

MARTIN MARIETTA

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**ENVIRONMENTAL
RESTORATION
PROGRAM**

**Annual Summary Report of the
Decontamination and
Decommissioning Surveillance and
Maintenance Program at Oak Ridge
National Laboratory for Period
Ending September 30, 1992**

**M. K. Ford
L. Holder, Jr.**

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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Date Issued—September 1992

**Prepared by
Waste Management and Remedial Actions Division
Oak Ridge National Laboratory**

**Prepared for
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**OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831-6285
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MARTIN MARIETTA ENERGY SYSTEMS, INC.**

**for the
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ACRONYMS

CAAM	constant alpha air monitor
CAM	constant air monitor
D&D	decontamination and decommissioning
DOE	Department of Energy
DOP	dioctylphthalate
ESO	engineering service order
FRCAS	Facility Radiation and Contamination Alarm System
HEPA	high efficiency particulate air
HRE	Homogeneous Reactor Experiment
LITR	Low-Intensity Test Reactor
Energy Systems	Martin Marietta Energy Systems, Inc.
MSRE	Molten Salt Reactor Experiment
NPDES	National Pollutant Discharge Elimination System
OGR	Oak Ridge Graphite Reactor
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Research Reactor
OSHA	Occupational Safety and Health Act
PCB	polychlorinated biphenyl
S&M	surveillance and maintenance

EXECUTIVE SUMMARY

The Decontamination and Decommissioning (D&D) Program was established at Oak Ridge National Laboratory (ORNL) in 1976 to provide collective management of all surplus sites under ORNL control on the Oak Ridge Reservation. Some 34 facilities, classified into 16 D&D related projects, are currently managed by the recently integrated D&D Program. Support includes (1) surveillance and maintenance (S&M) planning, (2) routine S&M, and (3) special maintenance projects. This report documents planning, routine S&M, and special maintenance performed on these facilities for the period October 1991 through September 1992.

1. INTRODUCTION

The Oak Ridge National Laboratory (ORNL) Decontamination and Decommissioning (D&D) Program is part of the Department of Energy (DOE) Environmental Restoration D&D Program and has continued to provide surveillance and maintenance (S&M) support for 34 surplus facilities. The objectives are (1) to ensure adequate containment of residual radioactive materials remaining in the facilities, (2) to provide safety and security controls to minimize the potential hazards to on-site personnel and to the general public, and (3) to manage the facilities in the most cost-effective manner while awaiting decommissioning. This support has included work in three principal areas: (1) S&M planning, (2) routine S&M, and (3) special projects designed to correct serious facility deficiencies beyond the scope of routine maintenance.

2. SURVEILLANCE AND MAINTENANCE PLANNING

2.1 SURVEILLANCE AND MAINTENANCE PLAN UPDATE

The S&M plan was updated this year to incorporate changes made to the program as it has evolved into part of DOE's Environmental Restoration D&D Program. The report documented changes in priorities that resulted from degrading facility conditions or increasing regulatory pressure and environmental, safety, and health oversight which result in significant increases in costs for S&M. The report projected those impacts for the period FY 1993 through FY 2002. Revised decommissioning priorities were also reflected in the curtailment of S&M support as these facilities complete D&D planning and actual operations are initiated.

2.2 FACILITY HAZARD SCREENING

Facilities in the D&D Program have been segregated and grouped for hazard screening. Facilities were grouped according to the magnitude of their hazards in order to determine the need for an extent of follow-on safety documentation.

The hazard screening process results in the placement of facilities into one of four initial hazard classifications. The initial classification is used in determining if further analysis is required and in a future recommendation to DOE of a classification for each facility. At this stage in the screening process, all surplus facilities in the D&D Program have been proposed as generally acceptable hazard facilities, with the exception of the Molten Salt Reactor Experiment (MSRE), which has been proposed as a low hazard facility.

2.3 SURVEILLANCE PLANNING

Documentation was submitted for National Environmental Policy Act compliance for (1) Occupational Safety and Health Act (OSHA) compliance upgrades at the Homogeneous Reactor Experiment (HRE) and Low-Intensity Test Reactor (LITR) (1/92), (2) asbestos abatement at the Oak Ridge Graphite Reactor (OGR) and the MSRE (4/91), and (3) cleanup of Decontamination Facility (Building 9419-1) (7/91). Internal documentation at ORNL was completed for annual tests at MSRE for fuel containment integrity (4/91).

