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WORLD MARITIME UNIVERSITY

MALMO.SWEDEN

PROPOSAL OF THE FUTURE MARITIME EDUCATION AND TRAINING
FOR MARITIME OFFICERS OF PAKISTAN

BY

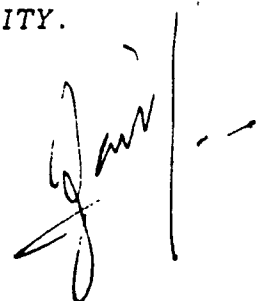
SAYEED A. ZAIDI

SEVENTH NOVEMBER 1986

A PAPER SUBMITTED TO THE FACULTY OF THE WORLD MARITIME
UNIVERSITY IN PARTIAL SATISFACTION OF THE REQUIREMENTS OF
THE MASTER OF SCIENCE DEGREE IN MARITIME EDUCATION AND
TRAINING (ENGINEERING).


THE CONTENTS OF THIS PAPER REFLECT MY OWN PERSONAL VIEWS
AND ARE NOT NECESSARILY ENDORSED BY THE UNIVERSITY.

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ABSTRACT

THIS PAPER IS SPECIFICALLY DIRECTED TOWARDS THE MARITIME EDUCATION AND TRAINING OF PAKISTAN.

THE OBJECTIVES OF THIS PAPER ARE EXPLAINED IN THE FOLLOWING PARAGRAPHS.

.1 IN COUNTRIES WHERE SHIPPING ACTIVITIES ARE NOT SIZABLE THE MARITIME INSTITUTIONS HAVE TO JUSTIFY THEIR SURVIVAL. THERE ARE QUESTIONS ASKED ABOUT THE COST EFFECTIVENESS OF THE MARITIME EDUCATIONAL INSTITUTIONS. THERE IS AN ACUTE NEED TO PUBLICISE THE IMPORTANCE OF SUCH EDUCATION AND TRAINING, WITH REASONS FOR HAVING IT IN SPECIALISED INSTITUTIONS.

.2 THE PRESENT SLUMP IN SHIPPING HAS RENDERED MANY USEFUL TECHNICAL PERSONNEL (SEAFARERS) JOBLESS. ONE OF THE MAJOR REASONS IS THE NON-EQUIVALENCE OF MARITIME EDUCATIONAL SYSTEMS WITH THE REGULAR NATIONAL ACADEMIC EDUCATIONAL SYSTEMS . IT IS OF PARAMOUNT IMPORTANCE TO ELIMINATE THIS REASON AND SO EASE THE PRESSURES ON THE SHIPPING INDUSTRY AND ITS PERSONNEL. DOING THIS WILL HELP THE GENERAL NATIONAL POLICIES OF ROOTING OUT THE SOCIAL EVILS OF UNEMPLOYMENT.

.3 WE ARE PASSING THROUGH THE END OF A TECHNOLOGICAL ERA, THIS FACT IS TO BE TAKEN SERIOUSLY. A REVIEW OF THE ENTIRE MARITIME EDUCATION AND TRAINING SYSTEM IS THE NEED OF THE TIME.

IN THIS PAPER I HAVE TRIED TO PROVIDE ONE POSSIBLE WAY OF SOLVING THESE PROBLEMS, PARTICULARLY IN THE CONTEXT OF PAKISTANI ENVIRONMENT.

ACKNOWLEDGEMENTS

I OWE MY VERY SINCERE GRATITUDE AND THANKS TO ALL THOSE WHO PROVIDED ME WITH INFORMATION GUIDANCE AND ENCOURAGEMENT, AND MADE IT POSSIBLE FOR ME TO COMPLETE THIS PAPER.

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LIST OF ABBREVIATIONS USED

1. DGP&S. DIRECTORATE GENERAL PORTS AND SHIPPING.
2. PMA. PAKISTAN MARINE ACADEMY.
3. P.N.S.C. PAKISTAN NATIONAL SHIPPING CORPORATION.
4. K.S.E.W. KARACHI SHIPYARD AND ENGINEERING WORKS.
5. K.P.T. KARACHI PORT TRUST.
6. MET. MARITIME EDUCATION AND TRAINING.
7. NED. NADERSHAW EDELJEE DINSHAW (UNIVERSITY OF SCIENCE AND TECHNOLOGY).
8. DPO. DUAL PURPOSE OFFICER. (ENGINEERING AND NAUTICAL)
9. GOVT. GOVERNMENT.
10. MAR. MARITIME.
11. I.M.O. INTERNATIONAL MARITIME ORGANISATION.
12. STC. SEAMEN TRAINING CENTRE.
13. D.O.T. DEPARTMENT OF TRADE. UNITED KINGDOM.
14. STCW. STANDARDS OF TRAINING CERTIFICATION AND WATCHKEEPING OF SEAFARERS. (IMO CONVENTION 78)
15. WMU. WORLD MARITIME UNIVERSITY.
16. BMET. BOARD OF MARITIME EDUCATION AND TRAINING.

1. NATIONAL ASPIRATIONS.

1.1 PAKISTAN'S NATIONAL ASPIRATIONS TOWARDS EDUCATION CAN BEST BE FELT BY READING THROUGH THE NATION'S SIXTH FIVE YEAR PLAN (1983 TO 1988). QUOTED BELOW ARE SOME EXCERPTS FROM THE CHAPTERS ON EDUCATION, SCIENCE & TECHNOLOGY AND INDUSTRY.

1.2 "EDUCATION IS THE MOST VITAL INVESTMENT FOR ANY PROGRAMME OF SOCIO-ECONOMIC DEVELOPMENT. ITS NEGLECT CAN COST GENERATIONS. NO UN-EDUCATED SOCIETY HAS EVER ACHIEVED THE HEIGHTS OF ECONOMIC AND POLITICAL POWER. NO EDUCATED SOCIETY HAS EVER BEEN LEFT BEHIND IN THE RELENTLESS MARCH OF HISTORY".

1.3 "TECHNICAL MANPOWER IS VITAL FOR ENHANCING THE PRODUCTIVE CAPACITY OF THE NATION AND FOR ENSURING IMPLEMENTATION OF DEVELOPMENT PLANS. THE QUALITY AND THE QUANTUM OF THE DEVELOPMENTS WHICH TAKE PLACE IN A COUNTRY ARE, IN THE LAST ANALYSIS, DETERMINED BY THE TECHNICAL EXCELLENCE OF MANPOWER, AND THE EXTENT TO WHICH SCIENTIFIC KNOWLEDGE AND TECHNOLOGICAL SKILLS CAN BE UTILISED FOR RAISING THE QUALITY OF THE DEVELOPMENT WORK. THE TRAINING PROGRAMMES OF TECHNICAL MANPOWER ARE THEREFORE OF CRUCIAL SIGNIFICANCE FOR PROVIDING THE TRAINED MANPOWER REQUIRED FOR THE ACCOMPLISHMENT OF DEVELOPMENT OBJECTIVES".

1.4 "IT IS IN RECOGNITION OF THE CRITICAL POSITION OF THE TECHNICAL MANPOWER, THAT THE GOVERNMENT OF PAKISTAN PLACES HIGH PRIORITY ON THE DEVELOPMENT OF TRAINING PROGRAMMES OF ALL CATEGORIES OF TRAINED MANPOWER BOTH IN QUALITY AND SIZE".

1.5 "PROPOSED PROGRAMMES THEREFORE LAY GREATER EMPHASIS ON QUALITATIVE IMPROVEMENTS BY RESTRICTING GROWTH OF UNDER-GRADUATE ENROLLMENT AT UNIVERSITIES, AND MAKING PROVISION OF ADEQUATE FACILITIES OF WORKSHOPS, MACHINERY, LABORATORY MATERIALS, AND BOOKS, AND BY ESTABLISHING LINKAGES WITH EMPLOYERS AND PROVIDING EXPATRIATE (PAKISTANI) EXPERTS AS VISITING PROFESSORS".

1.6 "SCIENCE LABORATORIES AND LIBRARIES SHALL BE PROVIDED BETTER EQUIPMENT AND LATEST BOOKS AND JOURNALS".

✓ 1.7 "TEACHERS SHALL BE PROVIDED FACILITIES AND INCENTIVES TO IMPROVE THEIR QUALIFICATIONS THROUGH STUDY AT PAKISTANI AND FOREIGN UNIVERSITIES".

1.8 "ONE OF THE BASIC OBJECTIVES OF THE GOVERNMENT OF PAKISTAN INDUSTRIAL POLICY IS TO PROVIDE WELL FOCUSED CLEAR DIRECTION FOR FUTURE INDUSTRIAL PROGRESS. STRUCTURAL ADJUSTMENTS WOULD BE THE KEY ELEMENT..... CONSIDERABLE EMPHASIS WOULD BE PLACED ON IMPROVED MANAGEMENT AND ABSORPTION OF NEW TECHNOLOGY".

1.9 "AN EFFECTIVE PROGRAMME OF INDUSTRIAL TRAINING IN ALL THE IMPORTANT FIELDS, TO MATCH WITH THE PLAN REQUIREMENTS WILL BE UNDERTAKEN".

1.11 "THE ENORMOUS POTENTIAL OF MARITIME AREAS AS A RICH SOURCE OF FOOD, MINERALS, AND ENERGY IN FUTURE MAKES IT IMPERATIVE THAT INSTITUTIONAL ARRANGEMENTS BE AVAILABLE IN THE COUNTRY TO CARRY OUT ON CONTINUING BASIS, DETAILED INVESTIGATIONS.....".

1.12 "THE PLAN RECOGNIZES THE NEED OF MODERNISATION IN THE SHIPPING, AND NECESSITY OF ENCOURAGING THE PRIVATE SECTOR TO OWN NEW SHIPS WITH MODERN TECHNOLOGY".

2. ENVIRONMENT.

2.1 ALL SYSTEMS ARE AFFECTED BY THE ENVIRONMENT AROUND THEM. THE MARITIME SPHERE OF PAKISTAN IS ALSO AFFECTED BY NATIONAL AND INTERNATIONAL ENVIRONMENT. GLOBAL TRENDS IN SHIPPING ARE THE RESULT OF THE POLICIES OF MAJOR MARITIME NATIONS, WHICH IN MOST CASES ARE ALSO HIGHLY INDUSTRIALISED. THE STUDY OF SUCH INTER-ACTIONS DEMANDS EXTREME CAUTION AND CAREFUL ANALYSIS, BECAUSE THIS IS A VERY COMPLEX, INTRICATE, AND VOLATILE PHENOMENA.

2.2 THE ENVIRONMENT EFFECTING THE MARITIME ACTIVITIES IN PAKISTAN IS BRIEFLY AS FOLLOWS:

2.3 PAKISTAN IS SITUATED NORTH OF THE TROPIC OF CANCER. PAKISTAN HAS FRONTIERS WITH CHINA IN THE NORTH, INDIA IN THE EAST, IRAN IN THE WEST, AND AFGANISTAN IN THE NORTH-WEST.

2.4 THE SOUTH OF PAKISTAN OPENS TO THE ARABIAN SEA WITH 870. KILOMETERS OF COAST LINE. AMONG THE NEIGHBOURING COUNTRIES, AFGANISTAN IS LAND-LOCKED, MOST OF THEIR SEA TRADE GOES THROUGH PAKISTANI PORTS. PAKISTAN HAS FAIRLY GOOD ROAD LINKS WITH ALL THE NEIGHBOURS AND ALSO HAS

RAILWAY LINKS WITH IRAN AND INDIA. KARACHI IS PAKISTAN'S MAJOR PORT CITY. "PORT MOHAMMED BIN QASIM" HAS BEEN DEVELOPED RECENTLY, AT ABOUT 70 KILOMETERS FROM KARACHI. "PORT MOHAMMED BIN QASIM" SPECIALISES IN BULK CARGO HANDLING.

2.5 IT IS PLANNED THAT "GAWADER", A PORT WEST OF KARACHI, WILL BE DEVELOPED IN THE NEAR FUTURE.

2.6 PAKISTAN'S IMPORTS ARE ESTIMATED AT TWICE AS MUCH AS ITS EXPORTS IN RUPEES AND THREE TIMES AS MUCH IN FREIGHT TONS. PAKISTAN PRESENTLY OWNS 43 FOREIGN GOING VESSELS (ABOUT HALF MILLION TONS DWT).

2.7 THE NATIONAL FLAG CARRIERS CARRY 25% OF THE TOTAL DRY TRADE AND 55% OF THE TOTAL LIQUID TRADE. COMBINED THIS IS FAR BELOW THE 40-40-20, ALLOWANCE OF THE CONFERENCE LINES.

2.8 THE PAKISTAN NATIONAL SHIPPING CORPORATION HAS SURVIVED THE PRESENT DEPRESSION OF SHIPPING, HAVING SHOWN HEAVY LOSSES DURING 1982/83 AND 1983/84. THE CORPORATION HAS COME UP INTO PROFITS DURING 1984/85. SINCE THEN THE PROGRESS HAS BEEN FAIRLY SATISFACTORY.

2.9 PAKISTAN IS BASICALLY AN AGRICULTURAL COUNTRY, STRUGGLING TO BE INDUSTRIALISED VERY EAGERLY. THE PROGRESS IN THIS

RESPECT IS SLOW BUT SATISFACTORY. THE POPULATION IS 91.88 MILLIONS. THE POPULATION DENSITY IS 115 PERSONS PER SQUARE KILOMETER. PER-CAPITA INCOME IS RUPEES 4530/-. THESE FIGURES ARE 1983/84 ESTIMATES OF THE STATISTICAL DIVISION OF THE GOVERNMENT OF PAKISTAN.

2.11 PAKISTAN HAS THE WORLDS SECOND LARGEST SHIP SCRAPPING YARD (SHIP BREAKING INDUSTRY) AT GADDANI BEACH.

2.12 THE "KARACHI SHIPYARD AND ENGINEERING WORKS" HAS BUILT MANY OCEAN GOING VESSELS IN THE PAST, PRESENTLY THEY ARE MAINLY DOING SHIP REPAIRS AND GENERAL ENGINEERING WORKS.

2.13 FISHING IS A VERY OLD PROFESSION IN THE COASTAL AREAS OF PAKISTAN. THIS ALSO IS THE SOLE MEANS OF SUBSISTANCE FOR A GREAT MANY SEA SIDE DWELLERS. A LOT MORE REMAINS TO BE DONE IN THIS SECTOR IN PAKISTAN.

2.14 PAKISTAN HAS A NEW AND EXTREMELY LARGE STEEL MILL WHICH PROVIDES THE BASE FOR ALL HEAVY INDUSTRIES LIKE SHIP BUILDING.

2.15 ALL THESE FACTS SHOW THAT PAKISTAN HAS AN EXCELLENT POTENTIAL FOR DEVELOPING THE MARITIME SECTOR. BUT THERE STILL REMAINS A LOT TO BE DONE BEFORE ACHIEVING THIS END.

3. BRIEF HISTORY

MARITIME EDUCATION . THE BACKGROUND

- 3.1 MOST OF THE MARITIME EDUCATION INSTITUTIONS OF THE PRE-PAKISTAN DAYS WERE SITUATED IN BOMBAY (THE MAJOR PORT CITY OF BRITISH INDIA). AFTER THE CREATION OF PAKISTAN IN 1947 ,THE COUNTRY DID NOT INHERIT ANY MARITIME EDUCATION INSTITUTIONS.
- 3.2 DURING THE YEARS 1947 TO 1962 THE MERCHANT MARINE WAS TRAINED IN THE THEN TRADITIONAL WAY OF ON THE JOB TRAINING . APPRENTICES WERE TAKEN FOR THE MARINE ENGINEERING AND THE NAUTICAL SIDES . THE ENGINEERING APPRENTICES WERE RECRUITED BY THE VARIOUS RECOGNISED MARINE WORKSHOPS . NAUTICAL APPRENTICES , COMMONLY TERMED AS DECK CADETS WERE RECRUITED BY SHIPPING COMPANIES AND AT TIMES ALSO , BY THE GOVERNMENT SHIPPING OFFICE . UP TO 1962 THE BASIC ENTRY QUALIFICATION FOR THESE RECRUITS WAS 10TH CLASS/MATRICULATION CERTIFICATE (TEN YEARS OF SCHOOL EDUCATION). AFTER 1962 THIS WAS INCREASED TO INTERMEDIATE SCIENCE (TWELVE YEARS OF EDUCATION .)
- 3.3 IN 1962 THE FIRST MERCHANT MARINE ACADEMY WAS ESTABLISHED IN CHITTAGONG (THEN IN EAST PAKISTAN). AFTER THE SEPARATION OF EAST PAKISTAN IN 1971, THE COUNTRY WAS ONCE AGAIN LEFT WITHOUT ANY MERCHANT MARINE ACADEMY. HOWEVER, THE DECISION TO BUILD A NEW MARINE ACADEMY WAS TAKEN IMMEDIATELY . A TEMPORARY CAMPUS OF "PAKISTAN MARINE ACADEMY" WAS ESTABLISHED IN KARACHI ,AND THE WORK ON BUILDING A PERMANENT CAMPUS STARTED.

3.4 THE MAIN BUILDINGS OF THE NEW CAMPUS WERE READY IN 1978 AND THE ACADEMY STARTED TO OPERATE FROM THIS NEW CAMPUS. ALTHOUGH THE FIRST MARINE ACADEMY WAS ESTABLISHED IN 1962 AND LATER IN 1971 , APPRENTICES SCHEMES AND CADETS ENTRIES OF THE OLD SYSTEM WERE NOT SUSPENDED INFACIT, THEY CONTINUED TO RECRUIT THE CANDIDATES FROM BOTH ENGINEERING AND NAUTICAL SIDES UN-RESTRICTED UPTO 1967(WHEN THE FIRST BATCH OF ACADEMY CADETS GRADUATED). FROM 1968 ONWORDS THERE WERE SOME EFFORTS TO MINIMISE THE TRADITIONAL RECRUITMENT OF APPRENTICES AND DIRECT ENTRY DECK CADETS. THESE EFFORTS WERE HALF HEARTED SINCE;(A) THE IMPACT OF SURPLUS MANPOWER IN FUTURE WAS NOT VISUALISED. (B) THE WORK SHOP AND THE SHIPPING COMPANY MANagements WERE RELUCTANT TO PART WITH THE CHEAP LABOUR FROM THE ENERGETIC YOUTH.(C) SOME OTHER SOCIO-ECONOMIC/POLITICAL REASONS .

3.5 PRESENTLY THE MARITIME ADMINISTRATION HAS MADE STRICTER RULES AND ONLY THE MARINE ACADEMY IS TAKING THE FRESH ENTRIES OF ENGINEERING AND DECK CADETS AS AND WHEN REQUIRED.MARITIME EDUCATIONAL INSTITUTES OF PAKISTAN ARE CONCENTRATED IN THE PORT CITY OF KARACHI, AND ARE LISTED BELOW:

- .1 PAKISTAN MARINE ACADEMY . (PMA)
- .2 SEAMAN TRAINING CENTRE. (STC)
- .3 P.N.S.C MARINE COLLEGE.
- .4 K.P.T STAFF COLLEGE.

