegible]

[illegible] DATA, [illegible] AND [illegible], WATER, AIR AND [illegible], AND OTHER DATA
[illegible] PAGES, [illegible], RADIATION DATA AND REPORTS, [illegible], PP. [illegible] (MAY 1973)

[illegible] DATA [illegible] BY [illegible], STATE, [illegible] ENVIRONMENTAL AGENCIES, AND OTHER COOPERATING ORGANIZATIONS. DATA [illegible] WERE [illegible] FROM SURVEILLANCE PROGRAMS CONCERNING RADIONUCLIDE CONCENTRATIONS IN MILK, FOOD, WATER, AND AIR AND [illegible]. [illegible] AND ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT SOME ATOMIC ENERGY COMMISSION INSTALLATIONS. SOME OF THE MORE IMPORTANT RADIONUCLIDES OF CONCERN ARE STRONTIUM, CESIUM, IODINE, RADIUM, COBALT, URANIUM, PLUTONIUM, AND PLUTONIUM.

RADIUM • CESIUM • COBALT • DEPOSITION • IODINE • [illegible] • [illegible] • STRONTIUM • WATER • MILK • AIR • MILK • MONITOR, ENVIRONMENTAL • [illegible], RADIATION • [illegible] PERSONNEL • SOIL • [illegible] PROGRAM • DATA COLLECTION • CONCENTRATION • RADIATION [illegible] • [illegible]

[illegible]
[illegible] SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
[illegible] PAGES, [illegible] TABLES, [illegible] FIGURES, [illegible] REFERENCES, APRIL 1973

SURFACE AND GROUND WATER SAMPLES WERE ANALYZED FOR TRITIUM FROM 115 SAMPLING STATIONS DURING THE PERIOD AUGUST 1966 THROUGH MAY 1969. TRITIUM WAS DETECTED ONLY IN SURFACE AND GROUND WATER IN THE STREAM-CHANNEL AQUIFERS IN THE ALLUVIUM OF DP, LOS ALAMOS, AND MORTANDAD CANYONS WHICH ARE CONTAMINATED AREAS. THESE CANYONS RECEIVE TRITIUM, LOW-LEVEL RADIOACTIVE EFFLUENTS. THE TRITIUM IN DP AND LOS ALAMOS CANYON IS DERIVED FROM SEEPAGE PITS THAT CONTAINED TRITIUM. THE TRITIUM CONCENTRATIONS DECREASE DOWNSTREAM IN THE CANYONS DUE TO DILUTION WITH OTHER WASTE WATER, SEEPAGE EFFLUENT, AND STORM RUNOFF.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible] • DILUTION • GROUND WATER • SURFACE WATER • SURVEY, RADIATION • [illegible] • MONITOR, AREA • [illegible]

[illegible]
MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY
U.S. ATOMIC ENERGY COMMISSION, TECHNICAL INFORMATION CENTER
TID-[illegible], 190 PAGES, MAY 1973

A SELECTED BIBLIOGRAPHY OF 191 REFERENCES ON TRITIUM. THE REFERENCES WERE RETRIEVED FROM NSA DATA BASE BY COMPUTER SEARCH AND SORTING. REFERENCES ARE ARRANGED IN A SUMMARY CHRONOLOGICAL ORDER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY • WASTE DISPOSAL • MONITOR • RADIATION SAFETY AND CONTROL

[illegible]
[illegible]
ENVIRONMENTAL MONITORING TECHNIQUES
[illegible] STATE [illegible] LABORATORIES, ONTARIO, CANADA
[illegible] PAGES, PP. [illegible] OF TRITIUM, PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

DISCUSSES SUCH TOPICS AS MONITORING REACTOR EFFLUENTS, ANALYTICAL TECHNIQUES, MONITORING IN AQUATIC ENVIRONMENT AND THEORETICAL ANALYSIS OF TRITIUM IN WATER, A METHOD FOR AIR AND GAS SAMPLING, STACK MONITOR, AND A MONITOR FOR NATURAL GAS FROM NUCLEAR STIMULATION.

MONITOR, STACK • PLUTONIUM • WATER • MONITOR, GAS • SAMPLING • AIR • ANALYTICAL TECHNIQUE • MONITOR, ENVIRONMENTAL • MONITOR, AREA • GAS • STIMULATION • [illegible]

[illegible]
[illegible] • [illegible] • [illegible]
ENVIRONMENTAL MONITORING, DATA
NATIONAL ENVIRONMENTAL RESEARCH CENTER, CINCINNATI
[illegible] PAGES, PP. [illegible] OF TRITIUM, PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

DEALS WITH MONITORING AND DATA COLLECTION OF RELEASES FROM THE VARIOUS SOURCES. INCLUDED IN THESE SOURCES ARE NUCLEAR POWER REACTORS, CONTAMINATION BY NUCLEAR POWER PROGRAM, PROJECT GASBUGGY, PROCESSING OPERATIONS OF GASBUGGY GAS, ACCIDENTAL TRITIUM RELEASE, AND TRITIUM INVARE IN NEW YORK CITY.

INGESTION • INHALATION • [illegible], RADIATION • [illegible], MONITOR • REACTOR, POWER • MONITOR, ENVIRONMENTAL • NUCLEAR DETONATION • [illegible] EXPOSURE • CONTAMINATION • EMERGENCY PROCEDURE • FISSION PRODUCT, AIRBORNE • MONITOR • RADIOACTIVITY RELEASE • [illegible], NUCLEAR • [illegible] (PNE) • GAS • OFF SITE • DATA COLLECTION • PLANT • RESEARCH, NATIONAL • [illegible]

007077
STOP WL
RADIOLOGICAL STATUS OF THE CONTAMINATED GROUND THE HANFORD PROJECT - JANUARY-JUNE 1977
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-2197 p. 91 PAGES, 4 TABLES, 3 FIGURES, JUNE 1977

THIS REPORT IS PREPARED SEMI-ANNUALLY TO PROVIDE AN EVALUATION OF THE STATUS OF GROUNDWATER CONTAMINATION RESULTING FROM DISPOSAL OF HANFORD PLANT EFFLUENTS. THE DATA PRESENTED IN THIS REPORT WERE COLLECTED DURING THE FIRST SIX MONTHS OF 1977

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMMERCE • EFFLUENT • ELEMENTS AND ISOTOPES • GROUND WATER • DISTRIBUTION • WASTE DISPOSAL • GROUND WATER, WELLING REFERENCE • CONTAMINATION • GROUND SITE • QUALITY EVALUATION • CONCENTRATION

007017
WELD EF • NELSON WA • SCHELL WR • IKAD
ENVIRONMENTAL RADIOLOGICAL PROGRAM PROGRESS REPORT FOR MARCH 1977 TO DECEMBER 1977
WASHINGTON UNIVERSITY, SEATTLE
WHO-200-10 p. 40 PAGES, 22 TABLES, 0 FIGURES, 10 REFERENCES, JUNE 1978

AN EXTENSIVE SEARCH WITH SENSITIVE INSTRUMENTS FOR CONTAMINANTS IN BIOLOGICAL AND ENVIRONMENTAL SAMPLES CONTINUE. TERRESTRIAL, FORESHORED COLLECTED DURING THE FIRST 14 MONTHS OFTEN THE CONTROLLED REPORTING INDICATES NO CONTAMINATION OF THE SHORELINE ENVIRONMENT. RECENT DATA INDICATES SIX NO NEW RADIONUCLIDES. EXCEPT THAT OFF WAS INCLUDED IN THE RADIONUCLIDES THAT WERE REPORTED, AND (2) AN IMPROVEMENT IN THE SENSITIVITY OF ANALYSIS FOR TRITIUM IN ABOUT 15 TRITIUM WELLS. THE PAST AND PRESENT ANALYSES ARE SUMMARIZED, INCLUDING GAMMA-EMITTING RADIONUCLIDES IN AND FILTERS, SEAWATER, PRESHORED, MARINE ALGAE, MARINE INVERTEBRATES, MARINE FISH, SEA OTTER, AND PRESHORED ORGANISMS (MOSS, PLANTS, AND FISH): SOME IN DATA AND REPORTS: AND TRITIUM IN SEAWATER, PRESHORED AND FISH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEPOSITION • FALLOUT • STRONTIUM • POTASSIUM • NUCLEAR DETONATION • CRITICAL MULTIPLE PATHWAY • ALASKA • MONITORING UPTAKE • FOOD CHAIN • AQUATIC ORGANISM • SEAFOOD • MARINE ORGANISM • CONCENTRATION FACTOR • DEPOSITION, ESTIMATING

008060
ENVIRONMENTAL ISOTOPE DATA NO. 4: WORLD SURVEY OF ISOTOPE CONCENTRATION IN PRECIPITATION (1960-1969)
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
IAEA SERIES NO. 147 p. 333 PAGES, 1973

REPORTS THE CONCENTRATION OF THE ENVIRONMENTAL ISOTOPES TRITIUM, DEUTERIUM AND OXYGEN-18 IN MONTHLY SAMPLES OF PRECIPITATION TAKEN FROM A GLOBAL NETWORK OF 177 STATIONS IN 1960-1969. SELECTED METEOROLOGICAL DATA, SUCH AS AMOUNTS OF PRECIPITATION, THE VAPOR PRESSURES AND TEMPERATURES ARE ALSO PRESENTED. TOGETHER WITH REPORTS OF PRE-1960 DATA.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, NEW YORK, 10016

DEUTERIUM • RADIONUCLIDES AND ISOTOPES • OXYGEN • SURVEY, ENVIRONMENT • PRECIPITATION • INTERNATIONAL • DATA COLLECTION

007023
NUCLEAR SAFETY PROJECT - THIRD PROJECT REPORT/FIRST HALF OF 1973
KERNFORSCHUNGSZENTRUM, KARLSRUHE, F. R. GERMANY
KFK-1950 p. 235 PAGES, FIGURES, REFERENCES, NOVEMBER 1973

DESCRIBES THE ACTIVITIES OF THE PROJECT AND THE FIRST 6 MONTHS OF 1973. SUBJECTS INCLUDE DEVELOPMENT OF FILTER AND OFF-GAS SYSTEMS, MEASUREMENT OF ENVIRONMENTAL TRITIUM CONCENTRATION, KRYPTON AND XENON DERIVED FROM THE EXHAUST AIR OF NUCLEAR PLANTS, RAIN AND MEASURING RADIO, CORE MELTDOWN OF LIGHT-WATER REACTORS, AND RISK ANALYSIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FILTER SYSTEM • KRYPTON • ACCIDENT, LOSS OF COOLANT • XENON • CORE MELTDOWN • GERMANY • OFF GAS • SAFETY PROGRAM • R AND D PROGRAM

004010
TSTLUMP MG
A SAMPLING SYSTEM FOR ATMOSPHERIC HT AND HTO
UNIVERSITY OF MIAMI, FLORIDA
3 PAGES, 3 FIGURES, IEEE TRANS. ON NUCLEAR SCIENCE, NS-21(1), PP. 510-512 (FEBRUARY 1974)

A SYSTEM IS BRIEFLY DESCRIBED, WHICH IS DESIGNED FOR THE SAMPLING OF TRITIUM GAS (HT AND T SUB 2) AND TRITIATED WATER VAPOR (HTO) IN THE AIR AT LEVELS FAR BELOW HPC AND DOWN TO PRESENT-DAY ATMOSPHERIC BACKGROUND LEVELS. THE TRITIUM GAS IS EXTRACTED FROM THE AIR BY CATALYTIC CONVERSION TO HTO AT AMBIENT TEMPERATURE. THE RESULTANT WATER IS ABSORBED ON MOLECULAR SIEVE CONTAINING THE HTO. THE SYSTEM IS WELL SUITED FOR FIELD WORK. PRESENT-DAY WORLD-WIDE HT LEVELS ARE ABOUT 2.5 PCI/MG AIR.

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A CONSECTIVE OF KEYWORDS IS USED TO DESCRIBE THE MAIN SAFETY RELATED ISSUES COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS CHOSEN REFERENCES TO EACH ARTICLE WHICH HAS BEEN MADE BY IT.

ABSORPTION
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ACCIDENT, MONITOR
007041 P 25 007101 P 35
ACCIDENT, RADIOISOTOPE
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SPECTRUM MEASUREMENTS OF SUBTERRANEAN	WATERS IN SOME SOUTH AFRICAN SITES*	019885 P 16
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SPECTRUM IN SURFACE	WATERS OF THE UNITED STATES, 1960*	027980 P 12
EVALUATION OF TRITIUM IN GROUND AND SURFACE	WATERS OF THE WESTERN UNITED STATES, APRIL 1960-DEC. 1969*	075973 P 19
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GENERAL ENVIRONMENTAL MONITORING REPORT: CALENDAR	YEAR 1970*	074591 P 29
OF SPECTRUM-85, CARBON-14, AND TRITIUM IN RECENT	YEARS* NATURAL CONCENTRATION	051102 P 17
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THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, NEW	ZEALAND.* MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF	051441 P 18

X Non-Compliance and Accident Reports

B - NON-COMPLIANCE AND ACCIDENT REPORTS

C07707
RECENT EP
REFUELING AND REPAIRS OF THE PM-3A DURING THE 1964-65 AUSTRAL SUMMER
NEW YORK OPERATIONS OFFICE, U. S. ATOMIC ENERGY COMMISSION
NYO-10736 O, 49 PAGES, 19 FIGURES, 2 TABLES, 11 REFERENCES, AMERICAN NUCLEAR SOCIETY CONFERENCE ON REACTOR OPERATING EXPERIENCE, JACKSON LAKE LODGE, WYOMING, JULY 29-30, 1965, ANS TRANSACTIONS, SUPPLEMENT TO VOLUME 8, PAGE 3

THE NUMBER ONE FORTY COVS WERE REQUIRED - 13 FOR REFUELING AND 127 FOR MAINTENANCE AND TESTING. REMOTES WERE ABLE TO USE SOLD TENSIONERS DIRECTLY WITHOUT REMOTE MANIPULATION OR HEAD REMOVAL BUT WERE JUMPED DURING HEAT REPLACEMENT BECAUSE THE STUD-OPERATING NUT ATTACHES OPPOSITE TO THE STUD NUT. CONTROL-ROD-DRIVE COLLETS ARE REPORTED AND WERE REPLACED. ROD-DRIVE ACTUATORS FAILED TWICE USED IN GROUPS BECAUSE OF EXCESSIVE CURRENT DEMAND. THREE ROD INTERNAL SHORTS IN THE COILS BECAUSE OF INTERNAL WIRE MOVEMENT LOOSENING THE POTTING, AND MOISTURE INTRUSION THROUGH ROD CABLE DEVICES AND CONNECTORS. ON STARTUP, A STEAM-GENERATOR WATER-LEVEL INDICATOR MALFUNCTIONED, AND THE SHELL WAS RUN DRY. MACH TIME WAS LOST BECAUSE PROCUREMENT AND ENGINEERING EVALUATION WERE DONE OFF-SITE.

FAILURE, EQUIPMENT • MAINTENANCE AND REPAIR • REACTOR, PWR • OPERATING EXPERIENCE SUMMARY • REFUELING • PM 3A (PWR) • REACTOR, MILITARY

C00000
INADVERTENT RADIATION CONTROL, TO SCHWARZ, INC., LANCASTER, PA.
SCHWARZ STROBOPHE D.I INC.
2 PAGES- AUGUST 27, 1965, ATOMIC ENERGY CLEARING HOUSE 1110030- 29-30 OCTOBER 25, 1965- RCO

A LETTER FROM DSLR INDICATES STACK DISCHARGES MAY BE ABOVE LIMITS. CONTAMINATION SURVEYS IMPROPERLY OR NOT DONE, CON AND FOOD IN SAME ROOMS, HAND CONTAMINATIONS UP TO 1 MREM WAS AS HIGH AS 50,000 D/M. PROTECTIVE GLOVES NOT USED PROPERLY. RESPIRATORS NOT PROPERLY FOLLOWED DECONTAMINATION.

ADMINISTRATIVE CONTROL • SOURCE, RADIATION • RADIATION SAFETY AND CONTROL • FAILURE, MAINTENANCE ERROR

C00000
A LETTER TO REVIEW CORRECTIVE ACTIONS PROPOSED BY DEAL-PRINTING FACILITY
U.S. NAVAL COMMUNICATION, NAVY DEPT
50 PAGES, LETTER - U.S. RADIUM CORPORATION TO DIVISION OF COMPLIANCE (REG) - APRIL 15, 1960

WE REQUEST YOUR CONSIDERATION OF THE FOLLOWING MAJOR TYPES OF GENERAL APPLICABILITY - ITEMS 1 AND 2) OLD FOUNDATION OF THE PROBLEM OF STACK ESSAYS TO UNDERSTANDING AREAS AND OUR APPLICATION OF AND DEVELOPMENT OF DISTRIBUTED AREAS, AS SUGGESTED BY OUR HEALTH PHYSICS CONSULTANT. BASED ON THE RELOCATION OF OUR PROPOSED DEAL PRINTING FACILITY AND CONSIDERING THE MEASUREMENTS WE HAVE MADE DURING THE PAST 6 TO 8 MONTHS RELATIVE TO THE CONTRIBUTION TO THE TOTAL PROBLEM OF RADIUM IN THE MAJOR AREAS OF OPERATION. RELEASE, WE BELIEVE THIS DEMONSTRATION OF DISTRIBUTED AREAS WILL COMPLETELY ELIMINATE THIS PROBLEM OF SUSPECTED NON-COMPLIANCE. [illegible] IN LINE WITH STANDARD AND GENERALLY ACCEPTED VALUES THE MAXIMUM PERMISSIBLE LEVELS OF CONTAMINATION WE PROPOSE TO ADHERE TO IN ALL APPLICABLE AREAS AND FOR ALL TYPES OF CONTAMINATION. [illegible] MEASUREMENTS WILL, IN THE FUTURE, BE MADE BY LIQUID SCINTILLATION COUNTING RATHER THAN BY INTERNAL GAS FLOW COUNTER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

RECOMPLIANCE • PERSONNEL EXPOSURE, RADIATION

C10000
DISCOVERY OF RADIOACTIVE MATERIAL FROM WELL AIR FORCE BASE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO
3 PAGES, LETTER - DEPARTMENT OF THE AIR FORCE, WRIGHT-PATTERSON AFB, TO DIVISION OF COMPLIANCE (REG) - APRIL 11, 1960

REPORTS LOSS, PROBABLY IN SHIPPING OF 53 LABORATORY COMPASSES (DIRECTIONAL).

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

DEPLETED MATERIAL • NONCOMPLIANCE • SOURCE, RADIATION, LOSS

C10000
DIVISION OF COMPLIANCE CITES COMPANY FOR UNAUTHORIZED POSSESSION OF TRITIUM
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
2 PAGES, LETTER - DIVISION OF COMPLIANCE (REG) TO SCHWARTZ DISTILLERS, INC. - MAY 1, 1963

BASED ON INFORMATION PUBLISHED ON APRIL 11, 1963, IT APPEARS THAT SCHWARTZ DISTILLERS, INC., POSSESSED ON THAT DATE A 2.0-MILLICURIE TRITIUM GAS CHROMATOGRAPH WITHOUT A VALID NRC LICENSE. ADDITIONALLY, THE TRITIUM GAS CHROMATOGRAPH WAS TRANSPORTED TO THE PLANT IN LAWRENCEBURG, INDIANA. ACCORDING TO OUR RECORDS, SCHWARTZ DISTILLERS, INC., HOLDS NO VALID LICENSE WHICH WOULD AUTHORIZE POSSESSION AND USE OF THE HYDROGEN MATERIAL IN QUESTION AT LAWRENCEBURG, INDIANA. IF THE INTENTION IS TO POSSESS AND USE THIS MATERIAL AT LAWRENCEBURG, IT WILL BE NECESSARY THAT AN

010646 [illegible]
APPLICATION FOR AN APPROPRIATE LICENSE BE FILED WITH THE COMMISSION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. (30 CENTS/PAGE -- MINIMUM CHARGE $2.00)

KEYWORDS STATES • NONCOMPLIANCE

010931
PRACE LIQUID RADIOACTIVE WASTE STORTINGS TO DUMP
UNIVERSITY OF MISSOURI, COLUMBIA
3 PAGES. LETTER - UNIVERSITY OF MISSOURI TO DIVISION OF COMPLIANCE (NRC) - SEPTEMBER 5, 1970

TECHNICIAN TELEPHONED TO ASK IF A REPRESENTATIVE OF THE RADIATION SAFETY OFFICE HAD PICKED UP THE CONTENTS OF HER 20-GALLON RADIOACTIVE-WASTE CONTAINER. IT HAD BEEN FULL AND SHE HAD GONE TO REQUEST THAT IT BE EMPTIED. BUT WHEN SHE CHECKED THAT MORNING SHE FOUND IT EMPTY. A NEW ADDITION, SHE HAD BEEN INSTRUCTED HOW TO EMPTY THE CLEARLY MARKED YELLOW DRUM, HAD EMPTIED THIS ONE THE NIGHT BEFORE. ON REGULAR SCHEDULE, THE CONTENTS LEFT THE MEDICAL CENTER WITH A GENERAL TRASH REMOVAL AT APPROXIMATELY NOON ON FRIDAY TO BE DELIVERED TO THE DUMP OPERATED BY THE CITY OF COLUMBIA. PRIOR THAT THE TREATMENT OF THE TRASH HAD BEEN CHANGED. INSTEAD OF BURNING, THE TRASH WAS BEING COMPACTED AND COVERED BY 3-FEET OF DIRT. BECAUSE THE TRASH WAS NOT BURNED, IT WAS CONSIDERED INAPPROPRIATE TO OBTAIN A DISMISSAL FOR EITHER OF THE TWO EQUIPMENT OPERATORS. BECAUSE THE TRASH FROM THE MEDICAL CENTER HAD ALREADY BEEN BURIED, NO ATTEMPT WAS MADE TO RECOVER IT. IT IS LIKELY, HOWEVER, THAT WE WILL FIND THAT 1 MCI OR LESS WAS THE QUANTITY ACTUALLY LOST.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. (30 CENTS/PAGE -- MINIMUM CHARGE $2.00)

KEYWORDS, OPERATED BEHAVIOR • REACTOR, RESEARCH • BYPRODUCT MATERIAL • NONCOMPLIANCE • WASTE DISPOSAL, LIQUID • COLLEGES AND UNIVERSITIES

011700
[illegible]
NORTHWESTERN UNIVERSITY TRITIUM SOURCE LOSS
NORTHWESTERN UNIVERSITY
2 PAGES. ATOMIC ENERGY CLEARING HOUSE 12(5)01. PAGES 10-14 (OCTOBER 4, 1960)

A 2.0-CURIE TRITIUM SOURCE TO BE USED AS AN ACCELERATOR TARGET WAS DISCOVERED MISSING IN AUGUST 1960. IN NOV 1959, THE SOURCE HAD BEEN DELIVERED FROM THE SHIPPING CONTAINER, WHERE IN A TRIAL RUN OF THE ACCELERATOR BEFORE COMPLETION OF THE EXPERIMENT CHAMBER, AND STORED IN AN ORANGE-JUICE CAN IN A LEAD-LINED CONTAINER BEHIND A WORKBENCH. APPARENTLY, CONSTRUCTION WORKERS HAD THROWN IT OUT.

FAILURE, OPERATED BEHAVIOR • RESOURCE, RADIATION, LOST • FAILURE, ADMINISTRATIVE CONTROL • ACCELERATOR

011940
NEW ENGLAND NUCLEAR CORPORATION CITED FOR NONCOMPLIANCE, AUGUST 8, 1960
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE. ATOMIC ENERGY CLEARING HOUSE 12(6)21. PAGE 19 (OCTOBER 17, 1960)

PROBLEMS ADMINISTRATIVE FAILINGS DESCRIBED, INCLUDING FAILURE TO TRACE CAUSES OF HIGH TRITIUM CONTENT IN WORK, DISCHARGING 6.5 CURIES OF TRITIUM TO SEWER SYSTEM, AND CONSISTENTLY INADEQUATE EVALUATION OF AMOUNT OF RADIOACTIVE WASTE RELEASED TO SEWERS.

NONCOMPLIANCE • SAFETY, RADIATION • WASTE DISPOSAL, LIQUID

013940
WILLIAM CE
TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1960
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
2 PAGES. ATOMIC ENERGY CLEARING HOUSE 12(5)01. PAGES 20-21 (OCTOBER 17, 1960)

(1) DURING THREE WEEKS IN EARLY OCTOBER 1960, A TECHNICIAN RECEIVED 3.4 REM INTERNAL EXPOSURE FROM TRITIUM DUE TO INADEQUATE AIR VELOCITY IN HOOD. THE PARTICULARLY SAFETY TECHNICIAN WELL NOT MEASURE AIR VELOCITY DURING ANY OPERATIONAL SURVEY. (2) DURING LATE OCTOBER, A SECOND CAPITS RECEIVED AN INTERNAL TRITIUM EXPOSURE DUE TO INADEQUATE DECONTAMINATION OF A VACUUM LINE BECAUSE HIS SUPERVISOR FAILED TO APPLY THE DECONTAMINATION.

EXPOSURE, RADIATION • RADIATION SAFETY AND CONTROL • FAILURE, ADMINISTRATIVE CONTROL

[illegible]
9 5 SUMMARY CHANGE 5 - MISC. ADMINISTRATION AND TESTING
DIVISION OF REACTOR LICENSING, UNITED STATES ATOMIC ENERGY COMMISSION
9 PAGES. FEBRUARY 5, 1967. DOCKET NO. 50-230

CHANGES INCLUDE ADE - (1) CHANGE IN ORGANIZATIONAL TITLES, (2) PROVIDE FOR TRITIUM MONITORING IN

[illegible] (CONTINUED)
WASTE DISPOSAL. [illegible] LESS FREQUENT EVACUATION [illegible]. [illegible] CLARIFY REPORTING RESPONSIBILITY [illegible]
STAFF HEALTH PHYSICIST. [illegible] AUTHO CHANGES 16 AND 17 REQUIREMENTS FOR RADIATION MONITORING DURING
FILTER TESTS. AND [illegible] ALLOW PCOR FAMILY IF A [illegible] TEST WITHIN 1 WEEK PRIOR SHOWS A FILTER FACTOR OF
1000 OR MORE.

AVAILABILITY - USARC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

KEYWORDS: NEWS COVERAGE • REACTOR, MONITORING • US SAVANNAH (PWR) • REACTOR, PWR • WASTE DISPOSAL • TEST, [illegible]
FILTER CONTAINMENT FILTERING SYSTEM • MECHANICAL SPECIFICATIONS • SAFETY EVALUATION • RADIATION MONITORS

015080
WET REACTOR HEAT EXCHANGER LEAK, FEBRUARY 25-26, 1967
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
1 PAGE. ATOMIC ENERGY CLEARING HOUSE 139188. PAGE 26 [illegible] 6, 1967) REPORT NO. 53-26

ELEVEN, FEBRUARY 27D 15 GA OF EXC TRITIUM CONCENTRATION [illegible] PRIMARY AND SECONDARY SYSTEM. NONE CONTAMINATES SECONDARY WATER WAS RELEASED. THE HEAT EXCHANGER
WELL OF PERMD. RECOMMENDED ASARC TO DISCHARGE SECONDARY WATER AT 5 GPM INTO SECONDARY SEWER BY
CHARLES RIVER.

EFFLUENT • REACTOR, PWR • MAINTENANCE, PERF • REACTOR, RESEARCH • WASTE DISPOSAL, [illegible] • [illegible], EQUIPMENT

015085
U.S. ARMY CORPORATION TRITIUM LEAK AND STACK-DISCHARGE
U.S. ARMY CORPORATION
2 PAGES. ATOMIC ENERGY CLEARING HOUSE 139188. PAGES 36-37. (MARCH 13, 1967)

U.S. ARMY CORP. REPORTS APR. 21 THE INCIDENTS. [illegible] APR. 16. [illegible] FILLING OF GAS TUBES.
SOLUBLE TRITIUM WAS MONITORED AT STACK AS [illegible] PER ANY PERIOD. THIS IS [illegible]
PLUMBING GAS TRANSFER TO PUMP STA. [illegible] APR. 23. [illegible] A REPAIR OF A GAS-FILLING TUBE. NO CAUSE
WAS LEFT, GIVING STACK DISCHARGE AS [illegible] PER [illegible] SUPPRESSION [illegible] ON [illegible] A [illegible]
DURING SOLUBLE [illegible]. STACK WAS NOT [illegible] MONITORED THAT DAY.

EFFLUENT • MONITOR, STACK • STACK • INCIDENT, EQUIPMENT

015109
[illegible] • [illegible]
A PEAK IN THE TRITIUM CONTENT OF ATMOSPHERIC [illegible] THE ACCIDENT AT WINDSCALE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, BOULDER, COLORADO
2 PAGES. 1 FIGURE. NATURE, 209(5263), PAGES 537-[illegible], (FEBRUARY 26, 1966)

A PEAK IN THE TRITIUM CONTENT OF SURFACE AIR DURING OCTOBER 1957 WAS ATTRIBUTED TO THE WINDSCALE
INCIDENT. THE TOTAL TRITIUM RELEASED COMPUTED BY ESTIMATES, BUT SINCE THE CONCENTRATION RETURNED
TO ITS NORMAL VALUE WITHIN EIGHT DAYS IT COULD NOT HAVE CONTRIBUTED SIGNIFICANTLY TO THE GLOBAL
INVENTORY.

INCIDENT, WINDSCALE

015316
[illegible]
US ARMY CORP. LISTS OF TRITIUM RELEASES JULY - DECEMBER 1966
U.S. ARMY CORP., PITTSBURGH, PA.
2 PAGES. ATOMIC ENERGY CLEARING HOUSE 139188. PAGES 32-33. (MARCH 27, 1967)

U.S. ARMY REPORTS (FEB. 17, 1967) 51 RELEASES OF TRITIUM ATC UNRESTRICTED AREAS IN EXCESS OF
MPC, AND 76 RELEASES OF TRITIUM ATC UNRESTRICTED AREAS OF 10 TIMES THE [illegible] LIMITS. ALL
WERE STACK DISCHARGES OF WATER FROM FACILITIES, CAUSED BY VARIOUS [illegible].

MISCHARGE RELEASE • EFFLUENT • STACK

015396
YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 77
YANKEE ATOMIC ELECTRIC COMPANY, WESTON
10 PAGES. 2 FIGURES. 1 TABLE. (DECEMBER 21, 1966. REPORT NO. 55-79

THE MAIN COOLING SYSTEM WAS HEATED TO 400 F AT 550 PSIG AND RELEASE TO 50PM 600 IN 24 HOURS TO ALLOW
COMPLETE EXPANSION OF HYDRAZIN FROM THE REACTOR VESSEL REPORT TEMPS. THE REACTOR CRITICAL. A LEAK
FROM THE PRIMARY TO THE SECONDARY SYSTEM WAS DETERMINED TO BE 36 GAL/DAY BY USING TRITIUM AS A
TRACER.