3. ROUTINE SURVEILLANCE AND MAINTENANCE

3.1 NONDEFENSE SURPLUS FACILITIES

3.1.1 Molten Salt Reactor Experiment

Routine S&M were conducted at the MSRE in FY 1992 as scheduled. Dioctylphthalate (DOP) tests for particulate efficiencies were performed on all three banks of the cell ventilation filters, and all three banks were approved for extended service. Radiological surveys were conducted in several areas in excess of normal requirements to assess potential migration of volatile fuel fission and/or activation products. The North Electric Service Area, adjacent to the drain tank cell, was the primary area surveyed. Only direct readings were taken, and pre-set points were identified to better quantify changes or trends. Data from these surveys are listed in Sect. 4. Programmed maintenance was performed on both pumps for the main sump. Spare bearings were ordered to replenish the supply depleted during recent maintenance. Also, calibrations were performed twice in FY 1992 on all remote sensing devices for MSRE and once on all local pressure sensing devices. Semiannual checks and programmed maintenance were performed on both constant air monitors (CAMs) and monitrons. Replacement of one count rate meter was required on the local CAM in the high bay. Programmed maintenance was performed on both high bay cranes this fiscal year as well. The 30-ton crane failed the portion of the inspection requiring safety clasps on the ball and hook. After a clasp was added and maintenance was performed on the crane motor bearings, the unit was approved for extended service.

Subcontracted health physics personnel conducted a complete characterization of MSRE to update a mid-1970s report identifying radiological status of the facility. Upon completion of the surveys for the remaining surplus reactors at ORNL, a report will be published as a single document. Radiological survey maps are on file for the work performed, and Remedial Action personnel responsible for the MSRE are conducting follow-up surveys based on the data gathered, traffic in the areas surveyed, and access control measures in place.

Several locations were sampled during FY 1992 at MSRE. The main building sump was sampled and analyzed for gross alpha and beta-gamma. Also, discharge of this foundation draining device was sampled for the same constituents further downstream at the outfall. All results were satisfactory. Also, a 3-in. penetration was made in the Building 7512 stack. Environmental Monitoring and Compliance personnel at ORNL will use this penetration for upgraded instrumentation to meet criteria for the stack effluent established by National Emission Standards for Hazardous Air Pollutants requirements. An intermediate handrail was added to the platform on the stack at the 50-ft level to accommodate the increased instrumentation and to adhere to OSHA regulations. Also, siderails were added to the stack ladder this year to meet OSHA guidelines. No siderails were added above 50 ft because there is no need for access to this portion of the stack.

Several areas at the MSRE were sampled for friable asbestos during the year. The switchgear room, vent house, and coolant drain cell were all included, and results were negative for each.

Both air compressors servicing the MSRE remote instrumentation for facility surveillance were removed this year. A new, smaller unit with considerably less potential for oil spills replaced these compressors. A backup was also ordered and will be placed near the operating unit, along with spare parts to service both units. All electrical service was reworked for the new compressors, and obsolete conduit was removed from the area to accommodate the refurbishment.

All signs and placards at MSRE were upgraded this fiscal year to reflect changes in areas, regulations, and personnel. An emergency call list was made to aid personnel in contacting cognizant personnel available, abnormal operating procedures were developed to assist emergency response personnel in combatting shutdowns in critical S&M equipment/systems, and spare parts were increased to service critically-defined systems and components.

At the MSRE stack and filter pit area, new metal plates were fabricated and installed on the concrete plugs that seal the roughing and High Efficiency Particulate Air (HEPA) filters. Neoprene gaskets were cut to fit the plates and installed under each plate to assure better prevention against water inleakage to the filters.

An engineering service order (ESO) was generated to complete hazard screening for the MSRE and all other surplus reactors. Martin Marietta Energy Systems, Inc., (Energy Systems) Engineering has committed to a December 1992 date for completion of the MSRE report.

A study was conducted on all sinks, sumps, and floor drains at the MSRE this year. Original construction drawings for the facility were marked, and individual checklists were completed for each drainage point. Follow-up action in FY 1993 will include physical identification of inactive system drains by dye test, walk-through, etc.