- .5 K.S.E.W APPRENTICES TRAINING CENTRE.
- .6 K.P.T.APPRENTICES TRAINING CENTRE.
- .7 P.N.S.C.WORKSHOP APPRENTICES TRAINING CENTRE.
- .8 NATIONAL INSTITUTE OF OCEANOGRAPHY.

3.6 .1 PAKISTAN MARINE ACADEMY.

THE ACADEMY IMPARTS PRE-SEA/PRE-WORKSHOP TRAINING TO THE CANDIDATES INTENDING TO QUALIFY AS DECK OR ENGINEERING OFFICERS IN THE MERCHANT NAVY.

3.7 THE ACADEMY WAS ESTABLISHED AT KARACHI ON 29TH NOVEMBER 1971.SINCE THEN AN AVERAGE OF 54 CADETS PER YEAR HAVE BEEN TRAINED.IN ADDITION A NUMBER OF SAUDI-ARABIAN, SRILANKAN,MALAYSIAN,PALESTINIAN,AND ETHIOPIAN CADETS HAVE BEEN TRAINED AT THIS ACADEMY.ACCORDING TO THE RECENT TECHNICAL ASSISTANCE AGREEMENT WITH THE "ISLAMIC REPUBLIC OF IRAN" THE ACADEMY WILL PROVIDE TRAINING TO 50 IRANIAN CADETS ON YEARLY BASIS.

3.8 THE S.T.C.W.CONVENTION OF 1978 ENTERED INTO FORCE FOR THE GOVERNMENT OF PAKISTAN ON THE 10 OF JULY 1985.THE ACADEMY CONDUCTS COURSES PERTAINING TO THE REQUIREMENTS OF THIS CONVENTION.THE ACADEMY ALSO OFFERS THE PREPARATORY COURSES FOR VARIOUS CERTIFICATES OF COMPETENCY EXAMINATIONS OF ENGINEERING AND NAUTICAL FIELDS.SINCE THIS ACADEMY IS A MAJOR SOURCE OF MARITIME MANPOWER,THIS WILL BE DISCUSSED IN DETAIL AT A LATER STAGE.

3.9¹.2 SEAMEN TRAINING CENTRE. (STC)

STC IS HOUSED WITHIN THE BOUNDARY WALLS OF PAKISTAN MARINE ACADEMY, BUT IS A SEPARATE ADMINISTRATIVE UNIT. PRESENTLY PAKISTAN HAS A VAST SURPLUS OF SEAMEN. STC IS BASICALLY A TRAINING INSTITUTE FOR RATINGS. HOWEVER, PRESENTLY THEY ARE WORKING IN CLOSE CO-OPERATION WITH PMA, TO CONDUCT ELEMENTARY REFRESHER COURSES. BOTH OF THESE INSTITUTIONS (PMA & STC) ARE FEDERALLY ADMINISTERED AND FINANCED.

3.11 .3 P.N.S.C MARINE COLLEGE.

PAKISTAN NATIONAL SHIPPING CORPORATION MARINE COLLEGE IS A UNIT OF THE CORPORATION AND CONDUCTS THE PREPARATORY COURSES FOR THE CERTIFICATE OF COMPETENCY EXAMINATIONS. RECENTLY THEY ALSO STARTED ON CERTAIN LIFE SAVING APPLIANCES (LSA), COURSES RELATED TO STCW 78.

3.12.4 K.P.T STAFF COLLEGE.

KARACHI PORT TRUST STAFF COLLEGE ARRANGES THE COURSES OF DIVERSIFIED NATURE ACCORDING TO THE NEEDS OF THE EMPLOYEES OF THE PORT OF KARACHI. APART FROM A VERY SMALL NUMBER OF ADMINISTRATIVE STAFF WHO ARE PERMANENT EMPLOYEES, THE ENTIRE FACULTY IS COMPOSED OF VISITING PROFESSORS/LECTURERS FROM LOCAL AND/OR FOREIGN INSTITUTES. PROFESSIONALS WORKING IN THE FIELD ARE ALSO INVITED TO PARTICIPATE IN SEMINARS ETCETERA.

3.13 5,.6,.7 APPRENTICES TRAINING CENTRES.

THERE ARE THREE MAJOR MARITIME WORKSHOPS WHICH ARE RECOGNISED BY THE THE MARITIME ADMINISTRATION OF THE GOVERNMENT OF PAKISTAN,(A) KARACHI SHIPYARD AND ENGINEERING WORKS.(B) KARACHI PORT TRUST WORKSHOP.(C) PAKISTAN NATIONAL SHIPPING CORPORATION WORKSHOP.

THESE WORKSHOPS GIVE PRACTICAL TRAINING TO THE SUCCESSFUL ENGINEERING CADETS OF PMA.

ACCORDING TO THE APPRENTICE-SHIP ORDINANCE OF 1962 AND APPRENTICE-SHIP RULES OF 1966 OF THE GOVERNMENT OF PAKISTAN,THESE WORKSHOPS ALSO TRAIN SOME TRADE APPRENTICES(FITTERS,ELECTRICIANS,CARPENTERS,ETC).THESE WORKSHOPS,ACCORDING TO THE AFORESAID RULES,ARE SUPPOSED TO HAVE ORGANISED APPRENTICES TRAINING CENTRES.GRANTING THE COMMERCIAL PRESSURES/RESTRICTIONS THEY ARE DOING A FAIRLY SATISFACTORY JOB.

3.14.8 NATIONAL INSTITUTE OF OCEANOGRAPHY.

THIS INSTITUTE IS MAINLY CONCERNED WITH SURVEY AND RESEARCH RELATED TO SEA-BEDS, MARINE-LIFE AND POLLUTION ETCETERA.

3.15 APART FROM THESE INSTITUTES THE UNIVERSITY OF KARACHI IS ALSO CONDUCTING COURSES ON MARINE BIOLOGY AND TRANSPORT ECONOMICS.

4. MARITIME EDUCATION ! WHY?

4.1 APART FROM BEING A REGULAR PROFIT AND LOSS ENTERPRISE, THE NECESSITY OF A MERCHANT FLEET IN A COUNTRY ARISES MAINLY OUT OF THE FOLLOWING REASONS:

.1 TO PROVIDE ECONOMIC SECURITY IN TIMES OF AN NATIONAL/INTERNATIONAL EMERGENCY.

.2 TO ENSURE A STABLE SUPPLY OF NEEDED MATERIAL FOR THE INDUSTRY IN TERMS OF QUANTITY AND COST.

.3 TO REDUCE TRANSPORTATION COSTS IN THE "BALANCE OF PAYMENTS" FIGURES.

.4 TO PROVIDE EMPLOYMENT OPPORTUNITIES FOR NATIONAL SEAMEN ON NATIONAL SHIPS.

.5 TO POSSESS AND MAINTAIN CERTAIN LEVEL OF MARITIME EXPERTISE/TECHNOLOGY WITHIN THE COUNTRY.

4.2 SINCE THE PRIVATE SECTOR IS PROFIT AND LOSS MOTIVATED, AN APPROPRIATELY SIZED PUBLIC SECTOR (IN ADDITION TO PRIVATE SECTOR) IS NECESSARY TO SAFEGUARD THE NATIONAL OBJECTIVES.

4.3 THE PRIVATE SECTOR IS OBVIOUSLY, ALWAYS VERY SENSITIVE TO THE CHANGE IN ENVIRONMENT, HENCE IT TRADITIONALLY PROVIDES THE EXAMPLES TO COMPARE WITH THE EFFICIENCY OF THE PUBLIC SECTOR.

4.4 A STRONG PRIVATE SECTOR ALWAYS HELPS THE PUBLIC SECTOR IN THE DIAGNOSIS OF THE FAMOUS "PARKINSON SYNDROM" OF THE BEAUROCRACY. THE ABOVE EXPLANATIONS HELP US TO CONCLUDE:

(A) SHIPPING IS ESSENTIAL FOR A SEAFARING NATION.

(B) PRIVATE AND PUBLIC SECTORS IN SHIPPING ARE EQUALLY IMPORTANT.

4.5 HAVING ESTABLISHED THESE TWO FACTS, IT IS WORTHWHILE TO QUOTE THE WORDS OF A FAMOUS PAKISTANI SOLDIER WHO HAD SAID "IT IS NOT THE GUN BUT THE MAN BEHIND THE GUN WHO MATTERS"

4.6 COMING TO THE FINAL POINT, I AM CONVINCED THAT A WHOLE-HEARTED EFFORT ON HUMAN RESOURCE DEVELOPMENT IS THE KEY FOR ACHIEVING THE GOALS IN THE MERCHANT SHIPPING AND ITS ASSOCIATED ORGANISATIONS IN PAKISTAN. IT IS OBVIOUS THAT PRESENTLY OUR EFFORTS IN THIS REGARD SHOULD CONCENTRATE ON QUALITY RATHER THAN ON QUANTITY.

5. IDENTIFICATION OF PROBLEMS.

5.1 TECHNICAL EDUCATION ORIGINATED OUT OF THE GROWING NEEDS OF USE OF TECHNOLOGY BY MANKIND. SOME OF THE MOST EFFECTIVE AND ORIGINAL TECHNIQUES WERE DEVELOPED IN EUROPE AND ENGLAND, HOWEVER MOST OF THEM WERE NOT THE RESULT OF ANY COLLEGE OR UNIVERSITY RESEARCH. THE EARLY ENGINEERS AND EVEN THE APPLIED SCIENTISTS SUCH AS DAVEY, DALTON, AND FARADAY DID NOT GO TO ANY UNIVERSITY.

5.2 MID 19TH CENTURY WAS THE ZENITH OF THE BRIEF PERIOD OF UNITED KINGDOM AS LEADING WORKSHOP OF THE WORLD. THE 19TH CENTURY LITERATURE DESCRIBES THE GREAT INVENTOR AS "ONE WHO HAS WALKED FORTH UPON THE INDUSTRIAL WORLD, NOT FROM THE UNIVERSITIES BUT FROM THE HOVELS, NOT AS CLAD IN SILKS AND DECKED WITH HONOURS, BUT AS CLAD IN FUSTIAN AND GRIMED WITH SOOT AND OIL".....THE ATTITUDES TOWARDS ENGINEERS WERE ALREADY TAKING SHAPE.

5.3 A CENSUS CARRIED OUT IN GREAT BRITAIN IN 1841 DID NOT EVEN LIST ENGINEERING AS A PROFESSION. THE VERY SUCCESS OF BRITISH CRAFTSMEN GAVE RISE TO THE PERSISTENT IMPRESSION THAT EDUCATION WAS UN-NECESSARY FOR ENGINEERS, AND ENGINEERING WAS A TASK FOR UN-EDUCATED LOWER ORDERS OF THE SOCIETY. BUT IN 1851 A VERY BOLD ARTICLE IN "THE TIMES" CALLED FOR A REVOLUTIONARY CHANGE IN THE BRITISH EDUCATION SYSTEM, SUBSTITUTING A LIVING SCIENCE (ENGINEERING) FOR A DEAD LITERATURE, WITH A RE-DISTRIBUTION OF HONOURS AND REWARDS ACCORDINGLY.

THE MARITIME ENGINEERING AND NAUTICAL PERSONNEL ARE FACED WITH SOMEWHAT SIMILAR ATMOSPHERE IN PAKISTAN TODAY.

*5.4 DUE TO ADVANCEMENTS IN TECHNOLOGY AND SPEEDY COMMUNICATIONS, SHIPS AND SHIPPING HAVE BECOME COMMONLY KNOWN TERMS. THE IDENTIFICATION OF SHIP OFFICERS WITH PROFESSION AND THEIR REFERENCE TO "MY SHIP" HAVE FADED AWAY, HOWEVER THE PERCEPTION OF A SEAFARER AS AN OUTSIDER HAS NOT UNDERGONE THE SAME DEGREE OF CHANGE AND HAS BEEN ALMOST MAINTAINED IN THE NON-SEAFARING CIRCLES OF SOCIETY. HERE I WILL ADVISE THE SEAFARERS TO TAKE A LESSON FROM THE LAWS OF NATURE. THE LEAVES OF A TREE FALL TOWARDS ITS ORIGIN (THE LAND) AND THE SMALL STREAMS HAVE TO FLOW TO JOIN THE BIG RIVERS. THE SEAFARER WILL HAVE TO MAKE AN EFFORT TO ELIMINATE THE CAUSES OF SUCH PERCEPTIONS AS MENTIONED ABOVE.

*5.5 WITH CHANGE IN VALUES THE ATTRACTION OF SEAFARING AS A CAREER HAS DIMINISHED. THE FAMILY IS OBVIOUSLY THE MAIN CAUSE FOR GOING ASHORE. THERE ARE OTHER FACTORS LIKE UN-ATTRACTIVE WORKING CONDITIONS ON BOARD, THE OPPORTUNITY TO SEPERATE THE PROFESSIONAL AND PRIVATE LIFE ASHORE, AND SELECTION FROM A WIDE VARIETY OF EDUCATIONAL AND SOCIAL ACTIVITIES ASHORE. EFFORTS TO KEEP MAN AT SEA BY STRESSING TRADITIONAL VALUES OF ROMANTICISM AND ADVENTURE CAN NOT SUCCEED. A YOUNG MAN'S IDEA OF "A DIFFERENT WAY OF LIFE" HAVE BEEN SUBDUED BY THE MATERIALISTIC PRESSURES OF THE MODERN WORLD. THE ISSUE FOR MAJORITY OF SEAFARERS IS NOT WHETHER TO LEAVE THE

SEA, BUT WHEN TO LEAVE. THE PRESENT EMPLOYMENT SITUATION HAS ALSO PLAYED A BIG ROLE IN DISTRACTION OF YOUNGSTERS FROM THE SEAFARING CAREERS.

*5.6 SHIPPING, UNLIKE MANY OTHER INDUSTRIES, HAS A CYCLIC NATURE. THE PRESENT DEPRESSION HAS WIPED OFF MANY SHIPPING COMPANIES AND SHIPS FROM THE LLOYDS LIST. ALTHOUGH MARITIME EDUCATION AND TRAINING (MET) SERVES SHIPPING MAINLY. SHIPPING CAN NOT GUARANTEE THE CONTINUITY OF SUPPORT TO THE MET INTITUTIONS.

*5.7 OPERATIONAL CONTINUITY IS VITAL ELEMENT OF AN EDUCATIONAL ESTABLISHMENT WHICH CAN NOT BE ACHIEVED WITHOUT FINANCIAL SUPPORT AND WORK INPUT AND OUTPUT. HUGE INVESTMENTS IN CAMPUSSES AND LABORATORIES CANNOT BE DUMPED FOR LONGER DURATIONS AND LEFT TO RUST, NEEDLESS TO SAY OF THE RISK OF LOOSING THE MATURE MEMBERS OF FACULTY, DUE TO IRREGULAR ACTIVITY AT THE CAMPUS.

*5.8 BRITISH MET CAN BE REGARDED AS AN EXAMPLE OF A SYSTEM WHICH DEPENDED MOSTLY ON SHIPOWNERS IN THE PAST. CONSEQUENCES ARE VERY CLEARLY FELT IN THE UNITED KINGDOM AND IN THE REST OF THE COMMONWEALTH COUNTRIES WHICH ARE STILL FOLLOWING THE OLD BRITISH SYSTEM OF EDUCATION. PRESENTLY THEY ALL HAVE THEIR HEADS DOWN AND ARE WORKING OUT THE NECESSARY QUALITATIVE AND QUANTITATIVE CHANGES FOR THE FUTURE MET SO AS TO MATCH THE CHANGED MARITIME ENVIRONMENT.

5.9 TWO THIRDS OF THE PLANET EARTH IS COVERED WITH WATER. THE PROPER EXPLORATION AND EXPLOITATION OF THE AVAILABLE SEA AND SEABED RESOURCES IS BECOMING ESSENTIAL FOR MANKIND AS THE DECADES ARE TICKING AWAY. A STUDY OF THE UNITED NATIONS LAW OF THE SEA CONVENTION, AND ITS BACKGROUND CAN GIVE A FAIR INDICATION OF TO WHAT EXTENT THE NATIONS HAVE GONE IN ESTABLISHING THERE RIGHTS OVER OCEANS. THE EXTENSION OF TERRITORIAL WATERS HAVE TAKEN PLACE. THE TERMS LIKE "CONTINENTAL SHELF", "EXCLUSIVE ECONOMIC ZONE", ETCETERA HAVE BEEN DEFINED. THE CONVENTION IS NOT YET IN FORCE. MANY COUNTRIES HAVE OBJECTIONS OVER VARIOUS ISSUES, YET AT THE SAME TIME WE FIND THAT SOME DEFINITIONS HAVE ALREADY FOUND PLACES IN VARIOUS NATIONAL LEGISLATIONS. IT IS VERY OBVIOUS THAT FISHING IS JUST ON THE SURFACE, THERE IS A LOT MORE TO IT DEEP DOWN, AND NO MATTER WHAT THE LAW SAYS, ONLY THOSE WHO HAVE THE KNOWLEDGE AND TECHNOLOGY WILL GET THERE EARLY ENOUGH.

5.11 ATTENDENCE OF THE INTERNATIONAL CONFERENCES AND SYMPOSIA BRINGS NEW IDEAS AND FOOD FOR THOUGHT ON CURRENT AFFAIRS. EVEN IF THE SUBJECT IS CONSIDERED OF NON-VITAL IMPORTANCE FOR THE NATION, THE EDUCATIONAL ASPECT CANNOT BE DENIED. IN THE PRESENT WORLD OF HIGH TECHNOLOGY AND FAST COMMUNICATIONS, THERE ARE HARDLY ANY SUBJECTS WHICH ARE OF ISOLATED IMPORTANCE, POLITICALLY, ECONOMICALLY, AND GEOGRAPHICALLY. THERE ARE MANY INTERNATIONAL CONFERENCES AND SYMPOSIA WHICH ARE NOT ATTENDED BY PAKISTANS NATIONAL REPRESENTATIVES. PROCEEDINGS OF THE VERY FEW CONFERENCES

OR SYMPOSIA WHICH ARE IN FACT ATTENDED BY PAKISTAN'S REPRESENTATIVES ARE VERY OFTEN NOT MADE PUBLICLY AVAILABLE EVEN AMONG THE PEOPLE OF CONCERNED PROFESSIONS.

5.12 THE ENVIRONMENT OF PAKISTAN'S SEAS CAN BE AFFECTED BY INTERNATIONAL TRAFFIC, COASTAL TRAFFIC, THE LOCAL INDUSTRIAL WASTE, AND A LOT OF FISHERMEN LIVING ALONG THE COAST. THE FISHERMEN ARE ALSO AFFECTED DIRECTLY BY ANY ENVIRONMENTAL CHANGES IN THEIR AREA, AND OFF COURSE ULTIMATELY THE WHOLE NATION IS AFFECTED DUE TO THE INCREASE OR DECREASE OF SEA FOOD RESOURCE.