AVAILABILITY - USARC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

KEYWORDS: REPORT, OPERATIONS • REACTOR, PWR • TEST, LEAK RATE • YANKEE (PWR) • REACTOR, POWER •
OPERATING EXPERIENCE SUMMARY • TRACER • NOT GAS • MAIN COOLING SYSTEM

C10000
SELECTED YANKEE OPERATING EXPERIENCE.
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
9 PAGES, 2 FIGURES, 1 TABLE, MAY 26, 1967, DOCKET NO. 50-29, MAIN YANKEE NUCLEAR POWER STATION OPERATIONS REPORT NO. 70 FOR THE MONTH OF APRIL 1967

(1) CORE REACTIVITY CONTINUES SLOWLY AT 0.7% DELTA K/K PER 1000 MWD/MT. (2) INCREASING NO.-1 STEAM-GENERATOR CHLORIDE LEVEL HAS TRACED TO CHLORIDE CONTAMINATION OF THE MORPHOLINE ADDITIVE. AS OTHER INDICATORS OF TUBE-CORROSION TUBE LEAKS WERE ABSENT. (3) AN ACCIDENTAL RELEASE OF RECOMBINER GAS CONTAINED GASES. A ROUTINE SAMPLING OF THE PRESSURIZED GAS SPACE OVER THE RECIRCULATION TANK WHILE TO THE LOW-PRESSURE SURGE TANK WAS LEFT OPEN, ALLOWING BACKFLOW FROM SURGE TANK TO SAMPLE HOOD. 32 MICROCURIES OF BETA-GAMMA AND 63 MILLICURIES OF TRITIUM WERE RELEASED IN A 2-1/2-HOUR PERIOD.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

RECOMBINER RELEASE • HOLD DOWN • PARALLEL, OPERATION EFFECT • REACTOR, PWR • YANKEE ROWE (PWR) • RECOMBINER CHEMISTRY • INCIDENT, HUMAN ERROR • NOBLE GAS • CONTAINED • REPORT, OPERATIONS SUMMARY • STEAM GENERATOR • HEAT EXCHANGERS

C10000
T. H. SCHROLL CITED FOR NON-COMPLIANCE
SHIPPING B. SCHROLL, INC., LANCASTER, PA.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13:290, PAGES 28-29 (JULY 17, 1967)

DURING THE A JANUARY 10 INSPECTION RESULTED IN CITATION ON 5 ITEMS OF TRITIUM CONTAMINATION, DISCHARGE, AND SURVEY PROBLEMS. RESULTS OF SUBSEQUENT SURVEYS ARE NOT AVAILABLE FOR A MONTH AFTER DISCHARGE.

NONCOMPLIANCE • RADIATION SAFETY AND CONTROL

C10001
U.S. DISCHARGE CONTAMINATED REPORTS EXCESSIVE STACK DISCHARGE OF TRITIUM
UNITED STATES DISCHARGE CORPORATION, BLOOMSBURG, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13:290, PAGE 29 (JULY 17, 1967)

FROM 11 TO APRIL 1966 AND 2070. SOLUBLE TRITIUM WAS DISCHARGED ABOVE MPC FROM THROUGH THE OPERATIONS WASTE PROCESSING AND VACUUM PUMP IS WASTE TRANSFER DRAIN COLUMNS. THE PROBLEM WILL BE STUDIED FURTHER.

MISDISCHARGE RELEASE • MISTAKE

C17710
V. H. SCHROLL REPLIES TO COMPLIANCE CITATION OF MAY 11, 1967
PHOS. H. SCHROLL, INC., LANCASTER, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13:330, PAGE 20 (AUGUST 14, 1967)

TRITIUM, ALSO AT 111 PLANT WAS OVER DECONTAMINATED. (2) TRITIUM STACK RELEASE FROM NEW FACILITIES IS WELL WITHIN LIMITS. DOSE IS A PERSPECTIVE AREA. (3) WEEKLY SURVEYS ARE TAKEN OF TRITIUM RELEASED TO TRAPS. WATER SAMPLES TAKEN OF MASS LIMITS. (4) SURGE TESTS OF SCREENS FOR TRITIUM POINTING SPEED 1000 DPM/100 CC. POINTS TO A SEPARATE BUILDING WILL ELIMINATE MANY PROBLEMS.

NONCOMPLIANCE • CONTAMINATION • RADIOISOTOPE

C17373
PENNSYLVANIA STATE UNIVERSITY RECEIVES TRITIUM CONTAMINATED PACKAGE
PENNSYLVANIA STATE UNIVERSITY
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13:390, PAGE 33, (AUGUST 21, 1967)

(1) ON JULY 11 LOUISIANA STATE UNIVERSITY SHIPPED A PACKAGE CONTAINING 1 CURIE OF TRITIUM AS 1 % OF WATER. RECEIVED BY PENNSYLVANIA STATE UNIVERSITY ON JULY 10, 1967. THE PACKING MATERIAL WAS GREATLY CONTAMINATED, AND THE LEAD PLUG WITH STOPPER WOULDN'T TO BE BROKE. FURTHER INVESTIGATION UNDERWAY.

SHIPPING CONTAINER • TRANSPORTATION AND HANDLING • INCIDENT • RADIOISOTOPE

C17511
MIT GRANTED EXEMPTION FROM 10CFR 20 PROVISIONS RELATING TO DISCHARGE OF TRITIUM TO SEWER
AEC, DIVISION OF REACTOR LICENSING
2 PAGES, MARCH 8, 1967, DOCKET NO. 50-20, MIT RESEARCH REACTOR

A LEAKY HEAT EXCHANGER CONTAMINATED THE SECONDARY COOLING SYSTEM WITH ABOUT 12 CURIES OF TRITIUM. EXEMPTION WAS GRANTED TO DISCHARGE THIS CONTAMINATED WATER (20,000 GALS) INTO A SANITARY SEWER AT A CONTROLLED FLOW RATE TO ENSURE DILUTION IN THE SEWER BELOW MPC.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

C17511 [illegible]
DILUTION • DEBRIS, [illegible] • NRC • REACTOR, RESEARCH • WASTE DISPOSAL, [illegible] • WASTE DISPOSAL, [illegible] •
RADIATION SAFETY AND CONTROL

C16305
CASE INSTITUTE OF TECHNOLOGY REPORTS REFRIGERATOR EXPLOSION ENGINEERING ISSUES
CASE INSTITUTE OF TECHNOLOGY, CLEVELAND, OHIO
1 PAGE, ATOMIC ENERGY CLEARING HOUSE (1966), PAGE 29, [illegible]

BULLETIN, JULY 31) - 5 MICROCURIES OF CARBON-14 AND 2 MICROCURIES OF TRITIUM WERE IN A REFRIGERATOR WHICH EXPLODED JULY 26. RESULTING IN EXTENSIVE DAMAGE TO LAB. THE ISOTOPES WERE IN A BOTTLE CARBON, WERE CRUSHED AND FLUSHED DOWN THE DRAIN.

CARBON • REFRIGERATOR • INCIDENT • STORAGE CONTAINER • [illegible]

C16306
JOHNS HOPKINS U TRITIUM ACCIDENT
JOHNS HOPKINS UNIVERSITY, MCCELLON-HARTY INSTITUTE, BALTIMORE, MD.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE (1966), PAGE 29, [illegible]

BULLETIN, JUNE 16) - AN INDIVIDUAL PURCHASED 5 [illegible] OF 10 CURIES EACH OF TRITIUM [illegible] FROM BROOKHAVEN WITHOUT A LICENSE AND WITHOUT NOTIFYING PHYSICS DEPT. CHAIRMAN OR SAFETY OFFICER. PROCEDURES THAT THE INDIVIDUAL SET UP FOR HANDLING AND IN CASE OF BREAKAGE WERE TOTALLY INADEQUATE. TWO OTHER INDIVIDUALS RECEIVED [illegible] AND [illegible] DAYS. FOLLOWING A SPILL IN REFRIGERATOR [illegible] CENTRAL AIR CONDITIONING SOURCE. TRITIUM WAFER THROUGH THE BUILDING. BEFORE IT WAS TRACED. [illegible] CONTAMINATIONS - BAD PROG. WAS SEARCHED FOR UNLICENSED STUDIES, WHICH WERE DISCOVERED. [illegible] REPORTS NOTIFIED. ACC UNIVERSITY OF WAS DEMONSTRATED OF WILL TAKE A PERSONAL INTEREST IN PROCEDURE ENCOUNTERED BY RADIATION SAFETY OFFICER, WHOSE STAND IS [illegible].

VENTILATION SYSTEM • RECONTAMINATION • INCIDENT, [illegible] • [illegible] ISOTOPE • [illegible], ADMINISTRATIVE CONTROL

C20015
HARBOR NUCLEAR CIV. CITED FOR NON-COMPLIANCE FEBRUARY 20, 1967
HARBOR AIRCRAFT CORP., HARBOR NUCLEAR CIV., CALCOAST, SPRINGS, CALIFORNIA
1 PAGE, FEBRUARY 20, 1967, ATOMIC ENERGY CLEARING HOUSE, [illegible], PAGE [illegible], [illegible]

BULLETIN FEBRUARY 20) A DECEMBER 1966 CHECK REVEALED - ITEMS OF NON-COMPLIANCE CITED FOR FEBRUARY 1965 AND FEBRUARY 1966 INSPECTIONS. (1) INADEQUATE TRITIUM RADIATION SURVEYS, (2) EXPOSING HIGH-RADIATION-AREA INTERLOCKS WHEN HIGH RADIATION AREAS EXISTED, (3) SET ACCELERATOR TUBES MOVED IN UNRESPONSIBLE AREAS WITHOUT RADIATION SAFETY OFFICER'S AUTHORIZATION, [illegible] TRITIUM TARGET [illegible] NOT LABELED. AND COMPLIANCE DIVISION BELIEVES IMPROVEMENTS ARE NEEDED IN MANAGEMENT TO CONTROL RADIATION SAFETY PROGRAM.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C. 20452

NONCOMPLIANCE • INSTRUMENT, INTERLOCK • FAILURE, A ADMINISTRATIVE CONTROL • SURVEILLANCE FAILURE

C20020
TORCHLAB CITED FOR NON-COMPLIANCE MARCH 7, 1967
LABORATORY FOR ELECTRONICS, TORCHLAB CIV., WALTHAM, MASS.
2 PAGES, MARCH 7, 1967, ATOMIC ENERGY CLEARING HOUSE, [illegible], PAGE [illegible], [illegible]

A DEC. 1966 INSPECTION AFTER A FEB. 5 TRITIUM RELEASE [illegible] EXPLANATION [illegible] IN 2 ITEMS OF INADEQUATE SURVEYS. [illegible] MARCH [illegible] EMPLOYEE MUST REQUEST A SURVEY WHEN MOVING AREA, AND START STACK MONITOR. HOOD-VENTILATION SYSTEMS WERE NOT REVIEWED. [illegible] STORE WASTE IN HOODS OUT PACK BY IMMEDIATELY IN CLOSED CONTAINERS FOR DISPOSAL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C. 20452

TRITIUM • WASTE STORAGE • NONCOMPLIANCE • SURVEILLANCE PROGRAM

C20722
YANKEE STEAM GENERATOR TUBE REPAIRS
YANKEE ATOMIC ELECTRIC COMPANY, PESTER, MASS.
1 PAGE, YANKEE ATOMIC OPERATIONS REPORT NO. 70 FOR JULY 1967, PAGE [illegible], [illegible], [illegible]

SYSTEM LEAKAGE WAS 700 GALLONS WHEN SHUT DOWN FOR TUBE REPAIRS. [illegible] TUBE SHEET 19.6 GPD, WHILE 56-2 WAS 200 GPD FROM THE TUBE FROM NEAR THE TUBE SHEET. SAMPLE-CONTAINER HOLES WERE FOUND ON THE PRIMARY SIDES, WHILE 2 STEEL FABRICATION WELDS WERE FOUND IN THE SECONDARY. REACTOR PUMPS 1 AND 3 THRUST BEARINGS WERE REPLACED. SAFETY RELIEF SPRING NO. 10 CONTROL [illegible] STICKING AT 10 IN. OUT THE HAZARDS. THE ACCIDENTAL GAS RELEASE ON [illegible] WAS 32.2 MILLICURIES OF BETA-GAMMA AND 68.5 MILLICURIES OF GASEOUS TRITIUM. [illegible] INTO CHARGING PUMPS INCREASED BY FROM 5 TO 8.07, CAUSING CRUD WASTE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C. 20452

RADIOACTIVE RELEASE • EQUIPMENT • MAINTENANCE AND REPAIR • REACTOR, OPERATIONS • REACTOR, PWR • YANKEE ATOMIC (PWR)

C20722 [illegible]
* CORE * COOLANT [illegible] * FAILURE, SCRAM MECHANISM * [illegible], TUBING * STEAM GENERATOR

C21650
US ARCTUR CORP REPORTS EXCESSIVE TRITIUM RELEASES SEPT 27/28, 1967
U.S. ARCTUR CORP., RECCOPLAG, PA.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13853, PAGE 36 AND 37, DECEMBER 16, 1967, DOCKET NO. 50-219

LETTER, OCT. 24, 67) THE TRITIUM GLASS-TUBE-WELL-FACILITY STACK WAS MONITORED FOR 2 CONSECUTIVE 24-HR PERIODS SEPT. 27 AND 28 AND SHOWED [illegible] DISCHARGE EFFLUENTS EXCEEDED MPC BY A FACTOR OF 54.77 AND 63.48 DURING ROUTINE WORK. A AND B IS PROCESSING ON MINIMIZING CONCENTRATIONS AT THE SOURCE. [illegible] IS BEING CONVERTED TO [illegible] WHICH IS SCRUBBED/TRAPPED BY WATER IMPINGEMENT AND COVERING COLUMN.

[illegible] RELEASE * EFFLUENT * SCRUBBER * STACK

C21619
TRITIUM RELEASE FROM PET REACTOR DUE TO HEAT EXCHANGER LEAK
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13180, PAGES [illegible] MAY 1, 1967

LETTER, MARCH 20 A TUBE LEAK WAS INDICATED FEB. 21 AND PROVED ON FEB. 23. 60 LITERS OF D2O, CONTAINING 67.0 CURIES OF TRITIUM, WERE LEAKED INTO THE 23,000-GAL SECONDARY SYSTEM. WATER SAMPLES FROM TUBE REACTOR-CONDITIONS DEMONSTRATE MPC SHIP CONA THE COOLING TOWER WERE 0.29 TO 0.91 PICOCURIES/LITER. ORLCA MPC. RECOVERY TO THE SEWER AND COOLING TOWER EVAPORATION WERE [illegible] MPC.

EFFLUENT * REACTOR, PWR * DOMESTICATION * [illegible], TUBING * HEAT EXCHANGERS

C21710
MAINTENANCE OF
U.S. ARCTUR CORP. REPORTS * EXCESSIVE STACK DISCHARGES
U.S. ARCTUR CORP., RECCOPLAG, PA.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13180, PAGES 21-22 MAY 1, 1967

LETTER, MARCH 22) DISCHARGES DURING THE FIRST QUARTER OF 1967 WERE 19.20, 124.39, 63.44, 221.77, 19.44, AND 61.76 TIMES MPC PROBABLY INSTANTANEOUS CONCENTRATION OF TRITIUM GAS IN WATER TO MTC. SO THAT PERMISSIBLE CONCENTRATIONS OF [illegible] IN A FACILITY WITH [illegible] MAINTENANCE WELL PROBABLY RESULT IN CONCENTRATIONS OF MORE THAN MPC.

[illegible] RELEASE * COMMERCIAL REACTOR * MPC * STACK * [illegible]

C20304
SEPARATION OF
[illegible] COMPLIANCE CITATION OF US ARCTUR
US ARCTUR CORPORATION, MERRISTOWN, N. J.
3 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14213, PAGE 19-21 MAY 20, 1968

LETTER, APRIL 12) A NOV. 1967 INSPECTION REVEALED SEVERAL SPECIFIC ITEMS INVOLVING INADEQUATE SURVEYS OF AIRBORNE TRITIUM AND A OTHER ISOTOPES, POOR INADEQUATE RECORD KEEPING, INSUFFICIENT DECONTAMINATION AND SAFETY INSTRUCTIONS, AND FAILURE TO REPORT EXCESSIVE AIRBORNE CONCENTRATION EXPOSURE TO ARC. [illegible] THESE ARE SIMILAR TO ONES IN OUR MAY 20, 1967, CITATION. WHICH INDICATED INADEQUATE MANAGEMENT CONTROL. STEPS SPECIFIED BY U.S. ARCTUR IN AUG. 15 AND OCT. 5 CORRESPONDENCE AND AT SEPT. 27 MEETING AND DEMONSTRATED INEFFECTIVE IN NOV CHANGE. [illegible] ARCTUR FACILITY REPAIRS GASSED CONTAMINATED AND POORLY VENTILATED. NEVERTHELESS, IMPORT, [illegible] RESULTS, AND SOME OF THESE PROBLEMS ALSO [illegible] WITH [illegible]-PRODUCT MATERIAL.

[illegible] RELEASE * [illegible] * [illegible] * [illegible] * [illegible] * [illegible] * [illegible] * [illegible] * [illegible]

C19525
SELECTED TOPICS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY, MASSACHUSETTS
[illegible] 5 PAGES, YANKEE [illegible] REPORT NO. 116, AUGUST 1970, DOCKET NO-29, [illegible]

ONE OF A SERIES OF MONTHLY OPERATING REPORTS. REACTOR WAS SHUT DOWN TO REPAIR [illegible] LEAKS IN THE NO.1 AND 3 STEAM GENERATORS. PRIMARY-TO-SECONDARY LEAK RATE INCREASED FROM 520 TO 1007 GPD IN 21 DAYS. MAINTENANCE REQUIRED 10 DAYS. TUBES PLUGGED BY USING THE EXPLOSIVE WELDING TECHNIQUE. LIQUID RELEASE CONTAINED 0.044 MC OF GROSS BETA-GAMMA ACTIVITY AND 98.05 CURIES TRITIUM. GASEOUS RELEASE REPORTED 1.76 CURIES OF GROSS BETA-GAMMA ACTIVITY AND 5.4 MC OF TRITIUM. SECONDARY PLANT WATER DISCHARGE CONTAINED [illegible] MC OF BETA-GAMMA AND 73.03 CURIES OF TRITIUM. MISC 3.44 CURIES OF TRITIUM RELEASED AS VAPOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MAINTENANCE AND REPAIR * REPORT, OPERATIONS * REACTOR, PWR * WASTE DISPOSAL * YANKEE ROWE [illegible] *

C27525 CONTINUED
RADIOACTIVITY RELEASE * MAIN COOLING SYSTEM * FAILURE, TUBING * STEAM GENERATOR * LEAK * OPERATING EXPERIENCE

C28573
ICN 60
NONCOMPLIANCE CITATION
U.S. ATOMIC ENERGY COMMISSION
LETTER TO U.S. RADIUM CORPORATION, SEPT. 19, 1960

A JULY 1960 INSPECTION REVEALED THAT (1) AIRBORNE TRITIUM CONCENTRATIONS SAMPLES WERE NOT MADE, (2) TRITIUM CONTAMINATION EXCEEDED LIMITS, (3) AIRBORNE RADIUM CONCENTRATION EXCEEDED LIMITS. IN ADDITION, WE NOTE (4) RADIUM AND 2 DIRECTIONS ARE UNDERSTRIKE AREAS, SO DIFFUSION CALCULATIONS ARE NOT APPROPRIATE. CALCULATIONS WERE NOT SUPPORTED BY METEOROLOGICAL DATA. (5) EACH STACK WAS CONSIDERED INDIVIDUALLY, EVEN ALL STACKS MAY BE RELEASING AT SAME TIME. (6) TRITIUM IS IMPINGED WATER SAMPLES AND URINE SAMPLES WERE 300 MILLIONTH ACTUAL CONCENTRATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE * DIFFUSION * BYPRODUCT MATERIAL * STACK * RADIUM * RADON * CONTAMINATION * CYLINDER GAS

C29142
CITATION CORRESPONDENCE
UNITED STATES RADIUM CORPORATION
LETTER TO COMPLIANCE, OCTOBER 6, 1960

REGARDING THE CITATIONS SEPT. 19, WE ARE SUBMITTED AT A RNC & ESCAPED CONTAMINATION AS THESE WERE INADVERTENT SPILLS BEING CLEANED UP. (1) - DURING 2 OPERATING CYCLES, OPERATION WAS EXCEEDED RCM 1PC 20 LIMIT FOR 60 MINS. THIS CHECKS WITH URINE SAMPLING. (2)(3) - WE HAVE ASKED ASSISTANCE TO REMOVE FIRST RADIUM CONTAMINATION. A NEW CONTROL PROGRAM IS EFFECTIVE. DAILY WIPE SAMPLES ARE NO RESPONSIBLE WHEN CLEANED UP. (3) - THE AREA HAS BEEN CUT OF 24 STATION SINCE LATE 1960 AND HAS NOW BEEN LOCKED. (4) TRITIUM RELEASE PARAMETERS IN 1960 HAVE BEEN WITHIN SITE STANDARDS. (4) THE STACK SUMMATION METHOD HAS USED TO TREAT THE SEVERAL STACKS AS BY ONE SOURCE, USING LEAST FAVORABLE METEOROLOGY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL * RADIUM, CONTINUOUS * COMPLIANCE * RADIUM * CONTAMINATION * RADIOACTIVITY RELEASE * FAILURE, DEFINE,TRATIVE CONTROL * RADIUM, MATERIAL

C30279
CORRESPONDENCE ON TRITIUM PAINTING
THEODORE D. SCHWARTZ, INC.
2 PAGES, LETTER TO COMPLIANCE, OCTOBER 3, 1960

IN ANSWER TO CITATION OF SEPT. 26, 1960 - (1) ALCOVE-NOT SUBJECT TO MAIN EXHAUST IS OF 50.. AND CONTAINED AND SAMPLES SHOW WITHIN LIMITS. (2) THESE TESTS HAVE BEEN PERFORMED FOR YEARS BY THE MATERIAL SUPPLIER. SATISFACTORY TO PREVIOUS REC INSPECTIONS. (3) AIR SAMPLES SUBMITTED OF PAINTING ROOM WERE SATISFACTORY. (4) FOR SPECIAL ASSURE THAT THIS DOES NOT INCREASE AIRBORNE ACTIVITY FROM TRITIUM STORED THERE. (5) CERTIFICATION OF SUPPLIER TO PAINT INVESTIGATION AND IMPROVED REGULATED. (6) SAMPLES FROM OUTSIDE FACILITY ARE INADEQUATE. STACK DISCHARGES ARE BELOW MPC. SHOULD CONTINUE TO BE USED WITH DILUTION CALCULATIONS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE * DILUTION * ALCOVE DCR * BYPRODUCT MATERIAL * VENTILATION SYSTEM * COMPLIANCE * RADIUM * SURFACE, POINTED * MANUFACTURING PROCESS, ENVIRONMENTAL

C32204
SHIPMENT RADIATION LEVELS 20 R/HR
PITTSBURGH TESTING LABORATORY
1 PAGE, TWX TO NRC-COMPLIANCE, NEW JERSEY, JANUARY 24, 1961

ON 20-102 RADIOGRAPHY SOURCE WAS RECEIVED FROM OUR SALT LAKE CITY OFFICE, INDICATING 20 R/HR ON ONE SIDE OF THE SHIPPING CONTAINER. WE ARE TRACING SHIPMENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

TRANSPORTATION AND HANDLING * RADIATION SAFETY AND CONTROL * RADIOGRAPHY * SHIPPING * FAILURE, ADMINISTRATIVE CONTROL

C36066
NONCOMPLIANCE CITATION FOR UNAUTHORIZED TRANSFER AND POSSESSION OF TRITIUM
U.S. ATOMIC ENERGY COMMISSION

030066 (CONTINUED)
7 PAGES, LETTERS TO ARMY MOBILITY EQUIPMENT COMMAND, MARCH 7, 1969

A NOVEMBER 13, 1966, INVESTIGATION REVEALED LEAKAGE CONTAINING TRITIUM WERE TRANSFERRED OCT. 1966 FROM ENDICOTT CAP MILITARY RES. TO DEFENSE SUPPLY AGENCY, WHICH DID NOT POSSESS A VALID NRC LICENSE TO RECEIVE AND POSSESS TRITIUM. THIS IS CONTRARY TO 10 CFR 30.3 ON UNLICENSED USE OF MATERIAL. SOME OF THE LEAKAGE COMPASSES WERE EVENTUALLY SOLD TO THE GENERAL PUBLIC.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545. 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

LICENSE STATUS • BYPRODUCT MATERIAL • NONCOMPLIANCE • FAILURE, ADMINISTRATIVE CONTROL • CONSUMER PRODUCT

033694
T.B. SCHWARTZ JR LANCASTER, PA. CITED FOR NONCOMPLIANCE WITH LICENSE AND 10CFR20 (TRITIUM)
THEODORE B. SCHWARTZ, INC., LANCASTER, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 191330, PAGE 29 (AUGUST 10, 1971)

EXCESSIVE AMOUNT OF RADIOACTIVE MATERIAL (TRITIUM) RELEASED FROM STACK AS INDICATED BY MEASUREMENTS MADE OF MAIN STACK EXHAUST SINCE MARCH 1966. NO RECORDS MAINTAINED OF TESTS CONDUCTED AS REQUIRED BY LICENSE. EXCESSIVE AMOUNT OF REMOVABLE RADIOACTIVE CONTAMINATION ON FLOOR AND OTHER SURFACES IN UNRESTRICTED AREA. *** CONDITIONS MUST BE CORRECTED AND APPROPRIATE RESPONSE MADE.

SURFACE CONTAMINATION • WASTE DISPOSAL, ATMOSPHERIC • STACK • ACCIDENT, RADIOISOTOPE • WASTE DISPOSAL, GAS • INCIDENT, UNCORRECTED • RADIOACTIVITY RELEASE • FAILURE, ADMINISTRATIVE CONTROL

070070
U. S. RADIUM CORPORATION EMPLOYEE RECEIVES OVERDOSE OF TRITIUM
U. S. RADIUM CORPORATION
2 PAGES, LETTER TO DIRECTOR, DIVISION OF COMPLIANCE, SEPTEMBER 8, 1969

BECAUSE OF A FAULTY GAS-FILL SYSTEM MANIFOLD AND SEAL AND FAULTY OPERATION OF THE MONITOR SYSTEM AN EMPLOYEE RECEIVED AN OVERDOSE OF AIRBORNE TRITIUM. CALCULATIONS INDICATED PROBABLE EXPOSURE TO CONCENTRATION 15.6 TIMES PERMISSIBLE 40-HR WEEK LIMIT FOR RESTRICTED AREA. INVESTIGATIONS REVEAL SHORTCOMINGS OF TRITIUM MONITORS. ADDITIONAL MONITORING EQUIPMENT WILL BE UTILIZED IN FUTURE AND MORE RIGID CONTROL OF MONITORING BEFORE RE-ENTERING RESTRICTED AREAS.

PUBLIC DOCUMENT ROOM, 1717 H. STREET, WASHINGTON, D. C. 20545

AIRBORNE RELEASE • VENTILATION SYSTEM • FAILURE, INSTRUMENT • PERSONNEL EXPOSURE, RADIATION • INCIDENT, UNCORRECTED • FAILURE, ADMINISTRATIVE CONTROL

030079
EMPLOYEES INHALE AIRBORNE RADIOACTIVE MATERIAL (TRITIUM)
UNITED STATES RADIUM CORPORATION
5 PAGES, LETTER TO DIRECTOR, DIVISION OF COMPLIANCE, SEPTEMBER 10, 1969

THREE EMPLOYEES BREATHED AIRBORNE RADIOACTIVE MATERIALS IN A RESTRICTED AREA IN EXCESS OF 10CFR20. DAILY URINE SAMPLES INDICATED AN INCREASE VARYING FROM 3-11 MICROCURIES/LITER. *** CONTAMINATION WAS CAUSED BY IMPROPER VENTILATION OF AN OPERATION NOT PREVIOUSLY PERFORMED IN THE BUILDING, INVOLVING 15-20 TIMES AMOUNT OF TRITIUM NORMALLY WORKED WITH. PROGRAM TRANSFERRED TO GLOVE BOX WITH HIGH VENTILATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545. 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

INCIDENT, EXPOSURE • AIRBORNE RELEASE • VENTILATION SYSTEM • ANALYTICAL TECHNIQUE • PERSONNEL EXPOSURE, RADIATION • INCIDENT, UNCORRECTED • EXCRETION, URINE

030795
REPORTED LOSS AND SUBSEQUENT RECOVERY OF 2 TRITIUM SOURCES
U.S. ATOMIC ENERGY COMMISSION • BARBER-COLMAN COMPANY
3 PAGES, LETTERS BETWEEN BARBER-COLMAN CO. AND U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE, SEPTEMBER 8, 1969

ON JUNE 27, 1969, BARBER-COLMAN CO. REPORTED TO THE DIV. OF MATERIALS LICENSING THE LOSS OF TWO DETECTORS CONTAINING TRITIUM SOURCES (SHIPPED TO A CUSTOMER). AUG. 27, 1969, BARBER-COLMAN CO. REPORTED THE SOURCES FOUND AND DELIVERED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545. 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

COMPLIANCE • SOURCE, RADIATION, LOST

070420
NONCOMPLIANCE OF LICENSE BY NON-CERTIFICATION OF SPECIFICATIONS DESCRIBED IN LICENSE
U.S. ATOMIC ENERGY COMMISSION

C99620 RECONTINUED
2 PAGES, LETTER TO TRITIUM AMERICA, INC. [illegible]

COMPANY IMPORTS TRITIUM(S) WITH [illegible] SPECIFICATIONS. THE ORIGINAL LETTER OF [illegible] WERE SENT ON [illegible] 1984.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, [illegible]
CHARGE: 02.000

COMPLIANCE + RECORDKEEPING

C99021
TRITIUM IMPORTED INTO UNITED STATES FOR USE IN TIMEPIECES
PULSAR WATCH COMPANY, INC.
1 PAGE, LETTER - PULSAR WATCH COMPANY TO DIVISION OF MATERIALS LICENSING - DECEMBER [illegible] 1984

STATES THAT DURING CALENDAR PERIOD ENDING JUNE 30, 1984, THE COMPANY IMPORTED [illegible] UNDERGOING-1 STRUTTAR AS APPLIED TO TIMEPIECES [illegible]

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, [illegible]
CHARGE: 02.000

BYPRODUCT MATERIAL + MANUFACTURING, ARC + RADIOISOTOPE + [illegible] NUCLEAR MATERIAL + MISCELLANEOUS [illegible]

C96056
QUANTITY OF TRITIUM IMPORTED FOR FISCAL YEAR 1984
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
1 PAGE, LETTER - ARC DIVISION OF COMPLIANCE TO PULSAR WATCH COMPANY - [illegible]

STATES THAT ANNUAL REPORTS SHOULD REFLECT ACTUAL QUANTITY OF TRITIUM IMPORTED. LETTER OF [illegible] TO ARC INDICATED THAT 2100 CURIES HAD BEEN IMPORTED WITH AMOUNT [illegible] FISCAL YEAR 1984. PULSAR COMPANY. A SIGNIFICANT ITEM OF NONCOMPLIANCE WAS NOTED AND FISCAL YEAR 1984.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, [illegible]
CHARGE: 02.000

NONCOMPLIANCE + FAILURE, ADMINISTRATIVE CONTROL + INCORRECT [illegible]

C01100
NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
ARC, DIVISION OF COMPLIANCE
2 PAGES, LETTER - ARC DIVISION OF COMPLIANCE TO [illegible] - [illegible] 1984

NONCOMPLIANCE ITEMS INCLUDE [illegible] CONCENTRATION [illegible] RECORDS MAINTENANCE OF REQUIRED TESTS, [illegible] TRITIUM UP TO 15,000 CPM/100 CM2, [illegible] TRITIUM AT UNRESTRICTED SEWER AREA.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, [illegible]
CHARGE: 02.000

GLOVE BOX + BYPRODUCT MATERIAL + NONCOMPLIANCE + [illegible] + RADIOACTIVITY RELEASE + RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + FAILURE, ADMINISTRATIVE CONTROL + [illegible] LABORATORY

C01159
UNAUTHORIZED POSSESSION OF TRITIUM TARGET
ARC, DIVISION OF COMPLIANCE
1 PAGE, LETTER - ARC DIVISION OF COMPLIANCE TO UPSALA COLLEGE - DECEMBER 10, 1984

STATES THAT THE COLLEGE POSSESSES A [illegible]-CURIE TRITIUM TARGET WITHOUT A VALID LICENSE AND THAT APPLICATION SHOULD BE SUBMITTED

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, [illegible]
CHARGE: 02.000

BYPRODUCT MATERIAL + COMPLIANCE + REGULATION, ARC + FAILURE, ADMINISTRATIVE CONTROL + COLLEGES AND UNIVERSITIES

C01356
NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
ARC, DIVISION OF COMPLIANCE
2 PAGES, LETTER - ARC DIVISION OF COMPLIANCE TO LUMINOUS PROCESSES, INC. - DECEMBER 12, 1984

INSPECTION IN NEWARK REVEALED A VIOLATION WITH CONSISTENT OF INADVERTENT FABRICATION OF ABOVEGROUND TRITIUM CONCENTRATIONS IN RESTRICTED AREAS, AND EFFLUENT TO UNRESTRICTED AREAS.