3.1.2 Oak Ridge Research Reactor Experimental Facilities and Trane Coolers

Routine S&M were conducted on the experimental facilities within the Oak Ridge Research Reactor (ORR) and the Trane coolers. Vegetation maintenance was performed three times during the year around the coolers, and additional surveys (beyond normal surveys) were performed each time. Placards were placed around several areas of the ORR basement adjacent to the experiments to better segregate control boundaries for the ORR experiments. The outer housings of the Trane coolers were painted to retard corrosion in conjunction with an effort by ORNL to maintain field equipment associated with the former ORR. The units are internally contaminated, and corrosion through the outer housing could spread contamination extensively to an uncontrolled environment. Radiological surveys were conducted before, during, and following the painting, and no contamination was detected outside the housing. Decommissioning of these coolers has been delayed from the initial FY 1988 planned date, and the paint applied will help retard weathering.

3.1.3 High Level Chemical Development Laboratory (Building 4507)

Routine S&M were conducted as scheduled with the exception of two incidences this fiscal year. In July 1992 and September 1992, a constant alpha air monitor (CAAM) tape advance failed, allowing radon buildup on the tape and giving a false high alarm. The CAAM is part of a Facility Radiation and Contamination Alarm System (FRCAS), an ORNL plantwide system for continuous remote monitoring of critical radiological facilities.

(category III) were written each time, and the corrective action recommended on each is to proceed with removing the facility from the FRCAS at ORNL. According to facility management at Building 4507, the FRCAS is unnecessary since cell cleanout of hazardous constituents and the removal of tritium lights have been completed. Paperwork has been completed requesting the concurrence of the Office of Operational and Facility Safety and the Office of Radiological Protection, both internal ORNL organizations, to discontinue and remove this system from the facility.

3.1.4 Shielded Transfer Tanks

It was determined that shielding the Shielded Transfer Tanks from the weather would be of great benefit in slowing their rate of deterioration. A canopy, complete with drains to divert rain water away from them, was installed over all five tanks. Quarterly radiological inspections have not shown any increase in surface contamination levels, but rust spots have developed on all tanks.

3.1.5 Molten Salt Corrosion Loop

Routine S&M were performed at the Molten Salt Corrosion Loop in FY 1992. No off-normal situations or maintenance needs were encountered.

3.1.6 Coolant Salt Technology Facility

Routine S&M were performed at the Coolant Salt Technology Facility as scheduled during FY 1992. No off-normal situations or maintenance needs were encountered.

3.1.7 Decontamination Facility (Building 9419-1)

Routine S&M were performed at the Decontamination Facility (Building 9419-1) in FY 1992. No off-normal situations or maintenance needs were encountered.

3.1.8 Storage Tank

Routine S&M were performed at the Storage Tank in FY 1992. The Industrial Hygiene organization at the Y-12 plant sampled the area around the storage tank in the mezzanine of Building 9201-3 and inside the tank for any residuals that may imply a need for surveillance to meet increased regulatory requirements. In addition, in these same areas, radiological smears and probes were completed above those required through program surveillance requirements. Results indicated that the tank did not contain hazardous constituents above regulatory guidelines or that radiation or contamination existed above previously known amounts. These efforts were part of a Y-12 Plant effort at updating inactive tank information for compliance status of inactive tanks at the Y-12 Plant.

3.2 DEFENSE SURPLUS FACILITIES

3.2.1 Surplus Reactors

Routine S&M were conducted as scheduled at the Oak Ridge Graphite Reactor (OGR) in FY 1992 without incident. The eyewash station on the ground level was relocated in order that asbestos could be removed from pipe insulation in an adjacent area. Also, an electrical breaker was placed in the area where the eyewash station had previously been located. New indicator lights were placed where the eyewash station was located, and an indicator light for the safety shower was replaced. Fire extinguishers were replaced in some areas of the facility (a total of three were replaced for OGR) to accommodate recent OSHA regulation changes. A fixed ladder from a past experiment on top of the reactor pile was removed and disposed of. OSHA regulations required changes to existing ladders, and removal was the best economic alternative since the ladder and experimental system are surplus.

One designated contaminated area for the OGR was inventoried this year, and many items were removed and disposed of. Lead totalling approximately 50 ft³ was placed into drums, and the three drums accumulated were removed and given to ORNL Waste Operations for continued storage at another site. Several pumps were drained of oil (previously sampled-non polychlorinated biphenyl) and the oil disposed of, cadmium sleeves from past reactor operation were repackaged in plastic for continued storage (mixed-waste form), and three process pumps were placed in tumulus storage.