5.13 MOST OF THE FISHERMEN ON THE PAKISTAN COAST ARE DOING THEIR JOBS IN TRADITIONAL AND HISTORIC WAYS, WITHOUT KNOWING ABOUT DO'S & DONOTS WHICH CAN AFFECT THE LONG TERM PLANING OF THE NATIONAL FISHING FIELDS. ACCORDING TO THE 1984 YEAR BOOK OF THE FISHERIES DEPARTMENT, THE NUMBER OF ACTIVE FISHERMEN IN 1983 WERE 209431, OUT OF WHICH 84481 WERE ACTIVE IN SEA FISHING, EXPORTING A TOTAL OF US \$ 802 MILLION WORTH OF FISH. THESE FIGURES HAVE DECLINED FROM 1982 FIGURES.

5.14 UNEMPLOYMENT IS A GREAT SOCIAL EVIL, MORE SO WHEN THE UNEMPLOYED ARE SKILLED AND EDUCATED WORKERS. AN EDUCATED PERSON'S FRUSTRATIONS ARE VERY OFTEN SPREAD AROUND AND BECOME THE CAUSE OF UNREST IN THE SOCIETY. NO SYSTEM IN

THE FREE WORLD CAN GUARANTEE 100 PERCENT EMPLOYMENT. PERHAPS THIS IS ONE OF THE PRICES OF FREEDOM WHICH WE HAVE TO PAY. HOWEVER WE CAN MAKE AN EFFORT TO WIDEN THE SCOPE OF EMPLOYMENT OF WORKERS THROUGH CONTINUOUS SYSTEMS OF EDUCATION AND TRAINING.

5.15 STATISTICS SHOW THAT 80% OF ALL COLLISIONS AND GROUNDINGS ARE DUE TO HUMAN ERROR. ANOTHER STUDY CARRIED OUT IN NORWAY SHOWED ANALYSIS OF 2742 CASUALTIES, 50% WERE THE RESULT OF HUMAN ERROR AND ONLY 7% RELATED TO THE TECHNOLOGICALLY RELATED FACTORS. EVERY SHIPOWNER KNOWS THAT SAFETY IS MOSTLY SYNONYMOUS WITH EFFICIENCY AND SOUND BUSINESS IN THE LONG RUN. ONLY THE COST OF SAFETY AND THE EXTENT OF SAFETY ARE USUALLY DEBATED. THE STATISTICS HAVE SHOWN MANY TIMES THAT MACHINES ARE MORE EFFICIENT THAN MAN, SPECIALLY WHEN THE TASK IS LABOURIOUS AND UNDER DIFFICULT CONDITIONS. MAN IS BEING REPLACED BY MACHINES ON THE STEEL SHIPS SINCE 1960.

5.16 AS THE NUMBERS OF STAFF ON BOARD DIMNISHES, THE IMPORTANCE OF THE HUMAN INTERACTION MAGNIFIES. AN ANALYSIS OF THE FACTORS INFLUENCING HUMAN BEHAVIOUR ON BOARD BECOMES ESSENTIAL. EVERY POSSIBLE BARRIER OR BULKHEAD BETWEEN THE MINDS OF THE SHIP STAFF NEEDS TO BE REMOVED.

5.17 THE PROBLEM AREAS TOUCHED IN THE PRECEEDING PARAGRAPHS ARE ALL IN ONE WAY OR OTHER RELATED TO THE MARITIME EDUCATION AND TRAINING. TO ROOT OUT (OR MINIMIZE) THESE DEFFICIENCIES IS VERY MUCH IN HARMONY WITH THE NATIONAL

ASPIRATIONS EXPRESSED THROUGH THE SIXTH FIVE YEAR PLAN OF THE GOVERNMENT OF PAKISTAN, EXCERPTS OF WHICH WERE PRESENTED EARLIER IN THIS PAPER.

5.18 SUMMARISING THE PRECEEDING PARAGRAPHS WE CAN EXTRACT THE MACRO-OBJECTIVES WHICH ARE GIVEN IN SECTION SIX.

6. MACRO-OBJECTIVES.

6.1 .1 THE STATUS OF THE SEAFARER IS TO BE BROUGHT IN PARALLEL WITH SHORE BASED MEMBERS OF THE SOCIETY.

.2 ATTRACTION OF THE SEAFARING CARREER SHALL BE INCREASED

.3 MARITIME EDUCATION AND TRAINING INSTITUTION'S NEEDS FOR CONTINUOUS AND PRODUCTIVE OPERATION SHALL BE REALISED BY THE AUTHORITIES, AND PROVISIONS FOR SAME BE MADE IN THE LONG TERM PLANING.

.4 TRANSFER OF MARITIME TECHNOLOGY AND OCEAN SCIENCES BE MADE THROUGH AND BY STRENGTHENING THE MET INSTITUTIONS.

.5 SUFFICIENT NUMBERS OF MARITIME PERSONNEL BE HIGHLY EDUCATED AND TRAINED IN SPECIALISED MARITIME FIELDS SO THAT ENOUGH MARITIME PERSONNEL ARE AVAILABLE TO REPRESENT PAKISTAN AT INTERNATIONAL CONFERENCES/SYMPOSIA/SEMINARS.

.6 ENVIRONMENTAL CONSCIOUSNESS SHALL BE DEVELOPED AMONG THE PEOPLE IN GENERAL AND AMONG THE SEAFARING PEOPLE IN PARTICULAR, FISHERMEN OF PAKISTAN SHALL ALSO BENEFIT FROM SUCH PROGRAMMES.

.7 THE FACT THAT SEPARATE ENGINE ROOM AND DECK DIVISIONS HAS NOT PROVED TO BE A HARMONIOUS AND EFFICIENT SYSTEM FOR MANAGEMENT SHALL BE NOTED, AND ALL EFFORTS SHALL BE MADE TO INTEGRATE THESE DEPARTMENTS, SINCE THE PRESENT SITUATION IN SHIPPING WARRANTS OPTIMUM EFFICIENCY.

.8 REASONS OF HIGH UN-EMPLOYMENT RATES OF SEAFARERS BE CRITICALLY ANALISED AND STEPS TAKEN TO MINIMIZE THIS SOCIAL EVIL.

6.2 THE MICRO-OBJECTIVES DERIVED FROM THIS BROAD SPECTRUM CAN BE NUMEROUS, BUT FOUR OF THESE MENTIONED AT SECTION SEVEN ARE OF UTMOST AND BASIC IMPORTANCE. THESE WILL BE DISCUSSED IN DETAIL IN THE FOLLOWING PAGES.

7. THE MICRO-OBJECTIVES.

7.1 .1 A BOARD OF MARITIME EDUCATION & TRAINING (BMET) SHALL BE ESTABLISHED ON SOUND FOOTING. THIS BOARD SHALL COME INTO EXISTANCE BY A DECREE OF NATIONAL MARITIME LAW THROUGH AN ACT OF THE PARLIAMENT.

.2 REVIEW AND UPDATING OF MET STRUCTURE, FACILITIES, AND CURRICULAM, TO SUIT THE CHANGED ENVIRONMENT, SHALL BE DONE THROUGH THE GUIDELINES GIVEN BY THE BOARD OF MARITIME EDUCATION & TRAINING.

.3 THE SCOPE OF UTILISATION OF THE MET INSTITUTIONS AND THEIR PRODUCT, SHALL BE BROADENED.

.4 LINKING OF THE MET INSTITUTIONS WITH THE NATIONAL EDUCATION SYSTEM AND AFFILIATION WITH INTERNATIONAL (MARITIME/NON MARITIME) EDUCATIONAL INSTITUTIONS, SHALL BE ENCOURAGED AND EFFECTED.

7.2 MICRO-OBJECTIVES AT .1 AND .2 WILL LEAD TOWARDS REALISATION OF THOSE AT .3 AND .4.

8. BOARD OF MARITIME EDUCATION
AND TRAINING.

- 8.1 NO RECOMMENDATION ON SHIPPING POLICY SHOULD BE CONSIDERED COMPLETE UNLESS, IT INCLUDES OR HAS ASSOCIATED WITH IT RECOMMENDATIONS ON MARITIME EDUCATION AND TRAINING. THE COMPLEX BUSINESS OF SHIPPING REQUIRES A VARIETY OF KNOWLEDGE, SKILLS, AND EXPERIENCE IF SHIPS ARE TO BE SAFELY AND ECONOMICALLY RUN.
- 8.2 FOR THE INSTITUTIONS SUCH AS THE "PAKISTAN MARINE ACADEMY" AND "SEAMEN TRAINING CENTRE" WHICH SERVE THE ENTIRE NATION, IT IS OF UTMOST IMPORTANCE THAT THEIR OPERATIONAL POLICIES ARE ARRIVED AT BY THE CONSENSUS OF THE CONCERNED PARTIES, FORMED INTO A BOARD. THERE ARE NUMEROUS EXAMPLES OF SUCH ORGANISATIONS AROUND THE WORLD. THE "MERCHANT NAVY TRAINING BOARD" (MNTB) OF UNITED KINGDOM AND INDIA, AND THE "BOARD OF ADVISERS" OF THE MARITIME ADMINISTRATOR OF THE DEPARTMENT OF TRANSPORTATION AT WASHINGTON D.C. CAN BE MENTIONED AS SUCH EXAMPLES.
- 8.3 LEGAL AUTHORITY OF THE DECISION MAKING IS INVARIABLY SHARED AMONG THE OFFICIALS WHO ARE APPOINTED FOR THE EXERCISING OF SUCH POWERS AS ARE DELEGATED TO THEM BY THE LAW OF THAT LAND. HOWEVER ACTUAL IMPLEMENTATION OF THE DECISIONS MADE INVOLVES MANY MORE PEOPLE THAN ONLY THOSE WHO HAVE THE RESPONSIBILITY. VERY OFTEN IT IS FOUND RATHER DIFFICULT TO IMPLEMENT THE DECISIONS WHICH WERE MADE IN ISOLATION BY AUTHORITATIVE INDIVIDUALS.

8.4 IN MANY COUNTRIES THE MARITIME ADMINISTRATION APPOINTS THE MEMBERS OF THE "ADVISORY BOARDS" WHICH REPRESENT A GOOD CROSS-SECTION OF THE CONCERNED MARITIME AND EDUCATIONAL CIRCLES. THIS BOARD THEN MEETS AT THE AGREED TIME INTERVALS TO DISCUSS/DEBATE ON VARIOUS ISSUES ON WHICH THE DECISIONS HAVE TO BE MADE. THESE DECISIONS ARE THEN FORWARDED TO THE AUTHORITIES IN THE FORM OF RECOMMENDATIONS. THE AUTHORITIES THEN WEIGH THESE RECOMMENDATIONS FOR PRACTICALITY, LEGALITY, LONG TERM CONSEQUENCES, AND LASTLY THEY ALSO CHECK FOR ANY VESTED INTERESTS. AFTER ALL SUCH CHECKS, IF THE DECISIONS ARE ALL RIGHT THEY RECEIVE THE BLESSINGS OF THE AUTHORITIES AND THE IMPLEMENTATION IS EFFECTED THROUGH PROPER CHANNELS.

8.5 SUCH SYSTEMS HAVE TO BE SAFEGUARDED AGAINST UNNECESSARY DELAYS, BUT THEY CERTAINLY PROVIDE A VERY HARMONIOUS AND SMOOTH WORKING ATMOSPHERE.

8.6 A BOARD OF MARITIME EDUCATION AND TRAINING NEEDS TO BE SET UP IN PAKISTAN. SINCE THE GOVERNMENT OF PAKISTAN IS TOTALLY RESPONSIBLE FOR THE MET FINANCIALLY AND ADMINISTRATIVELY, IT IS PROPOSED THAT THE BOARD SHALL BE CHAIRED BY THE DIRECTOR GENERAL OF PORTS AND SHIPPING. APART FROM THE REPRESENTATION OF MARITIME PARTIES ON THIS BOARD, IT IS OF VITAL IMPORTANCE THAT SIND BOARD OF TECHNICAL EDUCATION, THE KARACHI UNIVERSITY, AND THE NED UNIVERSITY OF SCIENCE AND TECHNOLOGY BE ALSO CONSIDERED AS EQUALLY IMPORTANT MEMBERS OF THE BOARD.

8.7 THE BMET SHALL HAVE ITS BYLAWS, AND SHALL MEET ATLEAST ONCE A YEAR. BMET SHALL GIVE ITS RECOMMENDATIONS ON THE POLICY MATTERS, AND SET UP VARIOUS SUB-COMMITTEES TO LOOK INTO THE MATTERS WHICH REQUIRE DETAILED PROFESSIONAL STUDIES.

8.8 BMET MAY HAVE ITS ORIGIN IN THE NATIONAL MARITIME LAW WHICH SHALL BE COVERED BY AN ACT OF THE PARLIAMENT.

9. SHIP OWNER'S INFLUENCE ON MARITIME EDUCATION
AND TRAINING.

9.1 DEVELOPMENTS OF THE LAST TWO DECADES HAVE RENDERED MANY UPSETS PARTICULARLY ON THE SHIPPING SCENE. AMONG THESE, THE UNDER MENTIONED FEW HAVE LEFT THE MOST DISTINGUISHABLE MARKS ON THE SHIPPING ECONOMY.

9.2 .1 EFFECTIVE IMPLEMENTATION OF THE POLICIES TO SEEK SELF SUFFICIENCY, AND TECHNOLOGY AMONG MOST DEVELOPING COUNTRIES.

.2 THE ENERGY CRISES OF 1972 AND 1979.

.3 RAPID ADVANCE IN TECHNOLOGY, AND WIDENING OF THE TECHNOLOGY GAP BETWEEN DEVELOPED AND DEVELOPING COUNTRIES.

9.3 MANY NEW NATIONAL FLAG CARRIERS EMERGED ONTO THE SCENE RESULTING IN THE EXCESSIVE TONNAGE IN THE WORLD MARKET. ECONOMIC PRESSURES CAUSED THE DEVELOPING COUNTRIES TO IMPLEMENT POLICIES OF CUTTING DOWN IMPORTS, WHICH WAS DONE COMPARATIVELY EASILY THAN PROMOTION OF EXPORTS. THIS WAS ONE OF THE RETARDING FACTORS IN THE EXPANSION OF WORLD SEA TRADE.

9.4 THE ENERGY CRISIS CAUSED DRASTIC INCREASES IN THE OPERATING COSTS OF THE SHIPS, CONSEQUENTLY THE FREIGHT RATES WENT SKY HIGH. THIS AGAIN WAS A BIG RETARDING FACTOR IN THE GROWTH OF THE WORLD SEA TRADE.

9.5 THE RAPID ADVANCE OF TECHNOLOGY RESULTED IN REDUCING THE WEIGHTS AND SIZES OF THE MANUFACTURED GOODS. FURTHERMORE THE INDUSTRY TURNED TO KNOWLEDGE ORIENTED GOODS. MANY OF THESE GOODS ARE LIGHTER AND SMALLER THAN THEIR OLDER COUNTERPARTS. THESE ARE VERY FREQUENTLY SHIPPED BY AIR.

9.6 THERE ARE MANY MORE FACTORS WHICH CONTRIBUTED TO WORLD'S DECLINE OF SHIPPING. TO MAKE THE LONG STORY SHORT, THE SHIP OWNERS ARE IN AN ECONOMIC CRISIS TODAY. THERE ARE INDICATIONS THAT THESE TRENDS WILL CONTINUE DURING THE PRESENT DECADE. EVEN IF THE CRISIS IS OVERCOME IN FUTURE THE PRESENT TRENDS OF REDUCED MANNING AND ENERGY SAVING ON SHIPS ARE LIKELY TO CONTINUE.

9.7 MOST OF THE SHIP OPERATION COSTS ARE FIXED COSTS. VERY FEW ARE VARIABLE AND CAN BE USED FOR REDUCTION OF EXPENDITURE. SHIPBOARD MANNING COSTS ARE VARIABLE AND CAN BE INFLUENCED. THEY CAN BE REDUCED BY USE OF CHEAPER LABOUR OR THE REDUCTION OF THOSE WHO ARE ON THE PAYROLE OF THE SHIP.

9.8 REDUCTION OF THE NUMBER OF CREW (RATINGS) ON SHIPS HAS ALREADY TAKEN PLACE, THE RATIO OF OFFICERS TO CREW HAS CHANGED FROM 1:4 TO CLOSE TO 1:1. THERE IS EVERY LIKELYHOOD THAT THIS WILL GO FURTHER DOWN (1:<1). RADIO OFFICER IS ALREADY BEING CONSIDERED REDUNDANT AND WILL SOON BE PHASED OUT DUE TO MODERN COMMUNICATION TECHNOLOGY

9.9 MODERN TECHNOLOGY HAS SHIFTED THE BURDEN OF PHYSICALLY DEMANDING TASKS OF SHIPBOARD PERSONNEL TO CONTROL ORIENTED AND ATTENTION REQUIRING ONES.

9.11 SHIPBOARD MANNING IS BEING ATTACKED FROM TWO SIDES.

.1 NEED FOR ENERGY SAVING AND EFFICIENT ENGINES, WHICH IMPLIES USE OF AUTOMATION. RESEARCH HAS SHOWN THAT 75% TO 80% OF ERRORS ARE DUE TO HUMAN FAILURES, HENCE THE NOTION OF BETTER EFFICIENCY THROUGH AUTOMATION.

.2 THE NEED FOR REDUCED MANNING COST. THIS DIRECTLY IMPLIES REDUCTION OF PERSONNEL AND REVISION OF THE JOB DESCRIPTIONS OF SHIP OFFICERS.