061355 *CONTINUED*
EFFLUENT * *FAILURE * BYPRODUCT MATERIAL * *COMPLIANCE * *MONITOR, AIR * RADIOACTIVITY RELEASE * *SURVEY * HOT LABORATORY

061365
POSSESSION OF SOURCE WITHOUT A LICENSE
AEC, DIVISION OF COMPLIANCE
2 PAGES. LETTER - AEC DIVISION OF COMPLIANCE TO TENNECO CHEMICALS, INC. - JULY 22, 1969

STATES THAT COMPANY POSSESSES A 250-MILLICURIE TRITIUM SOURCE IN A CHROMATOGRAPHY DETECTOR CELL AND THAT A LICENSE IS REQUIRED FOR POSSESSION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL * SOURCE, RADIATION * COMPLIANCE * *FAILURE, ADMINISTRATIVE CONTROL

061503
NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
AEC, DIVISION OF COMPLIANCE
2 PAGES. LETTER - AEC DIVISION OF COMPLIANCE TO LUMINOUS PROCESSES, INC. - AUGUST 5, 1969

INSPECTION IN APRIL, JUNE, AND JULY REVEALED THAT EVALUATIONS OF AIRBORNE TRITIUM CONCENTRATIONS IN RESTRICTED AREA AND OF EFFLUENT TO UNRESTRICTED AREA WERE NOT ADEQUATE. CONCENTRATIONS OF 15.9 PICO-MICRO-CURIES WERE OBSERVED IN EMPLOYEE BREATHING ZONES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL * *COMPLIANCE * *MONITOR, GAS * *FAILURE, ADMINISTRATIVE CONTROL * MONITORING SYSTEM, RADIATION * HOT LABORATORY * INDUSTRIAL SAFETY

061502
CONTROL OF RADIATION SAFETY
AEC, DIVISION OF COMPLIANCE
3 PAGES. LETTER - AEC DIVISION OF COMPLIANCE TO LUMINOUS PROCESSES, INC. - JUNE 6, 1969

STATES THAT RESPONSE TO PREVIOUS NONCOMPLIANCE LETTER IS NOT SUFFICIENT AND REQUESTS ADDITIONAL INFORMATION CONCERNING STEPS TAKEN TO STRENGTHEN MANAGERIAL CONTROL OF RADIATION SAFETY ASPECTS OF TRITIUM PROGRAM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL * COMPLIANCE * *MONITOR, GAS * *RADIATION SAFETY AND CONTROL * *FAILURE, ADMINISTRATIVE CONTROL * INDUSTRIAL SAFETY

061503
NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
AEC, DIVISION OF COMPLIANCE
4 PAGES. LETTER - AEC DIVISION OF COMPLIANCE TO LUMINOUS PROCESSES, INC. - APRIL 10, 1969

INSPECTION IN JAN. AND FEB. 1969 REVEALED THAT NONCOMPLIANCE ITEMS - (1) INADEQUATE EVALUATIONS OF RADIATION HAZARDS INCIDENT TO USE OF TRITIATED PAINT - 5 EMPLOYEES EXHIBITED QUARTERLY AVERAGE TRITIUM EXCRETION DATA IN EXCESS OF 20 MICROCURIES/LITER OF URINE ON 9 OCCASIONS IN 1968. (2) RICASSAYS FOR TRITIUM NOT PERFORMED PROMPTLY. (3) TEN DRUMS OF WASTE NOT LABELED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL * *COMPLIANCE * *PERSONNEL EXPOSURE, RADIATION * RADIATION SAFETY AND CONTROL * *FAILURE, ADMINISTRATIVE CONTROL * HOT LABORATORY

061645
CASTO OP
CONTAMINATION AT TRITIUM PAINTING ESTABLISHMENT
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
1 PAGE, NUCLEAR SAFETY, 11(1), PAGE 64 (JANUARY-FEBRUARY 1970)

AN UNRESTRICTED AREA AT T.R. SCHWARTZ, INC., LANCASTER, PA. PLANT WAS CONTAMINATED WITH TRITIUM IN JUNE AND OCTOBER 1968. IN MARCH 1969 THE ACTIVITY WAS 18,000 TO 25,000 DPM/100 SQ CM. LIMIT FOR TRANSFERRABLE TRITIUM CONTAMINATION IS 1000 DPM/SQ CM. CONTAMINATION ON THE PASS BOX SHELF (RESTRICTED AREA) WAS 43,000 CPM/SQ CM. CONTAMINATION IN VARIOUS RESTRICTED AREA WAS GREATER THAN 10,000 DPM/SQ CM.

*CONTAMINATION

043005
MAN AT U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE REPAIRING EQUIPMENT
U.S. RADIUM CORPORATION
2 PAGES, LETTER TO DIVISION OF COMPLIANCE FROM U.S. RADIUM CORPORATION, JANUARY 7, 1970

THE DAILY URINE SAMPLE SHOWED THAT AN EMPLOYEE RECEIVED 1.6 TIMES WEEKLY DOSE OF TRITIUM WHILE REPAIRING A DEFECTIVE MANOMETER GAUGE. INDIVIDUAL CONSIDERED IT HIS PREROGATIVE AS A MEMBER OF MANAGEMENT TO DECIDE WHETHER OR NOT TO RISK LOW-LEVEL EXPOSURES. HE WAS INFORMED THAT THE RADIATION PROTECTION OFFICER IS TO BE NOTIFIED OF ALL NONROUTINE RADIOACTIVE OPERATIONS AND THAT THE RPO IS TO DECIDE UPON THE MONITORING AND PROCEDURES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FAILURE, OPERATOR ERROR * *INHALATION * *PERSONNEL EXPOSURE, RADIATION * *FAILURE, ADMINISTRATIVE CONTROL

044041
EXPOSURE OF AN EMPLOYEE TO TRITIUM
TRACERLAB, WALTHAM, MASSACHUSETTS
4 PAGES, LETTER - TRACERLAB TO DIVISION OF COMPLIANCE (AEC) - MARCH 30, 1970

WHILE TRANSFERRING A SOLID PRODUCT FROM A FLASK TO A VIAL USING A SPATULA, WORKER RAISED HOOD WINDOW FOR BETTER VIEW. SHE WAS IN LAB FOR 2.75 HR. TRITIUM URINALYSES INDICATED A TOTAL INTERNAL DOSE OF 153 MREM FOR THE PERIOD OF MARCH 3 THROUGH MARCH 16, 1970. EMPLOYEE WILL RECEIVE ADDITIONAL TRAINING. CLOSER SUPERVISION WILL BE PROVIDED. FOR TRANSFERS OF MATERIAL WINDOWS WILL BE CLOSED AS FAR AS POSSIBLE OR WORK WILL BE DONE IN A DRY BOX.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*INCIDENT, EXPOSURE * FAILURE, OPERATOR ERROR * INHALATION * BYPRODUCT MATERIAL * *PERSONNEL EXPOSURE, RADIATION * *INCIDENT, HUMAN ERROR * INCIDENT, NONREACTOR * RADIOCHEMICAL PROCESSING * SOLID * HOT LABORATORY

044040
CONTAMINATION OF TWO PERSONS WITH TRITIUM
UNIVERSITY OF IOWA, IOWA CITY
24 PAGES, LETTER - UNIVERSITY OF IOWA TO DIVISION OF COMPLIANCE (AEC) - MARCH 9, 1970

THE STAFF MEMBERS OF RADIATION RESEARCH LABORATORY WERE EXPOSED TO 35 MICROCURIES OF TRITIUM IN THE FORM OF TRIPHENYL. APPLICATION OF EXCESSIVE PRESSURE TO A SYRINGE CAUSED THE NEEDLE TO POP OFF. SOLUTION SPRAYED ON THE TWO PERSONS. BLOOD AND URINE SAMPLE COUNTS WERE ONLY SLIGHTLY HIGHER THAN BACKGROUND. PARTIAL SKIN CONTAMINATION WAS NOT OFF AT ONE LOCATION. ACCIDENT WAS AN OPERATIONAL ERROR SINCE THE TECHNIQUE BEING USED HAD BEEN DONE SUCCESSFULLY IN THE PAST.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*INCIDENT, EXPOSURE * FAILURE, OPERATOR ERROR * BYPRODUCT MATERIAL * *CONTAMINATION * *PERSONNEL EXPOSURE, RADIATION * *INCIDENT, HUMAN ERROR * INCIDENT, NONREACTOR * RADIOLOGY * *PRESSURE, SKIN * *RADIOPHARMACEUTICAL

047157
TWO OVEREXPOSURES REPORTED (AIRBORNE EFFLUENT, TRITIUM)
U.S. RADIUM CORPORATION
2 PAGES, LETTER - U.S. RADIUM CORPORATION TO DIVISION OF COMPLIANCE (AEC) - OCTOBER 17, 1969

DAILY BREATHING-ZONE SAMPLES FOR THE EMPLOYEES SHOWED EXPOSURES OF 1.03 AND 1.16 TIMES THE 40-HOUR WEEK LIMIT RESPECTIVELY, FOR THE WEEK OF SEPTEMBER 15 THROUGH SEPTEMBER 21, 1969. THE EMPLOYEES INVOLVED WERE IMMEDIATELY RESTRICTED FROM ALL WORK WITH RADIOACTIVE MATERIALS. THE CAUSE OF THE EXPOSURE WAS A LACK OF ADEQUATE WRITTEN PROCEDURES FOR THE LEVEL VIAL OPERATION AND POOR COMMUNICATION BETWEEN PRODUCTION AND HEALTH PHYSICS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*AIRBORNE RELEASE * BYPRODUCT MATERIAL * *COMPLIANCE * *PERSONNEL EXPOSURE, RADIATION * *RADIOCHEMICAL PLANT SAFETY

047229
LAMBERT DE * SHARP DA * DOWSON RP
AN ACCIDENTAL INTAKE OF TRITIATED WATER
RADIOLOGICAL PROTECTION SERVICE * SOCIAL SECURITY AND MEDICAL RESEARCH COUNCIL, ENGLAND
9 PAGES, 1 FIGURE, 1 TABLE, 14 REFERENCES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 32(10), PP. 682-686 (OCTOBER 1971)

PRESENTS DATA ON AN ACCIDENTAL INTAKE OF TRITIUM WHICH RESULTED IN ABOUT 400 MCI OF TRITIUM DISTRIBUTED THROUGHOUT THE BODY WATER OF ONE MAN. THE URINARY EXCRETION AND LOSS OF TRITIUM FROM BLOOD WERE FOLLOWED OVER A PERIOD OF TIME WHICH ALLOWED A PRECISE ESTIMATE OF DOSE TO BLOOD AND

C47229 *CONTINUED*
BODY TISSUES TO BE CALCULATED. IN ADDITION, LYMPHOCYTE CHROMOSOME ABERRATIONS WERE SCORED IN BLOOD SAMPLES AND ATTEMPTS WERE MADE TO CORRELATE DOSE AND ABERRATION YIELD. THE REASONS FOR THE DIFFICULTIES INVOLVED IN DOSE-EFFECT CORRELATIONS IN SUCH CASES ARE DISCUSSED.

ACCIDENT * BIOLOGICAL EFFECT * CONCENTRATION * DOSE * EXPOSURE, ACUTE * EXPOSURE, SKIN * WHOLE BODY * BODY FLUID * EXPOSURE, RADIATION * GAS * ABSORPTION * CHROMOSOMAL * RADIATION EFFECT * PERSONNEL

C40187
NRC INSPECTION CALLS FOR RE-EVALUATION OF COMPANY RADIATION SAFETY PROGRAM
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
4 PAGES, LETTER - DIVISION OF COMPLIANCE (DEC) TO NEW ENGLAND NUCLEAR CORPORATION - MAY 15, 1970

DIV. OF COMPLIANCE NOTES NUMEROUS DEVIATIONS FROM SAFETY RULES SET FORTH IN 10 CFR 20 AND 30. CITATIONS DEAL MOSTLY WITH AIRBORNE CONCENTRATIONS. NOTHING SERIOUS, BUT NONCOMPLIANCE NEVERTHELESS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

AIRBORNE RELEASE * INHALATION * NRC * BYPRODUCT MATERIAL * NONCOMPLIANCE * PERSONNEL EXPOSURE, RADIATION * FAILURE, ADMINISTRATIVE CONTROL * RADIOLOGY * RADIATION EXPOSURE, RECORD KEEPING

C40251
LEAKY VIAL OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND WORK AREA
TEMPLE UNIVERSITY, PENNSYLVANIA
3 PAGES, LETTER - TEMPLE UNIVERSITY TO DIVISION OF COMPLIANCE (DEC) - JANUARY 21, 1970

THE LEAK WAS VERY SMALL. THERE WAS NO VISIBLE EVIDENCE OF BREAKAGE IN THE VIAL. EITHER THE VIAL WAS NOT SEALED PROPERLY DURING THE MANUFACTURE OF THE VIAL, OR THE BREAK-SEAL HAD BEEN BROKEN IN PACKAGING, SHIPPING, OR UNPACKAGING OF THE TRITIATED GAS. CORRECTIVE ACTION - A WINDOWLESS PROPORTIONAL COUNTER WAS OPEN ESTABLISHED IN THE ROOM SO THAT ALL INCOMING PACKAGES WILL BE SPEARED AND COUNTED THERE. THE PACKAGES WILL BE SPEARED FIRST ON THE OUTSIDE SURFACES AS WELL AS THE SOURCE CONTAINER ITSELF TO INDICATE WHETHER THE RADIOACTIVE MATERIAL MAY HAVE BEEN LEAKING PRIOR TO ITS ENTRANCE INTO THE UNIVERSITY AND WHETHER ANY COULD HAVE ESCAPED AND BE DEPOSITED WITH THE CARRIER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

BYPRODUCT MATERIAL * SOURCE, RADIATION * NONCOMPLIANCE * NONCONTAMINATION * PERSONNEL EXPOSURE, RADIATION * LEAK

C40281
EXPOSURE OF TWO TECHNICIANS TO TRITIUM
UNIVERSITY OF MARYLAND
14 PAGES, LETTER - UNIVERSITY OF MARYLAND TO DIVISION OF COMPLIANCE (DEC) - APRIL 23, 1970

BIOASSAY INDICATED A CALCULATED CONCENTRATION OF ABOUT 1.8 AND 2 MICROCURIES/LITER FOR TWO WORKERS AT THE UNIVERSITY OF MARYLAND FOLLOWING A PRIOR TRACING OF BLOOD PLASMA STEROIDS. SINCE BOTH WERE CONTINUALLY INVOLVED, EACH WOULD BE EXPOSED TO THE SAME AIRBORNE CONCENTRATION OF TRITIUM. EXPOSURE MUST HAVE BEEN FROM DIRECT CONTACT OR INGESTION. THOUGHT TO BE AN ISOLATED INCIDENT. PROCEDURES WERE REVIEWED AND WORKERS WERE RE-INSTRUCTED IN PROPER ISOTOPE HANDLING TECHNIQUES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

INCIDENT, EXPOSURE * FAILURE, OPERATOR ERROR * INGESTION * BYPRODUCT MATERIAL * SOURCE, RADIATION * PERSONNEL EXPOSURE, RADIATION * RADIOLOGY * COLLEGES AND UNIVERSITIES

C40268
FLASK CONTAINING 2.25 CURIES OF TRITIUM IMPLODES AT RADIOPHARMACEUTICAL LAB.
PEARL LABORATORIES, INC., PA.
4 PAGES, LETTER - PEARL LABORATORIES, INC. TO DIVISION OF COMPLIANCE (DEC) - MAY 8, 1969

A FLASK CONTAINING 2.25 CURIES OF TRITIUM IN THE FORM OF ORGANIC MATERIALS IN METHANOL SOLUTION AT LIQUID-NITROGEN TEMPERATURE UNDER VACUUM IMPLODED. THE CONTENTS OF THE FLASK WERE SPATTERED INSIDE A STAINLESS-STEEL HOOD. SOME OF THE LABELED MATERIAL WAS THROWN OUT OF THE HOOD AND WAS DEPOSITED OVER THE SURROUNDING AREA. THE LABORATORY WAS SEALED OFF IMMEDIATELY. AN OPERATOR STANDING NEAR THE IMPLODING FLASK, ALTHOUGH NOT DIRECTLY IN THE PATH OF THE FLYING MATERIAL, IMMEDIATELY DISCARDED THE LABORATORY COAT HE WAS WEARING AND SCRUBBED HIMSELF THOROUGHLY. URINE LEVELS OF TRITIUM WERE FOLLOWED FOR THREE DAYS, SHOWING ALMOST NO CONTAMINATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

*FAILURE, EQUIPMENT * EXPLOSION * BYPRODUCT MATERIAL * NONCOMPLIANCE * NONCONTAMINATION * PERSONNEL EXPOSURE, RADIATION * RADIOCHEMICAL PROCESSING * RADIOLOGY * PRESSURE, SUBATMOSPHERIC

C09547
PINDER H
INTERNAL CONTAMINATION WITH TRITIUM
AUS DER SEKTION FUR STRAHLENSCHUTZ DES EIDG. GESUNDHEITSAMTES, BERN
5 PAGES, 2 FIGURES, 1 TABLE, 7 REFERENCES, STRAHLENTHERAPIE, VOL. 137, PG. 700-704 (1969)(IN GERMAN)

SERIOUS CHRONIC INTAKE OF TRITIUM GAS BY SEVERAL EMPLOYEES PAINT WORKERS LED TO DEATH IN ONE CASE. THE EXPONENTIAL 24.9 EXP (-0.0009T) PLUS 11.9 EXP (-0.0057T) WAS FITTED TO THE PRIMARY SET OF DATA OVER 340 DAYS, IN PICOCURIES PER LITER. THE LONGEST BIOLOGICAL HALF-LIFE CALCULATED TO BE 139 DAYS. DATA FROM J KOTSCHEWSKY BY PERSONAL COMMUNICATION. THE LONGEST BIOL. HALF-LIFE FOUND WAS 230 DAYS (?!). 90% OF THE TRITIUM HAVING LEFT OUT WITH A 30 DAY HALF LIFE, FOR ONE WORKER. A 26 OCTOBER 1963 AUTOPSY GAVE TRITIUM IN PICOCURIES PER KILOGRAM AS FOLLOWS - LUNG 15, LIVER 24, KIDNEY 28, MUSCLE 29, SPLEEN 18. WATER AND FAT CONTENTS ARE GIVEN FOR THE SAME ORGANS.

INHALATION • WATER • PERSONNEL EXPOSURE, EXPLOSION • GAS • PERTONEUM SIDE UPTAKE • ANIMAL, VERTEBRATE • BIOLOGICAL HALF-LIFE • PHYSIOLOGY/METABOLISM • TOXICITY • DISTRIBUTION • EXCRETION, URINE • REPRODUCTIVE FUNCTION • EXPOSURE, CHRONIC • FAT • KIDNEY • LIVER • LUNG • MAN • MUSCLE • SPLEEN • YEAR

C09696
SECLET J • ROBINSON J • FARMER W
A COBALT ARC A TRITIUM INCIDENT AT ARGONNE NATIONAL LABORATORY
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-7023 V. 6 PAGES, 2 TABLES, PG. 131-136, 1950

THE MEN DECONTAMINATING MODE ELECTRODE WHERE NEUTRON-IRRADIATED COBALT METAL ARC WERE CLEANED WITH A WIRE BRUSH NOTED THAT THEY ARE HANDLED SOME DUST AND WERE UNCLEAR-DEEP COVERED. BIOLOGICAL HALF-LIFE WAS 1.6 DAYS BETWEEN 2ND AND 7TH DAY POSTEXPOSURE, WITH A 42 DAY HALF-LIFE BETWEEN 17TH AND 50TH DAY, AND AFTER 90 DAYS THE HALF-LIFE HAD INCREASED TO 110 DAYS, AT WHICH TIME BODY BURDEN WAS ABOUT 0.05 MICROCURIE, WITH MOST OF THE COBALT PROBABLY IN THE LIVER. 80-90 PERCENT APPEARED IN FECES IN 1ST WEEK. FECAL/URINE RATIO OF CO INCREASED TO 152 IN 2 TO 5 DAYS, RISING 2.5 ON 29TH DAY WITH TOTAL EXCRETION AMOUNTING TO 1.7 OF BODY BURDEN, CORRESPONDING TO A HALF LIFE OF 42 DAYS. REF R D JORDAN ET AL., RADIOACTIVITY IN MAN, CC THOMAS PUB (1965) PG 281-93. GASKET LEAK OF HEAVY WATER CONTAINING 700 MICROCURIES TRITIUM/ML FROM THE CP-5 REACTOR CONTAMINATED A CLEANUP MAN. MOST URINARY TRITIUM SHOWED HALF LIVES RANGING FROM 7.4 TO 8.8 DAYS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

COBALT • INHALATION • REACTOR SAFETY SYSTEM • PERSONNEL EXPOSURE, RADIATION • RADIONUCLIDE UPTAKE • ANIMAL, VERTEBRATE • PHYSIOLOGY/METABOLISM • MAN • PREVENTION • NUCLEI BODY • PREVENTIVE FUNCTION • MONTH

C09915
PERSONNEL EXPOSURE TO TRITIUM
THEODORE A. SCHWALM INC.
1 PAGE, LETTER - THEODORE A. SCHWALM, INC. TO DIVISION OF COMPLIANCE (AECD) - MARCH 3, 1970

WHINE COUNT REACHED A MAXIMUM OF 31.1 MICROCURIES/LITER. GIRL OPENS SHIPMENTS AND STORES THEM. MAN RECEIVED TRITIUM SHIPMENT FROM SWITZERLAND. WILL MOVE OPERATION NEAR AN EXHAUST HOOD.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*INCIDENT, EXPOSURE • INHALATION • OVERCOAT MATERIAL • VENTILATION SYSTEM • COMPLIANCE • PERSONNEL EXPOSURE, RADIATION • INCIDENT, NONREACTOR • FAILURE, ADMINISTRATIVE CONTROL • RADIOLOGY

C09909
RESPONSE TO AEC NONCOMPLIANCE CITATION
THEODORE A. SCHWALM, INC., LANCASTER, PENNSYLVANIA
5 PAGES, LETTER - THEODORE A. SCHWALM, INC. TO DIVISION OF COMPLIANCE, REGION I (AECD) - JANUARY 13, 1972

CITATION CONCERNED THE FAILURE TO PROPERLY MONITOR THE CONCENTRATION OF TRITIUM RELEASED TO ATMOSPHERE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE • GASEOUS PARTICLE RELEASE • RADIOIOD. STACK • COMPLIANCE • SURVEY, RADIATION • RADIOCHEMICAL PROCESSING • FAILURE, ADMINISTRATIVE CONTROL

C97036
MATTHEY BISHOP POSSESSED TRITIUM WITHOUT LICENSE
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
1 PAGE, LETTER - DIVISION OF COMPLIANCE (AECD) TO MATTHEY BISHOP, INC. - AUGUST 17, 1970

MATTHEY BISHOP OBTAINED 2.5-CURIE TRITIUM FROM J. BISHOP AND CO. WITHOUT A VALID AEC LICENSE. COMPANY IS REQUESTED TO APPLY FOR LICENSE OR DESCRIBE THE DISPOSITION OF THE MATERIAL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM

070030 (CONTINUED)
CHARGE $2.00)

LICENSE STATUS • BYPRODUCT MATERIAL • NONCOMPLIANCE • FAILURE, ADMINISTRATIVE CONTROL

290951
NEW ENGLAND NUCLEAR REPORTS THREE INCIDENTS IN WHICH WORKERS WERE OVEREXPOSED
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES, LETTER - NEW ENGLAND NUCLEAR CORPORATION TO DIVISION OF COMPLIANCE (AEC) - SEPTEMBER 23, 1970

NEN RECEIVED AN INTERNAL EXPOSURE OF .04 TO 1.61 MILLICURIES OF CO-58 WHEN HE STRUCK HIS HEAD IN A HOOD DURING A CLEANUP OPERATION.### FLASK CONTAINING 12 CURIES OF H-3 IN FORM LOOSE THROUGH A SEAL, EXPOSING 20 PEOPLE. CALCULATED INTERNAL EXPOSURES RANGED UP TO 135 MREM. FLASK WAS RESEALED.### ONE EMPLOYEE TUBE FROM A PUMP BREAK RELEASING H-3 TO LAB. ATMOSPHERE. CHEMIST RECEIVED AN INTERNAL EXPOSURE OF 27 MREM. PROCEDURES CHANGED TO CORRECT THIS SITUATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE • OPERATOR ERROR • INGESTION • INHALATION • BYPRODUCT MATERIAL • SHIPPING CONTAINER • CONTAMINATION • COMPLIANCE • PERSONNEL EXPOSURE, RADIATION • RADIOCHEMICAL PROCESSING • OPERATOR, TUBING • OLEAN

060110
BRANDT RC • PLUNY M • FRICK U • SUTER P
DEFECTIVE FUEL ELEMENTS AND DECONTAMINATION OF THE REACTOR CIRCUIT (PART II)
EIDGENOSSISCHES INSTITUT FUER REAKTORFORSCHUNG, WUERENLINGEN (SWITZERLAND)
EIR-ISSUEPT.13 P. 72 PAGES, SEPTEMBER 1969 (IN GERMAN)

ON OCTOBER 11, 1967, ONE FUEL ELEMENT OF THE REACTOR CIRCUIT SUFFERED SEVERE DAMAGE THAT PRODUCED EXTENSIVE CONTAMINATION OF THE REACTOR TANK AND THE PRIMARY COOLING CIRCUIT WITH FISSION PRODUCTS AND URANIUM. AFTER ONE YEAR, THE REACTOR WAS PLACED INTO OPERATION AGAIN. REASONS FOR THE FUEL ELEMENT DEFECT, A RUPTURE OF THE 2.5 ALUMINUM CLADDING, WERE STUDIED. EXTENSIVE DECONTAMINATION PROCEDURES WERE PERFORMED. PROTECTIVE MEASURES FOR PERSONNEL PARTICIPATING IN THE DECONTAMINATION WERE DEVELOPED FOR VARIOUS PHASES OF THE PROCEDURE. DURING THE ENTIRE RESTORATION PERIOD, NINE PERSONS RECEIVED INTERNAL DOSES FROM 3.5 TO 3.8 REM. A FEW INDIVIDUALS SWOLLOWED TRITIUM INCORPORATION THAT WAS BELOW 1/5 OF THE PERMISSIBLE BODY BURDEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ALUMINUM • DECONTAMINATION • CLADDING • FISSION PRODUCT RELEASE • FAILURE, FUEL ELEMENT • REACTOR, RESEARCH • RADIATION PROTECTION, CHARACTERIZATION • CONTAMINATION • PERSONNEL EXPOSURE, RADIATION • SWITZERLAND • FAILURE, CLADDING • STRESS RUPTURE • PATH COOLING SYSTEM • FUEL ELEMENTS

C01440
UNMONITORED LIQUID WASTE RELEASE
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50741-51 P. 1 PAGE, LETTER - CAROLINA POWER AND LIGHT COMPANY TO DIVISION OF REACTOR LICENSING (AEC) - FEBRUARY 5, 1971, DOCKET 50-261, TYPE--PWR, REG--WEST., RF--EGASCC

ABOUT 200 GAL OF LIQUID WASTE WAS RELEASED WITHOUT MONITORING WHEN AN OPERATOR REMOVED THE MONITOR FROM SERVICE TO CLEAN THE VOLUME CHAMBER. ANALYSIS BEFORE THE RELEASE WAS 3.43 MICROCURIES BETA-GAMMA AND .011 CURIE TRITIUM PER CC, AND AFTER THE RELEASE WAS 4.24 MICROCURIES B-G AND .011 CURIE TRITIUM PER CC. ### ALL OPERATORS WERE REMIND THE IMPORTANCE OF PROCEDURES AND COOPERATION WITH SERVICE OPERATOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OPERATOR, OPERATOR ERROR • MONITOR, LIQUID • REACTOR, PWR • WASTE DISPOSAL, LIQUID • ROBINSON 2 (PWR) • OPERATING EXPERIENCE

D03190
CONTAMINATION IN UNRESTRICTED AREA AND TRITIUM ACTIVITY
U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
10 PAGES, LETTER TO T. P. SCHNOOR, INC., NOVEMBER 16, 1970

DURING AN INSPECTION NOV. 10-20, 1970, SWEAR SAMPLES IN AN UNRESTRICTED AREA ADJACENT TO A PAINTING FACILITY WERE FOUND TO 2,630.00 DPM PER 100 SQUARE CENTIMETERS. NRC REQUESTS THE COMPANY TO REVALUATE AND IMPROVE CONTAMINATION CONTROL. ALSO TRITIUM RELEASES FROM STACK CONTINUE TO EXCEED PERMISSIBLE LIMITS. THE COMPANY REQUESTED THAT A DILUTION FACTOR OF 20 BE APPLIED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL • COMPLIANCE • DECONTAMINATION • RADIATION SAFETY AND CONTROL • RADIOACTIVITY RELEASE • FAILURE, ADMINISTRATIVE CONTROL

[illegible]
COMPANY HAS APPROVED OF THE PRECAUTIONS OF TRITIUM FROM A [illegible] PLANT
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES. LETTER TO DIVISION OF COMPLIANCE FROM NEW ENGLAND NUCLEAR CORP., STS BLUEHILL ST., BOSTON, MASS.
OBTAIN. COPPER 13, 1971