Programmed maintenance was performed on the high bay cranes, building elevator, and CAM on top of the reactor pile. A new count rate pump was placed on the CAM, and the removed pump was drained of residual oil and placed in tumulus storage. The elevator was repaired through placement of sheet metal in an opening around the motor to avoid accidental injury through belt contact with maintenance personnel.

Asbestos abatement was conducted at several areas of the facility this year. Several pipes overhead on the ground level were in proximity to high traffic areas, and the insulation at these points was removed. Asbestos was removed from two areas on the west face of the reactor pile, and the asbestos was bagged and disposed of. The insulation removed was not replaced because all of the lines were surplus. One area on the northwest portion of the high bay was temporarily repaired through taping of friable areas until scheduling conflicts can be eased and ORNL abatement teams can complete this subtask.

A new door was placed on the east end of the Filter House (Building 3002) to replace the existing one, which was heavily corroded and warped. A new lock core was installed. The door frame was surveyed by health physics and painted to alleviate existing corrosion. DOP tests were conducted on existing HEPA filters for the OGR at Building 3002. The results were satisfactory for extended service.

The 3002-A seal tank for the Filter House was sampled for gross radioactivity in an effort to prepare to pump several hundred gallons of liquid waste from the tank. The results, necessary for planning the means of pumping and treatment of the tank, have not been received to date.

An ESO was written to complete hazard screening for the OGR according to Central Safety Evaluation Team requirements at ORNL. This effort is part of the Safety Analysis Report Upgrade Program. The estimated completion date, as dictated in the ESO, is December 1992.

A study was conducted this fiscal year to identify all sink, sump, and floor drains that have historically existed at the OGR. Original construction drawings were acquired from ORNL Engineering, all drains were highlighted on the drawings, and individual checklists were completed. Follow-up action in FY 1993 will include physical verification of drains active at the facility. This will be accomplished through dye tests, walk throughs, etc.

Routine S&M were conducted at the LITR this year without incidence. A new walkway was installed on the area accessing the midriff and high bay. The walkway includes a rail to discourage people from straying off the path and walking to the edge of the roof. This task was completed to alleviate an OSHA finding on a recent walk-through by the ORNL Safety Department. New heaters were added in the high bay, and a motor was replaced in the existing heater in the high bay this year. Many of the floor problems existing in the LITR high bay have been the result of faulty heaters. Asbestos was abated from an existing steam supply line and was replaced by new insulation.

Programmed maintenance was performed on cranes for the facility. Safety clasps were placed on two of the cranes, alleviating an OSHA finding from an internal safety inspection, and some additional maintenance was conducted on one crane to aid in the service of the aging unit. Both units were approved for continued use. A leaking roof has been the cause of some structural concerns in the LITR Control Room, and some equipment was removed to make room for repairs. All surplus electrical service was stripped out of the control room and disposed of. The leaking roof is scheduled for repair.

Contaminated lead from the LITR primary exit water line was removed, decontaminated, and turned over to the ORNL Lead Shop for possible reuse. Fifty-one bricks in the midriff level were surveyed, tagged, and sent to the lead repository for ORNL for possible reuse as "suspect contaminated." Several surplus items in the LITR demineralizer shed were placed into tumulus boxes and shipped to an ORNL solid waste storage area. Contaminated buckets used to hold spent resin during resin transfers, transfer hoses, etc., were bagged and included in the tumulus shipment.

Instrument calibrations at LITR were conducted on schedule. The differential pressure gauge across the exit water line ventilation connection was found to be faulty during a calibration. A new gauge was installed and calibrated and is performing satisfactorily.

Historical drawings of the LITR facility were retrieved from ORNL Engineering and marked for all sumps, sinks, and floor drains that existed at the completion of construction. From these drawings individual checklists were developed for each sump, sink, or floor drain listed. The current status of each will be further verified through physical means (dye tests, physical walk-through, etc. as required).

Routine S&M activities were conducted at HRE this fiscal year with one incident. In January 1992, an occurrence was reported on a non-permitted outfall from HRE. Outfall 283 was sampled—a routine surveillance by the ORNL Sampling and Monitoring Group—and

found to exceed National Pollutant Discharge Elimination System (NPDES) limits for oils and greases. Action was taken immediately through resampling of source discharges upstream of the actual outfall. Two sources feed the outfall, and both, when resampled, were found to be well below the NPDES limits for oils and greases. Two abandoned experiments (both with inactive drains) were physically disconnected from Outfall 283 to assure compliance. Historical documentation indicated a probability of migration of these two components into Outfall 283 or from a transformer west of the outfall. The transformer was removed in 1991, and the two sources from the facility feeding the outfall have shown no indication of oils and greases in further samplings. The final closeout report was completed this fiscal year.