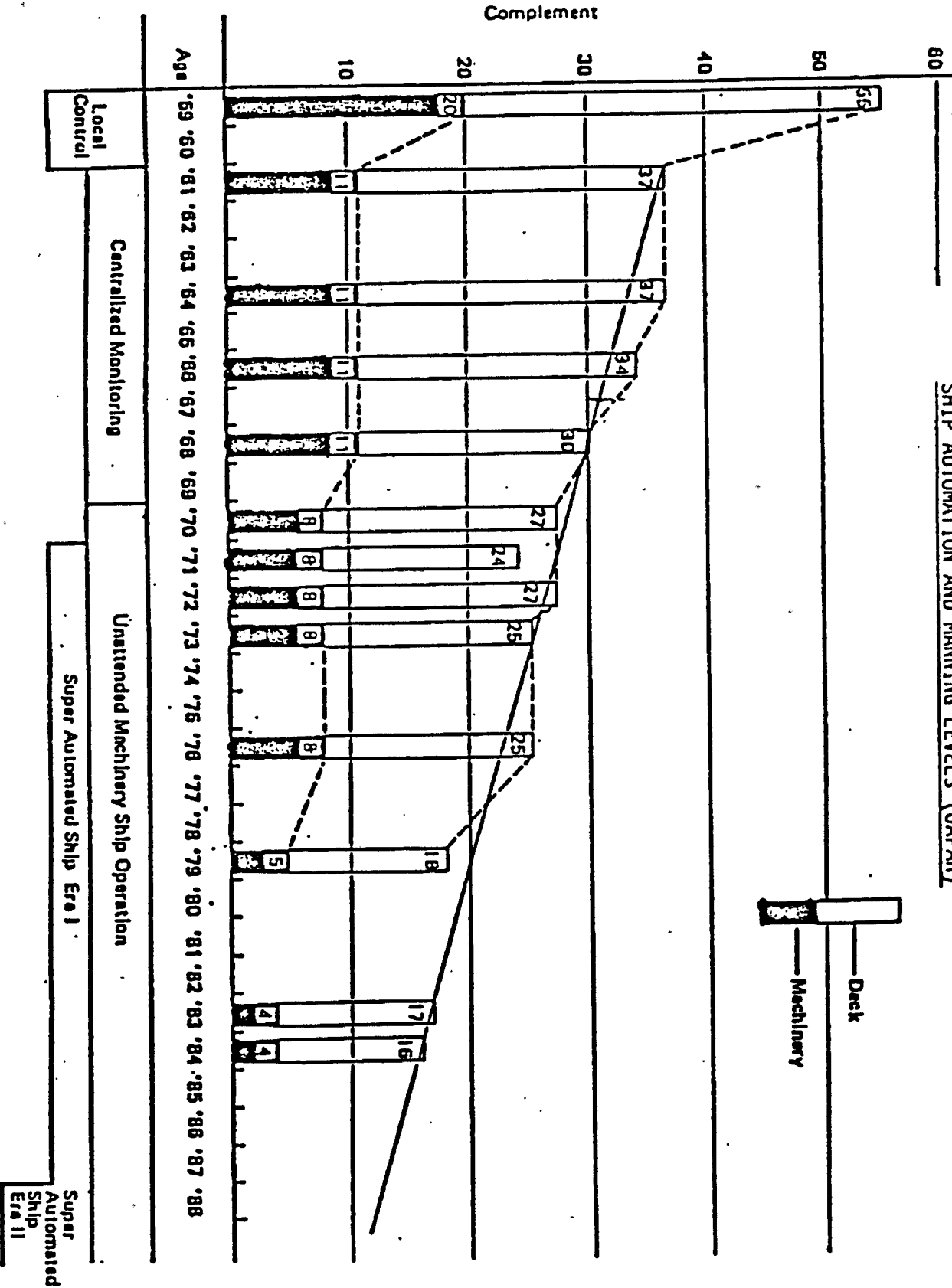
9.12 THE ONLY FACTORS IN FAVOUR OF TRADITIONAL SHIPBOARD MANNING ARE THE CAPITAL COSTS OF THE AUTOMATION EQUIPMENT AND THE AVAILABILITY OF SURPLUS MANPOWER IN CERTAIN COUNTRIES. THESE ARGUMENTS DO NOT STAND WELL, AS THE COST OF AUTOMATION EQUIPMENT IS COMING DOWN NOW, AND THE LEADERS OF THE SHIP BUILDING INDUSTRY ARE THE DEVELOPED COUNTRIES. MOST OF THE PREVIOUSLY OPTIONAL AUTOMATION AND CONTROL EQUIPMENT IS BECOMING STANDARD AS THE TIME IS PASSING. IT WILL BE VERY DIFFICULT TO REMAIN IN ISOLATION (TECHNOLOGICALLY) AND OPERATE AT DIFFERENT STANDARDS IN AN INTERNATIONAL COMPETITIVE MARKET.

9.13 DECK-ENGINE BIVALENCE SEEMS TO BE THE KEY WORDS OF THE FUTURE. THE TWO TYPES OF DECK-ENGINE BIVALENCE MARITIME EDUCATION AND TRAINING SYSTEMS, WHICH ARE PRESENTLY EFFECTIVE IN MANY DEVELOPED COUNTRIES ARE:

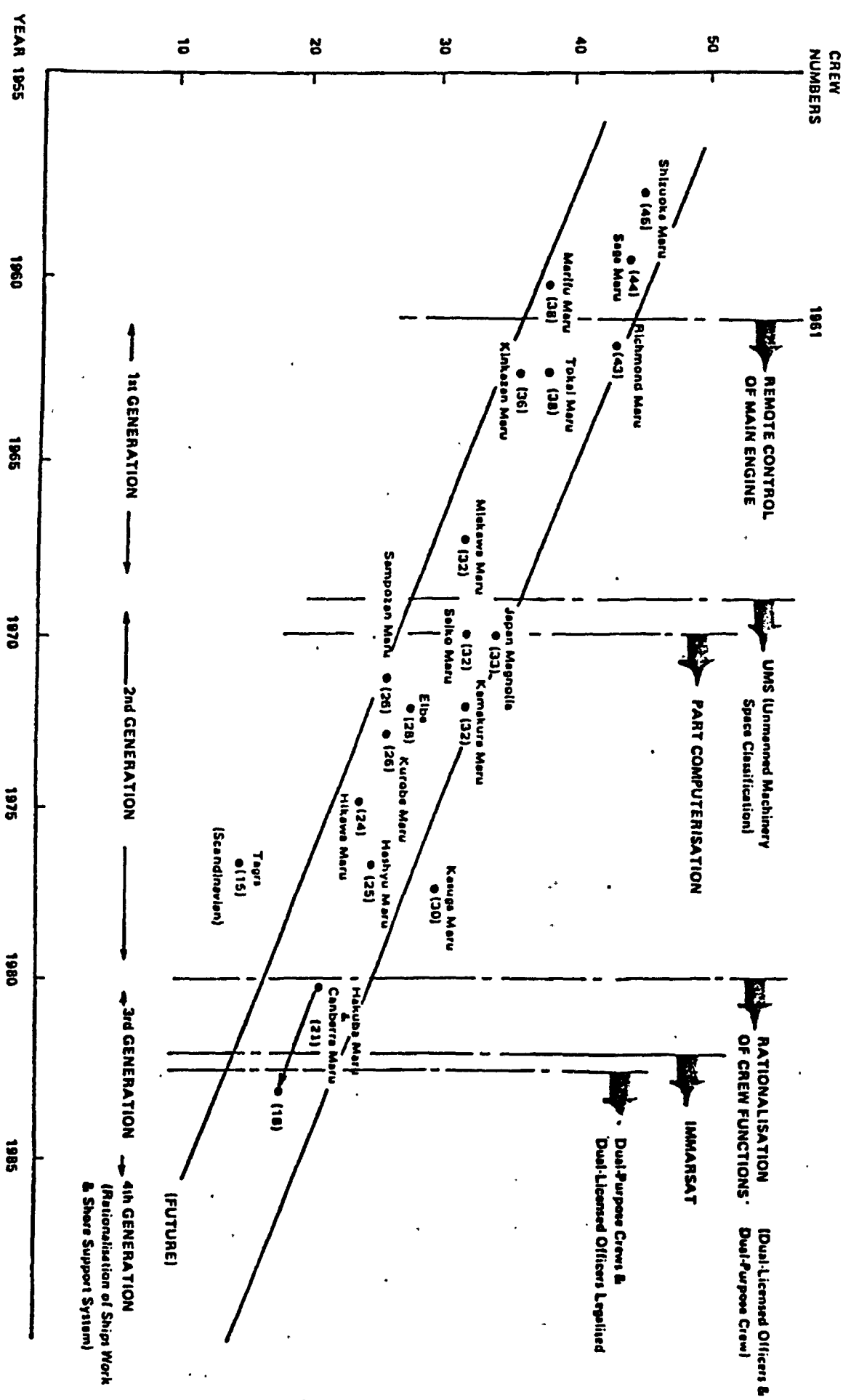
.1 FULL BIVALENCE I.E. THE COMBINATION OF A MASTER MARINER CERTIFICATE WITH A CHIEF ENGINEER CERTIFICATE. JAPAN IS PRESENTLY HEADING FOR THIS TYPE (THEY HAVE ALREADY COME TO THE STAGE OF COMBINING CHIEF OFFICER AND FIRST ENGINEER CERTIFICATES).

.2 SEMI BIVALENCE I.E. HIGHEST CERTIFICATE IN ONE OF THE TWO BRANCHES (DECK OR ENGINE) IS COMBINED WITH THE WATCH KEEPING CERTIFICATE IN THE OTHER BRANCH (DECK/ENGINE). THIS SYSTEM IS IN PRACTICE IN FRANCE, JAPAN AND HOLLAND. THE CHRONOLOGICAL EVOLUTION OF THE SHIPBOARD MANNING IN THE JAPANESE MERCHANT FLEET IS GIVEN ON THE FOLLOWING TWO PAGES. THE CHARTS ALSO SHOW THE EFFECTS OF AUTOMATION ON SHIPBOARD MANNING OF DEVELOPED COUNTRIES (MAINLY JAPANESE AND EUROPEAN).

SHIP AUTOMATION AND MANNING LEVELS (JAPAN)



'SHIP AUTOMATION & MANNING LEVELS'



10. INFLUENCE OF MARITIME ADMINISTRATION ON MET.

10.1 BROADLY SPEAKING, MARITIME ADMINISTRATIONS HAVE A TWO FOLD FUNCTION. FIRSTLY THEY ARE TO OVERSEE AND REGULATE THE SAFETY OF SHIPS AND PERSONNEL, AND MAKE REGULATIONS INCORPORATING THE INTERNATIONAL CONVENTIONS WHICH THE NATION HAS RATIFIED ON THESE MATTERS (MAINLY IMO CONVENTIONS). SECONDLY THEY HAVE TO OVERSEE AND FACILITATE THE EFFICIENT RUNNING OF THE MARITIME INDUSTRY. IN OTHER WORDS THEY CAN NOT NEGLECT THE ECONOMICS OF THE SHIPPING INDUSTRY. MOSTLY THE MARITIME INDUSTRY HAS A GOOD CHANCE OF SURVIVAL/PROGRESS WITH THE INFLUENCE OF MARITIME ADMINISTRATIONS.

10.2 MARITIME ADMINISTRATIONS TO A LIMITED EXTENT CAN STEP UP OR SLOW DOWN THE PROCESS OF CHANGE IN SHIP BOARD MANNING AND/OR MARITIME EDUCATION AND TRAINING. MARITIME ADMINISTRATIONS COULD INTERPRET THE TERMS LIKE " SAFE MANNING " OR " SAFE SHIPS " TOWARDS FURTHER REDUCTIONS IN THE SHIPS STAFF, AND THEY COULD FIND MANY WAYS TO DO IT . SHIFTING OF MANY SHIP'S TASKS TO SHORE (I.E. CARGO WORK AND MAINTENANCE) GIVES MORE REASON TO THE ADMINISTRATION'S PERMISSION TO SAIL VESSELS WITH LESSER CREWS.

10.3 MARITIME ADMINISTRATIONS OF THE COUNTRIES WITH HIGH LABOUR COSTS ARE INCREASINGLY WILLING TO ADAPT REGULATIONS TO THE ECONOMIC NECESSITIES. RECENT CONVENTIONS OF IMO ALSO ONLY STRESS THE MINIMUM REQUIREMENTS OF THE SHIPBOARD MANNING.

11. INFLUENCE OF SOCIETY ON MET

11.1 ONE OF THE MAJOR SOCIAL CONSEQUENCES OF NEW TECHNOLOGIES IS THEIR EFFECT ON EMPLOYMENT.

11.2 ALTHOUGH THE CONSEQUENCES OF TECHNOLOGICAL DEVELOPMENTS IN THE LAST 25 YEARS HAVE BEEN LESS DRAMATIC IN INDUSTRIALISED COUNTRIES THAN WAS FEARED, THOSE RESULTING OUT OF CHANGE FROM MECHANICAL TO MICRO-ELECTRONIC TECHNOLOGY ARE GOING TO BE VERY DIFFERENT. THE LABOUR SAVING IMPACT IS LIKELY TO BE GREATER AND WILL EFFECT NOT ONLY UNSKILLED AND SEMI-SKILLED WORKERS BUT ALSO HIGHLY QUALIFIED MANUAL AND NON MANUAL WORKERS AS WELL AS MANAGEMENT STAFF.

11.3 TWO FACTORS CONTRIBUTE TO THIS. FIRSTLY THE MICRO-ELECTRONIC TECHNOLOGY IS RELATIVELY CHEAP TO INTRODUCE AND IS CONVENIENT. SECONDLY WE ARE PASSING THROUGH A PERIOD WHERE HIGHER GROWTH RATES (ECONOMIES OF SCALE) ARE NO LONGER FEASIBLE AS A REMEDY TO LOSS OF JOBS RESULTING FROM NEW TECHNOLOGY. THIS STRATEGY HAD BEEN USEFUL IN 1950'S AND 1960'S. ON THE OTHER HAND IT IS CERTAIN THAT USE OF NEW TECHNOLOGY WILL RESULT IN PRODUCTIVITY AND EFFICIENCY GAINS.

11.4 IN GENERAL ALL THAT HAS BEEN STATED IS TRUE FOR THE SOCIETY AT LARGE, WHICH IS INFLUENCING THE MARITIME SETORS AS A MOTHER INFLUENCES THE CHILD. THE OBJECTIVES OF THE NATIONAL EDUCATION SYSTEMS ARE UNDERGOING A CHANGE TO CONFORM TO THE NEW REQUIREMENTS.

11.5 THE SITUATION HAS CHANGED A LOT FOR THE SEAFARER. THE MARITIME TECHNOLOGY WHICH WAS LEADER OF THE SHORE-BASED INDUSTRY DURING EARLY TWENTIETH CENTURY, IS NOW BEING LED BY THE SHORE-BASED INDUSTRY. THE MARITIME TECHNOLOGY HAS COME VERY CLOSE TO THE GENERAL INDUSTRIAL WORLD, AND HENCE THE MARITIME EDUCATION AND TRAINING MUST COME CLOSER TO THE NATIONAL EDUCATION SYSTEMS. BECAUSE OF THIS THE STATE OF SOCIETY AND THE VALUES WHICH THE MAJORITY OF MEMBERS OF SOCIETY IDENTIFY WITH, HAVE HAD A GROWING INFLUENCE ON WHAT SEAFARERS REGARD AS IMPORTANT AND ARE TRYING TO ACHIEVE. THIS CAN BE FELT BY THE INTRODUCTION OF ACADEMIC DEGREES FOR MARITIME STUDIES IN UNITED KINGDOM, THE SIMULTANEOUS ISSUANCE OF CERTIFICATES OF COMPETENCY AND ACADEMIC DEGREES IN THE FEDERAL REPUBLIC OF GERMANY, AND EQUIVALENCE OF MET CERTIFICATES TO ACADEMIC DEGREES IN FRANCE AND SIMILAR SYSTEMS IN GERMN DEMOCRATIC REPUBLIC, NETHERLANDS, POLAND, AND THE USSR. THIS CERTAINLY MAKES IT IMPERRATIVE TO INCREASE THE LEVEL OF MARITIME EDUCATION AND TRAINING AT THE EXPENSE OF ADDITIONAL TIME AND FINANCE, IN PAKISTAN.

11.6 AN ANALYSIS OF THE NATIONAL TRAINING PROGRAMMES OF 56 COUNTRIES WAS DONE BY THE JOINT MARITIME COMMISSION OF ILO. THEY REPORT THAT IN 22 OF THESE COUNTRIES, INCLUDING ALMOST ALL THE MAJOR MARITIME NATIONS, THE TRAINING OF MERCHANT MARINES IS OF A STANDARD EQUIVALENT TO THAT PROVIDED FOR OTHER INDUSTRIES.

11.7 IT IS A RECOGNISED FACT THAT TURN OVER AND WASTAGE OF SEAFARERS IS MUCH HIGHER THAN IN OTHER INDUSTRIES, AND THAT MEN WHO LEAVE THE SEA NEED TO BE EDUCATIONALLY EQUIPPED FOR OTHER OCCUPATIONS.

AN EARLY ANALYSIS OF WASTAGE FROM BRITISH MERCHANT NAVY , (J.M.M.HILL) REVEALED THAT ABOUT 75% LEFT THE SEA FOR GOOD BEFORE SERVING EVEN 5 YEARS AT SEA.

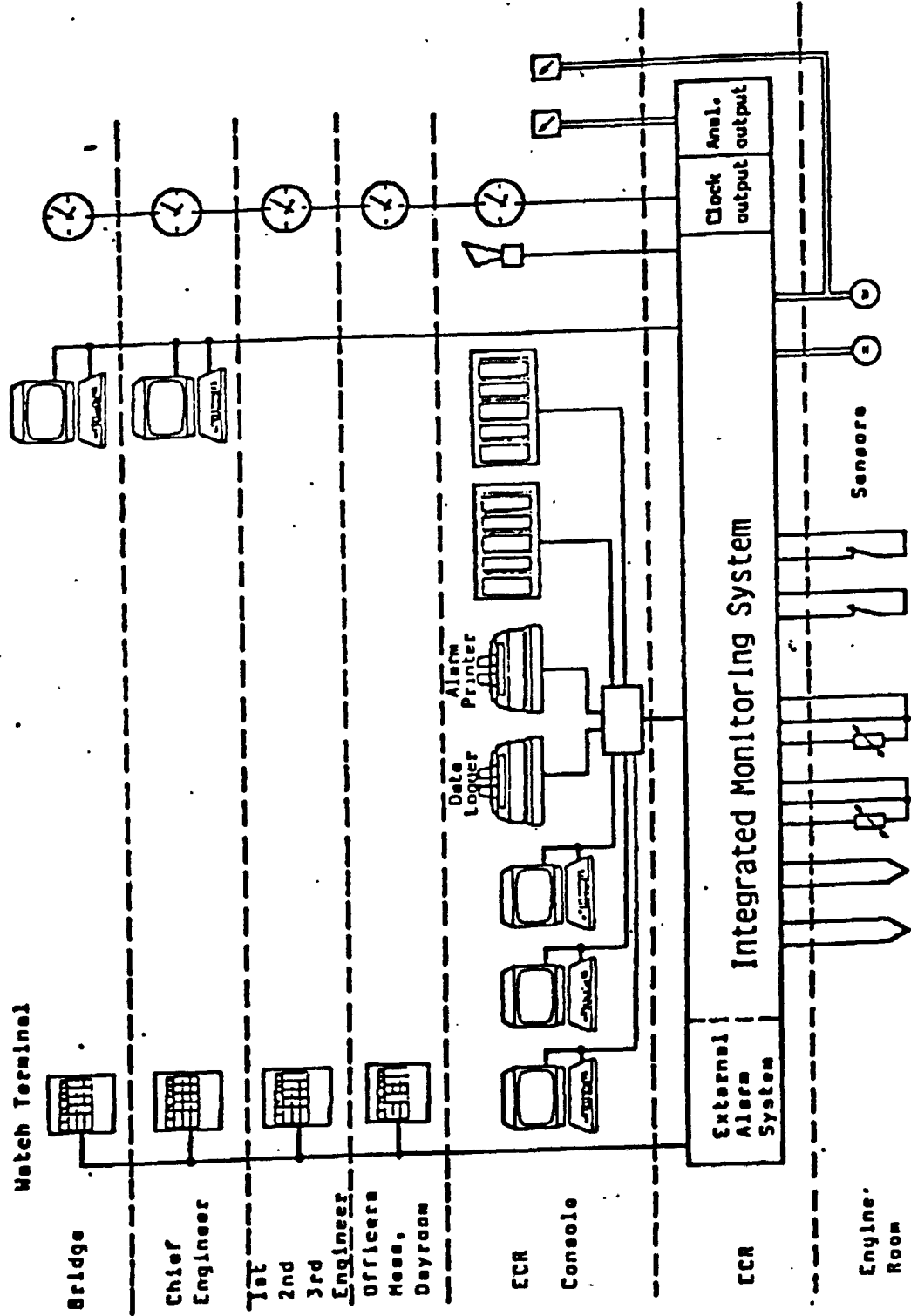
THE GUARANTEE OF PROFESSIONAL SECURITY IN TERMS OF ABILITY AND EQUIVALENCE WITH OTHER MEMBERS OF INDUSTRIAL SOCIETY IS THE ONLY WAY OF CULTIVATING SEAFARER'S INTREST ONBOARD.