THIS PROCESS PRODUCED TRITIATED CHLORIC ACID. THE OPERATIONS WERE DONE INSIDE A [illegible] WITH A FACE VELOCITY CREATED FROM 150 CFM. GLOVES WERE WORN AND NO PROCEDURES WERE VIOLATED. AN TWIN DONOVED THE SOLVENT FROM THE [illegible] AND ADDED IT TO A CHROMATOGRAPHY COLUMN OUTSIDE THE HOOD. THE COLUMN WAS [illegible] TO FIT IN THE HOOD HOOD. [illegible] HAD ASSUMED THAT THERE WERE NO VOLATILES ON LAPPER [illegible] AFTER AT THIS STAGE. TOTAL CALCULATED EXPOSURE WAS 37.5 MILLIREMS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

FAILURE, OPERATED FROM • NONCOMPLIANCE • PERSONNEL EXPOSURE, RADIATION • RADIOCHEMICAL PROCESSING

[illegible]
SEWAGE WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (NFS), STRONTIUM, TRITIUM
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, ALBANY, N.Y.
DOCKET-50-201-73 •. 3 PAGES. LETTER TO NUCLEAR FUEL SERVICES, INC., DOCKET NO. 50-201 FROM NEW YORK STATE DEPT. OF ENVIRON. CONSERVATION, JUNE 8, 1971

N.Y. STATE ENVIRONMENTAL DECLARED THAT THE SOURCE OF CONTAMINATION AND THE CONTAMINATION OF ELEMENTS. IF THE SITUATION CANNOT BE CORRECTED, RECOMMENDED THAT THE SANITARY WASTE SYSTEM EXPERIMENT OF SUBJECTED TO THE SAME CONTROLS THAT HAVE OTHER RADIOACTIVE LIQUID WASTE WOULD BE, THAT IS, QUALIFICATION, QUANTIFICATION, FLOW CONTROL, AND ANY NEEDED TREATMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REGULATION, STATE • STRONTIUM • NONCOMPLIANCE • LACKS DATA • NONCONTAMINATION • RADIOCHEMICAL PROCESSING • NFS • FUEL REPROCESSING • WASTE, SEWAGE

[illegible]
PERSONNEL EXPOSURE TO AIRBORNE ACTIVITY
U.S. RADIUM CORPORATION, BLOOMSBURG, PA.
2 PAGES. LETTER - DIVISION OF COMPLIANCE (REG) FROM U.S. RADIUM CORPORATION - MAY 21, 1973

PROCEDURE PLANNING FOR REPLACING A VALVE WHICH FAILED LEAD TO AN INDIVIDUAL EXPOSURE OF 11.0 MREM CONSISTING OF TRITIUM 12.2 TIMES WEEKLY WORK LIMITS. NEW PROCEDURE CALLS FOR REPLACING ENTIRE VALVE INSTEAD OF THE FAILED PARTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

FAILURE, OPERATED FROM • EXPLANATION • BYPRODUCT MATERIAL • NONCOMPLIANCE • OPERATOR ERROR, RADIATION • PERSONNEL, RADIATION CONTROL

[illegible]
NONCOMPLIANCE WITH RADIATION SAFETY STANDARDS AT U OF ILLINOIS
UNIVERSITY OF TRUSTEES, CHICAGO, ILLINOIS
2 PAGES. LETTER TO UNIVERSITY OF ILLINOIS FROM DIVISION OF COMPLIANCE (REGION), MAY 15, 1971

AN INSPECTION ON MARCH 23-26, 1971, REVEALED THE FOLLOWING ITEMS - OPERATORS WERE NOT INSTRUCTED IN RADIATION HAZARDS IN LABORATORIES USING RADIOACTIVITY MATERIAL. WORKERS WERE PERMITTED TO PIPETTE THE RADIOACTIVE SOLUTIONS BY MOUTH , TO STORE FOOD IN REFRIGERATORS CONTAINING TRITIUM AND TO DRINK COFFEE IN LABS USING RADIOISOTOPES. RECORDS OF PURCHASE, USE, TRANSFER, AND DISPOSAL OF RADIOACTIVE MATERIAL WERE NOT ACCURATE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

CARBON • DECAY • PROCEDURES AND MANUALS • BYPRODUCT MATERIAL • COMPLIANCE • RADIATION SAFETY AND CONTROL • FAILURE, ADMINISTRATIVE CONTROL • NCT LABORATORY • COLLEGES AND UNIVERSITIES • RECORDS

[illegible]
NOTE. BUREAU OF STANDARDS REPORTS LESS OF TWO STANDARD SAMPLES OF TRITIATED WATER
U.S. DEPARTMENT OF COMMERCE, NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
2 PAGES. LETTER FROM NATIONAL BUREAU OF STANDARDS TO DIVISION OF COMPLIANCE (REGION), JULY 13, 1971

SAMPLES WERE SENT IN TRANSIT TO NFS, NORWELL, MASSACHUSETTS. EACH CONTAINED ABOUT 7 MICROCURIES OF TRITIUM IN 50 ML OF WTR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

BYPRODUCT MATERIAL • TRANSPORTATION AND HANDLING • NONCOMPLIANCE • RESEARCH, RADIATION, TEST • [illegible]

[illegible]
TITANIUM TRITIUM CONTAMINATION, TABLE TOP
STATE OF ILLINOIS, DEPARTMENT OF PUBLIC HEALTH, SPRINGFIELD, ILLINOIS
2 PAGES, LETTER TO DIVISION OF COMPLIANCE INSPECTS FROM ILLINOIS DEPARTMENT OF HEALTH, MAY 24, 1971

DURING THE PROCESS OF REMOVING THE BETA FROM ONE OF THE ACTIVE CELLS IN THE DETECTOR, SOME TITANIUM TRITIUM FLUORIDE GAS THE CELL AND SPILLED ON THE TABLE TOP, WHICH WAS COVERED WITH PAPER TOWELS. THIS MATERIAL WAS QUITE RADIOACTIVE EVEN WHEN TO GET A CONSIDERABLE COUNT WITH OUR INSTRUMENTS. THE AREA WAS THEN DECONTAMINATED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

KEYWORDS - COMPLIANCE + DECONTAMINATION + PACT LABORATORY

[illegible]
LEAK IN PRIMARY HEAT EXCHANGER, NATL. BUR. STANDARDS RESEARCH REACTOR
U.S. DEPT. OF COMMERCE, NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
DOCKET-50200-30 V. 1 PAGE, LETTER TO DIVISION OF REACTOR LICENSING INSPECTS FROM NATIONAL BUREAU OF STANDARDS, AUGUST 2, 1971, DOCKET 50-184

ON JULY 20, 1971, A LEAK DEVELOPED IN THE ROTO PRIMARY HEAT EXCHANGER. THE LEAK WAS INDICATED BY THE SECONDARY COOLANT POSITIVE AND CONFIRMED BY SAMPLING ANALYSIS OF SECONDARY COOLANT. THE REACTOR WAS PROMPTLY SHUT DOWN AND THE HEAT EXCHANGER ISOLATED. AN ESTIMATED 20 CURIES OF TRITIUM HAVE TRANSFERRED TO THE COOLING TOWER BASIN AND SECONDARY LINES AND VERY LITTLE, IF ANY, RELEASED TO THE ENVIRONMENT. THE LEAKING TUBE AS WELL AS ANY OTHER WATER POTENTIAL LEAKERS WILL BE PLUGGED AND CHECKED PRIOR TO RESUMING REGULAR OPERATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

KEYWORDS - REACTOR, RESEARCH + TUBES + FAILURE, TUBING + LEAK + HEAT EXCHANGERS

[illegible]
LOSS OF COMPASSES CONTAINING TRITIUM BY THE AIR FORCE
DEPARTMENT OF THE AIR FORCE, WRIGHT-PATTERSON AIR FORCE BASE, OHIO
5 PAGES, LETTER TO DIVISION OF COMPLIANCE INSPECTS FROM DEPARTMENT OF THE AIR FORCE, APRIL 15, 1971

12 LUMINOUS LEUCHTIC COMPASSES WERE PREVIOUSLY TRANSFERRED TO THE TEXAS SURPLUS PROPERTY AGENT BY THE AIR FORCE IN SEPT. 1970. 26 WERE DISTRIBUTED. ALL BUT 1 WERE RECOVERED. A DISAPPEARED PRIOR STORAGE. EACH CONTAINED 120 MILLICURIES OF TRITIUM. THE TRANSFER WAS DUE TO HUMAN ERROR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

KEYWORDS, OPERATOR ERROR + PROPRIETARY MATERIAL + COMPLIANCE + INCIDENT, HUMAN ERROR + SOURCE, RADIATION, LOST + FAILURE, ADMINISTRATIVE CONTROL

[illegible]
SPILL PREPARATION TO TRITIUM AT PIT DISPOSAL REACTOR, MAY 24, 1971
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASSACHUSETTS
5 PAGES, LETTER TO DIVISION OF COMPLIANCE INSPECTS FROM MASS. INST. OF TECHNOLOGY, CAMBRIDGE, DOCKET 50-20, JULY 28, 1971

AS A SPENT FUEL-PACKAGE WAS BEING HOISTED ON ITS STAND ACCESS THE EQUIPMENT ROOM FLOOR, IT STRUCK A 1/2-IN. PIPE TRAPS VALVE DISTURBED BY A SMALL RIPPLE TO THE WATER SIDE OF A CHECK VALVE BODY LOCATED AT THE DISCHARGE END OF PRIMARY HEAT EXCHANGER NO. 10. THE RIPPLE WAS NEAR APPROXIMATELY 45 DEG. CAUSING IT TO CRACK ON THE SIDE AND TO RELEASE A SPRAY OF TRITIATED H2O. THREE PERSONS IN THE REACTOR OPERATIONS AND MAINTENANCE GROUPS WERE EXPOSED IN SOME DEGREE TO THE DISPERSED TRITIUM IN THE EQUIPMENT ROOM, AND THE SUM OF AT LEAST THREE WAS FOUND TO BE CONTACTED BY THE DPD LEGIOC. BASED ON THE TRITIUM CONTENT OF URINE SAMPLES COLLECTED FROM THESE INDIVIDUALS, IT WAS DETERMINED THAT FROM INDIVIDUALS WERE SUBJECT TO OVEREXPOSURE. NO CORRECTIVE STEPS WILL BE TAKEN TO PREVENT A RECURRENCE.

AIRBORNE RELEASE + FAILURE, OPERATOR ERROR + REACTOR, RESEARCH + PERSONNEL EXPOSURE, RADIATION + UNITED STATES + COLLEGES AND UNIVERSITIES

[illegible]
UNCONTROLLED RELEASE OF RADIOACTIVE WASTE AT POINT BEACH
WISCONSIN ELECTRIC POWER COMPANY, MILWAUKEE, WISCONSIN
DOCKET 50200-50 V. 1 PAGES, LETTER TO DIVISION OF REACTOR LICENSING FROM WISCONSIN ELECTRIC COMPANY, DOCKET 50-200, AUGUST 11, 1971, TYPE--PWR, MFG--WEST., AP--DECAYED

WHILE FILLING THE UNIT-2 DEPARTING WATER STORAGE TANK FROM THE UNIT 1 REACTOR HOLDUP TANK, THE STORAGE TANK OVERFLOWED TO THE SUMP AND RELEASED 4000 GAL. INTO THE SEWAGE-OUTFALL POND. SAMPLES FOR TRITIUM, GROSS BETA-GAMMA, AND IODINE INDICATED THAT THE RELEASE DID NOT EXCEED THE PERMISSIBLE CONCENTRATION. THE CAUSE OF THE OVERFLOW WAS THE MISCALIBRATION OF THE CONTROL-ROOM LEVEL INDICATOR FOR A 1000-GAL. RANGE INSTEAD OF 400-GAL. RANGE. THE LEVEL INSTRUMENT WAS THEN RECALIBRATED.

[illegible] <CONTINUED>
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MISSION PRODUCT RELEASE • ROCKS • REACTOR, PWR • WASTE DISPOSAL • LIQUID • INSTRUMENT, LIQUID LEVEL • [illegible], MAINTENANCE [illegible] • [illegible] • INSTRUMENT, ABNORMAL INDICATION • SHUTDOWN COOLING SYSTEM

[illegible]
TINNEY JF • [illegible] • [illegible] • [illegible]
ENVIRONMENTAL SAMPLING PROGRAM FOLLOWING AN ACCIDENTAL TRITIUM RELEASE
LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA
UCRL-51829 P. 10 PAGES, MARCH 12, 1971

ON AUGUST 6, 1970, 200,000 CI OF TRITIUM GAS WAS ACCIDENTALLY RELEASED THROUGH AN EXHAUST STACK AT THE LAWRENCE RADIATION LABORATORY IN LIVERMORE, CALIFORNIA. SOON AFTER THE RELEASE, EMERGENCY-RESPONSE PERSONNEL SURVEYED THE SITE WITH PORTABLE TRITIUM AIR MONITORS AND AN EXTENSIVE ENVIRONMENTAL SAMPLING PROGRAM WAS INITIATED. THE RESULTS INDICATE THAT NO SIGNIFICANT EXPOSURE TO ON- OR OFF-SITE INDIVIDUALS RESULTED FROM THE RELEASE. ALL ENVIRONMENTAL SAMPLES OF WATER, MILK, AND URINE CONTAINED NORMAL BACKGROUND LEVELS OF TRITIUM. ALTHOUGH DETECTABLE LEVELS OF RADIOACTIVITY WERE FOUND IN SOME VEGETATION AND ATMOSPHERIC WATER VAPOR SAMPLES, THE HIGHEST MEASURED CONCENTRATIONS AS WELL AS THE CALCULATED TRITIUM CONCENTRATIONS AT GROUND LEVEL DID CONCENTRATIONS DURING CLOUD PASSAGE WERE WELL BELOW THE OFF-SITE MAXIMUM PERMISSIBLE CONCENTRATIONS FOR CONTINUOUS EXPOSURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT • MPC • WATER • SAMPLING • MILK • MONITOR, ENVIRONMENTAL • MODULATION EXPOSURE • LRL • CRITICAL NUCLEAR PARAMETER • RADIOACTIVITY RELEASE • VEGETATION • CONCENTRATION • ABSORPTION, URINE • CLOUD • RADIATION MONITORS

[illegible]
HEAT EXCHANGER TUBE LEAK AT NPS
U.S. DEPARTMENT OF COMMERCE, NATIONAL BUREAU OF STANDARDS
1 PAGE. LETTER - NATIONAL BUREAU OF STANDARDS TO DIVISION OF REACTOR LICENSING DATED - DECEMBER 8, 1971.
DOCKET 50-184

NPS REPORTS 2 TUBES RUPTURED ON HEAT EXCHANGER DATED DETECTING SMALL LEAK IN HEAVY WATER. LESS THAN THE CURIE OF TRITIUM WAS TRANSFERRED TO SECONDARY SYSTEM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. [illegible], [illegible] CENTS/PAGE -- MINIMUM CHARGE $2.00

HEAVY WATER • REACTOR, PWR • REACTOR, RESEARCH • NPS • MODERATOR, TUBING • LEAK • HEAT EXCHANGERS

[illegible]
LAURENT DE • SHOPPE WVD • CRANCK WD
ACCIDENTAL INTAKE OF TRITIATED WATER (1971/73)
RADIOLOGICAL PROTECTION SERVICE, ENGLAND
5 PAGES, [illegible], [illegible] ASSOC. JOURNAL, NO. 32, PP. 602 [illegible] (1971)

DURING A ROUTINE OPERATION INVOLVING TRITIUM GAS AT A FACTORY MANUFACTURING TRITIUM-FILLED INSTRUMENT ILLUMINATORS AN EMPLOYEE WAS ACCIDENTALLY EXPOSED FOR 10 MIN TO LEAKAGE FROM A GLASS CONTAINING 500 CI OF H3. URINARY MONITORING STARTING [illegible] DAY POST-INCIDENT, SUGGESTING THAT TO BE VIA SKIN AS TRITIUM GAS ABSORB TRITIATED WATER. TOTAL INTERNAL BODY BURDEN OF TRITIUM CALCULATED TO BE ABOUT 350 MCI FROM THE 73 DAY [illegible] WITH ASSUMED TOTAL BODY WATER VOLUME OF 30 LITRES. DOSE TO HIS BODY TISSUES FROM TRITIATED WATER WAS ESTIMATED TO BE ABOUT 30 RADS. THE PROBABILITY OF TRITIUM PRO GP CP LOSING BETWEEN 3 DAY 100 DAYS WAS REPRESENTED BY 9.1 E (EXP - 0.693T/70.3) + 0.6 TIMES 10 (EXP -2) (EXP -0.693T/28) IN WHICH AGREEMENT WITH SUBJECT (1971/[illegible]) OF CISOEMP (1971C/50[illegible]). EXCRETOIC ABSORPTIONS IN HIS LYMPHOCYTES WERE [illegible] TO 12 [illegible] 200 TO 300 CELLS EXAMINED BETWEEN 12 AND 44 DAYS. FOR AN INTERNALLY MIXED [illegible] SE W 20 TO 30 RADS.

ACCIDENT • BIOMEDICAL • CRUDE • INDUSTRY, MANUFACTURING • DOSE CALCULATION, INTERNAL • PERSONNEL EXPOSURE, RADIATION • PROTECTION • URINE, VERTEBRATE • MICROSCOPIC EFFECT • DISTRIBUTION • BLOOD • RADIATION EFFECT • LYMPHADY • EXCRETION, URINE • EXPONENTIAL FUNCTION • MAN • NATURE • BONE • WHOLE • BODY BURDEN • TO DISSOLVE NORMAL • RETENTION FUNCTION • BODY FLUID • MONTH • HEMATOLOGY

[illegible]
CHEMIST RECEIVES INTERNAL EXPOSURE FROM TRITIUM
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE. LETTER - NEW ENGLAND NUCLEAR CORPORATION TO DIVISION OF COMPLIANCE - OCTOBER 25, 1971

A CHEMIST PERFORMING AN EXPERIMENT RECEIVED AN INTERNAL DOSE OF 100 MILLIREM. EXPOSURE WAS THROUGH THE SKIN. A PLASTIC GLOVE HAD SEPARATED AT THE SEAM. A URINE SAMPLE SHOWED AN INCREASE OF 4.0 DISINTEGRATIONS PER LITER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. [illegible], [illegible] CENTS/PAGE -- MINIMUM CHARGE $2.00

FAILURE • PERSONNEL PROTECTIVE DEVICE • EXPERIMENT MATERIAL • EXPERIMENTAL EXPOSURE, RADIATION • RADIOCHEMICAL PROCESSING • DESCRIPTION

C00007
REPORT OF PERSONNEL EXPOSURE
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
2 PAGES, LETTER - NEW ENGLAND NUCLEAR CORPORATION TO DIVISION OF COMPLIANCE (DRCE) - JULY 16, 1971

A CHEMIST RECEIVED INTERNAL EXPOSURE OF 20 MILLIREMS FROM TRITIUM WHILE PERFORMING A COMPOUND. CHEM WAS OVERAGE OF PLASTIC GLOVES, WHICH HAD NOT BEEN CHANGED OFTEN ENOUGH. FAILURE OF WORKERS TO DECONTAMINATE GLASSWARE, AND OVERCROWDING OF HOODS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

AVAILABLE, EQUIPMENT FORM • INHALATION • BYPRODUCT MATERIAL • PERSONNEL EXPOSURE, RADIATION • RADIOCHEMICAL PROCESSING • FAILURE, ADMINISTRATIVE CONTROL

C00002
ELECTRONS CO. ALLOWED TOO MUCH TIME BETWEEN LEAK TESTS
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
1 PAGE, LETTER - DIVISION OF COMPLIANCE (DRCE) TO ELECTRONS COMPANY, FAIRFIELD, NEW JERSEY - MARCH 20, 1972

SEVENTY-NINE SEALED SOURCES CONTAINING 10 MICROCURIES OF AM-241 EACH WERE LAST LEAK-TESTED IN OCTOBER 1970, A PERIOD OF 15 MONTHS. ALSO, 100 SIMILAR UNITS WERE LAST LEAK-TESTED IN APRIL 1971, A PERIOD OF NINE MONTHS. REGULATIONS CALL FOR 6-MONTH INTERVALS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

BYPRODUCT MATERIAL • RESOURCE, RADIATION • NONCOMPLIANCE • INSPECTION • TEST INTERVAL • TEST, LEAK

C72020
ACCIDENT ANALYSIS - RUPTURE OF STAINLESS PIPING
CONSUMERS POWER COMPANY
3 PAGES, LETTER - CONSUMERS POWER COMPANY TO DEPUTY DIRECTOR FOR REACTOR PROJECTS (DRCE) - JUNE 22, 1972, DOCKET 50-255, TYPE--PWR, NFG--(CRD., AE--BECHTEL

IF TANK RUPTURES, 2600 CURIES OF TRITIUM COULD BE RELEASED TO LAKE MICHIGAN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS • WASTE DISPOSAL, LIQUID • CONTAMINATION • STORAGE CONTAINER • PALISADES (PWR) • LAKE MICHIGAN

C76109
EXPOSURE TO TRITIUM AT UNITED STATES RADIUM CORP.
UNITED STATES RADIUM CORPORATION, PENNSYLVANIA
2 PAGES, LETTER - U. S. RADIUM CORPORATION TO DIVISION OF COMPLIANCE

TRITIUM URINE SAMPLES FOR AN EMPLOYEE SHOWED AN INCREASE THAT INDICATED AN EXPOSURE OF 2.6 TIMES THE NON-WORK LIMIT. A TUBE CONTAINING TRITIUM DEVELOPED A HAIR-LINE CRACK WHILE STORED IN A CABINET. THE CABINET WAS NOT PROPERLY VENTILATED. WHEN THE WORKER OPENED THE CABINET, SHE WAS EXPOSED. A FAN WILL BE INSTALLED IN THE CABINET.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

AVAILABLE, EQUIPMENT • INHALATION • BYPRODUCT MATERIAL • NONCOMPLIANCE • PERSONNEL EXPOSURE, RADIATION • STORAGE CONTAINER • RADIOCHEMICAL PROCESSING • FAILURE, DESIGN (DRCE)

C76230
FLOOD DAMAGE AT U.S. RADIUM CORP.
UNITED STATES RADIUM CORPORATION
2 PAGES, LETTER TO DIVISION OF COMPLIANCE (DRCE), JUNE 29, 1972

DURING THE FLOOD OF JUNE 22-26, THE EVAPORATOR HOUSE WAS SUBMERGED. A TANK CONTAINING 500 GAL OF TRITIATED WATER WAS FLOODED. WATER PUMPED FROM THE EVAPORATOR HOUSE CONTAINED 0.007 MICROCURIES/ML OF TRITIUM. NO OTHER RADIOACTIVE MATERIAL WAS PRESENT AT THE TIME OF FLOODING. CONTAMINATED WATER IS BEING STORED IN DRUMS UNTIL THE EVAPORATOR SYSTEM IS REPAIRED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CENTS/PAGE - MINIMUM CHARGE $2.00

BYPRODUCT MATERIAL • WASTE STORAGE • STORAGE CONTAINER • RADIOACTIVITY RELEASE • RADIOCHEMICAL PROCESSING • FAILURE, DESIGN (DRCE) • WASTE TREATMENT, EQUIPMENT • DAMAGE • WEATHER, STORM • FLOOD

C76007
EMPLOYEE EXPOSED TO HIGH AIR CONCENTRATION OF TRITIUM (4 TIMES THE MPC PER AIR)

[illegible]
TEMPLE UNIVERSITY, PHILADELPHIA, PA., [illegible]
14 PAGES, LETTER TO NRRC REGARDING LICENSING, SEPT. 5, 1972

[illegible] THE STACK CONTAINING 20 [illegible] WILL BE THE [illegible] THE [illegible] TO [illegible] THE [illegible] IN THE [illegible]. IT WAS AT THIS POINT OF THE PROCEEDING THAT WE DISCOVERED THAT [illegible] EQUIPMENT [illegible] WAS IN ADD CONCENTRATIONS GREATER THAN [illegible]. PLANT MANAGER INITIATE A STRICT PROTOCOL TO [illegible] WHENEVER [illegible] IS BEING USED AT ANYTIME. ALL CONTAINERS WILL BE MARKED [illegible] AND RESPONSIBLE GAS REMAINING REMOVED BY WAYNUP INTO A WASTE STORAGE TANK.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

AIRBORNE RELEASE • BIOLOGICAL • BYPRODUCT MATERIAL • NONCOMPLIANCE • PERSONNEL EXPOSURE, RADIATION • COLLEGES AND UNIVERSITIES

[illegible]
COMMENT RESPONSE TO TRITIATED WATER
NEW ENGLAND NUCLEAR CORP.
2 PAGES, LETTER TO DIVISION OF COMPLIANCE (REGI), SEPT. 25, 1972

DURING THE PERIOD FROM AUGUST 20, 1972 THROUGH SEPTEMBER 21, 1972, A COMMENT [illegible] AN INTERNAL [illegible] OF TRITIUM. THE COMMENTED CONCLUDED THAT THE [illegible] WATER WHICH WAS DISCHARGED TO THE SEWER [illegible] WHERE AFTER HEATING THE WATER TO 100 C. THE AIRBORNE WATER VAPOR WAS [illegible] THROUGH THE SEWER TO INCINERATE WHEN THE COMMENT OPENED THE [illegible] AND REMOVED THE WASTE CONTAINER. CALCULATED DOSAGE WAS CLASS PRELIMINARY. CORRECTIVE ACTION - REDESIGN THE GAS SYSTEM TO INCLUDE A [illegible] TO ASSIST IN EVAPORATION CATALYZING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

AIRBORNE RELEASE • BYPRODUCT MATERIAL • NONCOMPLIANCE • PERSONNEL EXPOSURE, RADIATION

[illegible]
STUDENT OVEREXPOSED TO TRITIUM AT UNIVERSITY OF VIRGINIA
UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE, VIRGINIA 22901
14 PAGES, LETTER WITH ATTACHMENTS TO DIVISION OF COMPLIANCE (REGI), AUG. 30, 1972

THE MISHAP INVOLVED THE FAILURE OF A SILVER SOLDER JOINT BETWEEN THE PLATINUM END CAP AND THE STAINLESS STEEL TUBE OF A TRITIUM GAS CELL WHICH ALLOWED THE RELEASE OF APPROXIMATELY 15 CURIES OF TRITIUM GAS. DISMISSAL ANALYSIS FOR TRITIUM OF THE 24 HOUR URINE SAMPLE SUBMITTED BY THE GRADUATE STUDENT INVOLVED IN THIS INCIDENT RESULTED IN A VALUE OF 3.9 [illegible]/LITER AND [illegible]. FROM THIS ONE CALCULATES THE TOTAL INITIAL BODY BURDEN [illegible] AND THE INTENSITY DOSE TO BE 2.9 [illegible].

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BYPRODUCT MATERIAL • NONCOMPLIANCE • PERSONNEL EXPOSURE, RADIATION • COLLEGES AND UNIVERSITIES

[illegible]
RESPONSE TO NRC LETTER ABOUT APPARENT NONCOMPLIANCE [illegible]
WARNER-LAMBERT RESEARCH INSTITUTE, MORRIS PLAINS, NEW JERSEY 07950
2 PAGES, LETTER TO DIRECTORATE OF REGULATORY OPERATIONS, NOV. 20, 1972

ITEMS - FAILED TO ESTABLISH PUBLIC RELATION BETWEEN INCINERATOR ELEMENTATION AND [illegible] OF TRITIUM; DISCHARGE WASTE [illegible] TRITIUM, [illegible] SEWER [illegible].

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

CANADA • FAILURE, OPERATED FROM • BYPRODUCT MATERIAL • WASTE DISPOSAL • NONCOMPLIANCE • PERSONNEL EXPOSURE, RADIATION • FAILURE, ADMINISTRATIVE CONTROL

[illegible]
IMPORTATION OF COMPASSES CONTAINING TRITIUM BY SILVA
SILVA, INC., LA PORTE, INDIANA 46350
1 PAGE, LETTER TO DIRECTOR OF REGULATORY OPERATIONS (REGI), NOV. 15, 1972

SILVA, INC., IMPORTED 500 COMPASSES CONTAINING 10 MILLICURIES OF TRITIUM EACH. THE COMPANY [illegible] A LICENSE TO POSSESS THIS MATERIAL AND IS APPLYING FOR LICENSE TO DISTRIBUTE THE COMPASSES AND IMPORT OTHERS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, 100 CENTS/PAGE -- MINIMUM CHARGE $2.00

LICENSE STATUS • BYPRODUCT MATERIAL • TRANSPORTATION AND HANDLING • COMPLIANCE • FAILURE, ADMINISTRATIVE CONTROL

[illegible]
[illegible] NUCLEAR CORPORATION
NEW ENGLAND NUCLEAR CORP., BOSTON, MASS. 02110
[illegible] PAGES. LETTER WITH ATTACHMENTS TO DIVISION OF COMPLIANCE DIRECT., NOV. 24, 1972.

[illegible] A [illegible] RECEIVED A CONTAMINATED [illegible] OF [illegible] OF TRITIUM. [illegible] ACTIVITY FROM [illegible] AND [illegible]. [illegible] A [illegible]. [illegible] [illegible]. [illegible] [illegible] [illegible]

[illegible]
[illegible] ATOMIC ELECTRIC COMPANY
1 PAGE. LETTER TO DIVISION OF REGULATORY OPERATIONS (RO:I), APRIL 2, 1973. DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE AND WEBSTER

A CONTRACTOR EMPLOYEE OPENED THE WASTE-CONTAINING [illegible] WITH THE [illegible] FROM [illegible] THE REACTOR WAS AT [illegible] PSI AND [illegible] F. DURING THIS [illegible] BREACH OF [illegible] INTEGRITY, THERE WAS A RELEASE OF TRITIUM VAPOR.

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AIRBORNE RELEASE + FAILURE + REACTOR, PWR + [illegible] + CONTAINMENT INTEGRITY + RADIOACTIVITY RELEASE + [illegible], MAINTENANCE [illegible]

[illegible]
TECHNICIAN EXPOSED TO TRITIUM AT NEW ENGLAND NUCLEAR
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES. LETTER TO DIVISION OF COMPLIANCE (RO:I), AUGUST 16, 1973

A TECHNICIAN REMOVED A LIQUID-NITROGEN COLD TRAP FROM A GLASS WASTE FLASK DURING A FLAME-SEALING OPERATION TO GET A BETTER GRIP ON THE CONTAINER. HEAT FROM HIS HAND WARMED THE LIQUID, PUTTING PRESSURE ON THE MOLTEN GLASS. THE OPERATION WAS IN A HOOD, AND GLOVES WERE WORN. HE WAS EXPOSED TO A CALCULATED [illegible] OF TRITIUM. NEW EQUIPMENT TO AUTOMATE THIS PROCEDURE WILL BE INSTALLED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. 10 CENTS/PAGE -- MINIMUM CHARGE $2.00

FAILURE, OPERATOR ERROR + BYPRODUCT MATERIAL + NONCOMPLIANCE + MODIFICATION + PERSONNEL EXPOSURE, RADIATION + [illegible]

[illegible]
CORRECTIVE ACTION TO VIOLATIONS OF AEC REQUIREMENTS
UNITED STATES NUCLEAR CORPORATION
2 PAGES. LETTER TO DIRECTORATE OF REGULATORY OPERATIONS, REGION I (RO:I), APRIL 23, 1973

ITEMS INCLUDED: (1) STACK RELEASES OF TRITIUM WHICH EXCEEDED THE LIMITS FOR THE YEAR 1971 BY A FACTOR OF 17.4 AND FOR 1972 BY A FACTOR OF 15.0, AND (2) THERE WAS NO DOCUMENTATION OF TRAINING [illegible] HAD [illegible] BEEN [illegible].