Subcontracted health physics services were utilized this year to recharacterize the HRE completely. All accessible areas of the facility were smeared and probed for alpha, beta-gamma, and neutron-emitting particles/radiation. This action and report supersede earlier characterization work performed in the mid-1970s. Maps were made of the areas, and new frequencies of future health physics surveillance were recommended. The final report is incomplete and awaiting completion of the remaining surplus reactors to summarize all information into one document.

Programmed maintenance was performed on building cranes this year. The filtration system for cell ventilation was tested by the Quality Assurance and Inspection Department at ORNL for particulate retention efficiency, and all necessary instrumentation was calibrated as required by the S&M Program. Each item was approved for continued service. An advance motor for the filter media was required for the building CAM, and craft personnel installed new DOP sample ports.

Totalizers were placed on the foundation sump pump and the north control room sump pump this year. Data has been gathered since June 1992 to evaluate the need for a catch tank(s) to alleviate pumping to Outfall 283 (foundation sump) and the 12,000-gal tank (north control room sump). Data will be gathered through December 1992 to support a decision on an alternate discharge method. Volumes are important in the consideration, and the frequency of removal of liquids by tanker must be considered in the effort to keep exposure rates as low as reasonably achievable.

Fences were placed around the HRE this fiscal year in an effort to control access into HRE areas by unauthorized personnel. Included in the fencing were the main 7500 Building, the cooling tower and associated equipment, the area around the charcoal bed and waste staging areas, plus the decontamination pad and rear entrances to the facility. Access to the high bay area was restricted further by locking the two entrances, providing an alternate pathway to the north control room lower levels, and constructing a hutment, complete with hasp and lock, around the north control room lower level entrance. Also, new ground straps were placed on the perimeter fencing at HRE to comply with an ORNL-wide Tiger Team finding.

Decontamination was completed of some areas discovered in the recent contract health physics characterization, including remote areas of the high bay and several spots in lower levels of the facility. Also, a contamination area in the east portion of the HRE high bay was partially decontaminated, with removal of approximately 200 ft³ of tumulus stored waste. Some items within other portions of the facility were surveyed and tagged for salvage pickup and further usage at ORNL. This material totalled approximately 1225 ft³.

Work was continued on disposal of surplus equipment stored in the HRE storage pool. Some 100 ft³ of surplus equipment was removed from the storage pool, wrapped in plastic (with absorbent rags added to the plastic bags), and stored in ORNL tumulus. This effort is to help lower the background radiation at the ground level of the pool, historically an area where weekly radiological surveillances are required to assure that the shielding water is adequate for continued storage. Due to extensive corrosion since the HRE shutdown, some items inventoried in FY 1991 may require chemical analysis before disposal is possible. A records search for the facility has not revealed any evidence of items initially stored in the pool.

Labelling of electrical, water supply, and waste lines was initiated this year. Approximately 60% of existing lines have been identified to date, helping update facility conditions and existing facility drawings. Line status is being recorded in facility log entries or memos-to-file, with changes to drawings planned as funding permits. Also, several inactive electrical circuits are being physically disconnected to comply with recent OSHA generic findings by a DOE Tiger Team. Radiological and emergency call list placards were upgraded this fiscal year to upgrade recent decontamination efforts at the facility, to react to changes in ORNL policies, and to list changes in facility oversight.

A study was conducted this fiscal year to determine all sink, sump, and floor drains in each facility. HRE construction drawings were gathered from ORNL Engineering and marked for drain locations. From this information, individual checklists were developed for each historic drain point. Follow-up action is planned for FY 1993 to physically identify current drain points (through dye tests, walk throughs, etc. as required).

3.2.2 Fission Product Development Laboratory

Routine surveillance and maintenance has been performed at the Fission Product Development Laboratory as scheduled during FY 1992. No off-normal situations or maintenance needs have been encountered.

3.2.3 Waste Evaporator (Building 3506)

The Waste Evaporator roof deteriorated to the point of leaking into the interior floor. An aluminum roof was designed, fabricated, and installed over the control room (east) side of the building to completely cover the old roof. This was determined to be the least expensive repair since the building had already been characterized and plans had been made to decommission this facility in the near future.