12. THE FUTURE SHIP. (1995 AD)

12.1 DURING OUR RECENT VISITS TO VARIOUS RESEARCH CENTRES OF EUROPE, USA, UK, AND USSR, WE HAVE NOTICED THE TRENDS OF THE FUTURE DEVELOPMENTS OF THE SEA TRANSPORT TECHNOLOGY. AMONG THESE RESEARCH CENTRES THE "INSTITUTE OF PERCEPTION " AT AMSTERDAM AND " FLENSBURG RESEARCH INSTITUTE FOR SHIP OPERATION" IN THE FEDERAL REPUBLIC OF GERMANY ARE ONLY MENTIONED HERE. AT THE FORMER WE SAW THE MODEL OF A FUTURE SHIP'S BRIDGE NAMED "BRIDGE 90" AND AT THE LATTER INSTITUTE WE WERE TRAINED AND EDUCATED ON THE DETAILS OF MICRO-PROCESSOR CONTROLLED AUTOMATION AND ITS OPERATION.

12.2 THE MODERN SHIP'S CONTROL CENTRE IS COMING VERY CLOSE TO THE COCKPIT TYPE OF CONTROLS AND THE BLACK BOX TYPE OF DIAGNOSTICS. SOME OF THE LINE DIAGRAMS ARE GIVEN IN THIS PAPER FOLLOWING THIS PAGE AND CAN GIVE A FAIR IDEA OF THE FUTURE TRENDS.

12.3 ENGINE ROOM IS BECOMING MORE AND MORE COMPACT EVERY DAY. THIS TREND IS EXPECTED TO CONTINUE TILL THE COMPLETE ELIMINATION OF AN ENGINE ROOM WATCH KEEPER IS ACHIEVED. THE FUTURE ENGINE ROOMS WILL HAVE MUCH HIGHER TEMPERATURES TO INCREASE THE THERMAL EFFICIENCIES AND DECREASE THE THERMAL STRESSES ON THE MACHINES. THE ABSENCE OF A HUMANBEING FROM THESE SPACES WILL FACILITATE THIS AND DECREASE EXPENSE ON MACHINES AND SPACES CONSUMED, ONLY FOR THE COMFORT OF A HUMAN PRESENCE.



Automation on Ships

SYSTEM OVERVIEW

NAVIGATION

ENGINEERING

EXTERNAL COMMUNICATIONS

OFFICIAL DOCUMENTATION

SHIP OPERATIONS IN HARBOUR

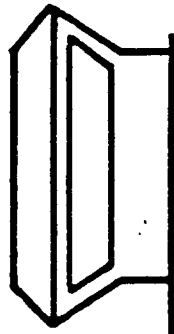
FAILURE ANALYSIS

MAINTENANCE

BOARD ORGANISATION CARGO

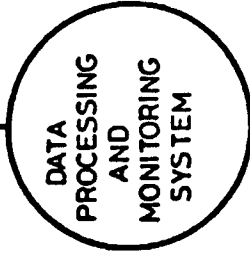
ADMINISTRATION

EXTERNAL COMMUNICATIONS IN HARBOUR



Ship OPERATION CENTRE

S O C

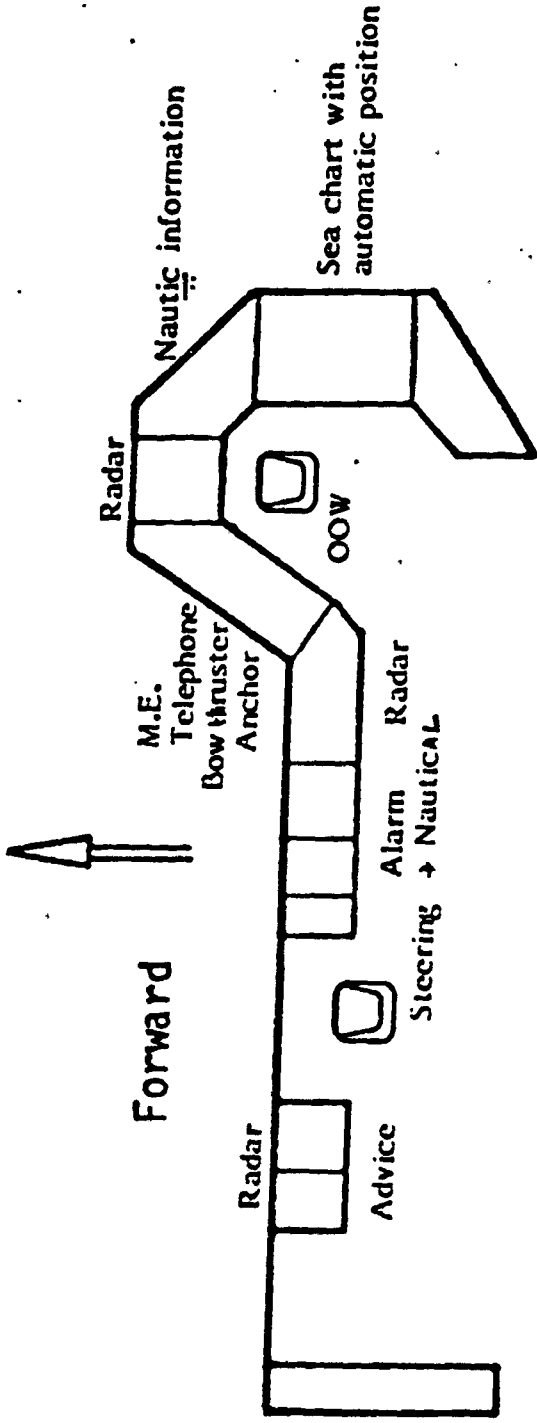


B M C

BOARD MANAGEMENT CENTRE

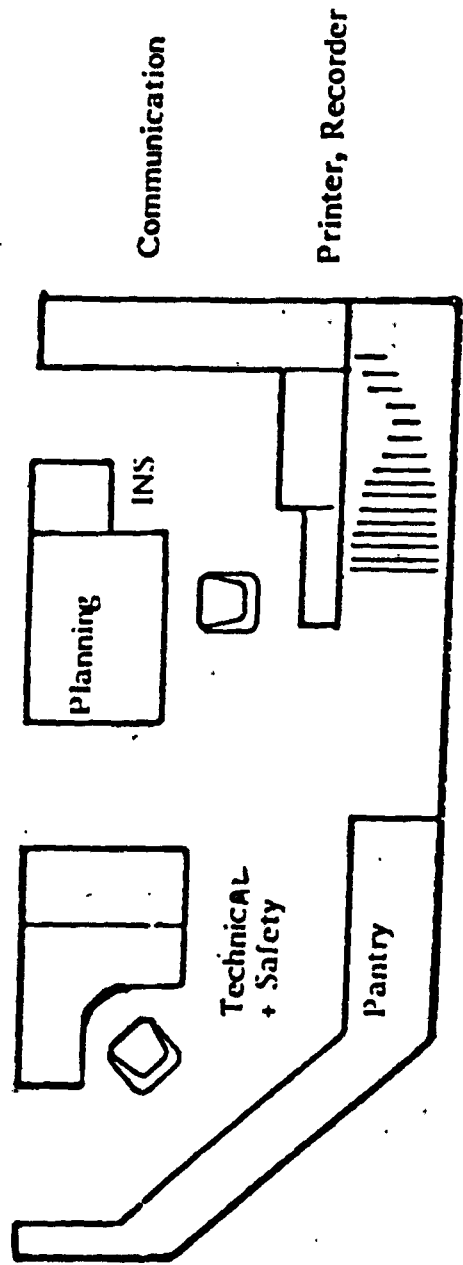
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DIVISION OF TASKS SDC - BMC

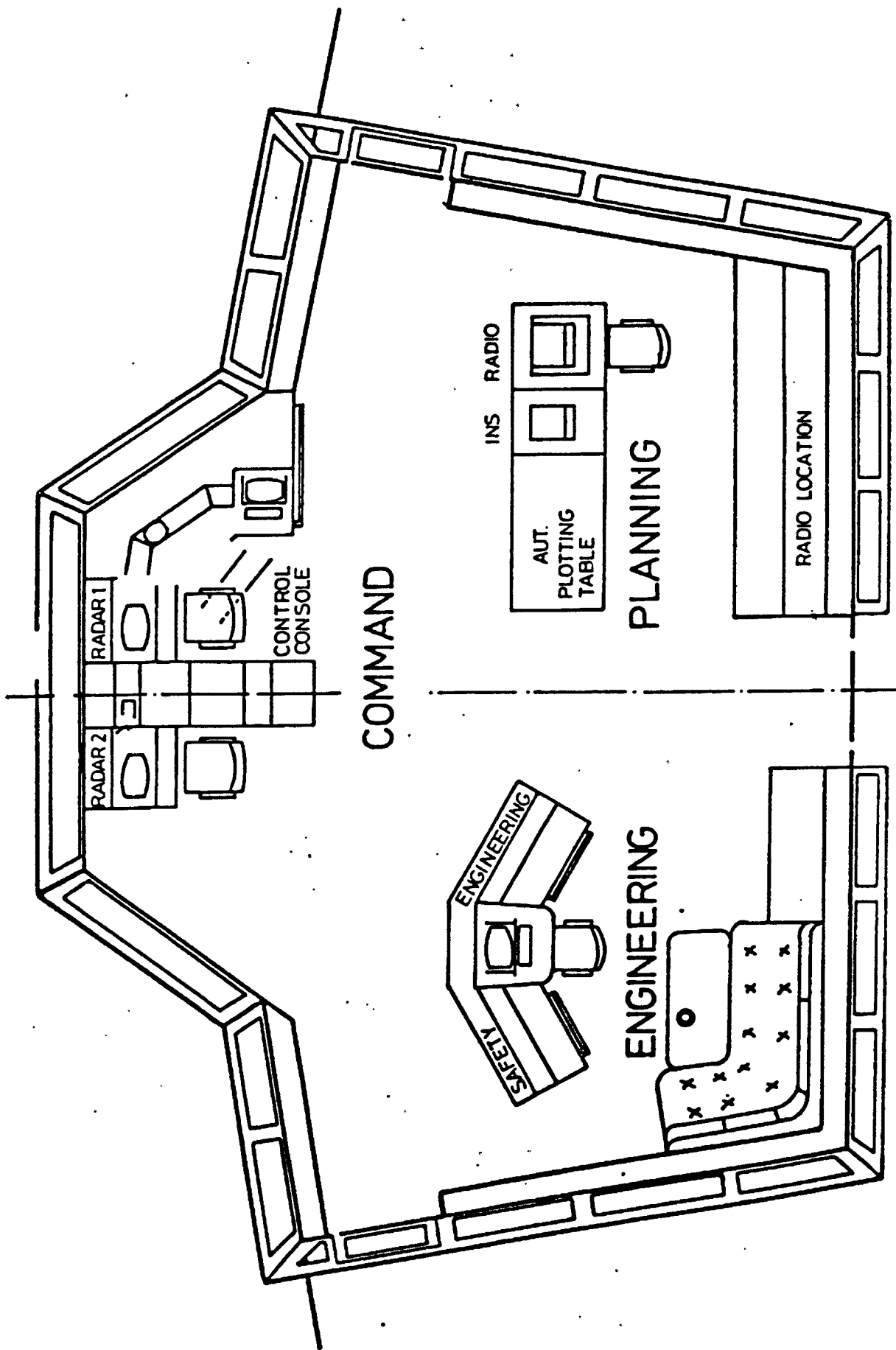


Port

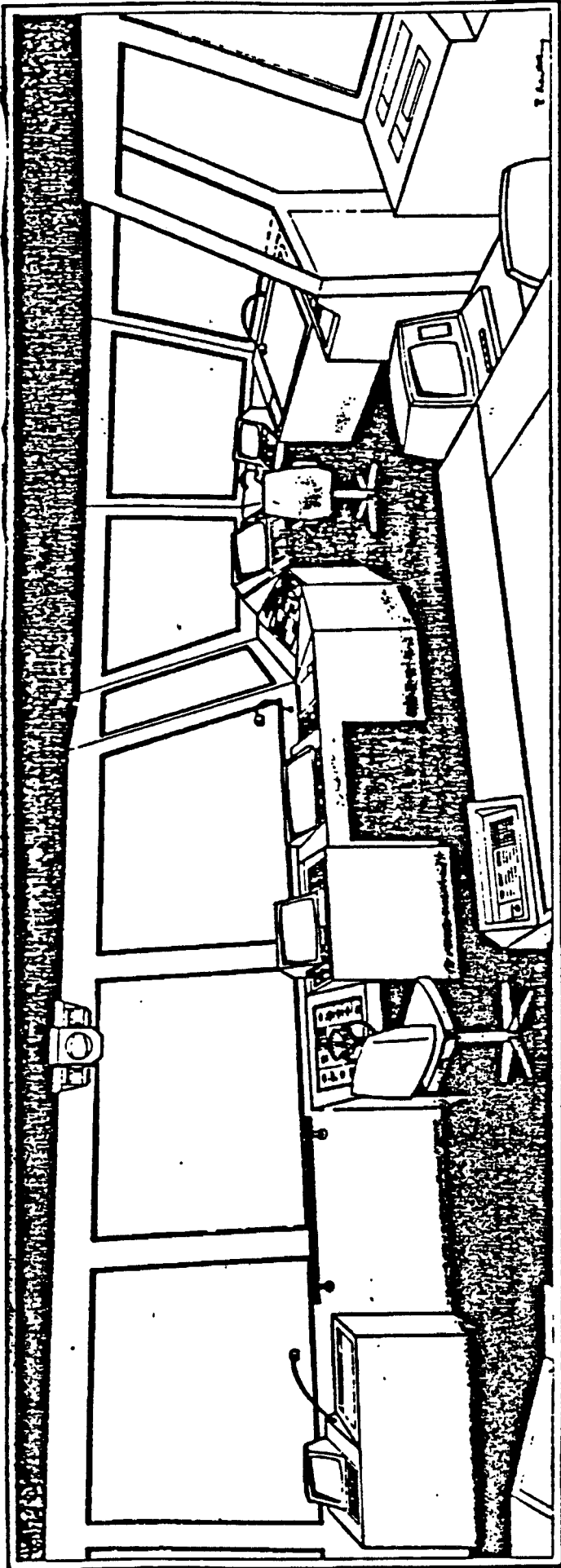
Starboard



Ship Operation Center (Task orientated)



BASIC LAYOUT OF SHIP OPERATION CENTRE (SOC)



Ship Operation Center
Task orientated

12.4 THE MODERN COMMUNICATIONS TECHNOLOGY ENABLES HEAD OFFICES OF SHIPPING COMPANIES TO STAY IN CLOSE CONTACT WITH THEIR SHIPS. DUE TO GROWING INFLUENCE OF SHORE ON THE OPERATION OF SHIPS, THE SHIPS ARE KEPT UNDER HIGH DEGREE OF CONTROL BY THE HEAD OFFICES. THE "SOLE MASTER AFTER GOD" POSITION HAS BEEN SCRAPED. A NEW ROLE FOR THE MASTER HAS EMERGED, REMOTE BUT CLOSE AND CONSTANT SUPERVISION FROM SHORE AND A LIMITATION IN THE RANGE OF INDEPENDENT DECISION MAKING. THE ROLE OF SHIP BOARD PERSONNEL MAY BE REDUCED TO ACCOMPANYING OF OVERSEAS TRANSPORT. THE AUTONOMY OF BRIDGE MANAGEMENT IS CHALLENGED BY AN INCREASE OF INSTALLATIONS FOR THE SURVEILLANCE OF SHIP TRAFFIC. PILOTS AND PILOT ORGANISATIONS OF EUROPE ARE VERY CONCERNED AND DISSATISFIED WITH THIS DEVELOPMENT.

12.5 WITH ALL THESE CHANGES THE POPULATION ON BOARD IS DRASTICALLY AFFECTED . NUMBERS OF STAFF ARE REDUCED AND A VERY HIGHLY SPECIALISED OFFICER WHO CAN DO MANY JOBS IS REQUIRED.

13. PRESENT MET SYSTEM IN PAKISTAN.

- 13.1 THE PRESENT MET SYSTEM OF PAKISTAN IS MORE THAN 20 YEARS OLD. RECENTLY THE KARACHI UNIVERSITY HAS GIVEN THE EQUIVALENCE OF AN ACADEMIC DEGREE TO THE TWO YEARS OF EDUCATION AND TRAINING AT PAKISTAN MARINE ACADEMY.
- 13.2 THE ENTRY LEVEL OF THE ACADEMY IS SAME AS THAT OF ANY ENGINEERING UNIVERSITY IN PAKISTAN. I.E. 10 YEARS OF SCHOOL PLUS TWO YEARS OF COLLEGE EDUCATION WITH PHYSICS, CHEMISTRY, AND MATHEMATICS AS MAJORS.
- 13.3 THERE IS A SELECTION PROCEDURE SIMILAR TO THE INTER SERVICES SELECTION BOARD'S ENTRANCE PROCEDURE. CADETS ARE SELECTED FROM THE ENTIRE NATION ON THE REGIONAL QUOTA BASIS.
- 13.4 THE TOTAL EDUCATION AND TRAINING IS SPREAD OVER FIVE YEARS. TWO YEARS ARE SPENT AT THE ACADEMY'S RESIDENTIAL CAMPUS AND THE REMAINING THREE YEARS ARE FOR THE PRACTICAL TRAINING. DURING PRACTICAL TRAINING, THE ENGINEERING CADETS JOIN THE MARITIME WORKSHOPS, WHILE THE NAUTICAL CADETS JOIN SHIPS AS CADETS. THERE IS NO PRACTICAL CONTROL OF PMA OVER THE CADETS WHILE THEY ARE UNDERGOING THE PRACTICAL TRAINING (I.E. LAST THREE YEARS).
- 13.5 AFTER THE FIVE YEARS OF EDUCATION AND TRAINING THE ENGINEERING CADETS ARE IN LINE FOR THE REGULAR LADDER OF CERTIFICATES OF COMPETENCY EXAMINATIONS AS PER RULES.