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. 10 CENTS/PAGE -- MINIMUM CHARGE $2.00

BYPRODUCT MATERIAL + NONCOMPLIANCE + RADIOACTIVITY RELEASE + FAILURE, ADMINISTRATIVE CONTROL + REPORT, AEC INSPECTION

[illegible]
CORRECTIVE ACTION TO VIOLATIONS OF AEC REQUIREMENTS
[illegible]
3 PAGES. LETTER TO DIRECTORATE OF REGULATORY OPERATIONS, REGION I (RO:I), AUGUST 23, 1973

REPORTS CORRECTIVE ACTION TO THE FOLLOWING APPARENT VIOLATIONS: (1) FAILURE TO GIVE 24-HR NOTIFICATION TO AEC CONCERNING A TRITIUM RELEASE, (2) FAILURE TO MAKE SURVEYS OF TRITIUM DISCHARGES FROM PLANT, (3) AVAILABLE COPY OF CODE OF FEDERAL REGULATIONS SECTIONS WAS SIGNIFICANTLY OUTDATED, AND (4) GAVE INADEQUATE INFORMATION IN A REPORT TO AEC.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555. 10 CENTS/PAGE -- MINIMUM CHARGE $2.00

BYPRODUCT MATERIAL + NONCOMPLIANCE + FAILURE, ADMINISTRATIVE CONTROL + REPORT, AEC INSPECTION

[illegible]
CIVIL PENALTIES IMPOSED ON [illegible] B. SCHMID, INC.
U.S. ATOMIC ENERGY COMMISSION
2 PAGES. LETTER TO [illegible] B. SCHMID, INC., OCTOBER 12, 1973

CIVIL PENALTIES OF $[illegible] WERE IMPOSED FOR FAILURE TO CONTROL THE RELEASE OF TRITIUM TO THE ATMOSPHERE IN UNRESTRICTED AREAS. THIS PROBLEM HAD BEEN BROUGHT TO THE COMPANY'S ATTENTION ON FIVE PREVIOUS INSTANCES.

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AIRBORNE RELEASE + BYPRODUCT MATERIAL + NONCOMPLIANCE + POPULATION EXPOSURE + FAILURE, ADMINISTRATIVE CONTROL + PENALTY, AEC + [illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

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[illegible]

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A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED TOPICS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH HAS ALREADY IN IT.

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@TRACE LIQUID RADIOACTIVE WASTE (TRITIUM) TO DUMP@	010931	P 7
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STORATION, TRITIUM)@ @SEWAGE WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (BETA,	043567	P 15
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@WHMIST FAILED TO TRITIATED WATER@	078539	P 23
STANDARDS REPORTS LOSS OF TWO STANDARD SAMPLES OF TRITIATED WATER@ @ATL. BUREAU OF	044438	P 15
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STATEMENT OF ATMOSPHERIC MEASURES FOLLOWING THE ACCIDENT AT WINDSCALE@ @A PEAK IN THE TRITIUM	015289	P 3
@POSSESSION OF SOMEONE WITHOUT A LICENSE@	041365	P 10
@MATTHEW WISHP POSSESSED TRITIUM WITHOUT LICENSE@	047036	P 13
OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND WORK AREA@ @FEARY VIAL	040251	P 12
WAS FOR AIR@ @EMPLOYEE WORKED IN HIGH AIR CONCENTRATION OF TRITIUM (6 TIMES THE	076467	P 19
@FEARY VIAL OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND WORK AREA@	040251	P 12
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@ YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 71@	015906	P 3
@SELECTED YANKEE OPERATING EXPERIENCE.@	015404	P 4
@VIOLATION OF CONTAINMENT AT YANKEE ATOMIC (AO 73-13)@	080114	P 23
@ YANKEE STEAM GENERATOR TUBE REPAIRS@	070727	P 8
@QUANTITY OF TRITIUM IMPORTED FOR FISCAL YEAR 1966@	063650	P 9

XI Responses to Environmental Impact Questions

II - RESPONSES TO ENVIRONMENTAL IMPACT QUESTIONS

016404
QUESTION 4.4 - ESTIMATE AND JUSTIFY TRITIUM DISCHARGED IN LIQUID
TENNESSEE VALLEY AUTHORITY
4 PAGES, PAGES 4.1-1 TO 4.1-4 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO NRC QUESTIONS.
NOVEMBER 18, 1966, REPORT NO. 50-259/260

STUDIES INDICATE TRITIUM IN THE LIQUID EFFLUENT IS A PRELIMINARY OF THE OFF-SITE DOSE BASED ON ONLY DERIVATION OF CONCENTRATIONS. NO SPECIAL MONITORING INSTRUMENTS ARE NECESSARY. CONCENTRATE CONTAIN THAT LEAVES TRACE IN OF THE TRITIUM IN A FIBERGLASS-CLAD FUEL ROD LEAVES THAT DECAYED OF NUCLEIDE REMOVAL. WHILE STAINLESS-CLAD FUEL RELEASES IT TO LEAK.

AVAILABILITY - USNRC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

REACTOR, GAS + MONITOR, LIQUID + CONTAINING COMPONENT SUMMARY + WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION + REPORT, PSAR

017016
QUESTION 17 - RADIATION CONTROL DCM-1 IN LIQUID WASTE SYSTEM.
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.
6 PAGES, 1 FIGURE, 1 TABLE, 1 REFERENCE, NATIONAL BUREAU OF STANDARDS REACTOR, FINAL SAFETY ANALYSIS REPORT, SUPPL. 8, PAGES 17-1/17-6, REVISED 1, 1964, REPORT NO. 53-104

PROVIDE CONSERVATIVE INFORMATION TO SHOW HOW RADIATION MONITOR DCM-1 IN THE LIQUID-WASTE SYSTEM CAN BE SET TO ENSURE THAT THE 10 CFR 20 LIMIT OF 3% CURIE PER YEAR FOR RELEASES TO SANITARY SEWER SYSTEMS IS NOT EXCEEDED. CONSIDERATION SHOULD BE GIVEN TO - VARIATIONS IN FLOW RATE AND COMPOSITION OF THE LIQUID WASTE MIXTURES, MINIMUM SENSITIVITY OF THE MONITORING INSTRUMENT, THE MAXIMUM AMOUNT OF POSSIBLE ACTIVITY RELEASED, THE NEED TO INCLUDE TRITIUM AND OTHER LOW-ENERGY EMITTERS. HOW IS THE NECESSARY FUNCTIONAL OR PHYSICAL REDUNDANCY PROVIDED IN THIS AUTOMATIC SYSTEM TO ENSURE ITS OPERATION WHEN REQUIRED.

AVAILABILITY - USNRC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

REACTOR, GAS + MONITOR, LIQUID + REACTOR, RESEARCH + REPORT, SAR + WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION

017074
QUESTION 10 - ANALYSIS OF TRITIUM DOSES FROM HEAT EXCHANGER FAILURE
NATIONAL BUREAU OF STANDARDS, REACTOR OPERATIONS DIVISION, INSTITUTE FOR MATERIALS RESEARCH
NBS-GE - WRI-0-0000 -, 4 PAGES, 1 TABLE, PAGE 10-1 THRU 10-4 OF SUPPLEMENT 8 TO THE FINAL SAFETY ANALYSIS REPORT OF THE NATIONAL BUREAU OF STANDARDS REACTOR, REVISED 10, 1964, REPORT NO. 53-104

ANALYZE TRITIUM DOSES RESULTING FROM A MASSIVE HEAT-EXCHANGER FAILURE WHEN THE HEAVY WATER LEAKS INTO THE SECONDARY COOLING TOWER. (ANSWER) A SINGLE TUBE RUPTURE WITH NO CORRECTIVE ACTION WILL GIVE AN OFF-SITE CONCENTRATION OF 4 MPC, REQUIRING 240 HR EXPOSURE TO REACH A DOSE OF 3.2 REM.

AVAILABILITY - USNRC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

RADIOGENIC RELEASE + DOSE + REACTOR, HWR + REACTOR, RESEARCH + REPORT, SAR + HAZARDS ANALYSIS + RESPONSE TO NRC QUESTION + NRC + FAILURE, TUBING + HEAT EXCHANGERS

071003
QUESTION 4.2--PRODUCTION RATE OF TRITIUM FROM ROUTINE OPERATION
PHILADELPHIA ELECTRIC COMPANY
1 PAGE OF THE PRELIMINARY SAFETY ANALYSIS REPORT, PEACH BOTTOM ATOMIC POWER STATION UNITS 2 AND 3, SUPPLEMENT NO. 1, REPORT 50-277/278, TYPE--BWR, MFG--G.E., 20--DECEMBER, 1967

SUBMIT THE ANALYSIS OF THE PRODUCTION RATE OF TRITIUM RESULTING FROM ROUTINE OPERATION, AND DESCRIBE CAPABILITY TO MEASURE ITS PRESENCE IN LIQUID AND GASEOUS EFFLUENTS, AND POSSIBLE RATE OF BUILDUP IN THE PRIMARY COOLANT SYSTEM OVER AN EXTENDED TIME. (ANSWER) PRODUCTION RATE IS 0.6 CURIE PER MONTH PER UNIT IN THE COOLANT WATER, AND 1400 CURIES IN THE FUEL/MODERATOR.

AVAILABILITY - USNRC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ACTIVITY BUILDUP + REACTOR, BWR + FISSION PRODUCT RELEASE + MEASUREMENT + RESPONSE TO NRC QUESTION + REPORT, PSAR + MAIN COOLING SYSTEM + PEACH BOTTOM 2 (BWR)

073405
QUESTION 4.7 - TRITIUM BUILDUP AND HAZARD
NORTHERN STATES POWER CO., MINNEAPOLIS, MINNESOTA
3 PAGES, 3 REFERENCES, PAGE 4.7-1 THRU 4.7-3 OF AMENDMENT 4 TO MONTICELLO CONSTRUCTION PERMIT APPLICATION, JAN. 18, 1967, REPORT NO. 50-263

ANALYZE THE BUILDUP OF TRITIUM IN THE PRIMARY COOLANT OVER THE LIFE OF THE PLANT. EVALUATE THE HAZARD FROM TRITIUM INVENTORY IN THE PRIMARY COOLANT IN TERMS OF A STEAM-LINE RUPTURE. WHAT PLANS OF TRITIUM MONITORING WILL BE PROVIDED TO ENSURE THAT EXCESSIVE CONCENTRATIONS ARE NOT REACHED IN THE REACTOR COOLANT OR RADWASTE SYSTEM. (ANSWER) MAXIMUM CONCENTRATION IN REACTOR COOLANT IS 0.5 MICROCURIE/CC. EFFLUENT CONCENTRATION WILL BE WELL OFF-SITE PERMISSIBLE CONCENTRATIONS BY A FACTOR OF 1 MILLION, SO NO SPECIAL MONITORS ARE NECESSARY. OFF-SITE DOSES

[illegible] - [illegible]
FOR STEAM-LINE-BREAK ACCIDENT WERE ANALYZED IN THE SER AND ARE BELOW LIMITS. SO ANALYSIS FOR TRITIUM IS NOT NECESSARY.

AVAILABILITY - [illegible] PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ACTIVITY RELEASE • REACTOR, PWR • EFFLUENT • [illegible], RELEASE • ACCIDENT, STEAM LINE RUPTURE • [illegible] ANALYSIS • CONTAMINATION • [illegible] • RESPONSE TO NRC QUESTION • [illegible] (PWR) • REPORT, PSAR • [illegible] COOLING SYSTEM

[illegible]
RESPONSE TO QUESTION 9-1 - CHANGE TRITIUM LEVEL IN LAKE MICHIGAN
[illegible] EDISON COMPANY
1 REC., PAGE 9-1-1 OF AMENDMENT 7 TO SECTS 1 AND 2 LICENSE APPLICATION (PSAR), APRIL 17, 1968, DOCKET NO. 50-[illegible], TYPE--PWR, REG--WEST, AF--SGT • LUMPP

WHAT IS THE TRITIUM LEVEL IN LAKE MICHIGAN. CONSUMERS LITERATURE SHOWS OCEAN LEVELS AS - 9 TO [illegible] [illegible] CONTAMINATED, AND RIVERS AS [illegible] TO [illegible]. WE ESTIMATE THE TRITIUM LEVEL IN LAKE MICHIGAN AS [illegible] TO [illegible] CONTAMINATED, AND THE SAMPLES WILL BE ANALYZED IN A MONTH. SEE QUESTION 14-1 IN VOL. 14 FOR REFERENCE OF TRITIUM BUILDUP IN THE LAKE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151. $1.50 (PPR), $0.65 MICROFICHE

ACTIVITY RELEASE • OCEAN AND SEA • REACTOR, PWR • BLOOD • RESPONSE TO NRC QUESTION • REPORT, PSAR • [illegible] (PWR) • WASTE DISPOSAL, LIQUID

[illegible]
WASTE HANDLING, VESSEL INTERNALS, AND TABULATION OF LOCATION OF RESPONSES TO NRC QUESTIONS
ROCHESTER GAS AND ELECTRIC CORP.
[illegible] PAGES, FIGURES, TABLES. AMENDMENT 12 TO STEAM LICENSE APPLICATION (SUPPL. TO FSAR), DEC. 6, 1968, DOCKET 50-[illegible], TYPE--PWR, REG--WEST., AF--GILBERT ASSOC.

CONTAINS REPLACEMENT PAGES FOR FSAR AND SOME ADDITIONAL INFORMATION ON WASTE HANDLING IN GENERAL AND TRITIUM IN PARTICULAR. ALSO INCLUDES ADDITIONAL FIGURES OF THE REACTOR INTERNALS ASSEMBLY. INCORPORATION IN REPLACEMENT PAGES COMPLETES RESPONSES TO NRC QUESTIONS AND PROVIDES A TABULATION OF THE LOCATION (SUPPLEMENT AND/OR FSAR) OF INFORMATION WHICH RESPONDS TO NRC QUESTIONS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545. [illegible] CENTS/PAGE -- MINIMUM CHARGE $2.00)

NRC QUESTION • REACTOR, PWR • REACTOR, INTERNAL SUPPORTS • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • CORE COMPONENTS

[illegible]
SUPPLEMENT 9 TO FSAR - ADDITIONAL INFORMATION TO NRC QUESTIONS IN SUPPLEMENT 1
VIRGINIA ELECTRIC POWER CORPORATION
[illegible] PAGES, AMENDMENT 9 TO FIRST LICENSE APPLICATION (SUPPL. 9 TO FSAR), APRIL 16, 1969, DOCKET 50-[illegible], TYPE--PWR, REG--[illegible], AF--STONE • WEBSTER

ADDED INFORMATION CONCERNING MAXIMUM POSSIBLE FLOOD, RESPONSE OF WESTINGHOUSE PUMPS, EARTHQUAKE ACCELERATION RESPONSE SPECTRA, AND DESIGN CRITERIA VS THE ARTICLE FRACTURE OF REACTOR CIRCULATING PUMPS, ANCHORAGE, VESSEL SUPPORTS, MAXIMUM HEAT REMOVAL SYSTEM, TRITIUM, EMERGENCY POWER, SAFETY SYSTEM, CLEANUP SYSTEM, AND SEISMIC ANALYSIS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545. [illegible] CENTS/PAGE -- MINIMUM CHARGE $2.00)

NRC QUESTION • REACTOR, PWR • ARTICLE FRACTURE • EMERGENCY POWER, ELECTRIC • NRC DESIGN CRITERIA • PRESSURE VESSELS • REACTOR SAFETY SYSTEM • WELDING • COOLING, SHUTDOWN • EARTHQUAKE • DESTRUCTIVE WIND • REPORT, PSAR • ACCELERATION • EARTHQUAKE ENGINEERING • RESPONSE SPECTRUM • FLOOD • FASTER (PWR) • AUXILIARY COOLING SYSTEM • PIPES AND PIPE FITTINGS • CONTROL ROD DRIVE MECHANISMS

[illegible]
RESPONSE TO QUESTION 7 - TRITIUM CONTROLS
VIRGINIA ELECTRIC POWER CORPORATION
6 PAGES, 1 TABLE, PP. 10-22 OF SUPPLEMENT 9 TO FIRST FSAR, APRIL 16, 1969, DOCKET 50-[illegible], TYPE--PWR, REG--[illegible], AF--STONE • WEBSTER

DISCUSS PRODUCTION RATES AND CONTROLS FOR TRITIUM. ONE ANSWER PRODUCTION RATE BY NEUTRON BOMBARDMENT IS 9 TIMES [illegible] THAN MICROCURIES/SEC IN 1000-MWT REACTOR, 105 MICROCURIES/SEC FROM FISSION, AND [illegible] MICROCURIES/SEC FROM BORON CONTROL RODS. [illegible] RELEASE IS FACTOR OF 6 BELOW NRC. GAS RELEASE FACTOR OF 4 BELOW LIMIT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545. [illegible] CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACTIVITY RELEASE • REACTOR, PWR • BORON • FISSION GAS RELEASE • FISSION PRODUCT, VOLATILE • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • RADIOACTIVE GAS • FISSION PRODUCT

[illegible]
DESCRIPTION • RESPONSE TO NRC QUESTION • REPORT, PSAR • MAIN COOLING SYSTEM • EASTERN [illegible] • CONTROL RODS

[illegible]
RESPONSE TO COMMENT 2.1[illegible]--TRITIUM
NEW YORK STATE ELECTRIC AND GAS CORP.
2 PAGES, AMENDMENT 1 TO DOCKET LICENSE APPLICATION (PSAR), DOCKET 50-[illegible], TYPE--PWR, MFG--G.E., AF--[illegible],
DECEMBER 1966

[illegible] SOURCES OF TRITIUM, AND RELEASE AMOUNT. DESCRIBE MEASUREMENT AND DETECTION TECHNIQUES. PRODUCTION SOURCE, PRODUCTION RATE, AMOUNT RELEASED TO COMPONENT, EXPECTED CONCENTRATION IN THE DISCHARGE CANAL CONSIDERING DILUTIONS RATE OF COOLANT, COOLANT RELEASED AS LIQUID WASTE, DESIGN OF RADWASTE SYSTEM, MODE OF RELEASE OF RADWASTE TO DISCHARGE CANAL. [illegible] TRITIUM CONCENTRATIONS ARE MEASURED IN EFFLUENTS, AND HEALTH AND SAFETY PROBLEMS ASSOCIATED WITH RELEASES. [illegible] SEE SIMILAR RESPONSE IN AMEND. 1 TO F.S. [illegible] (DOCKET 50-[illegible]). NO [illegible] CONCENTRATION [illegible]. NO HEALTH OR SAFETY PROBLEM. COOLING TOWERS PLANNED, [illegible] REPORTED, SO PERMISSIBLE LIMITS [illegible] WILL NOT BE EXCEEDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00
COPY, $0.65 MICROFICHE

ACTIVITY BUILDUP • REACTOR, PWR • [illegible], RELATIVE • [illegible] SAFETY AND CONTROL • RADIOACTIVITY RELEASE •
RADIOACTIVE GAS • [illegible], INDUCED • RESPONSE TO NRC QUESTION • REPORT, PSAR • MAIN COOLING SYSTEM • [illegible]
• [illegible]

[illegible]
RESPONSE TO QUESTION 2 - SPECIFICATIONS FOR COOLANT ACTIVITY AND LEAKAGE
SAXTON NUCLEAR EXPERIMENTAL CORPORATION
10 PAGES, 3 TABLES, PP. 5-20 OF LETTER TO D.J. SKOWRONEK, DPL, MARCH 12, 1969, DOCKET 50-146, TYPE--PWR, MFG--
WEST., AF--GILBERT ASSOC.

ANALYSIS AND SPECIFICATIONS REQUIRED FOR 7 ITEMS [illegible]. DESCRIBE FAILED FUEL, STEAM-GENERATOR LEAKAGE, ACTIVITY IN DEMINERS AND WATER-STORAGE TANKS, MONITORING OF ACTIVITY, RELIEF-VALVE TESTING). [illegible] (A) PRIMARY-COOLANT-GAS ACTIVITY LIMITS OF [illegible] MICROCURIES/CC, [illegible] TO GAS FROM 10 RODS. (B,C) EXISTING LIMIT ON [illegible] ACTIVITY AND HEAT-EXCHANGER LEAKAGE GIVES [illegible]-SIZE DOSES OF MILLIREMS IN STEAM-LINE BREAKS. (D) TRITIUM LIMIT OF 3.0000 MICROCURIES/CC PROPOSED FOR STORED WATER. (E,F) CONTINUOUS MONITORING OF PRIMARY-COOLANT FISSION-PRODUCT ACTIVITY ABOVE 2[illegible] POWER. [illegible] INTEGRITY VERIFIED TWICE WEEKLY. (G) RSS RELIEF VALVE TEST YEARLY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, [illegible] PAGE -- MINIMUM
CHARGE $2.00)

ACTIVITY BUILDUP • REACTOR, PWR • SAXTON (PSAR) • ACCIDENT, STEAM LINE RUPTURE • INSTRUMENT, DETECTION FAILED
FUEL ELEMENT • TECHNICAL SPECIFICATIONS • REFUELING • RESPONSE TO NRC QUESTION • MAIN COOLING SYSTEM

[illegible]
RESPONSE TO QUESTION 14.6--PRODUCTION RATE OF TRITIUM IN PRIMARY COOLANT
BALTIMORE GAS AND ELECTRIC COMPANY
7 PAGES, 2 TABLES, PAGES 14.6-1 AND -2 OF CALVERT CLIFFS NUCLEAR POWER PLANT LICENSE APPLICATION, UNITS 1 AND
2, DECEMBER 19, 1968, DOCKET 50-317, 318, TYPE--PWR, MFG--COMB., AF--BECHTEL

PROVIDE DATA ON PRODUCTION RATE OF TRITIUM BY TERNARY FISSION AND ACTIVATION OF COOLANT BORON AND LITHIUM. [illegible] TO PAGES 14.6-1 AND -2.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151. $3.00
COPY, $0.65 MICROFICHE

ACTIVITY BUILDUP • BORON • REACTOR, PWR • FACILITATION PRODUCT • LITHIUM • RESPONSE TO NRC QUESTION • MAIN
COOLING SYSTEM • CALVERT CLIFFS 1 (PWR) • CALVERT CLIFFS 2 (PWR)

[illegible]
RESPONSE TO QUESTION 12.6-8 - TRITIUM GENERATION AND CONTROL
JERSEY CENTRAL POWER AND LIGHT • METROPOLITAN EDISON COMPANY
7 PAGES, 3 FIGURES, PG. 12.6-8-1 THRU -4 OF THREE MILE ISLAND 2, PSAR, VOL. 4, MARCH 13, 1969, DOCKET 50-320,
TYPE--PWR, MFG--B&W, AF--[illegible] • B&W

DISCUSS TRITIUM GENERATION AND CONTROL. [illegible] PG. 12.6-8-1 THRU -4 PLUS 3 FIGURES.)

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00
COPY, $0.65 MICROFICHE

ACTIVITY BUILDUP • REACTOR, PWR • WASTE DISPOSAL, GAS • WASTE MANAGEMENT • STORAGE CONTAINER • RESPONSE TO
NRC QUESTION • REPORT, PSAR • THREE MILE ISLAND 2 (PWR)

[illegible]
RESPONSE TO QUESTION 7.[illegible] - TRITIUM AND IODINE CONCENTRATIONS FROM DPA

[illegible] RECEIVED
NEW YORK STATE ELECTRIC AND GAS CORPORATION
[illegible] PAGES, 1 TABLE, PG. [illegible] THRU [illegible] OF AMENDMENT [illegible] TO NELL LICENSE APPLICATION, JANUARY 27, 1980, DOCKET 50-[illegible]
[illegible], TYPE--RAD, MEG--[illegible], AF--[illegible]

ASSUMING ALL LIQUID RADWASTE RELEASED FOR 7 MONTHS IS CONFINED IN THE UPPER 50 FEET OF THE PRELIMINARY IN THE CENTRAL PORTION OF THE LAKE, WHERE IT IS UNAFFECTED BY ANY STREAM INFLOW DURING THIS PERIOD, PROVIDE NEW ANALYSES OF THE CONCENTRATIONS OF TRITIUM, LONG LIVED ACTIVITY, OR RADIOIODINE, AS APPROPRIATE, WHICH WOULD RESULT AT VARIOUS DISTANCES FROM THE REACTOR. CONSIDER IN THE ANALYSIS THE SAME EFFECTS LISTED IN PART A. ABOVE AS APPROPRIATE. ### CONTINUED ON PG. [illegible] THRU [illegible])

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, RAD + [illegible] + FISSION PRODUCT, [illegible] + RESPONSE TO NRC QUESTION + REPORT, PSAR + OFF SITE + WASTE DISPOSAL, LIQUID + NELL (PWR)

[illegible]
RESPONSE TO QUESTION [illegible] - TRITIUM AND IODINE CONCENTRATIONS AND DOSE
NEW YORK STATE ELECTRIC AND GAS CORPORATION
[illegible] PAGES, PG. [illegible] THRU [illegible] OF AMENDMENT [illegible] TO NELL LICENSE APPLICATION, JANUARY 27, 1980, DOCKET 50-[illegible], TYPE--RAD, MEG--[illegible], AF--[illegible]

PROVIDE ANALYSES OF THE CONCENTRATIONS OF TRITIUM, LONG LIVED ACTIVITY, OR RADIOIODINE, AS APPROPRIATE, WHICH WOULD RESULT AT VARIOUS DISTANCES FROM THE REACTOR ASSUMING RAD DECAYS DURING A SLOW DRIFT WHICH CONTINUES FOR 24 HOURS AND PROVIDES MAXIMUM FALLOUT EFFECTS AT ALL DISTANCES. ### CONTINUED ON PG. [illegible] THRU [illegible])

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, RAD + PRESSURE CONTAINMENT RELEASE + FISSION PRODUCT, IODINE + FALLOUT + RESPONSE TO NRC QUESTION + REPORT, PSAR + NELL (PWR)

[illegible]
RESPONSE TO QUESTION [illegible] - TRITIUM SAMPLING
CONSUMERS POWER COMPANY
1 PAGE, PG [illegible] OF AMENDMENT [illegible] TO PALISADES LICENSE APPLICATION, JULY 17, 1980, DOCKET 50-255, TYPE--RAD, MEG--CONS., AF--[illegible]

AT WHICH POINTS IN THE LIQUID WASTE SYSTEM WILL TRITIUM LEVELS BE MONITORED AND HOW WILL TRITIUM CONCENTRATIONS BE DETERMINED. ### ANSWER ON PG [illegible].

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

EFFLUENT + MONITOR, LIQUID + REACTOR, PWR + REPORT, SAR + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + PALISADES (PWR) + OPERATION MONITORS

[illegible]
RESPONSE TO QUESTION 12.6-8 - TRITIUM GENERATION AND CONTROL
JERSEY CENTRAL POWER AND LIGHT
1 PAGE, PG 12.6-8-1 TO AMENDMENT 5 TO OYSTER CREEK 2 LICENSE APPLICATION, DEC. 2, 1980, DOCKET 50-320, TYPE--RAD, MEG--PWR, AF--NORMS AND RAD

DISCUSS TRITIUM GENERATION AND CONTROL. ### CONTINUED FOR THE OYSTER CREEK UNIT 2 REACTOR, THIS IS BEING ANALYZED. ANALYSIS IS NOT YET COMPLETE AND WILL BE SUBMITTED LATER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

ACTIVITY RELEASE + REACTOR, PWR + REACTOR COOLANT + RESPONSE TO NRC QUESTION + REPORT, PSAR + MAIN COOLING SYSTEM + THREE MILE ISLAND 2 (PWR)

[illegible]
RESPONSE TO QUESTION [illegible] - TRITIUM RELEASE RATE
LONG ISLAND LIGHTING COMPANY, HICKSVILLE, NEW YORK
[illegible] PAGES, 1 ATTACHMENT, PG [illegible] THRU [illegible] TO AMENDMENT [illegible] TO SHOREHAM 1 LICENSE APPLICATION, APRIL 18, 1980, DOCKET 50-322, TYPE--RAD, MEG--GAF, AF--STORM + WASTE

PROVIDE INFORMATION CONCERNING ESTIMATED TRITIUM RELEASES FROM THIS FACILITY DURING REACTOR OPERATION. ### CONTINUED: THE FOLLOWING SOURCES OF TRITIUM ARE CONSIDERED - (1) TERNARY FISSION - FUEL LEAKAGE, AND (2) ACTIVATION OF NORMAL ATOMS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + RELEASE RATE + RESPONSE TO NRC QUESTION + REPORT, PSAR + SHOREHAM (PWR)

041121
RESPONSE TO QUESTION 9.5.2-1 - SOURCES OF TRITIUM PRODUCTION
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-0 ?, 1 PAGE, PG. 9.5.2-1 OF AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATION, JANUARY 31, 1969, DOCKETS 50-324/325, TYPE--RWD, MFG--G.E., AE--UFHC

IDENTIFY THE SOURCES OF TRITIUM PRODUCTION IN THE REACTOR, INCLUDING THE BASIS FOR EVALUATING THE PRODUCTION RATES. DISCUSS THE UNCERTAINTIES THAT ARE ASSOCIATED WITH THE PRODUCTION RATES. *** (ANSWER) THE PRESENT QUESTION OF TRITIUM HAS BEEN DISCUSSED IN TECHNICAL NOTES ON THE SIGNIFICANCE OF TRITIUM IN WATER REACTORS, BY JAMES M. SMITH, WHICH WAS SUBMITTED TO THE AEC AS PART OF AMENDMENT 1 TO THE F.S. HATCH NUCLEAR PLANT DOCKET 50-321.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, RWD * WASTE SOURCE AND TYPE * WASTE MANAGEMENT * RESPONSE TO NRC QUESTION * BRUNSWICK 1 (RWD) * BRUNSWICK 2 (RWD)

041123
RESPONSE TO QUESTION 9.5.4 - FRACTION OF TRITIUM RELEASED OF PRIMARY COOLANT
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-0 ?, 1 PAGE, PG. 9.5.4-1 OF AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATION, JANUARY 31, 1969, DOCKETS 50-324/325, TYPE--RWD, MFG--G.E., AE--UFHC

WHAT FRACTION OF THE TRITIUM PRODUCED FROM EACH OF THE SOURCES IS RELEASED TO THE PRIMARY COOLANT. HOW HAVE THESE VALUES BEEN DETERMINED. WHAT ARE THE UNCERTAINTIES IN THE VALUES. *** (ANSWER) SEE RESPONSE TO COMMENT 9.5.2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVITY BUILDUP * REACTOR, RWD * RESPONSE TO NRC QUESTION * MAIN COOLING SYSTEM * COOLANT QUALITY * BRUNSWICK 1 (RWD) * BRUNSWICK 2 (RWD)

041124
RESPONSE TO QUESTION 9.5.5 - TRITIUM/COOLANT/LIQUID-WASTE CHAIN
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-0 ?, 1 PAGE, PG. 9.5.5-1 OF AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATION, JANUARY 31, 1969, DOCKETS 50-324/325, TYPE--RWD, MFG--G.E., AE--UFHC

WHAT FRACTION OF THE TRITIUM RELEASED TO THE PRIMARY COOLANT IS RELEASED IN THE LIQUID WASTES. *** (ANSWER) SEE RESPONSE TO COMMENT 9.5.2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, RWD * WASTE DISPOSAL, LIQUID * WASTE MANAGEMENT * RESPONSE TO NRC QUESTION * BRUNSWICK 1 (RWD) * BRUNSWICK 2 (RWD)

041125
RESPONSE TO QUESTION 9.5.6 - EVALUATION OF TRITIUM CONCENTRATIONS IN DISCHARGE CANAL
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-0 ?, 1 PAGE, PG. 9.5.6-1 TO AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATION, JANUARY 31, 1969, DOCKETS 50-324/325, TYPE--RWD, MFG--G.E., AE--UFHC

DESCRIBE HOW THE TRITIUM CONCENTRATIONS IN THE DISCHARGE CANAL WILL BE EVALUATED FOR AVERAGE YEARLY DISCHARGES AND FOR CONDITIONS WHICH ON A SHORT TERM MIGHT LEAD TO HIGHER CONCENTRATIONS. *** (ANSWER) SEE RESPONSE TO COMMENT 9.5.2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, RWD * WASTE DISPOSAL, LIQUID * CONCENTRATION, PEAK TO AVERAGE * WASTE MANAGEMENT * RESPONSE TO NRC QUESTION * BRUNSWICK 1 (RWD) * BRUNSWICK 2 (RWD)

041126
RESPONSE TO QUESTION 9.5.7 - TRITIUM CONCENTRATIONS - DISCHARGE CANAL VS SOURCE OF WATER
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-0 ?, 1 PAGE, PG. 9.5.7-1 OF AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATION, JANUARY 31, 1969, DOCKETS 50-324/325, TYPE--RWD, MFG--G.E., AE--UFHC

HOW WILL THE TRITIUM CONCENTRATIONS IN THE DISCHARGE CANAL AND IN THE WISPER WATER SOURCE (I.E., FLOWING RIVER) COMPARE WITH THE TRITIUM ALREADY PRESENT IN THE WATER SOURCE. *** SEE RESPONSE TO COMMENT 9.5.2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, RWD * WASTE DISPOSAL, LIQUID * WASTE MANAGEMENT * RESPONSE TO NRC QUESTION * BRUNSWICK 1 (RWD) * BRUNSWICK 2 (RWD)

068335
RESPONSE TO QUESTION 11.9 - SAMPLING TRITIUM LIQUID RADWASTE SYSTEM
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
1 PAGE. PAGE 3 11.9-1 OF AMENDMENT 12 TO INDIAN POINT 2 LICENSE APPLICATION, NOVEMBER 21, 1969. DOCKET 50-247.
TYPE--PWR, MFG--WEST., AE--UNITED ENGR.