3.2.4 Fission Product Pilot Plant (Building 3515)

The Fission Product Pilot Plant has been maintained in very good condition this fiscal year. The previously installed roof has kept out the elements, thereby deterring radionuclide migration. This facility is also scheduled for decommissioning in the near future.

3.2.5 Old Hydrofracture Facility (Building 7852)

Conditions have been improved at the Old Hydrofracture Facility in FY 1992 by three changes made to aid monitoring and increase safety. The air compressor for the tank-level

measurement was replaced, which resulted in reliable readings for the five storage tanks at this facility. The blower drive assembly on the pumphouse replaced an obsolete unit that had long since outlived its design life. The power feeding the blower, pumps, and the cathodic protection was moved to the outside wall of the pumphouse, eliminating the exposure to personnel when the breakers had to be reset inside the highly contaminated pumphouse.

3.3 SURPLUS CONTAMINATED FACILITIES

Routine S&M were conducted at surplus contaminated facilities this fiscal year without incidence. Surveillances were made of the 86-in. cyclotron for radiological characterization of sources and surplus equipment for subsequent removal.

At the High Level Radiation Analytical Laboratory (Building 3019-B), additional surveillance was conducted at the cell face windows and on top of the cells to further characterize radiological levels for project activities there.

The Decontamination Facility was maintained in its present good condition. No additional material was removed from the inside storage area this fiscal year. The vegetation maintenance was continued to keep up its appearance, and the fence has been successful in excluding vehicular and personnel traffic.

4. SPECIAL MAINTENANCE PROJECTS

4.1 NONDEFENSE SURPLUS FACILITIES PROJECTS

4.1.1 MSRE Contamination Migration Study

A task team was developed this year to help identify possible causes for the alleged unexplained increase in radiation in an area adjacent to the drain tank cell storing the spent fuel salt. According to recollections by past operating personnel at the MSRE, a radiation field of approximately 10-100 mrem/h was present at shutdown in 1969. Since that time, readings have shown higher fields (up to 8 rem/h) beginning in 1988.

The initial action of this task team has been to gather radiological data in the north electric service area (the area adjacent to the drain tank cell where radiation was initially located) and vent house (the area where another incident occurred involving migration of certain undetermined isotopic species); to identify possible mechanisms for the migration, based on the data gathered; and to develop an action plan to mitigate further migration and possibly rectify the existing condition. To date, work has included: (1) completion of a gamma scan in the north electric service area using a collimator to damp out peripheral radiation scattering in the area, (2) taking of pre-set routine surveys in the same area around a penetration to the cell wall where the radiation appears to be concentrated, and (3) development of a work plan and other associated documentation related to the sampling of material in the vent house, where the material was discovered in 1987. Maintenance on a valve in the vent house at that time uncovered a powder-type substance coming from the ¼-in. tubing where maintenance was being performed. Considerable alpha activity was detected.

Future plans include development of a follow-up action plan for mitigating the problem and recommendations for possible changes to S&M methods now conducted on containment of the fuel salts. Other facility personnel familiar with the past operation at MSRE are being contacted for possible assistance and documentation (historical records) searches. Any activities beyond this scope will be contingent upon the data to be gathered presently and upon the complexity of the mechanism from a perspective of physical actions required to reverse the alleged radiation increase.

4.1.2 MSRE Compliance Assessment

During FY 1992, EBASCO Environmental Services Company toured the MSRE, requested and received historical and current S&M information on the facility, and completed a report defining areas of compliance and noncompliance of MSRE according to current DOE orders. Several inadequacies were identified, but the primary area needing attention centered around hazard screening, a process currently ongoing for the MSRE, and follow-up safety analysis or assessment for the shutdown facility based on the result of hazard-screening categorization. Ebasco considered the MSRE the equivalent to an Independent Spent Fuel Storage Installation in the private sector and, therefore, subject to equivalent regulations. The safety analysis or assessment, developed as a result of the hazard-screening process, will alleviate most of the findings in the report upon completion or will provide a better means of developing an action for any remaining deficiencies.