HOWEVER THE NAUTICAL CADETS ACQUIRE THE REQUISITE SEA SERVICE EARLIER THAN ENGINEERING CADETS BECAUSE THEY GET THEIR PRACTICAL TRAINING ON SHIPS AND THIS IS COUNTED TOWARDS THE SEA SERVICE (STCW 78). HENCE THE NAUTICAL CADETS ARE AHEAD OF THEIR ENGINEERING COUNTERPARTS OF THE SAME GROUP.

13.6 THE PAKISTAN MARINE ACADEMY CAMPUS, BUILDINGS, HOSTEL AND SPORTS FACILITIES ARE ALL VERY SPACIOUS AND WERE ORIGINALLY DESIGNED FOR PASSING OUT OVER 100 CADETS PER YEAR. PRESENTLY THE REQUIREMENT OF MARITIME MANPOWER HAS DIMINISHED IN TERMS OF QUANTITY, AND WITH THE PRESENT SYSTEM OF MET THE CAMPUS IS NOT BEING UTILISED TO ITS CAPACITY.

14. MET SYSTEM OF PAKISTAN VS MET OF EUROPE AND USA.

14.1 DURING OUR COURSE OF STUDY AT THE WORLD MARITIME UNIVERSIT, WE STUDIED VARIOUS MODELS OF MET SET-DOWN BY IMO EXPERTS. WE WERE ALSO PROVIDED WITH THE OPPORTUNITY OF VISITING THE SELECTED MARITIME INSTITUTIONS OF THE UNDERMENTIONED COUNTRIES.

- .1 UNITED STATES OF AMERICA.
- .2 UNION OF SOVIET SOCIALIST REPUBLICS.
- .3 UNITED KINGDOM.
- .4 FEDERAL REPUBLIC OF GERMANY.
- .5 NETHERLANDS.
- .6 FRANCE.
- .7 POLAND.
- .8 YUGOSLAVIA

- .9 SWEDEN
- .10 DENMARK.
- .11 FINLAND
- .12 GERMAN DEMOCRATIC REPUBLIC.

14.2 IN ADDITION TO THIS WE WERE GIVEN LECTURES ON THE MET SYSTEMS OF INDIA, AUSTRALIA, JAPAN, KOREA, AND EGYPT.

14.3 DURING OUR VISITS TO THE COUNTRIES MENTIONED AT .1 TO .12 ABOVE, WE WERE VERY GENEROUSLY EXTENDED ALL INFORMATION ABOUT THE EDUCATION SYSTEMS, BY THE REPRESENTATIVES OF THE RESPECTIVE INSTITUTIONS OF THESE COUNTRIES. THESE VISITS AND DISCUSSIONS WITH THE MARITIME EDUCATIONALISTS OF MORE THAN HALF OF THE WORLD'S MARITIME NATIONS, WERE OF VERY HIGH IMPORTANCE FOR US.

14.4 ALTHOUGH MOST OF THESE COUNTRIES DO NOT ENTIRELY MATCH WITH EACH OTHER OR WITH PAKISTAN, ECONOMICALLY, POLITICALLY, OR GEOGRAPHICALLY, THERE WERE SOME ASPECTS OF MET WHICH WERE FOUND COMMON AMONGST THEM.

14.5 IT IS MY INTENTION TO COMPARE PAKISTAN'S MET SYSTEM WITH THE COMMONALITIES OF THE MET SYSTEMS OF THESE COUNTRIES.

*1 ALL THESE SYSTEMS ADHERE TO MINIMUM SEA SERVICE REQUIREMENTS OF STCW CONVENTION OF 1978, AS THE PRACTICAL COMPONENT OF THEIR MET FOR NAUTICAL AND ENGINEERING CADETS. THEY ONLY HAVE ONE YEAR ON THE TRAINING SHIPS OR ARRANGED ON MERCHANT SHIPS, AND THREE YEARS AT ACADEMIES. IN PAKISTAN CADETS STILL HAVE TO UNDERGO THREE YEAR PRACTICAL TRAINING ON BOARD OR IN WORKSHOPS.

*2 ALL THESE SYSTEMS HAVE AT LEAST THREE YEARS OF CLASS ROOM/LABORATORY INSTRUCTIONS PROGRAMMES AFTER WHICH THE NAUTICAL AND ENGINEERING CADETS RECIEVE AN ACADEMIC DEGREE. IN MOST COUNTRIES ENGINEERING CADETS AFTER PASSING OUT FROM ACADEMY ARE ONLY ONE YEAR BEHIND THE REQUIREMENT OF THE ENGINEERING DEGREE LEVEL, WHICH THEY COULD EASILY DO IF THEY COULD AFFORD FURTHER EDUCATION. IN PAKISTAN ENGINEERING CADETS GET AN ACADEMIC DEGREE BUT IT IS NOT CERTAIN THAT ENGINEERING CADETS CAN FURTHER THEIR CARREER AS PROFESSIONAL ENGINEERS IN FUTURE AFTER GOING THROUGH A DESIGNED ONE YEAR COURSE.

*3 MARITIME INSTITUTIONS IN MOST OF THESE COUNTRIES ARE A PART OF A GREATER NATIONAL EDUCATION SYSTEM, HENCE THE MARITIME GRADUATES ARE ABLE TO ENHANCE THEIR QUALIFICATIONS THROUGH VARIOUS SHORT AND LONG COURSES WHICH SUIT THE SEAFARERS DUE TO NATURE OF THEIR PROFESSION. THERE ARE NO SUCH ARRANGEMENTS IN PAKISTAN YET.

*4 AMONG ALL THESE COUNTRIES A GREATER EMPHASIS IS PLACED ON LABORATORIES AND PRACTICAL WORKSHOPS, ESPECIALLY IN THE FIELD OF ELECTRONICS, MICROPROCESSORS, AND AUTOMATION. ALL OF THESE INSTITUTIONS OWN MARITIME SIMULATORS (ENGINE, RADAR AND SHIPHANDLING). SOME OF THEM ARE EVEN USING THESE SIMULATORS FOR RESEARCH WORK. IN PAKISTAN WE NEED TO IMPROVE IN THIS AREA AS SOON AS POSSIBLE.

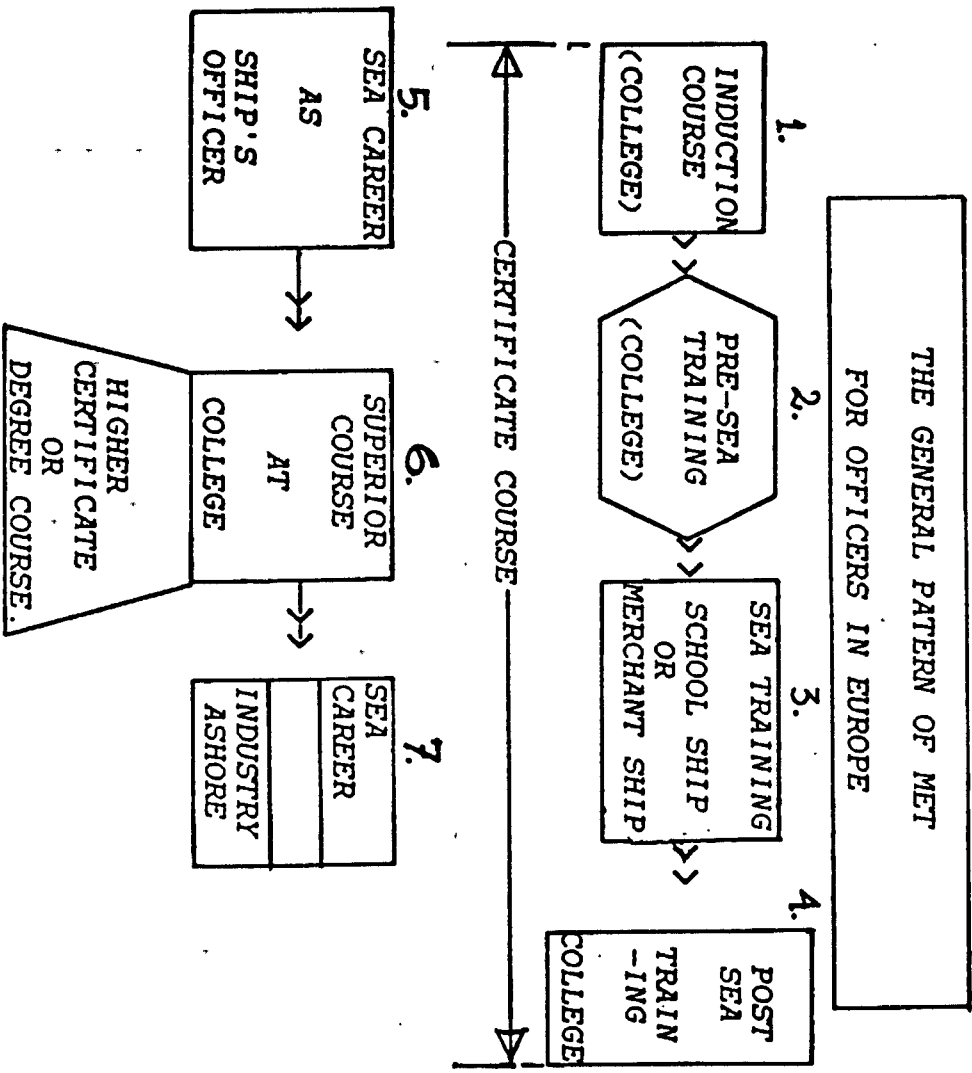
*5 TEACHING STAFF IN MOST OF THESE COUNTRIES IS COMPARATIVELY VERY HIGHLY PAID.

LABORATORY TECHNICIENS WHO FORM THE BACK BONE OF A TECHNICAL TRAINING INTITUTE, ARE ALSO VERY WELL PAID. THIS AREA NEEDS TO BE IMPROVED IN PAKISTAN.

*6 IN MOST COUNTRIES THE INSTITUTES ARE FEDERALLY FINANCED, THE MINISTRY OF EDUCATION IS ALSO INVOLVED JUST AS MUCH AS MINISTRY OF COMMUNICATIONS OR TRANSPORT. IN PAKISTAN WE SHOULD ALSO FIND A WAY OF INVOLVING THE MINISTRY OF EDUCATION TO SHARE THE BURDEN.

*7 AMONG ALL THESE COUNTRIES THE EDUCATIONAL INSTITUTIONS (ESPECIALLY THOSE RUN BY FEDERAL GOVERNMENT) ARE TAKEN VERY SERIOUSLY AS FAR AS THE BASIC INFRASTRUCTURE AND ADMINISTRATION IS CONCERNED. THE CARRIER OFFICERS ARE FILLING ALL POSITIONS. ACCOUNTABILITY IS STRAIGHT AND CLEAR.

*8 A TREND TOWARDS DUAL-PURPOSE OFFICERS TRAINING HAS ALREADY FORMED. JAPAN, FRANCE, HOLLAND AND USA ARE ALREADY HAVING THIS TYPE OF TRAINING. WEST GERMANY AND UNITED KINGDOM ARE LIKELY TO FOLLOW THE SUIT. IN FUTURE THERE IS A VERY STRONG LIKELIHOOD THAT DUAL PURPOSE MET WILL BE IN DEMAND AND WOULD ENTIRELY SUIT THE REQUIREMENTS OF THE FUTURE SHIP-OFFICER'S JOB DESCRIPTION. IT IS HIGHLY ADVISEABLE TO PREPARE A PLAN TO INTRODUCE THIS SYSTEM IN PAKISTAN, AND ADOPT A POLICY TO CONVERT TO THE NEW SYSTEM GRADUALLY. A GENERAL OUT LINE OF THE POSSIBLE SYLLABUS OF A DUAL PURPOSE OFFICER IN PAKISTAN WILL BE GIVEN IN THIS PAPER.



A COMPARATIVE TABLE OF SHIP'S OFFICERS EDUCATION

Country	Name of School or Course	Responsible Authority	Entry Qualification		Duration of Study	At College	Sea-Training/Workshop Period	When	Certificate or Qualification Gained							
			Deck, Eng. Dept.	Junior High School												
J A P A N	Merchant Marine Junior College (5 colleges)	Ministry of Education, Ministry of Transport	Deck, Eng. and Elec. Dept.	Junior High School	5½ years	4½ years	Deck: 1 year 6 months on sail. Ship 6 months on motor ship Engine: 9 months; sea 3 months; Workshop	Between 5th and 6th year	- Graduates of Deck Dept: Class 3 Dr Offr. Certificate + Class 3 Eng. Watchkeeper Cent. without written exam.							
										University of Merchant Marine (2 Universities)	Ditto	Deck, Eng. and Elec. Dept.	High School	1½ years *	3½ years	12 months
	Marine Technical College (Retraining Course)	Ministry of Transport	Deck, Eng. Dept. 1 year of sea career as officer	Special Course Class 1-3, and Class 4	2 years	2 years			Candidates with four years sea experience: Written Exam Exempt. Updating courses or Refresher course							
										Short course for officers for ratings	1½ years	1½ years	4-6 months 3-6 months			

Country	Name of School or Course	Responsible Authority	Entry Qualification	Duration of Study	At College	Sea-Training/Workshop		Certificate or Qualification Gained
						Period	When	
THE U. S. A.	United States of Merchant Marine Academy (Federal)	MarAd	High School, Sat Exam, Recommendation of Congressman	4 years	3 years	300 days	A semester of 2nd year and another of 3rd year	B.Sc. Degree, Third Mate or Third Assis. Eng. Cert. or Dual License. Reserve Naval Officer
	Maritime College State University (6 universities)	State Educational Committee + MarAd	High School Graduate (12 years)	4 years	4 years	6 months	Summer sea term 2 months x 3.	B.Sc. Degree, Third Mate or Third Assis. Engineer Certificate.
	Calhoun Mesta Engineering School	Marine Eng. Beneficial Association	High School Graduates (12 years)	3 years	2 years	1 year		Third Assistance Marine Engineer.
THE U.K.	BTEC/SCOTEC Nautical Science Diploma Programmes	BTEC/SCOTEC & DES & GCSS	GCE O-Level 4 subjects	3½ years	54 weeks	21 months		BTEC/SCOTEC Diploma & Class 4 Dr. Officer EDH, RTRC, CPSC, Radar Observer, First Aid, Nav. Aids, Fire-fighting
	BTEC/SCOTEC Marine Engg. Diploma Programmes	BTEC/SCOTEC & DES & GCSS	GCE O-Level 4 subjects	4 years **	3 years	1 year	During Third year	BTEC/SCOTEC Diploma Class 4 Certificate

Continued from the previous page.

Country	Name of School or Course	Responsible Authority	Entry Qualification	Duration of Study	At College	Sea-Training/Workshop		Certificate or Qualification Gained
						Period	When	
U.S.S.R.	MNC (Higher Marine Eng. College) (4 colleges)	Navy (Maritime Administration) and Ministry of Education	Junior High School (10 years) Max. Age: 35	5 1/2 years		8-15 months	3 months at the end of each year	Degree & Intercollegiate Navigator Class 3 Engineer Officer or Class 3 Electrician.
FRANCE	EMM (Ecoles Nationales de La Marine Marchande)	Ministry of Transport	Baccalaureat Examination Pass	4 years	4 years	24 months	two months each at the end of 1st & 2nd years and 20 months during 3rd year.	36 months sea career after graduation then C/M can be obtained (Captain 1st Class of Merchant Navy; Dual License)

Continued from the previous page. Changes currently taking place are not taken into consideration.

- * Those who do not want to go to sea can complete their course in four years.
- ** Three years cadet scheme is recently introduced.

COMPARATIVE TABLE OF EDUCATIONAL SYSTEMS FOR MARINE
ENGINEER OFFICERS IN ASIAN COUNTRIES

Item		Bangladesh	Burma	Hong Kong	Indonesia	Malaysia
Entry Age		18	16	16	19	17
Entrance Examination		HSC		O-Level	SMA	O-Level
Number of Subjects for Examination		6	6	5	6	4
Scheme	1st year	College	College	College + 6 months Workshop	Academy	College
	2nd year	College	College	College	Academy	College
	3rd year	Sea-Training	Ship Technical College	Sea-Training	Sea-Training	Sea-Training 1 year
	4th year	College	1 month Sea-Training + 3 1/4 years of Workshop Training	College	Academy	Workshop Training six months
	5th year			Workshop Training		College
	Total Duration	4 years	6 1/4 years	5 years	4 years	4 1/2 years
Certificate of Other Qualifications		DOT Exam Pass then Class 2 Engr. Offi.	Class 2 Engineer Officer	Higher Diploma	3rd Engineer Officer	Technician Diploma
Minimum Qualified age as an officer		22	23	21	23	22
The First Position		Junior Engineer	Junior Engineer	Junior Engineer	Third Engineer	Junior Engineer

Item	Papua Nya-Guinea	Phillipines	Republic of Korea		Singapore	Thailand		
Entrance Exam	SC	O-Level	National Preliminary Exam		O-Level	SC		
Number of Subjects for Exam	4	4	5		3	7		
Scheme	1st year	College	College		University/College	College + 2 months Workshop	Academy + 1½ months of sea training	
	2nd year	Sea-Training or Workshop	College		University/College	College	Ditto	
	3rd year	Sea-Training: 6 months College: 3 months	Sea-Training		College Sea-Training 6 months each	Sea-Training six months	6 months Workshop + 6 months College	Ditto
	4th year		Sea-Training		University		Sea-Training	Ditto
	5th year							Ditto
	Total Duration	2 3/4 years	4 years		4 years	2½ years	4 years	5 years
Certificate or other Qualifications	Class 3 Eng. Offi. Restricted	Diploma		B.E. Class 3 Eng. Offi.	Class 3 Engg. Offi.	Technician Diploma	B.Sc.	
Minimum Qualified age as an officer	21	21		22	21	20	23	
The First Position on Board	Class 3 Eng. Offi. Restricted	Class 4 Eng. Officer		3rd Engr.	Junior Engineer	Junior Engineer	Third Engineer	
Remarks		Associated Degree in Marine Engineering						

Continued from the previous page.

15. NEED FOR REORGANISATION OF MET
IN PAKISTAN

15.1 AFTER GOING THROUGH THE PREVIOUSLY PRESENTED TEXT, I AM SURE IT IS OBVIOUS THAT THERE IS AN ACUTE NEED FOR REORGANISATION OF THE MET SYSTEM IN PAKISTAN. EVEN IF WE IGNORE THE SYSTEMS OF THE OTHER COUNTRIES, THE BASIC REQUIREMENTS OF AN EFFICIENT AND PRODUCTIVE TECHNICAL EDUCATIONAL INSTITUTION CAN BE THE STARTING LINE FOR THE MET REORGANISATION IN PAKISTAN. THESE BASIC REQUIREMENTS CAN BE BROADLY SUMMARISED AS FOLLOWS:

*1 THE TEACHING, TECHNICAL (LABORATORY STAFFS ETC), AND ADMINISTRATIVE PERSONNEL SHALL HAVE THE HIGHEST POSSIBLE STANDARDS OF QUALIFICATIONS, SKILLS, AND EXPERIENCE.