WE UNDERSTAND THAT IT IS NOT YOUR INTENT TO SAMPLE FOR TRITIUM IN THE LIQUID RADWASTE SYSTEM ON A BATCH BY BATCH BASIS PRIOR TO RELEASE FROM THIS FACILITY. IF THIS IS SO, PROVIDE THE BASIS BY WHICH COMPLIANCE WITH THE TECHNICAL SPECIFICATIONS WILL BE DEMONSTRATED. **** ANSWER ON PAGE 3 11.9-1

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + REPORT, SAR + +SAMPLING + +WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + INDIAN POINT 2 (PWR) + RESPONSE TO NRC QUESTION

061790
RESPONSE TO QUESTION 9.2 - TRITIUM-RELEASE LIMITS
WISCONSIN ELECTRIC POWER COMPANY + WISCONSIN MICHIGAN ELECTRIC POWER COMPANY
50266-16 +. 1 PAGE. PG 3 9.2-1 OF AMENDMENT 2 TO POINT BEACH 1 AND 2 LICENSE APPLICATION, JANUARY 19, 1970. DOCKETS 50-266/301. TYPE--PWR, MFG--WEST., AE--BECHTEL

DISCUSS THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED (TABLE 9.2-6 IN FSAR). WHAT SPECIAL PRECAUTIONS WILL BE TAKEN CONCERNING TRITIUM DURING REFUELING WITH RESPECT TO PLANT PERSONNEL AND RELEASES TO THE ENVIRONMENT. *** (ANSWER) FOR UNCERTAINTIES, SEE TABLE 9.2-6. AS ANSWERED, FOR TRITIUM RELEASES TO THE ATMOSPHERE VIA THE CONTAINMENT PURGE SYSTEM, SEE THE RESPAR, SECTION 14.3.9.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + REPORT, SAR + +WASTE DISPOSAL, GAS + +WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + POINT BEACH 1 (PWR) + AQUATIC ENVIRONMENT + POINT BEACH 2 (PWR)

047230
RESPONSE TO QUESTION 9.4 - CONCENTRATION OF TRITIUM IN COOLING SYSTEM
VIRGINIA ELECTRIC AND POWER COMPANY
50338-11 +. 1 PAGE. PG 50.4-1 OF NORTH ANNA 1 AND 2 PSAR SUPPLEMENT, VOL. 2 TO AMENDMENT 4, JANUARY 26, 1970. DOCKETS 50-338/339. TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

THE PSAR STATES, ON PG 9.1.4-1, THAT THE CHEMICAL AND VOLUME CONTROL SYSTEM WILL BE USED TO CONTROL THE CONCENTRATION OF TRITIUM IN THE PRIMARY COOLANT SYSTEM. DISCUSS THE CONTROL TECHNIQUES AND CRITERIA. *** (ANSWER) THIS WILL BE DONE BY LETDOWN OF ABOUT A SYSTEM VOLUME PER REFUELING CYCLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + RESPONSE TO NRC QUESTION + REPORT, PSAR + +MAIN COOLING SYSTEM + NORTH ANNA 1 (PWR) + NORTH ANNA 2 (PWR)

047250
RESPONSE TO QUESTION 11.18 - TRITIUM RELEASES TO CANAL
VIRGINIA ELECTRIC AND POWER COMPANY
50338-11 +. 1 PAGE. PG 511.18B1-1 OF NORTH ANNA 1 AND 2 PSAR SUPPLEMENT, VOL. 2 OF AMENDMENT 4, JANUARY 26, 1970. DOCKETS 50-338/339. TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

WHAT FRACTION OF PRIMARY-COOLANT TRITIUM WILL BE RELEASED TO THE CIRCULATING-WATER DISCHARGE TUNNEL? *** (ANSWER) THE FRACTION IS A FUNCTION OF THE PRIMARY-CRAFT WATER MANAGEMENT AT THE STATION AND CANNOT BE ASSESSED AT THIS TIME.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + WATER + +WASTE DISPOSAL, LIQUID + +WASTE MANAGEMENT + +RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + REPORT, PSAR + NORTH ANNA 1 (PWR) + NORTH ANNA 2 (PWR)

047251
RESPONSE TO QUESTION 511.10 - TRITIUM ASSAYS - TREATMENT LAGOONS
VIRGINIA ELECTRIC AND POWER COMPANY
50338-11 +. 1 PAGE. PG 511.10B1 OF NORTH ANNA 1 AND 2 PSAR SUPPLEMENT, VOL. 2 TO AMENDMENT 4, JANUARY 26, 1970. DOCKETS 50-338/339. TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

DESCRIBE HOW THE TRITIUM CONCENTRATION IN THE TREATMENT LAGOONS WILL BE EVALUATED FOR TRADE AVERAGE CONCENTRATIONS AND FOR CONDITIONS WHICH MAY A SHORT TERM MIGHT CAUSE HIGHER CONCENTRATIONS. *** (ANSWER) WATER SAMPLES FROM THE TREATMENT LAGOONS WILL BE ANALYZED CONTAINED AS PART OF THE ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM. QUARTERLY ANALYSIS OF THE

043251 (CONTINUED)
SAMPLES WILL INCLUDE TRITIUM ASSAYS FROM WHICH YEARLY AVERAGE CONCENTRATIONS CAN BE DETERMINED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR • WATER • SAMPLING • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • RESPONSE TO NRC QUESTION • REPORT, DSAR • ENVIRONMENT • NORTH ANNA 1 (PWR) • NORTH ANNA 2 (PWR)

043252
RESPONSE TO QUESTION 11.1C - TRITIUM - RECYCLING EFFECTS
VIRGINIA ELECTRIC AND POWER COMPANY
53930-11 v. 1 PAGE, PG 11.1(C)-1 OF NORTH ANNA 1 AND 2 DSAR SUPPLEMENT, VOL. 2 OF AMENDMENT 4, JANUARY 26, 1976, DOCKETS 50-338/339, TYPE--PWR, MFG--WEST., AE--STONE • WEBSTER

AS TO TRITIUM, CONSIDER THE POTENTIAL RECYCLING EFFECTS DURING PERIODS OF MINIMUM RESERVOIR INFLOW AND MINIMUM OUTFLOW WHEN THE EFFLUENT DISCHARGE RATE FROM THE TREATMENT LAGOONS EXCEEDS THE INFLOW AND OUTFLOW RATE THROUGH THE NORTH ANNA RESERVOIR. *** (ANSWER) THIS QUESTION IS ANSWERED AS PART OF QUESTION 11.9.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR • WATER • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • RESPONSE TO NRC QUESTION • REPORT, DSAR • ENVIRONMENT • NORTH ANNA 1 (PWR) • NORTH ANNA 2 (PWR)

043253
RESPONSE TO QUESTION 11D - MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM STATION
VIRGINIA ELECTRIC AND POWER COMPANY
53930-11 v. 1 PAGE, PG 11.1(D)-1 OF NORTH ANNA 1 AND 2 DSAR SUPPLEMENT, VOL. 2 OF AMENDMENT 4, JANUARY 26, 1976, DOCKETS 50-338/339, TYPE--PWR, MFG--WEST., AE--STONE • WEBSTER

DESCRIBE THE METHODS FOR MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM THE STATION. *** (ANSWER) A WATER SAMPLE WILL BE OBTAINED FROM THE LOW LEVEL LIQUID WASTE TANK PRIOR TO STATION DISCHARGE. THE TRITIUM CONCENTRATION IN THIS SAMPLE WILL BE DETERMINED USING A LIQUID SCINTILLATION COUNTER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR • WATER • ANALYTICAL TECHNIQUE • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • RESPONSE TO NRC QUESTION • REPORT, DSAR • ENVIRONMENT • NORTH ANNA 1 (PWR) • NORTH ANNA 2 (PWR)

043647
RESPONSE TO QUESTION 9.5 - EMERGENCY POWER TO SAFETY FEATURES
LONG ISLAND LIGHTING COMPANY
53973-12 v. 1 PAGE, REFERENCES, PG 89-153 THRU -155 OF AMENDMENT 6 TO SHOREHAM LICENSE APPLICATION, JUNE 30, 1980, DOCKET 50-322, TYPE--PWR, MFG--GE., AE--STONE • WEBSTER

PROVIDE THE FOLLOWING INFORMATION CONCERNING ESTIMATED TRITIUM RELEASES FROM THIS FACILITY DURING NORMAL OPERATION - (A) THE ASSUMPTIONS, CALCULATIONAL METHODS, AND BASES FOR THE TRITIUM RELEASE RATE FIGURES SHOWN IN TABLE 10-2-1. (B) THE MAXIMUM TRITIUM RELEASE RATES THAT COULD OCCUR DURING NORMAL REACTOR OPERATION, AND HOW THESE VALUES WERE DETERMINED. (C) DESCRIBE THE MEANS THAT WILL BE USED TO MONITOR THE TRITIUM LEVELS IN THE RADWASTE SYSTEMS PRIOR TO RELEASE TO THE ENVIRONMENT. *** (ANSWER) ON PG 89-153 THRU -155.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR • OPERATION • RADIOACTIVITY RELEASE • RESPONSE TO NRC QUESTION • REPORT, DSAR • SHOREHAM (PWR)

045127
RESPONSE TO QUESTION 7.0 - SAMPLING FOR DISCHARGE CANAL
NORTHERN STATE POWER CO.
53[illegible] v. 1 PAGE, PG. 7.0-1 OF AMENDMENT 14 TO PRAIRIE ISLAND LICENSE APPLICATION, AUGUST 27, 1980, DOCKET 50-[illegible], TYPE--PWR, MFG--C.E., AE--BECHTEL

SPECIFICATION [illegible] OF YOUR PROPOSED TECHNICAL SPECIFICATIONS STATES THAT CANAL SAMPLES WILL BE TAKEN FROM THE DISCHARGE CANAL MONTHLY AND ANALYZED FOR TRITIUM AND SIGNIFICANT ISOTOPES. EXPLAIN THE APPARENT INCONSISTENCY OF THIS WITH THE STATEMENT MADE IN SECTION 9.2.3.1, OF THE FSAR THAT THE LIQUID WASTE SYSTEM FOR PRAIRIE ISLAND IS DESIGNED TO DISCHARGE RADIOACTIVE MATERIALS WITHIN THE LIMITS OF 10 CFR 20 WITHOUT THE ANNUAL AVERAGING PROVISION ON A BATCH-BY-BATCH BASIS. *** (ANSWER) SEE PG 7.0-1.

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REACTOR, PWR • SAMPLING • WASTE DISPOSAL, OTHER • WASTE DISPOSAL, LIQUID • RADIOISOTOPE • RESPONSE TO NRC QUESTION • PRAIRIE ISLAND (PWR) • STATE (NORTH)

049207
RESPONSE TO QUESTION 11.2 - LIQUID WASTES
FLORIDA POWER AND LIGHT COMPANY
50250-25 v. 1 PAGE. PG 0-47 OF TURKEY POINT 2 AND 4 LICENSE APPLICATION. MAY 1. 1970. DOCKETS 50-250/251.
TYPE--PUB. MFG--WEST.. RE--DECWTEL

THE FSAR STATES THAT AN ISOTOPIC IDENTIFICATION OF LIQUID WASTES WILL BE MADE IF NECESSARY. INDICATE THE CRITERIA TO BE USED FOR DETERMINATION OF THE NEED FOR ISOTOPIC IDENTIFICATION. HOW WILL TRITIUM DISCHARGES BE EVALUATED AND ACCOUNTED FOR. ... (ANSWER) SEE FSAR PAGES 11.1-1 (REV.9).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR • REPORT, SAR • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • REGULATIONS • RESPONSE TO NRC QUESTION • TURKEY POINT 3 (PWR) • TURKEY POINT 4 (PWR) • [illegible]

049390
PROJECT 900 BLANCO ENVIRONMENTAL IMPACT EVALUATION
CER GEONUCLEAR CORPORATION
PNE-80-4 v. 330 PAGES. 103 FIGURES. 44 TABLES. 82 REFERENCES. OCTOBER 17. 1971

THE ENVIRONMENTAL IMPACT IS CONSIDERED IN AN EXPERIMENT OF THE STIMULATION OF NATURAL GAS BY A NUCLEAR DETONATION; INCLUDING LONG-TERM FLARING OF THE RADIOACTIVE GAS INTO THE ATMOSPHERE FOR TESTING PURPOSES. CONSTRUCTION, GROUND MOTION, PLANNED RADIOACTIVITY RELEASE, AND SEEPAGE TO RADIOISOTOPES FROM THE WELL. TRITIUM-CONTAMINATED WATER SEPARATED FROM THE GAS WILL EITHER BE REINJECTED NEARBY OR EVAPORATED BY INJECTION INTO GAS WHICH IS FLARED. THE HYPOTHETICAL WORST EXPOSURE FROM RADIOIODINE SEEPAGE IS ABOUT 20 OF THE RECOMMENDED YEARLY THYROID DOSE LIMIT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT • IODINE • PLUMBROOK • SEISMOLOGY • WELL • DOSE CALCULATION, INTERNAL • GROUND WATER, NUCLIDE OCCURRENCE • HAZARDS ANALYSIS • CRITICAL NUCLIDE PATHWAY • EXCAVATION, NUCLEAR • HYDROLOGY, RATE OF MOVEMENT • FUEL, FOSSIL • RADIONUCLIDE UPTAKE • BIOACCUMULATION/TRANSFER • RADIONUCLIDE TRANSFER • STIMULATION • RESOURCE, NATURAL • BENEFIT VS RISK • REPORT, ENVIRONMENTAL

049649
RESPONSE TO QUESTION 3.4 - DURABILITY OF CONTROL-ROD POISON BLADE
NORTHERN STATES POWER COMPANY
DOCKET-50263-24 v. 1 PAGE. PG 3.4-1 OF AMENDMENT 17 TO MONTICELLO LICENSE APPLICATION. SEPTEMBER 17. 1969. DOCKET 50-263. TYPE--DWP. MFG--G.E.. RE--DECWTEL

DESCRIBE THE LENGTH OF TIME THE POISON CONTROL BLADES ARE EXPECTED TO REMAIN IN SERVICE, AND THE BASES FOR ESTABLISHING A REPLACEMENT SCHEDULE FOR THESE CONTROL BLADES. ALSO, DISCUSS THE MANNER IN WHICH PROPERTY CHANGES OF MATERIALS AND THE BUILDUP OF ACTIVATION PRODUCTS, SUCH AS TRITIUM, ARE CONSIDERED IN ARRIVING AT A USEFUL LIFETIME OF THE POISON CONTROL BLADES. ... (ANSWER) THE AVERAGE CONTROL-ROD LIFETIME IS ESTIMATED TO BE ABOUT 15 YEARS. WHEN EVALUATING REPLACEMENT DURING OPERATION, THE REFERENCE PROPERTIES, INTERNAL GAS PRESSURE AND ROOM REFLECTION ARE BASED ON PRESUMED CORE FLUXES, AND CROSSSTREAMENT INTEGRATED FLUX FOR INDIVIDUAL CONTROL RODS.

DESCRIBE THE LENGTH OF TIME THE POISON CONTROL BLADES ARE EXPECTED TO REMAIN IN SERVICE, AND THE BASES FOR ESTABLISHING A REPLACEMENT SCHEDULE F

REACTOR, BWR • PRESSURE, INTERNAL • RESPONSE TO NRC QUESTION • MONTICELLO (BWR) • POISON, FIXED • PROPERTIES, LONG • CONTROL RODS

049077
RESPONSE TO QUESTION 11.1 - ESTIMATE OF DAILY AND ANNUAL RELEASES OF RADIOACTIVITY
CONSUMERS POWER COMPANY
DOCKET-50320-0 v. 3 PAGES. PGS 11.1-1 THRU -4 OF AMENDMENT 6 TO MIDLAND 1 AND 2 LICENSE APPLICATION. DECEMBER 29. 1969. DOCKETS 50-329/330. TYPE--PWP. MFG--BWW. RE--DECWTEL

PROVIDE AN ESTIMATE OF THE AMOUNTS OF RADIOACTIVITY ON AN ISOTOPIC BASIS INCLUDING TRITIUM THAT WOULD BE RELEASED DAILY AND ANNUALLY FROM THE PROPOSED MIDLAND FACILITIES. CONSIDER BOTH LIQUID AND GASEOUS WASTES, ASSUMING THAT THE ACTIVITY OF THE PRIMARY COOLANT IS THAT CORRESPONDING TO OPERATION WITH 1 PERCENT FAILED FUEL. ... (ANSWER) ON PAGE 11.1-1 THRU -4.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DILUTION • REACTOR, PWR • REGULATION, NRC • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • POPULATION EXPOSURE • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • RESPONSE TO NRC QUESTION • MIDLAND 1 (PWR) • MIDLAND 2 (PWR)

049019
RESPONSE TO QUESTION 2.7 - SECONDARY COOLANT AND CONTROL ROD
CONSUMERS POWER COMPANY
50329-7 v. 3 PAGES. PG 2.7-1 THRU -3 OF MIDLAND 1 AND 2 FSAR. NOVEMBER 7. 1969. DOCKETS 50-329/330. TYPE--PWP. MFG--BWW. RE--DECWTEL

[illegible]
BASED UPON THE INDICATED PRIMARY-TO-SECONDARY COOLANT LEAK RATE LIMIT OF 1 GPM AND ASSUMING A PRIMARY COOLANT ACTIVITY LEVEL BASED UPON OPERATION WITH 1 PERCENT FAILED FUEL, PROVIDE THE FOLLOWING SECONDARY COOLANT AND COOLING POND ACTIVITY ON AN ISOTOPIC BASIS INCLUDING TRITIUM DUE TO LIQUID WASTE DISCHARGE TO THE POND. ### ANSWER ON PG 2.7-1 THRU -3.

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MIRACTOR, PWR • WASTE MANAGEMENT • RESPONSE TO NRC QUESTION • LEAK • COOLING POND • MIDLAND 1 (PWR) • MIDLAND 2 (PWR)

[illegible]
RESPONSE TO QUESTION II.1 - ESTIMATED AMOUNTS OF RADIONUCLIDES RELEASED DAILY AND ANNUALLY
CONSUMERS POWER COMPANY
[illegible] 7 P., 1 PAGE, PG II.1-1 THRU -3 OF MIDLAND 1 AND 2 PSAR, NOVEMBER 7, 1969, DOCKETS 50-329/330, TYPE--PWR, NRC--PWR, RT--REPORTS

PROVIDE AN ESTIMATE OF THE AMOUNTS OF RADIOACTIVITY ON AN ISOTOPIC BASIS (INCLUDING TRITIUM) THAT WILL BE RELEASED DAILY AND ANNUALLY FROM THE PROPOSED MIDLAND FACILITIES. ### ANSWER ON PAGE II.1-1 THRU -3.

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DILUTION • REACTOR, PWR • WASTE DISPOSAL, GAS • WASTE DISPOSAL, LIQUID • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • RESPONSE TO NRC QUESTION • MIDLAND 1 (PWR) • MIDLAND 2 (PWR)

[illegible]
RESPONSE TO QUESTION II.3 - RADIOACTIVITY DISCHARGED TO RIVER - ACCOUNTABILITY
FLORIDA LIGHT COMPANY
[illegible] 7 P., SEC. 9, PG 9 OF BEAVER VALLEY 1 PSAR DTD. 6, SEPTEMBER 9 1969, DOCKET 50-334, TYPE--PWR, NRC--WEST., RT--STORE • WASTES

DESCRIBE THE PROCEDURE FOR ACCOUNTING FOR THE ACTIVITY WHICH IS DISCHARGED AS WASTE TO THE RIVER. ### ANSWER: SEE SECTION 11.2.6, AMENDMENT 6, BVPS PSAR.

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REACTOR, PWR • WASTE DISPOSAL, RIVER • WASTE MANAGEMENT • RESPONSE TO NRC QUESTION • BEAVER VALLEY 1 (PWR)

[illegible]
RESPONSE TO QUESTION II.4 - TRITIUM
PENNSYLVANIA GENERAL ELECTRIC COMPANY
[illegible] 4 P., PG A-170 OF AMENDMENT 4 TO TORUS PSAR, APRIL 20, 1970, DOCKET 50-[illegible], TYPE--PWR, NRC--WEST., RT--REPORTS

DISCUSS THE UNCERTAINTIES ASSOCIATED WITH THE AMOUNTS OF TRITIUM GENERATED. PROVIDE THAT ANALYSIS OF THE FRACTION OF PRIMARY-COOLANT TRITIUM THAT WILL BE RELEASED TO THE CIRCULATING-WATER DISCHARGE CANAL. DESCRIBE THE METHODS FOR MONITORING TRITIUM CONCENTRATIONS BEFORE DISCHARGE FROM THE PLANT. ### ANSWER ON PAGE A-170.

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[illegible]TION, LIQUID • REACTOR, PWR • WASTE DISPOSAL, LIQUID • RESPONSE TO NRC QUESTION • REPORT, PSAR • WASTE [illegible] SYSTEM • TORUS (PWR)

[illegible]
RESPONSE TO QUESTION II.5 - TRITIUM AND OTHER RADIOACTIVITY IN LIQUID WASTE
FLORIDA POWER AND LIGHT COMPANY
1 PAGE, PG [illegible] OF SUPPLEMENT [illegible] TO TURKEY POINT 3 AND 4 LICENSE APPLICATION, JUNE 26, 1970, DOCKETS 50-[illegible], TYPE--PWR, NRC--WEST., RT--REPORTS

INDICATE [illegible] FOR ISOTOPIC IDENTIFICATION OF LIQUID WASTES. ### HOW WILL TRITIUM DISCHARGES BE EVALUATED. ### REFER TO PSAR PAGES II.1-1 (REV.1).

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REACTOR, PWR • REACTOR PRIMARY TRANSPORT • WASTE TREATMENT, LIQUID • WASTE SOURCE AND TYPE • RESPONSE TO NRC QUESTION • TURKEY POINT 3 (PWR) • TURKEY POINT 4 (PWR)

[illegible]
RESPONSE TO QUESTION II - INTERFERING RADIOISOTOPES IN LIQUID EFFLUENTS
FLORIDA POWER AND LIGHT COMPANY

[illegible]
DOCKET 50-[illegible]. 1 PAGE. PG. 11 OF AMENDMENT 4 TO SEQUOYAH 2 LICENSE APPLICATION. [illegible] 2. [illegible]. TYPE--PWR. NFG--WEST.. AF--[illegible]

SECTION 11 OF THE FSAR STATES THAT AN ISOTOPIC IDENTIFICATION OF LIQUID WASTES WILL BE MADE IF NECESSARY. STATE YOUR CRITERIA FOR DETERMINING WHETHER AN ISOTOPIC ANALYSIS OF WASTE PROCESSING SHOULD BE MADE. INCLUDE YOUR PLANS FOR MONITORING THE RELEASE OF TRITIUM AND OTHER RADIONUCLIDES CONSIDERED TO BE CRITICAL IN THE FUTURE CHANGE PATHWAY TO MAN. [illegible] ON PAGE 19.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR - REPORT, SAR - MONITOR, ENVIRONMENTAL - WASTE DISPOSAL, LIQUID - MANAGEMENT - RESPONSE TO NRC QUESTION - REGULATORY GUIDE - FSAR CHAPTER - [illegible]

[illegible]
RESPONSE TO QUESTION 11.1 - DISPOSAL OF RADIOACTIVE, GASEOUS AND LIQUID
WISCONSIN POWER COMPANY
50-266-7 ?. 17 PAGES. 5 TABLES. PG 11.1-1 THRU -17 OF DAVIS-BESSE PLANT, [illegible] 20, 1970. DOCKET 50-346. TYPE--PWR. NFG--[illegible]. AF--[illegible]

ESTIMATE THE AMOUNT OF RADIOACTIVITY ON AN ISOTOPIC BASIS (INCLUDING TRITIUM) THAT WOULD BE RELEASED DAILY AND ANNUALLY FROM THE PROPOSED FACILITIES. CONSIDER BOTH LIQUID AND GASEOUS WASTES, ASSUMING THAT THE ACTIVITY IN THE PRIMARY COOLANT IS THAT CORRESPONDING TO OPERATION WITH AN ACTIVITY LEVEL TO BE STATED IN THE TECHNICAL SPECIFICATIONS. [illegible] ON PG 11.1-1 THRU - 17.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $1.00 COPY, $0.65 MICROFICHE

RELEASE - REACTOR, PWR - STACK - AIR - WASTE DISPOSAL, GAS - WASTE DISPOSAL, LIQUID - WASTE MANAGEMENT - RESPONSE TO NRC QUESTION - REPORT, FSAR

[illegible]
RESPONSE TO QUESTION [illegible] - TRITIUM IN MAIN COOLING SYSTEM - HAZARD TO WORKER
TENNESSEE VALLEY AUTHORITY
DOCKET 50[illegible]-7 ?. 1 PAGE. PG. 9.4-1 OF AMENDMENT 4 TO SEQUOYAH 1 AND 2 LICENSE APPLICATION. SEPTEMBER 4, 1974. TYPE--PWR. NFG--WEST.. AF--TVA

ON PAGE 9.2-33, IT IS STATED THAT TRITIUM CONCENTRATION IN THE REACTOR COOLANT WILL BE MAINTAINED AT A LEVEL WHICH PRECLUDES PERSONNEL HAZARD DURING ACCESS TO THE CONTAINMENT. INDICATE WHAT CRITERIA AND PROCEDURES WILL BE USED TO ESTABLISH AND VERIFY AN ACCEPTABLE CONCENTRATION LEVEL. [illegible] - REPORT INCLUDING CONTAINMENT, AIRBORNE AND GASEOUS ACTIVITY WILL BE REDUCED TO CONCENTRATIONS CONSISTENT WITH APPLICABLE VALUES IN 10CFR20.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR - PERSONNEL EXPOSURE, RADIATION - RESPONSE TO NRC QUESTION - PRIMARY COOLING SYSTEM - SEQUOYAH 1 (PWR) - SEQUOYAH 2 (PWR)

[illegible]
RESPONSE TO NRC QUESTION 11.1 - ESTIMATE ISOTOPIC BASIS OF DAILY AND ANNUAL RELEASE OF RADIOACTIVE MATERIAL
TOLEDO EDISON COMPANY
50[illegible]-11 ?. 1 PAGES. PG. 11.1-1 OF AMENDMENT 7 TO DAVIS-BESSE LICENSE APPLICATION , JUNE 29, 1970. DOCKET 50-346. TYPE--PWR. NFG--OHO. AF--[illegible]

PROVIDE AN ESTIMATE OF THE AMOUNTS OF RADIOACTIVITY ON AN ISOTOPIC BASIS (INCLUDING TRITIUM) THAT WOULD BE RELEASED DAILY AND ANNUALLY FROM THE PROPOSED DAVIS-BESSE FACILITIES. CONSIDER BOTH LIQUID AND GASEOUS WASTES. ASSUMING THAT THE ACTIVITY IN THE PRIMARY COOLANT IS THAT CORRESPONDING TO OPERATION WITH AN ACTIVITY LEVEL TO BE STATED IN THE TECHNICAL SPECIFICATIONS. LIST ALL ASSUMPTIONS MADE AND EXPLAIN THEIR BASIS. INDICATE WHAT A SHUT-DOWN MODE FOR OPERATION WILL AFFECT RELEASES. BASED UPON THE ESTIMATED AVAILABLE ANNUAL AVERAGE DILUTION FACTOR, PROVIDE AN ESTIMATE OF THE MAXIMUM GASEOUS RELEASE LIMIT FOR THIS FACILITY WHICH WOULD BE WITHIN THE LIMITS OF 10 CFR 20. COMPARE THIS ESTIMATED RELEASE LIMIT WITH THE ESTIMATED GASEOUS RELEASES FROM THIS FACILITY. [illegible] ON PAGE 11.1-1 THRU -6. REVS THE TABLES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $1.00 COPY, $0.65 MICROFICHE

FISSION PRODUCT RELEASE - REACTOR, PWR - REGULATION, AEC - WASTE DISPOSAL, GAS - WASTE DISPOSAL, LIQUID - WASTE MANAGEMENT - RESPONSE TO NRC QUESTION

[illegible]
RESPONSE TO QUESTION 2.6.4 - HYDROGEN AND TRITIUM IN AIR EJECTOR EXHAUST
COMMONWEALTH EDISON COMPANY - PEOPLES-ILLINOIS GAS AND ELECTRIC COMPANY
DOCKET-50[illegible]-16 ?. 1 PAGE. PG. 9-2 OF QUAD CITIES 1 AND 2 LICENSE APPLICATION, JUNE 11, 1970. DOCKETS 50-254/265. TYPE--BWR, NFG--G.E.. AF--SGT + LUNDY

PROVIDE THE ASSUMPTIONS USED TO CALCULATE THE AMOUNTS OF HYDROGEN GAS AND TRITIUM IN THE AIR-EJECTOR EXHAUST. [illegible] THIS QUESTION IS ANSWERED IN SECTION 9.2.1 OF THE FSAR.