4.2 DEFENSE SURPLUS FACILITIES PROJECTS: HOMOGENEOUS REACTOR EXPERIMENT OCCUPATIONAL SAFETY AND HEALTH ACT COMPLIANCE UPGRADES

Craft personnel completed physical disconnections of various electrical pumps at the facility in an effort to alleviate OSHA-related findings (generic to ORNL) at the facility by DOE Tiger Team visits in FY 1990. This solution satisfied requirements for adding guards against injury caused by moving parts of the equipment since the equipment was made inactive by physical severing of the power supply. Also, some guards were placed on energizing switches to active motors and pumps, thereby alleviating the possibility of inadvertent switching of these units. Two ladders at the facility were modified to meet OSHA standards for bottom-rung-level ground clearance, and several rails were modified by adding another intermediate section to meet OSHA intermediate-rail-spacing requirements. Finally, the hutment over the liquid low-level waste valve pit (east of Building 7500) was modified at the entrance to meet OSHA requirements on egress from a confined space. (Note: LTR OSHA upgrades were completed as scheduled and are described in Sect. 3.2.1.)

4.3 SURPLUS CONTAMINATED FACILITIES PROJECTS

4.3.1 86-Inch Cyclotron Source Removal

All sources were packaged according to radiological surveillance data during inspection, and historical information. The sources were either placed in tumulus boxes or individually packaged (plastic overpack) and handed over to Solid Waste Operations at ORNL for storage or disposal based on waste acceptance criteria. Some 50 sources and targets of various sizes were removed, totalling approximately 200 ft³ of solid waste. Curie content totalled 3.08×10^{-8} Ci, the principal isotope being bismuth-207.

Removal of 376 lead bricks, 227 steel bricks, and 30 sheets of lead, all noncontaminated, was also completed this year. In addition, several process equipment items were removed from around the cell face cubicle, thereby completing this task as scheduled.

4.3.2 86-Inch Cyclotron Asbestos Abatement

Because Davis-Bacon approval to abate asbestos using Energy Systems personnel was not received and because there was not sufficient time to let a subcontract after notification that Energy Systems personnel were not allowed to perform this activity, this task was not accomplished.

4.3.3 86-Inch Cyclotron Z-Oil Line Removal

All Z-oil lines accessible outside the inner process cubicle were removed from the system, drained of any residual oils, and disposed of according to waste acceptance criteria by the Solid Waste Operations Group. Three lines, a chiller unit, and associated pumps were removed, totalling approximately 300 ft³ of contact-handled waste. Radiological surveys indicated that no contamination was present. Oils were packaged and picked up by Y-12 Hazardous Waste Operations. This task was completed on schedule.

4.3.4 High Level Radiological Analytical Facility Upgrade (Building 3019-B)

Several activities were completed this fiscal year at the High Level Radiological Analytical Facility. Included were: (1) sealing the cell face windows with ½-in.-thick lead plates and gaskets, (2) removal of approximately 850 ft³ of asbestos-laden floor tiles from in front of the cells, and (3) removal of a cell access drawer from cell 4 that was previously jammed from miscellaneous debris lodged in the track during cell operation. The drawer was cut and pushed into the cell and a ¾-in.-thick plate of lead was added for shielding purposes. The placement of lead over the cell windows and over the area where the drawer previously was located decreased the radiation background significantly in the front cell process area. Asbestos abatement of the duct above the cells was not accomplished as originally scheduled. The ruling on the Davis-Bacon agreement for subcontract versus in-house abatement was not expedient enough to allow for task completion. The remainder of tasks defined were completed on schedule.

4.3.5 Building 3110 Filter House

It has been known for some time that the filters in the Building 3110 Filter House were contaminated and should be changed. The roughing and HEPA filters were removed and a new set installed. New filters were required since the building is maintained at a negative pressure and the ductwork is known to have contaminants present.

4.3.6 Decontamination Facility (Building 9419-1)

Work was completed at the Decontamination Facility this year, including removal of all chemicals and hazardous materials identified. A roof leak was patched, and all wastes generated were segregated and packaged according to ORNL waste acceptance criteria. Approximately 35 gal of old reagents and waste fluids were removed and approximately 75 ft³ of solid contact handled waste was stored in tumulus. This task was completed on schedule.

5. SUMMARY

S&M activities will continue in FY 1993. Routine S&M will continue as scheduled. Work on mitigating migrating contaminants at MSRE will proceed through development of an active plan for lowering the radiation field in the north electric service area, the ORR will be placed under a program of S&M, and hazard screening will be completed for all surplus facilities.

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