*2 THE FACULTY MUST KEEP ABREAST OF THE ADVANCEMENTS IN TECHNOLOGY, ESPECIALLY THOSE WHO TEACH AND TRAIN THE CADETS ON APPLIED SCIENCES/TECHNOLOGIES. THE SYSTEM OF THE INSTITUTE SHALL PROVIDE EVERY POSSIBLE FACILITY TO THE TEACHING STAFF IN THIS REGARD.

*3 THE RECRUITMENT OF TECHNICIANS WHO WORK FOR THE MAINTENANCE OF THE FACILITIES, LABORATORIES, AND PREPARATION OF PRACTICAL LESSONS, SHALL BE GIVEN SPECIAL ATTENTION. THEY SHOULD BE OF THE INTRINSICALLY MOTIVATED TYPE. IF NEED BE THEY SHALL BE GIVEN SPECIAL TRAINING ON THE JOB DURING THE PROBATIONARY PERIOD.

*4 THE LABORATORIES SHALL BE INITIALLY PLANNED FOR ELEMENTARY RESEARCH CAPABILITY. THESE LABORATORIES MUST BE UPDATED FROM TIME TO TIME, SO THAT THE EQUIPMENTS ARE EXCHANGED WITH THE NEW TYPES WHILE THE OLD HAS STILL SOME MARKET VALUE.

*5 THE SYSTEM SHALL HAVE FLEXIBILITY, SO THAT THE SYLLABI AND CURRICULUM ARE CONSTANTLY SCANNED FOR OUTDATED TOPICS AND INCLUSION OF LATEST DEVELOPMENTS, OR ANY OTHER CHANGES DEMANDED BY THE ENVIRONMENT OR SOCIETY.

*6 FEAR OF GOD IS THE BEGINING OF WISDOM. THE CHARACTOR BUILDING AND INTEGRITY INSTILLING TECHNIQUES MUST NEVER STOP AT ANY STAGE OF EDUCATION IN ANY INSTITUTE. THE SUBJECTS OF MANAGEMENT AND ADMINISTRATION SHALL BE TAUGHT WITH SPECIAL INSIGHT TO THE EFFECTIVENESS OF CHARACTOR AND INTEGRITY ON THE OVERALL GROWTH AND ACCUMULATION OF CONSTRUCTIVE STRENGTH OF A NATION.

15.2 IN THE FOLLOWING PAGES A SYSTEM OF MARITIME EDUCATION FOR PAKISTAN WILL BE PROPOSED, KEEPING IN VIEW ALL THAT HAS BEEN EXPLAINED IN THE PREVIOUS TEXT. THE JOB PROFILE OF THE FUTURE SHIP OFFICER IS OF UTMOST IMPORTANCE, BEFORE STARTING ON THE DESIGN OF THE MET SYSTEM. FOR FURTHER EMPHASIS ON THE TRENDS OF SHIP BOARD MANNING, TWO CHARTS OF JAPANESE EXPERIMENTAL SHIP BOARD MANNING, AND ONE DATA TABLE FROM NAUTICAL INSTITUTE OF U.K. HAVE BEEN ADDED FOLLOWING THIS PAGE.

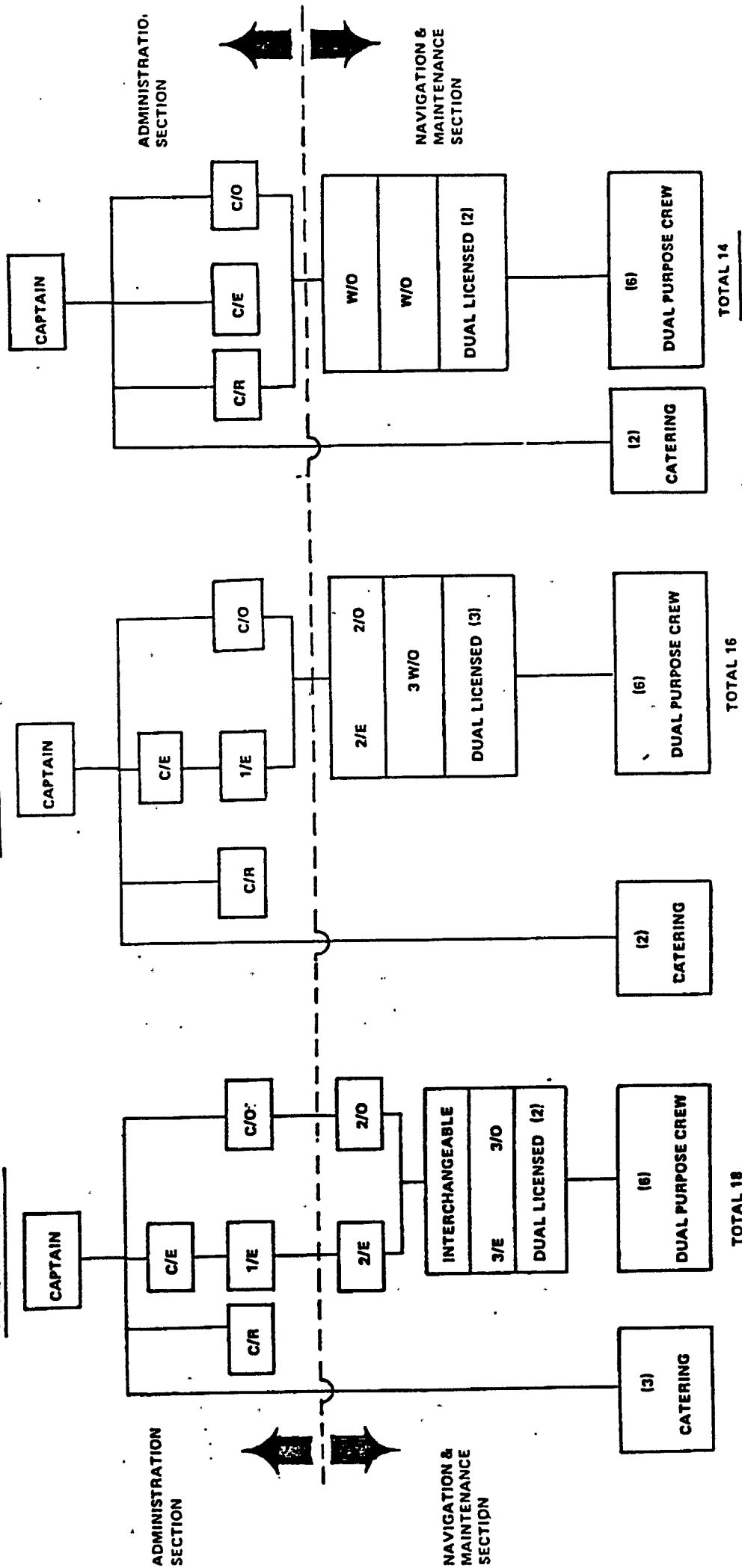
MODERNIZED JAPANESE CREW MANAGEMENT SYSTEMS (2)

EXPERIMENTAL HIGHLY RATIONALISED SHIPS (SHIP TYPES EXCLUDES ONLY GAS CARRIERS)

TYPE C FUTURE DEVELOPMENT

TYPE B No. 15

TYPE A No. 135



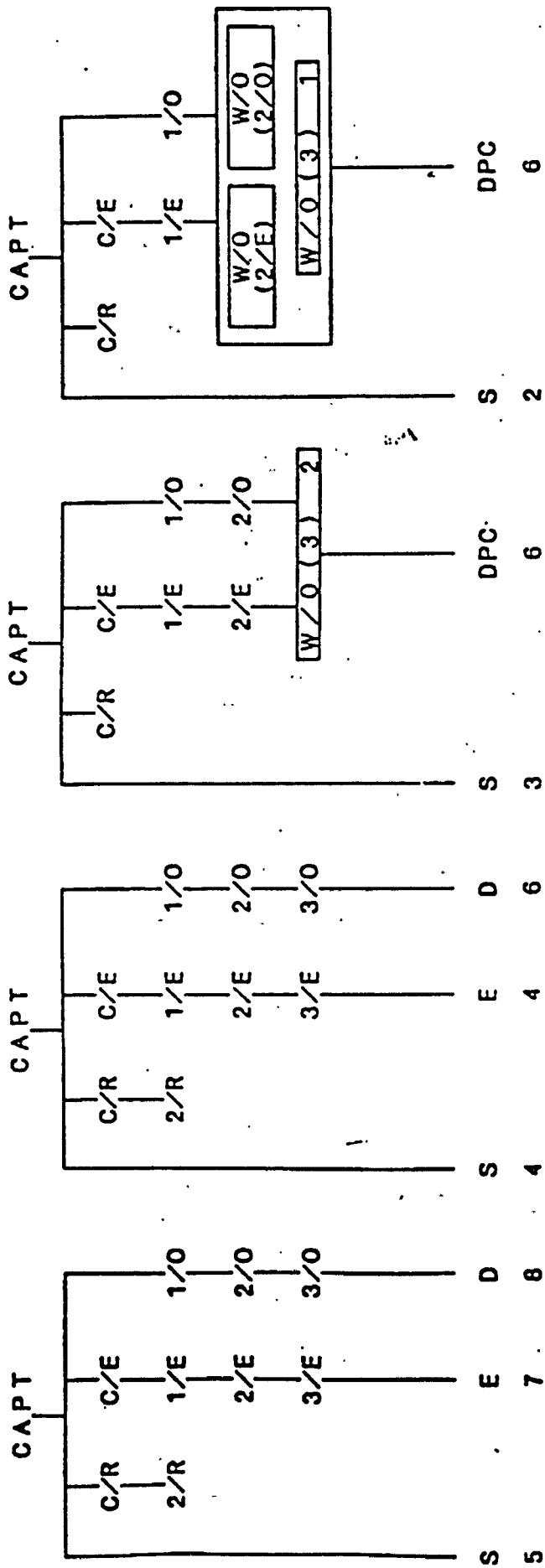
On 5th June 1985
 TYPE A (135) + TYPE B (15) = 150 SHIPS
 NOTE EXPERIMENT ENDED 15th July 1985

FORECAST BY 1990
 SHIP TYPE A + SHIP TYPE B = 350 SHIPS

TRANSITION OF COMPLEMENT

Conventional Ship → M zero Ship → Demonstration Ship A → Modernization Ship Experimental → Ship B

(Actual law) (Under experimentation)



Total. about 30

Total. about 24

Total. 18

Total. 16

C/R : Chief Radio Officer
 W/O : Watch Officer
 DPC : Dual Purpose Crew

REDUCTION OF MANNING SCALE

Department	Original Specification	Phased Reductions		
		A	B	C
Deck	Captain Mate Second Mate Third Mate Radio Officer Bosun (P.O.) Nine - ABs 15	Captain Mate Second Mate Third Mate Bosun (G.P.) Three ABs (G.P.) Radio Officer 9	Captain Mate Second Mate Third Mate Three - ABs (G.P.) Radio Officer/ Electronics Engineer 8	Captain Mate Second Mate Three - ABs (G.P.) Radio Officer/ Electronics Engineer 7
Engine Room	Chief Engineer Second Engineer Third Engineer Fourth Engineer Electrician Store Keeper (P.O.) Three Donkeymen Two Day Workers 11	Chief Engineer Second Engineer Third Engineer Electrician/Fourth Engineer Day Worker (G.P.) 5	Chief Engineer Second Engineer Third Engineer Engineering Hand/ Fitter (G.P.) 4	Chief Engineer Second Engineer Third Engineer 3
Hotel	Chief Steward Cook (P.O.) Assistant Cook Four Stewards 7	Cook/Chief Steward Steward Steward 3	Cook/Chief Steward Steward Steward 3	Cook/Chief Steward Steward 2
TOTAL	33	17	15	12

Source: Ship Manning Present and Future, 1983, The Nautical Institute, London.

16. JOB DESCRIPTION OF
DUAL PURPOSE OFFICER

16.1 THE PHILOSOPHY BEHIND THE DUAL PURPOSE MET HAS MAINLY TWO BASES.

- .1 FUTURE SHIP DESIGN IS THE MAIN CONCERN.
- .2 ECONOMY. ANY STEP FORWARD IN THIS FIELD BECOMES A POINT OF NO RETURN. EVEN IN THE FUTURE SHIP DESIGN ECONOMY IS A CONSIDERATION ONLY SECOND TO SAFETY.

16.2 BEFORE GOING ON TO THE DUAL PURPOSE MET, WE MUST LOOK AT THE JOB PROFILE OF THE FUTURE SHIP OFFICER. IN HOLLAND THIS JOB PROFILE WAS DESIGNED BY THE DUTCH SHIPOWNERS ASSOCIATION, THE DUTCH MINISTRY OF TRANSPORT AND THE SEAFARERS TRADE UNIONS JOINTLY. WHILE I PROPOSE THE JOB PROFILE I AM GUIDED BY THE DUTCH DOCUMENTS ON THIS SUBJECT. HOWEVER THESE DO NOT GO VERY FAR FROM A COMBINATION OF THE STCW 78 CONVENTION'S REG 11/4 AND 111/4 (REQUIREMENTS FOR CERTIFICATION OF NAUTICAL AND ENGINEERING WATCH KEEPING OFFICERS).

16.3 DESCRIPTION OF TASKS FOR A DUAL PURPOSE OFFICER.

NAVIGATION:

- .1 THE APPLICATION OF BASIC PRINCIPLES WHEN STANDING WATCH ON THE BRIDGE, ACCORDING TO REGULATION 11/1 OF STCW CONVENTION 1978.
- .2 DETERMINATION OF THE POSITION OF THE SHIP BY MEANS OF OBSERVATIONS OF CELESTIAL BODIES.
- .3 DETERMINATION OF THE POSITION OF THE SHIP BY MEANS OF OBSERVATIONS OF LAND MARKS AND NAVIGATIONAL BEACONS.
- .4 UNDERSTANDING OF GREAT CIRCLE SAILING, DEAD RECKONING

CACULATIONS INCLUDING WIND AND CURRENT INFLUENCES.

.5 DETERMINATION OF THE POSITION OF THE SHIP BY MAKING USE OF RADIO POSITIONING SYSTEMS NAMED, DECCA, LORAN C, OMEGA, AND SATELLITE NAVIGATION.

.6 MAKING USE OF THE RADIO DIRECTION FINDERS.

.7 MAKING USE OF NAVIGATIONAL CHARTS AND NAUTICAL PUBLICATIONS LIKE PILOTS, TIDE TABLES, LISTS OF LIGHTS, LISTS OF RADIO BEACONS, LIST OF RADIO SIGNALS, NOTICES TO MARINERS AND NAVIGATIONAL WARNINGS.

.8 MAKING USE OF MAGNETIC AND GYRO COMPASSES AND THE DETERMINATION OF COMPASS ERRORS BY MEANS OF SUNS AND STARS AZIMUTHS AS WELL AS LEADING LINES.

.9 MAKING USE OF NAUTICAL INSTRUMENTS LIKE SEXTANTS, AZIMUTH CIRCLES, CHRONOMETERS INCLUDING THE RECOGNITION OF ERRORS.

.10 MAKING USE OF ECHO SOUNDERS AND LOGS INCLUDING ELECTRICAL AND ELECTRONIC LOG SYSTEMS.

.11 MAKING USE OF RADAR FOR NAVIGATION AND FOR ANTICOLLISION INCLUDING AUTOMATIC RADAR PLOTTING AIDS.

.12 APPLICATION OF THE "RULES OF THE ROAD".

.13 KEEPING A GOOD LOOK OUT INCLUDING THE RECOGNITION OF LIGHTS AND SIGNALS AND OF AUDIBLE SIGNALS.

.14 STEERING THE SHIP GIVING RUDDER COMMANDS IN URDU AND ENGLISH, UNDERSTANDING THE OPERATION OF MANUAL AND AUTOMATIC STEERING SYSTEMS.

.15 MANEOUVRING THE SHIP, TAKING INTO ACCOUNT EFFECTS OF CARGO DISTRIBUTION, TRIM, DRAUGHT, SPEED, AND BOTTOM CLEARANCE, ALSO UNDERSTANDING THE EFFECTS OF SHALLOW WATERS ON THE CHANGES OF THE COURSE, TURNING CIRCLES, SHIP SPEED AND STOPPING DISTANCE.

.16 TAKING INTO ACCOUNT INFLUENCES OF WIND AND CURRENT WHILE MANEOUVRING.

.17 THE EXECUTION OF MANEOUVERS FOR MAN-OVER-BOARD.

.18 BEING INCHARGE OF AN ANCHOR PARTY.

.19 BEING INCHARGE OF A MOORING PARTY FORE AND AFT.

.20 ANCHORING THE VESSEL, MAKING USE OF THE ANCHOR WINCH. MAKING USE OF ROPE WINCHES AND ACCOMPANYING ROPE WORK.

.21 MAKING USE OF METEOROLOGICAL INFORMATION AND UNDERSTANDING OF WEATHER MAPS.

.22 REPORTING THE CURRENT WEATHER CONDITIONS ACCORDING TO INTERNATIONAL PROCEDURES, AND KEEPING UPTODATE AND CURRENT METEOROLOGICAL INFORMATION.

.23 MAKING USE OF METEOROLOGICAL INSTRUMENTS.

.24 FILLING IN OF THE SHIP'S LOG BOOK, INCLUDING THE CURRENT SITUATION REMARKS ETCETERA.

.25 PROCESSING INFORMATION FOR SAFE NAVIGATION INCLUDING THE CORRECTION OF CHARTS AND NAUTICAL PUBLICATIONS.

.26 SPEAKING UNDERSTANDING AND READING OF ENGLISH LANGUAGE AS NECESSARY FOR MAKING USE OF BRITISH SEA CHARTS, NAUTICAL PUBLICATIONS, NAVIGATION AND SAFETY MESSAGES, METEOROLOGICAL INFORMATION AND MESSAGES, THE COMMUNICATIONS WITH SHIPS AND COASTAL STATIONS FOR SAFE NAVIGATION, AS WELL AS MAKING USE OF THE IMO STANDARD MARITIME VOCABULARY.

.27 KEEPING AN EYE ON THE MAINTENANCE CONDITION OF THE SHIP.

16.4 PROPULSION:

.1 THE APPLICATION OF BASIC PRINCIPLES OF STANDING WATCH IN THE ENGINE ROOM ACCORDING TO THE REGULATION III/1 OF THE STCW CONVENTION 1978.