[illegible]
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

[illegible]
RESPONSE TO QUESTION [illegible] - TRITIUM
[illegible]
[illegible]

DISCUSSES THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNT OF TRITIUM GENERATED AND THE METHOD OF MONITORING THE PLANT EFFLUENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

[illegible]
RESPONSE TO QUESTION [illegible] - TRITIUM
[illegible]
[illegible]

DISCUSSES THE [illegible], METHODS, QUANTITIES, AND RATES FOR THE [illegible] OF TRITIATED WATER AND TRITIUM FROM THE REACTOR VESSEL TO THE [illegible], AND THE CONCENTRATION [illegible] AND HOW CONTROL AND MEASUREMENT IS ACCOMPLISHED TO ASSURE OPERATION WITH RADIOACTIVITY LEVELS AS LOW AS PRACTICABLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

[illegible]
RESPONSE TO QUESTION [illegible] - TRITIUM GENERATION RATE AND PROTECTION OF PERSONNEL
[illegible]
[illegible]

DISCUSSES THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED DURING PLANT OPERATION. [illegible] SPECIAL PRECAUTIONS [illegible] OF TRITIUM [illegible] PLANT PERSONNEL AND RELEASES TO THE ENVIRONMENT. [illegible] PRODUCTION OF TRITIUM BY FISSION [illegible] ACCURACY [illegible].

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]

[illegible]
[illegible]
[illegible] BY U. S. [illegible], [illegible], [illegible] [illegible] SERVICES
[illegible]
[illegible]

THIS SERVICE IS DIVIDED INTO [illegible] PAGES AND CONSISTS OF A DETAILED ANALYSIS OF [illegible] OPERATIONS TO DATE, WITH PREDICTIONS OF FUTURE [illegible] VALUES AND ANTICIPATED [illegible]. [illegible] OPERATIONS, THE [illegible] DISCUSSES ARE [illegible] OF CHEMICAL OPERATIONS, AND SAFETY AND OPERATING [illegible]. [illegible] OF TRITIUM [illegible] PLANT PARTS IN [illegible], E.G., URANIUM, PLUTONIUM, AND [illegible] FISSION PRODUCTS, [illegible] OF [illegible] PROCESSING OPERATIONS AND [illegible], STORAGE AND DISPOSAL [illegible] AND [illegible] WASTES. OTHER TOPICS COVERED ARE [illegible] REQUIREMENTS AND

056600 *CONTINUED*
CONTROLS, CONTROL OF EFFLUENTS (LIQUID WASTE CONTROL, GASEOUS WASTE CONTROL), ENVIRONMENTAL MONITORING PROGRAM, N.Y. STATE DEPT. OF HEALTH PROGRAM. EIGHT CHARTS ARE GIVEN TO SHOW RESULTS OF ENVIRONMENTAL MONITORING. ROLES OF AEC DIV. OF COMPLIANCE ENVIRONMENTAL MEASUREMENTS AND U.S. PUBLIC HEALTH SERVICE ARE PRESENTED.

IODINE * SITING, CHEMICAL PROCESS PLANT * STRONTIUM * WASTE DISPOSAL * MILK * REGULATION, AEC * *WASTE MANAGEMENT * RADIOACTIVITY RELEASE * *RADIOCHEMICAL PLANT SAFETY * *FUEL REPROCESSING * AGENCY, STATE * ENVIRONMENTAL CONTROL MEASURE * NYS * INDUSTRY, NUCLEAR * AGENCY, FEDERAL

056660
WEEKLY ROUNDUP OF AEC LICENSING MATERIAL - ALLIED-GULF NUCLEAR SERVICES
3 PAGES, ATOMIC ENERGY CLEARINGHOUSE, NO. 41, PG 13-15 (OCTOBER 12, 1970)

CAROLINA ENVIRONMENTAL STUDY GROUP ADVISES IT WISHES TO BECOME INTERVENOR AGAINST BARNWELL, S.C. REPROCESSING PLANT. THE DEPT. OF INTERIOR COMMENTED ON THE ENVIRONMENTAL REPORT SUBMITTED BY THE COMPANY. IT NOTES DEFICIENCIES IN THE FOLLOWING AREAS COVERED IN THE DRAFT - LICENSING AGENCIES, THERMAL CONSIDERATION, THERMAL ECOLOGY, TRITIUM RELEASES, AND RECREATIONAL CONSIDERATIONS, AND IT STIPULATES WHERE COMPANY SHOULD GENERATE FURTHER INFORMATION.

ECOLOGY * SITING, CHEMICAL PROCESS PLANT * FUEL REPROCESSING * THERMAL POLLUTION * AGENCY, STATE * *INDUSTRY, NUCLEAR * BENEFICIAL USE, RECREATIONAL * *AGENCY, FEDERAL * *ORGANIZATION, CITIZEN

056677
LANDIS JD
SPEECH BY J. W. LANDIS, GULF GENERAL ATOMIC
GULF GENERAL ATOMIC INCORPORATED, CALIFORNIA
14 PAGES, TESTIMONY BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY HEARINGS ON ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER, FEBRUARY 25, 1970

SPEAKER NOTES CONCERN OF PUBLIC AND OF GULF GENERAL OVER MATTERS PERTAINING TO ENVIRONMENT AND EFFORTS OF GULF OIL CORP. TO SOLVE POLLUTION PROBLEMS. HE EXPRESSES FUTURE OF N-POWER TO SOLVE POWER NEEDS AND MINIMIZE ENVIRONMENTAL INDIGNITIES. THE COMPANYS WORK ON HTGR IS REVIEWED, WHY IT IS LEAST POLLUTER (COMPARED WITH OTHER N-POWER REACTOR TYPES). HE DISCUSSES METHODS DEVELOPED TO PREVENT DISCHARGE OF KRYPTON, TRITIUM, AND PARTICLES. HTGR HAS THERMAL EFFICIENCY (THEREFORE LOW THERMAL EFFECTS) MATCHING THAT OF MODERN CONVENTIONAL PLANTS. HE NOTES GULFS PROGRESS IN FUSION RESEARCH -- THEIR PLAN TO DEMONSTRATE FEASIBILITY OF THERMONUCLEAR POWER BY 1975 AND HAVE PROTOTYPE FUSION REACTOR BY 1985. OTHER RESEARCHES CONCERN ANTIPOLLUTION EFFORTS IN THEIR PROCESS INDUSTRY, DEVELOPMENT OF SUPERCONDUCTIVE ELECTRIC TRANSMISSION LINES, AND ZINC-AIR BATTERIES TO REPLACE GASOLINE AND DIESEL ENGINES.

FISSION PRODUCT RELEASE * KRYPTON * REACH POINT 1 (NTER) * *INDUSTRY, MANUFACTURING * REACTOR, POWER * DESALTING * *ENVIRONMENTAL CONTROL MEASURE * POLLUTION * JCAE * INDUSTRY, NUCLEAR * BENEFICIAL USE, AGRICULTURE * BENEFICIAL USE, COMMERCIAL * BENEFICIAL USE, SPACE HEATING * WASTE HEAT, WATER * POWER TRANSMISSION * PROPERENT * SOCIO/PHILOSOPHICAL CONSIDERATION * *SPOKESMAN, INDUSTRY * N-POWER FORECAST

057199
RESPONSE TO QUESTION 9.3 - TRITIUM - ESTIMATED RATE OF PRODUCTION
PHILADELPHIA ELECTRIC COMPAN.
DOCKET 50352-7 *. 2 PAGES, PG. 75-76 OF SUPPLEMENT 1 TO LEMERICK-1 AND -2 LICENSE APPLICATION, OCTOBER 6, 1973, TYPE--NWR, MFG--G.E., AE--BECHTEL

PROVIDE ADDITIONAL INFORMATION TO SUPPORT YOUR STATEMENT IN SECTION 9.2.5 THAT THE MAXIMUM AMOUNT OF TRITIUM ESCAPING THE FUEL AND DIRECTLY FORMED IN THE WATER OF EACH REACTOR IS ESTIMATED TO BE 5.9 MICROCURIES/SEC BASED ON OPERATING EXPERIENCE. *** ANSWER ON PAGE 75-76.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR * *WASTE MANAGEMENT * *RESPONSE TO NRC QUESTION * *RATE * *LIMERICK 2 (BWR) * *LIMERICK 1 (BWR) * *PRODUCTION, GROSS

057709
RESPONSE TO QUESTION 11.4 - TRITIUM - GENERATION, RELEASE, MONITORING
PORTLAND GENERAL ELECTRIC COMPANY
DOCKET-50344-A *. 1 PAGE, PG 0-128 OF AMENDMENT 5 TO TROJAN LICENSE APPLICATION, FEBRUARY 19, 1975, DOCKET 50-344, TYPE--PWR, MFG--WEST., AE--BECHTEL

DISCUSS THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED. ANALYZE THE FRACTION OF PRIMARY COOLANT TRITIUM THAT WILL BE RELEASED TO THE CIRCULATING WATER DISCHARGE CANAL. DESCRIBE THE METHODS TO BE EMPLOYED FOR MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM THE PLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR * *WASTE DISPOSAL, LIQUID * *MONITOR * *RESPONSE TO NRC QUESTION * *REPORT, PSAR * *MAIN COOLING SYSTEM * *TROJAN (PWR) * *DISCHARGE

050968
RESPONSE TO QUESTION 10.9 - TRITIUM PRODUCED AND RELEASED
THE DETROIT EDISON COMPANY
DOCKET 50341-9 O. 7 PAGES. PG. 10.9-1 AND -2 OF AMENDMENT 9 TO FERMI-2 LICENSE APPLICATION. MAY 11, 1970. TYPE--PWR. PRG--C.F.. AF--SGT + EWDY

PROVIDE CALCULATIONS OF THE ANTICIPATED TRITIUM PRODUCTION AND DISCHARGE FROM THE PLANT. STATE TOTAL CURIES RELEASED PER YEAR. AND THE TRITIUM CONCENTRATIONS AND TOTAL ACTIVITY PER BATCH. *** ANSWER ON PAGE 10.9-1.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

REACTOR, PWR + NRC + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + RESPONSE TO NRC QUESTION + OFERMI 2 (PWR)

050811A
RESPONSE TO QUESTION 1.8-1910 - MANAGEMENT OF TRITIUM
SOUTHERN CALIFORNIA EDISON COMPANY
DOCKET 50361-10 O. 1 PAGE. PG. 1.8.1910 OF AMENDMENT 2 TO SAR ONOFRE 2 AND 3 LICENSE APPLICATION. SEPTEMBER 18. 1970. TYPE--PWR. PRG--C.F.. AF--BECHTEL

PROPOSED PLANS FOR TRITIUM MANAGEMENT. *** ANSWER - TRITIUM PRODUCTION AND ASSOCIATED PRECAUTIONS TO BE TAKEN ARE DISCUSSED IN SUBSECTION 11.6.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

REACTOR, PWR + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + FSAR ONOFRE 2 (PWR) + FSAR ONOFRE 3 (PWR)

050937
RESPONSE TO QUESTION 11.7 - ANNUAL RELEASES OF LIQUID WASTES (ESTIMATED)
VIRGINIA ELECTRIC AND POWER COMPANY
DOCKET-50280-91 O. 7 PAGES. PG 511. 7-1 AND -2 OF SURRY FINAL SAFETY ANALYSIS REPORT. DECEMBER 1. 1970. DOCKET 50-280. TYPE--PWR. PRG--WEST.. AF--STONE + WEBSTER

ESTIMATE THE ANTICIPATED ANNUAL RELEASES FROM THE FACILITY. ASSUME A PLANT OPERATING CYCLE BASED UPON THE MAXIMUM ANTICIPATED DEGREE OF LOAD-FOLLOWING. AND THE GREATEST EXPECTED NUMBER OF FUEL DEFECTS AND AMOUNT OF TRAPP URANIUM. *** ANSWER: ESTIMATED ANNUAL LIQUID EFFLUENT RELEASES ARE PRESENTED IN SECTION 11A.1 OF THE FSAR. TABLES 11A-7 AND 11A-10 LIST THE ACTIVITY AND ANNUAL DISCHARGE RATE OF LIQUID EFFLUENT FROM THE WASTE DISPOSAL SYSTEM WITHOUT AND WITH STEAM GENERATOR LEAKAGE. RESPECTIVELY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

FISSION PRODUCT RELEASE + REACTOR, PWR + URANIUM + REGULATION, AEC + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + SURRY 1 (PWR) + SURRY 2 (PWR)

050911
RESPONSE TO QUESTION 11.6 - TRITIUM PRODUCTION
VIRGINIA ELECTRIC AND POWER COMPANY
DOCKET-50280-91 O. 1 PAGE. PG 511.6-1 OF SURRY FINAL SAFETY ANALYSES REPORT. DECEMBER 1. 1970. DOCKET 50-280. TYPE--PWR. PRG--WEST.. AF--STONE + WEBSTER

ANALYZE THE PRODUCTION RATE. DISTRIBUTION. AND DISCHARGE OF TRITIUM FROM THE PLANT. DISCUSS THE METHODS THAT WILL BE USED TO EVALUATE AND ACCOUNT FOR THE TRITIUM CONTAINED IN EFFLUENTS FROM THE PLANT. *** ANSWER: AN ANALYSIS OF THE PRODUCTION OF TRITIUM IN THE REACTOR COOLANT IS PRESENTED IN FSAR TABLE 9.1-7. TABLE 11A-8 OF THE FSAR SHOWS THAT EVEN IF ALL THE TRITIUM PRODUCED IN THE REACTOR COOLANT IS DISCHARGED FROM THE PLANT. THE CONCENTRATION OF TRITIUM IN THE DISCHARGE CANAL WOULD BE 4.8 X 10 (-6TH) UCI/CC (LESS THAN 0.2 PERCENT OF THAT ALLOWED BY 10 CFR 20).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

REACTOR, PWR + REGULATION, AEC + POPULATION EXPOSURE + RESPONSE TO NRC QUESTION + SURRY 1 (PWR) + SURRY 2 (PWR) + REPRODUCTION

050955
RESPONSE TO QUESTION 9.2 - ADEQUACY OF SYSTEM FOR TREATING LIQUID RADWASTE
COMMONWEALTH EDISON COMPANY
DOCKET-50254-22 O. 6 PAGES. 1 TABLE. PG 9.2-1 THRU -6 OF AMENDMENT 13 TO QUAD CITIES 1-2 LICENSE APPLICATION. NOVEMBER 6. 1970. DOCKETS 50-254/265. TYPE--BWR. PRG--C.F.. AF--SGT + EWDY

TO FULLY EVALUATE THE ADEQUACY OF THE LIQUID RADWASTE TREATMENT SYSTEM. THE FOLLOWING DATA AND DISCUSSION ARE NEEDED - (A) DESCRIBE FULLY THE CONTROLS WHICH ARE BUILT INTO THE SYSTEM IN ORDER TO PREVENT ACCIDENTAL RELEASE OF LIQUID EFFLUENTS. (B) INDICATE THE SAMPLE LOCATIONS AND DESCRIBE THE MEASUREMENTS THAT WILL BE TAKEN TO DETERMINE THAT THE PERMISSIBLE LIQUID EFFLUENT LIMITS SET FORTH IN 10 CFR 20 ARE NOT EXCEEDED. (C) TABULATE THE NORMAL AND MAXIMUM CONCENTRATIONS OF THE PRINCIPAL RADIOACTIVITY AND THE QUANTITIES OF WASTE AT THE INFLUENT AND

090059 *CONTINUED*
EFFLUENT POINTS OF MAJOR COMPONENTS OF THE LIQUID WASTE SYSTEM. *** ANSWER ON PG 9.2.2 THRU -6.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, HTGR • NRC • *WASTE, LIQUID • WASTE TREATMENT, LIQUID • *SAMPLING • *PURIFICATION EQUIPMENT • *SYSTEM DESCRIPTION • *RESPONSE TO NRC QUESTION • *GRAND CITIES 1 (NEBR) • *SYSTEM CAPABILITY • *GRAND CITIES 2 (NEBR) • *CONCENTRATION

090063
RESPONSE TO QUESTION 9.10 - FAILURE OF SYSTEM TO PURIFY HELIUM
PUBLIC SERVICE COMPANY OF COLORADO
DOCKET-50267-24 F. 4 PAGES, 1 FIGURE, PG 9.10-1 THRU -4 OF AMENDMENT 17 TO FT. ST. VRAIN LICENSE APPLICATION, DECEMBER 21, 1970. DOCKET 50-267, TYPE--HTGR, REG--G.A., AF--G.A.

ON PAGE 9.6-15 OF THE FSAR YOU STATE THAT IN THE EVENT OF FAILURES IN THE HELIUM PURIFICATION SYSTEM REGENERATION SECTION OR IN THE HYDROGEN GETTER SECTION, UP TO 50 PERCENT OF THE ACTIVITY CONTAINED IN THE CLEANUP SYSTEM COULD BE RELEASED (PRIMARILY KR-85 AND TRITIUM). YOU FURTHER STATE THAT SUCH ACTIVITY RELEASED WOULD BE SWEPT AWAY AND FILTERED BY THE VENTILATION SYSTEM. PRESENT THE BASES FOR THE VALUE OF 50 PERCENT RELEASE AND INDICATE WHY IT COULD NOT BE 100 PERCENT OF THE PURIFICATION TRAIN CONTENTS AND A SIGNIFICANT FRACTION OF THE PRIMARY COOLANT IF THE FAILURE SHOULD OCCUR BETWEEN THE PCRV AND THE HIGH TEMPERATURE FILTER/ABSORBER UNITS. *** ANSWER ON PG 9.10-1 THRU -3, PLUS 1 FIGURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FAILURE • REACTOR, GRAPHITE MODERATED • KRYPTON • VENTILATION SYSTEM • HELIUM • *RADIOACTIVITY RELEASE • *RESPONSE TO NRC QUESTION • *COOLANT PURIFICATION SYSTEM • *FT. ST. VRAIN (HTGR) • *REACTOR, HTGR

090063
RESPONSE TO QUESTION 9.12 - EFFECTS OF LIOH ON COOLING WATER
PUBLIC SERVICE COMPANY OF COLORADO
DOCKET-50267-24 F. 1 PAGE, PG 9.12-1 OF AMENDMENT 17 TO FT. ST. VRAIN LICENSE APPLICATION, DECEMBER 21, 1970. DOCKET 50-267, TYPE--HTGR, REG--G.A., AF--G.A.

YOU STATE THAT LITHIUM HYDROXIDE IS ADDED TO THE PCRV COOLING WATER TO CONTROL PH (PAGE 9.7-11). IS THIS LITHIUM ENRICHED IN LI-7. WHAT IS THE NEUTRON FLUX AS A FUNCTION OF ENERGY RANGE IN THE AREA OF THE PCRV IN WHICH THIS COOLING WATER SYSTEM IS LOCATED. CALCULATE THE TRITIUM PRODUCTION RATE AS A RESULT OF NEUTRON ACTIVATION OF THE LITHIUM IN THE COOLING WATER AND STATE ALL ASSUMPTIONS. *** ANSWER ON PG 9.12-1.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GRAPHITE MODERATED • *STEEL (ALLOY) • LITHIUM • *RADIONUCLIDE, INDUCED • *RESPONSE TO NRC QUESTION • *FT. ST. VRAIN (HTGR) • REACTOR, HTGR • ADDITIVE • COOLING • HYDROXIDE • *PRODUCTION, RATE

090091
RESPONSE TO QUESTION 11.2 - DISPOSAL OF CERTAIN WASTES
PUBLIC SERVICE COMPANY OF COLORADO
DOCKET-50267-24 F. 1 PAGE, PG 11.2-1 OF AMENDMENT 17 TO FT. ST. VRAIN LICENSE APPLICATION, DECEMBER 21, 1970. DOCKET 50-267, TYPE--HTGR, REG--G.A., AF--G.A.

AS A RESULT OF THE DISCUSSION OF THE WASTE TREATMENT SYSTEMS, WE UNDERSTAND THAT (1) THE LIQUID-WASTE-TREATMENT DEMINERALIZER IS TO BE DISPOSED OF WHEN IT IS SPENT AND (2) THERE ARE PROVISIONS IN THE HELIUM-PURIFICATION-SYSTEM FILTER TRAIN THAT WOULD ALLOW THE REGENERATION OF THE CRYOGENIC AND HYDROGEN-GETTER COMPONENTS TO A CLOSED SYSTEM AND THENCE TO THE ENVIRONMENT. DESCRIBE THESE SYSTEMS IN SUFFICIENT DETAIL TO CONFIRM THESE CAPABILITIES. *** ANSWER ON PG 11.2-1.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GRAPHITE MODERATED • TITANIUM • *WASTE DISPOSAL, GAS • *WASTE DISPOSAL, SOLID • *PURIFICATION EQUIPMENT • *WASTE MANAGEMENT • *WASTE TREATMENT, EQUIPMENT • RESIN • *RESPONSE TO NRC QUESTION • *FT. ST. VRAIN (HTGR) • REACTOR, HTGR

090070
RESPONSE TO QUESTION 11.4 - TRITIUM
GRAND PUBLIC POWER DISTRICT
DOCKET-50205-39 F. 1 PAGE, PG XIII OF AMENDMENT 22 TO FORT CALHOUN 1 LICENSE APPLICATION, JANUARY 8, 1971. DOCKET 50-209, TYPE--PWR, REG--COND., AF--GIBBS • HULL

PROVIDE AN ANALYSES OF THE PRODUCTION RATE, DISTRIBUTION, AND DISCHARGE OF TRITIUM FROM THE PLANT. WHAT METHODS WILL BE USED TO EVALUATE AND ACCOUNT FOR THE TRITIUM CONTAINED IN EFFLUENTS FROM THE PLANT. *** ANSWER IN SECT. 11.1.2

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR • *WASTE DISPOSAL, LIQUID • RESPONSE TO NRC QUESTION • FT. CALHOUN (NEBR) • *DISTRIBUTION • *PRODUCTION, RATE

059447
RESPONSE TO QUESTION 10.3 - TRITIUM
THE DETROIT EDISON COMPANY
DOCKET-50361-25 +. 7 PAGES. PC 10.3-1 AND -2 OF AMENDMENT 15 TO PARAS 2 LICENSE APPLICATION, FEBRUARY 1, 1971. DOCKET 50-361. TYPE--RAD. REG--G.P.. AF--SGT + LUNDY

PROVIDE CALCULATIONS OF THE ANTICIPATED TRITIUM PRODUCTION AND DISCHARGE FROM THE PLANT. STATE TOTAL CURIES RELEASE PER YEAR, AND THE TRITIUM CONCENTRATIONS AND TOTAL ACTIVITY PER BATCH. *** ANSWER ON PC 10.3-1 AND -2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + DOSE + REGULATION, AEC + WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + RESPONSE TO AEC QUESTION + PARAS 2 (DAR) + CONSTRUCTION + CONCENTRATION

059461
RESPONSE TO QUESTION 9.2 - TRITIUM
COMMONWEALTH EDISON COMPANY + DAVIS-BESSE NUCLEAR POWER STATION
DOCKET-50346-27 +. 1 PAGE. PC 9.2-1 OF AMENDMENT 10 TO LICENSE APPLICATION FOR QUAD CITIES 1-2, FEBRUARY 8, 1971. DOCKETS 50-254/265. TYPE--RAD. REG--G.P.. AF--SGT + LUNDY

WITH RESPECT TO YOUR REPLY TO QUESTION 9.2C, AMENDMENT 11, YOUR ESTIMATES OF TRITIUM PRODUCTION BY ACTIVATION OF DEUTERIUM NATURALLY PRESENT IN THE COOLING WATER SHOULD BE REVISED CONSIDERING THE ESTIMATES SUBMITTED FOR THE LIMERICK NUCLEAR STATION, DOCKET NUMBERS 50-352 AND 353, QUESTION 9.3 OF SUPPLEMENT 1. PROVIDE CORRESPONDING ESTIMATES OF GASEOUS RELEASES OF LIQUID WASTE, RELATING THESE TO THE NRC. *** (ANSWER) WE HAVE COMPLETED OUR REVIEW RELATING TO TRITIUM FORMATION AND HAVE REVISED SECTION 9 OF THE FSAR TO CLARIFY THE RESULTS. ESPF PART I OF THIS AMENDMENT. THE REFERENCE RADIOACTIVITY CONTROL EQUIPMENT FOR THE GASEOUS EFFLUENTS IS CURRENTLY UNDER STUDY AND DATA WILL BE SUBMITTED WHEN AVAILABLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION + QUAD CITIES 1 (DAR) + QUAD CITIES 2 (DAR) + CONSTRUCTION

060133
RESPONSE TO QUESTION 11.4 - TRITIUM - PRODUCTION RATE
PUBLIC SERVICE COMPANY OF COLORADO
DOCKET-50267-27 +. 2 PAGES. PC 11.4-1 AND -2 OF AMENDMENT 10 TO LICENSE APPLICATION OF FT. ST. VRAIN, FEBRUARY 18, 1971. DOCKET 50-267. TYPE--HTGR. REG--G.R., AF--G.R.

ON PAGE 11.1-5 OF THE FSAR YOU PRESENT A CALCULATION OF THE EXPECTED TRITIUM PRODUCTION RATES. HOWEVER, SEVERAL RELEVANT PARAMETERS WERE OMITTED. *** ANSWER ON PC 11.4-1 AND -2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GRAPHITE MODERATED + RESPONSE TO NRC QUESTION + FT. ST. VRAIN (HTGR) + REACTOR, HTGR + PRODUCTION, RATE

060594
REPLY TO QUESTIONS BY SURVEILLANCE BRANCH, DIVISION OF SURVEILLANCE AND INSPECTION, RADIATION OFFICE, ENVIRONMENTAL PROTECTION AGENCY
19 PAGES. REPLY TO LETTER OF R. H. CRAMER, S. CALIFORNIA EDISON, WRITTEN TO C. L. WEAVER, FEBRUARY 10, 1971

QUESTIONS SUBMITTED - (1) ANY LARGE-SCALE RADIATION BACKGROUND SURVEYS OF L.A. AREA, (2) RADIATION DOSE TO U.S. CITIZEN, (3) INCREASED MORTALITY IN REGARD OF HIGH-RADIATION AREA, (4) DOSE TO PEOPLE FROM MEDICAL SOURCES, (5) FROM X-RAY, (6) FROM VARIOUS BUILDING MATERIALS, (7) FROM JET FLIGHTS, (8) FROM ARMS, (9) FROM CIGARETTES, (10) FROM DIAGNOSTIC X-RAY, (11) FROM WELL WATER, (12) CANCER ASSOCIATED THEREWITH, (13) DOSE TO PILOTS AND STEWARDESSES, (14) CONCLUSION OF USPHS ON EMISSION OF NUCLIDES FROM N-POWER PLANTS VIZ., OVERLOOP IN ENVIRONMENT, DOSE TO POPULATION, EXCESS DEATHS DUE TO RADIATION.

CESIUM + DOSE + FISSION PRODUCT RELEASE + RADIATION IN PERSPECTIVE + STRONTIUM + WATER + LEAD + POLONIUM + PROFESSION + REACTOR, POWER + AIRCRAFT + POPULATION EXPOSURE + CRITICAL NUCLIDE PATHWAY + ENVIRONMENT + X-RAY + MONITORING PROGRAM, ENVIRONMENTAL + MORTALITY + RADIATION EFFECT + RADIATION EXPOSURE + CANCER + AGENCY, FEDERAL

060602
TECH-SPEC CHANGE + GRANTED FOR RET RESEARCH REACTOR
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR LICENSING
7 PAGES. LETTER - DIVISION OF REACTOR LICENSING (AEC) TO MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DECEMBER 12, 1971. DOCKET 50-20

THE PROPOSED LIMITING CONDITION OF OPERATION FOR SECONDARY WATER TRITIUM CONCENTRATION OF 1 MILLICURIE IS WELL BELOW THE TRITIUM LIMITS SPECIFIED IN 10 CFR 20 FOR WATER EFFLUENTS TO UNRESTRICTED AREAS. SIGNIFICANT DILUTION, CONSIDERING ONLY RET DISCHARGE TO THE SEWERS, WILL FURTHER REDUCE THE TRITIUM CONCENTRATION IN THE SEWAGE WATER TO LESS THAN 1 PERCENT OF 10 CFR 20 LIMITS.

000002 *CONTINUED*
AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, 100 CONTINUAGE -- MINIMUM CHARGE $2.00)

NRC * REACTOR, RESEARCH * WASTE DISPOSAL, LIQUID * TECHNICAL SPECIFICATIONS * COLLEGES AND UNIVERSITIES

000049
PENDING DOCKET DIGEST OF OCTOBER 20
3 PAGES, ATOMIC ENERGY CLEARING HOUSE, 171441, PP. 32-34 (NOVEMBER 3, 1971)

A SUMMARY OF SITUATIONS INVOLVING LICENSING PROCEEDINGS AROUND THE COUNTRY. UNDER ITEMS COVERED ARE TOPICS SUCH AS FACILITY INVOLVED, TYPE, STATUS OF ASLB OR ASLAB HEARING AND DISPOSITION, INTERVENORS, DATES OF VARIOUS ACTIONS, ETC. TWO OTHER TOPICS ARE REVIEWED - (1) DURF MAKING -- (A) REPORTING AND CONTROL REQUIREMENTS FOR TRITIUM, AND (B) CONTAINMENT-LEAKAGE TESTING FOR WATER-COOLED POWER REACTORS, (2) GENERAL LITIGATION -- A REVIEW OF COURT ACTIONS BY CONSERVATIONIST AND ANTIWAR GROUPS TO PREVENT THE NUCLEAR WEAPONS TEST ON AMCHITKA ISLAND; TWO CONTENTIONS UNDER NEPA, LIMITED TEST BAN TREATY, AND REQUEST FOR AN IN-CAMERA REVIEW OF CERTAIN DOCUMENTS. ANOTHER COURT CASE INVOLVES A WOMAN FAMILY CHANGING AEC WITH EXCEEDING AEC GUIDELINES AT NEVADA TEST SITE, VIOLATION OF NEPA, SECRECY, AND, ACCORDINGLY, ENJOINING AEC FROM FURTHER TESTING.

CODES AND STANDARDS * CONTAINMENT * TEST, WEAPONS * REACTOR, POWER * REGULATION, AEC * TRIGA (RR) * PULSADES (PWR) * VERMONT YANKEE (BWR) * SHOREHAM (BWR) * OSWEGO * MAINE * MIDLAND 1 (PWR) * TEST, CLEAN * LITIGATION * OPPONENT * ORGANIZATION, CITIZEN * PUBLIC HEARING * NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

000002
ENVIRONMENTAL STATEMENT. UNDERGROUND NUCLEAR TEST PROGRAMS
U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
WD-200005-F P. 93 PAGES, SEPTEMBER 1971

ENVIRONMENTAL COSTS ARE BALANCED AGAINST THE BENEFITS OF TESTING. THE NEVADA TEST SITE IS ALREADY COMMITTED. WATER WILL BE ENTIRELY ACCEPTABLE FOR DRINKING BEFORE MOVING OUT GOVERNMENT-CONTROLLED LANDS. PRECAUTIONS ARE TAKEN TO PROTECT THE PUBLIC IN CASE OF AN ACCIDENTAL RELEASE OF RADIOACTIVITY. GROUNDWATER IS RELATIVELY DEEP AND SLOW MOVING. INTENSIVE SAMPLING OF ABOUT 100 WATER WELLS AND USE POINTS ON SITE AND OFF SITE HAS DETECTED NO RADIOACTIVITY. COMMENTS OF FEDERAL AND OTHER AGENCIES AND AEC'S RESPONSES ARE GIVEN. IT IS EXPECTED TO PUBLISH FURTHER INFORMATION IN THE AREA OF RADIONUCLIDE TRANSPORT AS THE RESULT OF STUDIES UNDERWAY.

ECOLOGY * IODINE * XENON * PLUTONIUM * RADIATION IN PERSPECTIVE * SURFACE WATER, NUCLIDE OCCURRENCE * GROUND WATER, NUCLIDE OCCURRENCE * NEVADA TEST SITE * HYDROLOGY * RADIONUCLIDE TRANSFER * ENERGY, ENVIRONMENTAL

000007
RESPONSE TO QUESTION 11.36 - COOLANT-TRITIUM CONCENTRATION
COMMONWEALTH EDISON COMPANY
DOCKET-50295-31 P. 2 PAGES, PGS. Q11.36-1 THRU -2 OF AMENDMENT 1A TO ZION 1 AND 2 LICENSE APPLICATION, OCTOBER 21, 1971, DOCKET 50-295, TYPE--PWR, MFG--WEST., AE--STONE * WEBSTER

DISCUSSES THE MAXIMUM COOLANT-TRITIUM CONCENTRATION EXPECTED AND THE OPERATIONAL LIMIT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVITY BUILDUP * REACTOR, PWR * REACTOR COOLANT * RESPONSE TO NRC QUESTION * ZION 1 (PWR) * ZION 2 (PWR)

000000
RESPONSE TO QUESTION 11.37 - TRITIUM DISPOSAL
COMMONWEALTH EDISON COMPANY
DOCKET-50295-31 P. 1 PAGE, PG. Q11.37-1 OF AMENDMENT 1A TO ZION 1 AND 2 LICENSE APPLICATION, OCTOBER 21, 1971, DOCKET 50-295, TYPE--PWR, MFG--WEST., AE--STONE * WEBSTER

STATES THAT THE DISPOSITION OF THE TRITIATED CONTROL VOLUME INVENTORY AT THE END OF PLANT LIFE WILL BE DECIDED UPON AT A TIME FAR ENOUGH IN THE FUTURE TO TAKE CONSIDERATION OF ADVANCES IN TECHNOLOGY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR * WASTE DISPOSAL, LIQUID * RESPONSE TO NRC QUESTION * ZION 1 (PWR) * ZION 2 (PWR)

000040
RESPONSE TO QUESTION 9.3 - CONTROL OF TRITIUM CONTAMINATION
MAINE YANKEE ATOMIC POWER COMPANY
DOCKET-50309-31 P. 1 PAGE, PG. 9.3 OF AMENDMENT 21 TO MAINE YANKEE LICENSE APPLICATION, MARCH 30, 1971, DOCKET 50-309, TYPE--PWR, MFG--COMB., AE--STONE * WEBSTER

DISCUSSES THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED. PROVIDES ANALYSIS OF THE FRACTION OF PRIMARY COOLANT TRITIUM THAT WILL BE RELEASED TO THE CIRCULATING WATER DISCHARGE POINT. DESCRIBES THE METHODS TO BE EMPLOYED FOR MONITORING TRITIUM

[illegible]
CONCENTRATIONS PRIOR TO DISCHARGE FROM THE PLANT. DISCUSSES THE SPECIAL PROCEDURES TO BE TAKEN CONCERNING TRITIUM DURING REFUELING WITH RESPECT TO PLANT PERSONNEL AND RELEASES TO THE ENVIRONMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR • WASTE HANDLING • WASTE MANAGEMENT • RADIOACTIVITY RELEASE • RESPONSE TO NRC QUESTION • MONITORING SYSTEM, RADIATION • PAPER VARIOUS (PWR)

[illegible]
TWELFE CHANGES TO TECH SPECS FOR NATIONAL BUREAU OF STANDARDS REACTOR
U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
DOCKET-50[illegible]-61 [illegible], 5 PAGES, LETTER - U. S. ATOMIC ENERGY COMMISSION TO NATIONAL BUREAU OF STANDARDS - APRIL 6, 1977, DOCKET 50-184

CHANGE 4 AUTHORIZES 3 CHANGES TO THE TECH SPECS - (1) ELIMINATES AN INTERMEDIATE ADMINISTRATIVE POSITION. (2) REPORTS TRITIUM DISCHARGES FROM 10 CFR 20 LIMITS DECREASE AS THE LONGER DELAYED RADIOLOGY. (3) SETS LIMITS ON THE LEAK RATE FROM THE PRIMARY TO THE SECONDARY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, RWR • REACTOR, RESEARCH • TECHNICAL SPECIFICATIONS • RADIOACTIVITY RELEASE • RBS • LEAK RATE • REPORTING

[illegible]
RESPONSE TO QUESTION 9.7 - TRITIUM PROJECTION
PUBLIC RIVER WATER RESOURCES AUTHORITY
DOCKET-50[illegible]-10 [illegible], 2 PAGES, PG. 9.7-1 THRU 9.7-2 OF AMENDMENT 9 TO REACTOR LICENSE APPLICATION, AUGUST 2, 1976, DOCKET 50-[illegible], TYPE--PWR, MFG--WEST., AF--GIRIS • WELL

BRIEF DISCUSSION OF TRITIUM PRODUCTION DURING OPERATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

RADIOACTIVITY RELEASE • POWER DURING • REACTOR, PWR • RESPONSE TO NRC QUESTION • REPORT, PLAN • REACTOR 1 (PWR)

[illegible]
RESPONSE TO QUESTION 9.6 - TRITIUM RELEASE
COMMONWEALTH EDISON COMPANY
DOCKET-50[illegible]-10 [illegible], 3 PAGES, PG. 3 9.6-1 THRU 3 9.6-3 OF AMENDMENT [illegible] TO LASALLE 1 AND 2 LICENSE APPLICATION, [illegible] 8, 1977, DOCKET 50-[illegible], TYPE--PWR, MFG--C.E., AF--SGI • LASALLE

PROVIDES THE INFORMATION ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED, THE FRACTION OF PRIMARY COOLANT TRITIUM THAT WILL BE RELEASED TO THE DISCHARGE WATER HEADER, AND THE METHODS TO BE EMPLOYED FOR MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR • RADIOACTIVITY RELEASE • RESPONSE TO NRC QUESTION • CONCENTRATION • PRODUCTION, RATE • LA SALLE 1 (PWR) • LA SALLE 2 (PWR)

[illegible]
RESPONSE TO QUESTION 9.6 - TRITIUM PRODUCTION AND RELEASE
SACRAMENTO PUBLIC POWER DISTRICT
DOCKET-50[illegible]-77 [illegible], 6 PAGES, PG. 9.6.1 THRU 9.6 OF AMENDMENT 4 TO COOPER LICENSE APPLICATION, MARCH 9, 1977, DOCKET 50-[illegible], TYPE--PWR, MFG--C.E., AF--BURNS • BWR

DISCUSSES THE INFORMATION ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED: PROVIDES ANALYSIS OF THE FRACTION OF PRIMARY-COOLANT TRITIUM THAT WILL BE RELEASED TO THE CONCENTRATING WATER DISCHARGE CANAL; DESCRIBES THE METHODS FOR MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM THE PLANT; AND THE TRITIUM CONCENTRATIONS IN THE DISCHARGE CANAL AND THE MISSOURI RIVER SOURCE COMPARES WITH THE TRITIUM BEHAVIOR EXPECTED IN THE WATER SOURCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR • MONITOR, LIQUID • WASTE DISPOSAL, LIQUID • RESPONSE TO NRC QUESTION • FORECAST • COOPER (BWR) • CONCENTRATION • PRODUCTION • PROJECTION, RATE

[illegible]
ENVIRONMENTAL IMPACT OF PLANT OPERATION UP TO JULY 1, 1977
CONSUMERS POWER COMPANY
DOCKET-50[illegible]-46 [illegible], 700 PAGES, CPC SPECIAL REPORT TO DIRECTORATE OF LICENSING EXPECT, JULY 19, 1977, DOCKET 50-[illegible], TYPE--PWR, MFG--CONB., AF--PRATTIS

CORRELATES RADIOACTIVE AND THERMAL RELEASE DATA AND THE EFFECT ON MONITORING OF OPERATION TO PLANNING ENVIRONMENTAL EFFECTS, IF ANY. NO MEASUREMENT INCREASE IN AMBIENT CONCENTRATIONS OF RADIOACTIVITY

072047 [illegible]

[illegible] WHICH COULD EXCEED [illegible] LEVELS OF RADIATION. THE EFFECT ON PLANTS IN PASSING THROUGH THE CONTAINED GAS MEASURED WITH AN ATTACHED HEATING. THE BIRD STUDY INCLUDED ENTANGLEMENT ON THE [illegible] SCREEN, [illegible], CELL-NETTING, AND EGG AND CLOACA SAMPLING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OPERATION • REACTOR, PWR • ENVIRONMENT • [illegible] (PWR) • THERMAL POLLUTION • [illegible] • [illegible] • BIRD • PHOTOPLANKTON • [illegible] • RADIATION EFFECT, BIOSYSTEM • [illegible], ENVIRONMENTAL

070004
ENVIRONMENTAL STATEMENT - RIO BLANCO GAS STIMULATION PROJECT, RIO BLANCO COUNTY COLORADO
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1519 V., 299 PAGES, TABLES, FIGURES, APRIL 1972

THIS ENVIRONMENTAL STATEMENT IS PREPARED IN COMPLIANCE WITH THE REQUIREMENTS OF THE NATIONAL ENVIRONMENTAL POLICY ACT AND IN SUPPORT OF THE ATOMIC ENERGY COMMISSION'S PARTICIPATION IN THE PROPOSED RIO BLANCO GAS STIMULATION PROJECT. IN ASSESSING AND BALANCING THE DIFFERENT VALUE OF THE NATURAL GAS CONTAINED IN LOW-PERMEABILITY RESERVOIRS OF THE PICEANCE BASIN AND THE NATION'S APPARENT SERIOUS NEED FOR SUPPLEMENTARY ENERGY SOURCES IN THE NEXT TEN TO TWENTY YEARS AGAINST THE COSTS INVOLVED AND IN CONSIDERING THE AVAILABLE ALTERNATIVES, THE AEC HAS CONCLUDED THAT THE PROPOSED PROJECT IS THE BEST AVAILABLE ALTERNATIVE, THAT THE BENEFITS OF THE PROPOSED ACTION JUSTIFY ITS PROBABLE ENVIRONMENTAL COSTS, AND THAT THE PROJECT SHOULD BE IMPLEMENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GEOLOGY • [illegible] • SEISMOLOGY • NATURAL GAS • NUCLEAR DETONATION • [illegible] • GROUND MOTION • [illegible] • CONTROL PROPERTY • STIMULATION • AGENCY, AEC • ASSISTANCE, NATIONAL • [illegible] VS DISK • [illegible] • STATEMENT, ENVIRONMENTAL

070023
ADDITIONS TO
PROBLEMS IN MEETING AEC REPORTING AND COMPLIANCE REQUIREMENTS
CONSUMERS POWER AND LIGHT COMPANY
CONF/SIB-72-4 V., 14 PAGES, PP. 19-28 OF THE PROCEEDINGS OF THE SOUTHERN CONFERENCE ON ENVIRONMENTAL RADIATION PROTECTION FROM NUCLEAR POWER PLANTS, APRIL 21-22, 1971

A DISCUSSION OF THE PRINCIPAL RADIATION CONTROL ENGINEER OF THE CONSUMERS POWER AND LIGHT CO. CONCERNING THE RADIATION SAFETY AND CONTROL MEASURES INVOLVED WITH THE EFFLUENTS OF THE M. B. ROBINSON PLANT.

AVAILABILITY - U. S. ENVIRONMENTAL PROTECTION AGENCY, RADIATION PROGRAMS OFFICE, WASHINGTON, D. C. 20460

POLLUTION • [illegible] • ELEMENTS AND ISOTOPES • SITING • REGULATION, AEC • [illegible] • [illegible] SAFETY AND CONTROL • [illegible] ASSISTANCE • [illegible] (PWR) • [illegible] • [illegible] • DATA COLLECTION • [illegible] • [illegible]

070009
RESPONSE TO QUESTION 11.4 - DETECTING TRITIUM WITHIN CONTAINMENT
LOUISIANA POWER AND LIGHT CO.
DOCKET-50-382-15 V., 1 PAGE, P. 011.4-1, AMENDMENT 4 TO WATERFORD UNIT 3 PSAR, JAN. 7, 1972, DOCKET 50-382, FVRJ-[illegible], [illegible]-[illegible], [illegible]-[illegible]

DISCUSS YOUR PROPOSED METHODS FOR DETECTING TRITIUM VAPOR WITHIN THE CONTAINMENT PERSONNEL ACCESS CONTROL. [illegible] ANSWER - DETECTION OF TRITIUM VAPOR WITHIN THE CONTAINMENT AS RELATED TO CONTAINMENT PERSONNEL ACCESS CONTROL WILL BE EFFECTED BY SAMPLING CONDENSATE OBTAINED FROM CONDENSED MOISTURE IN THE CONTAINMENT ATMOSPHERE. TRITIUM ACTIVITY WILL BE MEASURED WITH A LIQUID SCINTILLATION DETECTOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

[illegible]CONTAINMENT • REACTOR, PWR • [illegible] • RESPONSE TO NRC QUESTION • [illegible] • WATERFORD 3 (PWR)

070011
FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (RMIS/291)
U.S. ATOMIC ENERGY COMMISSION, DIRECTORATE OF REGULATORY STANDARDS
WASH-1258, VOL. 2 V., 300 PAGES, FIGURES, TABLES, REFERENCES, JULY 1973

CONTINUED FROM ASIC/TTBIG. APPENDIX A - PRINCIPAL PARAMETERS USED IN SOURCE TERM CALCULATIONS; B - BASES FOR THE PRINCIPAL PARAMETER USED IN SOURCE TERM; C - COMPUTER CODES TO CALCULATE RELEASES OF RADIOACTIVITY IN GASEOUS, LIQUID EFFLUENTS FROM LWRS; D - REPRESENTATIVE SYSTEM COST ESTIMATES; E - ATOMIC COMPUTER PROGRAM FOR CALCULATING ANNUAL AVERAGE EXTERNAL DOSES FROM GASEOUS ATMOSPHERE RELEASES OF RADIONUCLIDES; F - COMPUTATIONAL MODELS FOR CALCULATING DOSES FROM RADIONUCLIDES IN THE ENVIRONMENT. PRINCIPAL PARAMETERS COMPILED BY REGULATORY STAFF INTO A LIST IN STANDARDIZE CALCULATION OF RADIOACTIVE SOURCE TERMS, LATTER DEFINED AS AVERAGE AMOUNT RADIOACTIVE MATERIAL RELEASED TO ENVIRONMENT FROM NUCLEAR POWER REACTOR DURING NORMAL OPERATION (40-YEAR OPERATIONAL EXPECTANCY). [illegible] TRITIUM RELEASES IN LIQUID WASTE FOR ZIRCALOY CLAD FUEL = 350 CI/YR-REACTOR AND FOR STAINLESS STEEL CLAD FUEL = 5,000 CI/YR/REACTOR. GAS/WATER HEAVY PARTITION VS PH, BORON, CRITD, GROUP PROGRAMS FOR CALCULATING INTERNAL DOSES TO INDIVIDUALS AND POPULATIONS. ARGIN, REL,

070811 CONTINUED
CRITER, GIN. TONIC. DATA BASES FOR DOSE CALCULATION PROGRAMS. CF WPIS/292.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR • CODES AND STANDARDS • COMPUTER PROGRAM • DESIGN CRITERIA • NUMBER OF DAY (TOUR) • IODINE • REACTOR, T N • ELECTRIC POWER • DOSE CALCULATION, INTERNAL • REGULATION, AEC • POPULATION EXPOSURE • DOSE CALCULATION, EXTERNAL • ENVIRONMENT • FUEL REPROCESSING • PHYSIOLOGY/METABOLISM • FOOD CHAIN • RAM • EFFECT, PW • POWER PLANT, NUCLEAR • STATEMENT, ENVIRONMENTAL • NRC REGULATORY GUIDE • WPIS

070000
RESPONSE TO QUESTION 3.5F - RESERVE CF CONTAINMENT PURGES
CAROLINA POWER AND LIGHT CO.
DOCKET-50261-137 +, 2 PAGES, 1 TABLE, SUPPLEMENT 1 TO ENVIRONMENTAL REPORT FOR H.B. ROBINSON, UNIT 2, JAN. 15, 1973, DOCKET 50-261, TYPE--PWR, MFG--WEST., AF--FOSTER

FREQUENCY AND SCHEDULES OF CONTAINMENT PURGES ARE DISCUSSED AND ESTIMATED. TOTAL ACTIVITY RELEASED IN 11 PURGES WAS 22 CURIES OF GASEOUS ACTIVITY, 0.03 IN PARTICLES, 1.56 TRITIUM, AND 0.039 CURIE OF GROSS IODINE. RADIATION LEVELS IN CONTAINMENT ARE MONITORED USING TLD BADGES: RESULTS FOR 6 MONTH PERIOD ARE GIVEN IN TABLE. AT PRESENT, RECIRCULATION FILTERS ARE RUN CONTINUOUSLY IN CONTAINMENT BUILDING. FILTERS ARE BOTH HEPA AND CHARCOAL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GAS CLEANUP • CONTAINMENT • FILTER SYSTEM • IODINE • REACTOR, PWR • CONTAINMENT FILTERING SYSTEM • RADIOACTIVITY RELEASE • RESPONSE TO NRC QUESTION • ROBINSON 2 (PWR) • DATA COLLECTION • REPORT, ENVIRONMENTAL

070910
RESPONSE TO QUESTION 3.4 - CAPABILITIES OF THE WASTE PROCESSING SYSTEM
POWER AUTHORITY OF THE STATE OF NEW YORK
DOCKET-50333-43 +, 1 PAGE, P. Q.3.4-1, AMENDMENT 7 TO JAMES A. FITZPATRICK FSAR, APRIL 18, 1972, DOCKET 50-333, TYPE--PWR, MFG--G.E., AF--STEDF AND WEBSTER

AT AN ANNUAL RELEASE OF 87 CURIES EXCLUSIVE OF TRITIUM, BASED ON A FAILED FUEL BASIS OF 100,000 DISCHARGE AT 33 DAY DECAY TIME, THE PLANT MEETS THE PROPOSED REQUIREMENT THAT THE ANNUAL EXPOSURES TO THE WHOLE BODY OR ANY ORGAN OF AN INDIVIDUAL SHALL NOT BE IN EXCESS OF FIVE MILLIREMS IN LIQUID EFFLUENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR • EFFLUENT • FITZPATRICK (PWR) • WASTE TREATMENT • WASTE TREATMENT, LIQUID • WASTE DISPOSAL, LIQUID • RESPONSE TO NRC QUESTION • SYSTEM CAPABILITY • DECONTAMINATION

041014
RESPONSE TO QUESTION 11.7.3 - TRITIUM MONITORING
WISCONSIN PUBLIC SERVICE CORPORATION
DOCKET-50305-25 +, 1 PAGE, PG. 11.7.3-1 OF AMENDMENT TO KEWAUNEE FSAR, SEPTEMBER 15, 1971, DOCKET 50-305, TYPE--PWR, MFG--WEST., AF--PICKERD SERV.

PROVIDE A DESCRIPTION OF THE METHODS TO BE USED TO MONITOR TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM THE PLANT.RESPONSE - ALL RADIOACTIVE LIQUID BATCH RELEASES WILL BE SAMPLED AND ANALYZED FOR TRITIUM USING A REFRIGERATED LIQUID SCINTILLATION COUNTER. SAMPLE PREPARATION WILL BE CARRIED OUT USING AN APPROVED PROCEDURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR • WASTE DISPOSAL • MONITOR • RESPONSE TO NRC QUESTION • KEWAUNEE (PWR)

041431
RESPONSE TO QUESTION 11.21 - RELEASES OF TRITIUM AND KRYPTON-85
INDIANA AND MICHIGAN POWER CO.
DOCKET-50315--04 +, 1 PAGE, PG. 11.21-1 OF AMENDMENT 14 TO DONALD C. COOK FSAR, JAN. 30, 1973, DOCKETS 50-315/316, TYPE--PWR, MFG--WEST., AF--UTILITY

THE BASES FOR OUR ESTIMATED RELEASES OF TRITIUM AND KRYPTON-85 ARE THE ISOTOPIC SOURCE TERMS OF OUR LIQUID AND GASEOUS RADIOACTIVE RELEASES GIVEN BY WESTINGHOUSE. THE TABLES ARE ESTABLISHED ON THE DESIGN BASIS OF 1% FAILED FUEL. IT IS ALSO ASSUMED THAT NEITHER TRITIUM NOR K-85 WILL BE SUBSTANTIALLY DECAYED BEFORE RELEASE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT • KRYPTON • REACTOR, PWR • RELEASE RATE • WASTE DISPOSAL • RESPONSE TO NRC QUESTION • COOK 1 (PWR) • COOK 2 (PWR)

040170
RESPONSE TO QUESTION 11.12 - TRITIUM PRODUCTION AND DISCHARGE
BABCOCK POWER AND LIGHT CO.

090170 *CONTINUED*
DOCKET-50313-67 *. 2 PAGES. PP. 11.12 THRU 11.12B OF AMENDMENT 20 TO ARKANSAS NUCLEAR 1 LICENSE APPLICATION. AUGUST 10, 1972. DOCKET 50-313. TYPE--PWR. MFG--BOW. AF--DECHTEL

UNCERTAINTIES IN THE AMOUNT OF TRITIUM GENERATED MAY BE ATTRIBUTABLE TO UNCERTAINTIES WHICH MAY EXIST IN THE BASIC NUCLEAR DATA. THE PARAMETERS (SUCH AS NEUTRON FLUXES AND FLUX SPECTRUMS USED TO CALCULATE THE TRITIUM PRODUCTION RATE, THE MODEL USED TO ACCOUNT FOR THE CHANGING BORON COOLANT BORON CONCENTRATION, AND THE ASSUMED AMOUNT OF THE TRITIUM PRODUCED BY TERNARY FISSION THAT REACHES THE REACTOR COOLANT. THE EXPECTED TRITIUM DISCHARGE PER YEAR IS 403 CURIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT * REACTOR, PWR * RELEASE RATE * RESPONSE TO NRC QUESTION * ARKANSAS NUCLEAR 1 (PWR) * PRODUCTION, RATE * DISCHARGE

090499
FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (WPES/291)
U.S. ATOMIC ENERGY COMMISSION, DIRECTORATE OF REGULATORY STANDARDS
WASH-1258, VOL.2 *. 300 PAGES. FIGURES. TABLES. REFERENCES. JULY 1973

CONTD FROM NSIC/DOE90. APPENDIX A - PRINCIPAL PARAMETERS USED IN SOURCE TERM CALCNS: B - BASES FOR THE PRINCIPAL PARAMETERS USED ON SOURCE TERM: C - COMPUTER CODES TO CALC RELEASES OF RADIOACTIVITY IN GASEOUS, LIQUID EFFLUENTS FROM LWRS: D - RADWASTE SYSTEM COST ESTIMATES: E - ANSIC COMPUTER PROGRAM FOR CALCNG ANNUAL AVERAGE EXTERNAL DOSES FROM CHRONIC ATMOS RELEASES OF RADIONUCLIDES: F - COMPUTATIONAL MODELS FOR CALCNG DOSES FROM RADIONUCLIDES IN THE ENVIRONMENT. PRINCIPAL PARAMETERS COMPILED BY REGULATORY STAFF INTO A LIST TO STANDARDIZE CALCNS OF RADIOACTIVE SOURCE TERMS, LATTER DEFINED AS AV ANT RADIOACT MATERIAL RELEASED TO ENV FROM NUCLEAR POWER REACTOR DURING NORMAL OPERATION (40-YR OPERATIONAL EXPECTANCY).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR * *CODES AND STANDARDS * *COMPUTER PROGRAM * DESIGN CRITERIA * MOVEMENT RAY (MAT) * INDIVE * REACTOR, PWR * DOSE CALCULATION, INTERNAL * REGULATION, AEC * POPULATION EXPOSURE * DOSE CALCULATION, EXTERNAL * ENVIRONMENT * FUEL REPROCESSING * PHYSIOLOGY/PATHOLOGY * FOOD CHAIN * MAN * EFFECT, PW * POWER PLANT, NUCLEAR * STATEMENT, ENVIRONMENTAL * NPES * JACOBS

090772
RESPONSE TO QUESTION 11.15 - TRITIUM SHIPMENT
TENNESSEE VALLEY AUTHORITY, CHATTANOOGA
DOCKET-50438-16 *. 1 PAGE. PG. 11.15-1 OF AMENDMENT 4 TO BELLEFONTE 1 AND 2 LICENSE APPLICATION. OCTOBER 5, 1973. DOCKETS 50-438/439. TYPE--PWR. MFG--BOW. AF--TVA

TABLE 11.9-2 HAS BEEN REVISED TO SHOW 470 CURIES OF TRITIUM SHIPPED FROM THE PLANT. UNTIL RECENTLY, TVA HAD PLANNED TO SHIP TRITIATED LIQUID IN TANK TRAILERS OF ABOUT 5000 GALLONS CAPACITY. TVA HAS SINCE LEARNED THAT NRC DOES NOT CONSIDER SHIPMENT OF RADIOACTIVE LIQUIDS TO BE ACCEPTABLE. HENCE, TVA IS REEVALUATING ALTERNATIVE METHODS FOR DISPOSING OF TRITIATED LIQUID.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR * TRANSPORTATION AND HANDLING * WASTE DISPOSAL * WASTE TRANSPORTATION * RESPONSE TO NRC QUESTION * BELLEFONTE 1 (PWR) * BELLEFONTE 2 (PWR)

090779
RESPONSE TO QUESTION 12.10 - EXPOSURE DURING REFUELING
TENNESSEE VALLEY AUTHORITY, CHATTANOOGA
DOCKET-50438-16 *. 1 PAGE. PG. 12.10-1 OF AMENDMENT 4 TO BELLEFONTE 1 AND 2 LICENSE APPLICATION. OCTOBER 5, 1973. DOCKETS 50-438/439. TYPE--PWR. MFG--BOW. AF--TVA

IT IS EXPECTED THAT THE LARGEST PERSONNEL EXPOSURES TO TRITIUM WILL OCCUR DURING THE REFUELING CANAL WATER DURING REFUELING. A CALCULATION HAS BEEN PERFORMED UTILIZING A CONCENTRATION OF 1.25 MICROCURIES/CC IN THE REFUELING CANAL WATER, ASSUMING NO FORCED VENTILATION FLOW ABOVE THE WATER, AND CONSERVATIVELY ASSUMING A HIGH CONTAINMENT TEMPERATURE AND RELATIVE HUMIDITY. THE RESULTANT DOSE COMMITMENT TO AN INDIVIDUAL IN THIS ENVIRONMENT IS 10 MREM PER HOUR OF EXPOSURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR * DOSE CALCULATION, INTERNAL * REFUELING * RESPONSE TO NRC QUESTION * RADIATION EXPOSURE * BELLEFONTE 1 (PWR) * BELLEFONTE 2 (PWR)

091779
RESPONSE TO QUESTION 12.2.4 - TRITIUM MONITORING
TOLEDO EDISON COMPANY
DOCKET-50346-67 *. 1 PAGE. PG. 12.2.4-1 OF AMENDMENT 17 TO DAVIS-BESSE LICENSE APPLICATION. NOVEMBER 19, 1973. DOCKET 50-346. TYPE--PWR. MFG--BOW. AF--DECHTEL

CONTINUOUS MONITORING TECHNIQUES FOR TRITIUM DETECTION WILL NOT BE USED SINCE THE EXPECTED TRITIUM CONCENTRATION WILL BE FACTORS OF 10-100 LESS THAN THE MPC LEVEL FOR TRITIUM IN AIR FOR RESTRICTED AREAS. IN ADDITION, THERE ARE NO COMMERCIAL INSTRUMENTS AVAILABLE WHICH WILL RELIABLY MONITOR AIRBORNE TRITIUM SINCE THEY ARE SENSITIVE TO CHANGES IN HUMIDITY AND RESPOND TO CERTAIN GASEOUS

C01773 (CONTINUED)
RADIONUCLIDES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

REACTOR, PWR * WCESTOP * RESPONSE TO NRC QUESTION * MONITORING SYSTEM, RADIATION * MONITOR, AREA

C00601
RESPONSE TO QUESTION 11.3 - TRITIUM ACCUMULATION
WASHINGTON PUBLIC POWER SUPPLY SYSTEM, RICHLAND
DOCKET-50-460-19 P. 1 PAGE, PG. 011-1 OF AMENDMENT 4 TO WPPSS 1 LICENSE APPLICATION, MARCH 14, 1974, DOCKET 50-460, TYPE--PWR, MFG--GEN, AE--UNITED ENGR

THE GROWING CONCENTRATION OF TRITIUM IN THE PRIMARY COOLANT SYSTEM AND THE BORATED WATER STORAGE TANK, OVER THE 40 YEAR LIFETIME OF THE PLANT, IS CALCULATED BY USING THE GIVEN PHYSICAL MODEL AND ASSUMPTIONS. DURING NORMAL OPERATION A NET TOTAL OF .40 CI (ACCOUNTING FOR DECAY) IS EITHER PRODUCED IN OR LEAKS INTO THE PRIMARY COOLANT SYSTEM. THE PRIMARY COOLANT IS ASSUMED TO LOSE 15.000 GAL/YEAR TO THE RADWASTE SYSTEM.

AVAILABILITY - PICOSUPPORT, INC., P.O. BOX 3922 OAK RIDGE, TENN. 37830

REACTOR, PWR * RESPONSE TO NRC QUESTION * MAIN COOLING SYSTEM * OPERATION * WPPSS 1 (PWR)

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A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED TOPICS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS ASSIGNED TO IT.

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