- .2 PREPARATION OF THE ENGINE ROOM MACHINERY FOR OPERATION AND SHUT DOWN OF THE SAME WHEN REQUIRED IN THE SAFE AND ECONOMICAL MANNER.
- .3 OPERATIONAL SURVEILLANCE AND CONTROL OF AUXILIARY BOILERS AND ACCOMPANYING FIRE INSTALLATIONS.
- .4 THE PROPER CHEMICAL ANALYSIS OF WATER IN THE BOILERS, FEED WATER AND ENGINE COOLING WATER.
- .5 MAKING USE OF LUBRICANTS, AND LUBRICATING SYSTEMS ON BOARD.
- .6 GOOD UNDERSTANDING OF PRECAUTIONARY MEASURES REGARDING FIRE AND EXPLOSION DANGERS.
- .7 OPERATIONAL SURVEILLANCE OF STEAM TURBINE ELECTRIC GENERATORS, OR OTHER AUXILIARIES.
- .8 OPERATIONAL SURVEILLANCE OF INTERNAL COMBUSTION ENGINES.
- .9 SURVEILLANCE AND CONTROL OF THE AUXILIARY EQUIPMENT FOR MAIN PROPULSION INSTALLATION.
- .10 KEEPING WATCH ON THE GEARBOXES PROPELLER SHAFTS AND THE AFFILIATED EQUIPMENTS.
- .11 MANEOUVRING THE MAIN PROPULSION PLANT BY BRIDGE REMOTE CONTROLS, ENGINE CONTROL ROOM AND BY EMERGENCY PROCEDURES.
- .12 RECORDING ESSENTIAL PROCESSED DATA, AND REPORTING OR COMPLETING THE ENGINE ROOM LOG BOOKS.
- .13 MAKING USE OF THE CORRECT SEALING AND INSULATION MATERIALS AND MEANS ON BOARD.
- .14 READING THE TECHNICAL DRAWINGS AND DIAGRAMS LIKE THE ONES PRESENT ON BOARD.

16.5 SUPPORTING SYSTEMS:

PREPARING FOR OPERATION, SWITCHING ON AND SWITCHING OFF.

AS WELL AS SURVEILLANCE AND CONTROL OF INSTALLATIONS WITH THE ACCOMPANYING AUXILIARY EQUIPMENT FOR;

- A) REFRIGERATION OF CARGO SPACES.
- B) HEATING OF LIQUID CARGO IN TANKS.
- C) AIR CONDITIONING OF LIVING AND WORKING QUARTERS ON BOARD
- D) PURIFICATION OF FUEL AND LUBRICATING OILS.
- E) RAISING OF STEAM FOR POWER PLANTS AND HEATING.
- F) GENERATION OF ELECTRIC POWER.
- G) POWER SUPPLY FOR PNEUMATIC AND HYDRAULIC EQUIPMENT.
- H) ASSISTING OF THE SENIOR OFFICERS IN BUNKERING OF FUEL AND LUBRICATING OILS.

16.6 SAFETY, ENVIRONMENT PROTECTION AND FIRST AID.

.1 THE DETERMINATION OF STATIC STABILITY BY MAKING USE OF STABILITY DATA AND CRITICAL READINGS OF STABILITY CURVES.

.2 MAKING USE OF EQUIPMENTS/INSTRUMENTS FOR DETERMINATION OF STABILITY.

.3 TAKING PART IN AND BEING IN CHARGE OF FIRE AND BOAT DRILLS.

.4 PREPARING FOR ACTUAL USE, AND MAINTENANCE OF LIFE SAVING EQUIPMENT.

.5 BEING IN CHARGE AS BOAT OR RAFT COMMANDER.

.6 BEING ABLE TO TAKE CHARGE OF A FIRE FIGHTING OPERATION ON BOARD, AND USE, OPERATION, AND MAINTENANCE OF THE FOLLOWING EQUIPMENTS.

- A) FIRE FIGHTING EQUIPMENT.
- B) FIRE AND EXPLOSION PREVENTION SYSTEMS/INSTALLATIONS.
- C) DETECTION SYSTEMS OF FIRE AND EXPLOSIONS.

.7 TAKING PART IN PRACTICE OF USE OF FIRE SUITS AND USE OF BREATHING APPARATUS.

.8 BE ABLE TO OPERATE THE WATER TIGHT DOORS, AND BE CONVERSANT WITH ENTIRE WATER TIGHT DIVISIONS OF THE SHIP AND THE SYSTEMS OF BILGE AND BALLAST.

.9 MAKING USE OF THE STRUCTURAL STRENGTH DATA OF THE SHIP AND BE ABLE TO SUCCESSFULLY USE THE INSTRUMENTS AND AVAILABLE DATA IN MEASURING THE STRESSES IN THE SHIP'S STRUCTURES TO PREVENT EFFECTS OF INCORRECT LOADING OR EXCEPTIONAL WAVES.

.10 BE ABLE TO READ THE SAFETY PLANS AND MAKING USE OF EMERGENCY ESCAPE ROUTES.

.11 BE ABLE TO USE THE INSTALLED EMERGENCY ALARMS, AND USE OF RADIO TELEPHONE FOR SENDING EMERGENCY MESSAGES.

.12 TAKING CARE OF PERSONAL SAFETY WHEN WORKING ON BOARD INCLUDING USE OF PROTECTIVE DEVICES TO PREVENT PERSONAL INJURIES.

.13 TAKING CARE OF PERSONAL SURVIVAL IN CASE OF ABANDONING THE SHIP AT SEA.

.14 BE ABLE TO TAKE MEASURES TO RESTRICT MARINE POLLUTION DISCHARGE OF FUELS, AND LUBRICANTS ETCETERA.

.15 BE ABLE TO USE BILGE WATER SEPERATER AND MONITOR THE OIL CONTENTS.

.16 BE ABLE TO MAINTAIN AN OIL DISCHARGE LOG BOOK AS PER REGULATIONS (MARPOL 1978)

.17 BE ABLE TO ADMINISTER THE FIRST AID, AND RECOGNISE AND USE THE SHIPS MEDICAL INSTRUCTION BOOK.

16.7 GENERAL SHIP'S DUTIES

.1 BE ABLE TO UNDERSTAND SHIP'S PLANS, TECHNICAL DRAWINGS AND THE MACHINERY MANUALS PRESENT ON BOARD.

.2 BE ABLE TO USE MEANS OF COMMUNICATIONS OF THE SHIP.

.3 BE ABLE TO TAKE MEASURES TO MAKE TANKS GAS FREE AND ACCESSABLE FOR INSPECTION OR MAINTENANCE AND REPAIR.

.4 BE ABLE TO EFFECTIVELY USE THE SHIP'S WORKSHOP AND ITS MACHINES FOR SIMPLE TYPE OF REPAIRS. SHOULD BE ABLE TO MAKE SCREW THREAD BY USE OF A LATHE MACHINE.

.5 BE ABLE TO TAKE PART IN REPAIR AND MAINTENANCE IN THE ENGINEERING DEPARTMENT, ALSO BE ABLE TO REPAIR ELECTRICAL AND ELECTRONIC EQUIPMENT.

.6 BE ABLE TO TAKE PART IN TASK DISCUSSIONS (BRIEFINGS) BEFORE THE START OF REPAIR WORK.

.7 BE ABLE TO RECORD THE MAINTENANCE WORK AND BE ABLE TO INTERPRET PLANNED MAINTENANCE DOCUMENTS.

.8 BE ABLE TO USE EQUIPMENT AND MATERIALS EFFICIENTLY.

.9 BE ABLE TO APPLY AGENTS FOR SURFACE TREATMENT AND RUST PREVENTION OF SHIP'S PARTS AND THE EQUIPMENTS.

.10 BE ABLE TO APPLY CLEANING AGENTS AND EQUIPMENTS TO SHIP'S MACHINES AND TANKS.

.11 BE ABLE TO USE THE ELECTRONIC OFFICE MACHINES LIKE DATA PROCESSORS ETCETERA.

16.8 COMMUNICATIONS.

.1 BE ABLE TO OPERATE THE TRANSMITTERS AND RECIEVERS ON THE BRIDGE.

.2 BE ABLE TO TRANSMIT AND RECEIVE ACCORDING TO THE INTERNATIONAL REGULATIONS.

.3 BE ABLE TO USE THE CURRENT INTERNATIONAL CONVENTIONS REGARDING LONG DISTANCE MESSAGES AND THE ATTACHED REGULATIONS FOR EMERGENT, URGENT, AND SAFETY MESSAGES AS WELL AS THE NORMAL MESSAGES BY USE OF INTERNATIONAL CODE OF SIGNALS.

.4 THE USE OF VHF IN ENGLISH AND URDU IN CONNECTION OF SAFE NAVIGATION.

.5 KEEPING AND MAINTAINING A LOG BOOK OF COMMUNICATIONS.

16.9 CARGO CARE.

.1 SUPERVISING OF THE SAFE LOADING AND DISCHARGING OF SHIPS, WITH PARTICULAR ATTENTION TO DANGEROUS GOODS, AND LIQUID CARGOES OBSERVING SAFE WORKING PRACTICES WITH CARGO GEAR AND PUMPING SYSTEMS.

.2 LASHING AND SECURING OF CARGOES.

.3 SUPERVISING THE PREPARATION OF CARGO LOADING, AND CLEANING OF CARGO HOLDS AND TANKS, INCLUDING GAS FREEING OF TANKS AND JUDGEMENT OF THE QUALITY OF CLEANING AGENTS.

.4 APPLICATION OF THE CURRENT SAFETY REGULATIONS, SPECIALLY THOSE RELATING TO DANGEROUS GOODS.

.5 THE USE OF SCALE OF DISPLACEMENT (TONS/CMS) ETCETERA, CALCULATION OF TRIM AND DRAFT TAKING IN ACCOUNT THE WATER DENSITY.

16.11 NAVIGATION SPECIALISATION.(BEYOND THE REQUIREMENTS OF OFFICER OF THE WATCH)

.1 DETERMINATION OF ROUTES OF PASSAGE TAKING INTO CONSIDERATION THE CARGO, SAFETY, AND ECONOMY USING ALL AVAILABLE DATA.

.2 ADJUSTMENT OF THE VOYAGE PLAN IN VIEW OF THE METEOROLOGICAL DISTURBANCES. APPRECIATION OF SIGNS OF APPROACHING HEAVY WEATHER, TAKING OF NECESSARY PRECAUTIONARY MEASURES.

.3 NAVIGATING IN FOG OR RESTRICTED VISIBILITY.

.4 DETERMINATIONS OF THE INFLUENCE OF IN-ACURACIES AND/OR ERRORS IN THE FIXES, WHILE USING CELESTIAL FIXES, RADIO

BEARINGS AND ELECTRONIC POSITIONING SYSTEMS.

.5 TIDAL CALCULATIONS BY MEANS OF TIDAL CONSTANTS.

.6 MANEUVRING IN RESTRICTED WATERS, INCLUDING IN PORTS AND NEAR JETTIES.

.7 APPRECIATION OF ERRORS OF GYRO AND MAGNETIC COMPASSES.

.8 SAFE AND ECONOMIC LOADING ACCORDING TO SHIP'S STABILITY AND STRENGTH DATA.

.9 MAKING OF AN STOWAGE PLAN, A PLAN OF DANGEROUS GOODS AND MANAGEMENT OF CARGO DOCUMENTS.

.10 APPLICATION OF LEGAL REGULATIONS REGARDING THE SHIPMENT AND TRANSPORTATION OF CARGO.

.11 MONITORING OF CARGO CONDITIONS DURING TRANSPORT ON BOARD, TAKING OF MEASURES TO KEEP CARGO IN GOOD CONDITIONS, PREVENTION DAMAGE AND PILFERAGE.

.12 COMPLYING WITH THE SAFETY REGULATIONS ISSUED BY NATIONAL ADMINISTRATION.

.13 TAKING OF SUITABLE PREVENTIVE MEASURES AGAINST POSSIBLE DAMAGE TO THE SHIP, RECOGNITION OF DAMAGE TO THE SHIP.

.14 ESTIMATION OF THE INFLUENCE OF FLOODING ON THE SHIP'S STABILITY, DUE TO LEAKAGES OR DAMAGE TO THE SHIP.

.15 PROPER KEEPING OF THE SHIP'S RECORDS, MANGEMENT AND MAINTENANCE OF THE SHIP IN GENERAL, EXCLUDING THE ENGINEERING DEPARTMENT.

.16 TAKING OF MEASURES TO PREVENT ENVIRONMENTAL POLLUTION BY HARMFULL SUBSTANCES, AS WELL AS APPLICATION OF RELEVANT REGULATIONS AND KEEPING OF RECORDS.

.17 ORGANISING OF AND ACCOMPANYING DURING INSPECTIONS/SURVEYS.

(CONTINUED ON NEXT PAGE)

ENGINEERING SPECIALISATION: (BEYOND THE REQUIREMENTS OF THE ENGINEER OFFICER OF THE WATCH)

.1 MANAGEMENT AND MAINTENANCE OF THE MAIN PROPULSION PLANT WITH ALL THE AUXILIARY SYSTEMS, STEERING GEAR, AND THE CARGO GEAR.

.2 EVALUATION OF THE OPERATION OF;

A) DIESEL ENGINES.

B) STEAM ENGINES.

C) BOILERS.

D) AUXILIARY MACHINERY.

E) ELECTRIC MACHINERY.

F) ELECTRICITY GENERATORS.

G) AIR CONDITIONING AND REFRIGERATION MACHINERY.

H) PUMPS AND OTHER RELATED EQUIPMENT.

I) THE SYSTEMS AND PROCESSES ON BOARD AND IN THE ENGINE ROOM

.3 THE DIAGNOSIS AND REPAIR OF THE FAULTS AMONG ALL ABOVE LISTED MACHINES AND THE HYDRAULIC AND PNEUMATIC SYSTEMS.

.4 FUEL ANALYSIS AND SUITABILITY FOR ENGINES AND BOILERS.

.5 ORGANISATION OF AND ACCOMPANYING OF INSPECTIONS AND SURVEYS.

.6 USE AND APPLICATION OF INSTRUMENTS TO DETERMINE THE POWER OF ENGINES.

.7 MAKING USE OF METHODS, FORMULAE AND DIAGRAMS FROM RECOGNISED CLASSIFICATION SOCIETIES, CALCULATION OF ACTUAL STRESSES OCCURING IN PARTS OF ENGINES ETCETERA.

.8 EVALUATION OF BALANCING OF ENGINES INCLUDING THE EFFECT OF HARMFULL VIBRATIONS.

17. PROPOSED MET SYSTEM FOR
PAKISTAN.

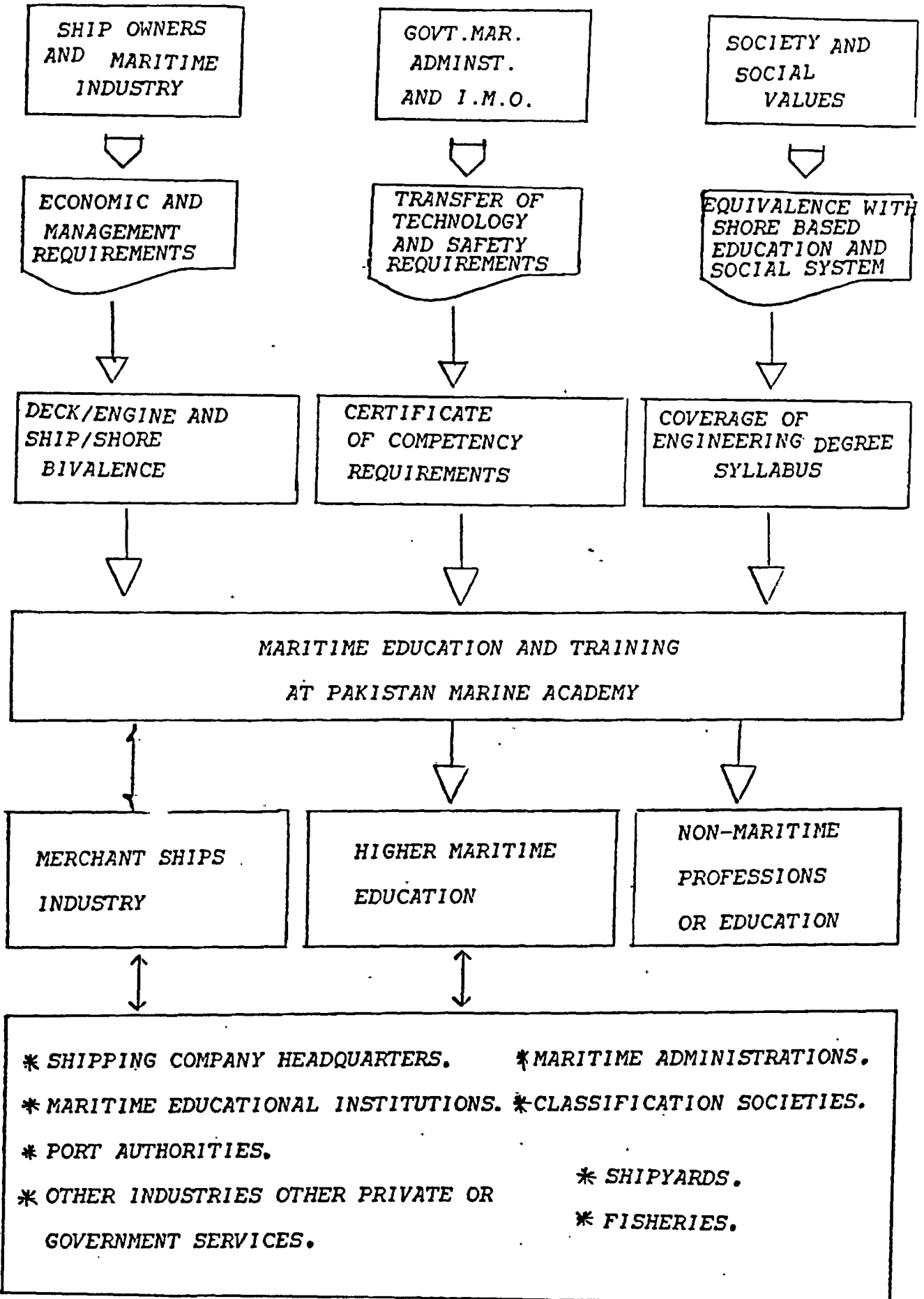
17.1 IN THE LIGHT OF MACRO AND MICRO OBJECTIVES ESTABLISHED EARLIER IN SECTIONS 6 AND 7 , A FLOW CHART OF THE ORIGINATING FACTORS AND THE RANGE OF SERVICE OF THE MET IS PRESENTED ON PAGE 69.

17.2 PAKISTAN'S MET SYSTEM HAS ONE EXTRA-ORDINARILY GOOD POINT AND THAT IS ITS FIVE YEARS SPAN OF THE CADET TRAINING. IN OTHER COUNTRIES THE EDUCATIONALISTS FIND IT VERY DIFFICULT TO RAISE THE TIME SPAN OF THEIR COURSES, INSPITE OF THE FACTUAL REASONS TO DO SO. THIS ALSO SEEMS TO BE THE MAIN REASON FOR MANY MET COURSES OF THE DEVELOPED COUNTRIES FINISHING ONLY ONE STEP SHORT OF THE ENGINEERING DEGREE LEVEL.

17.3 IF WE IN PAKISTAN TRY TO FOLLOW THE EXAMPLE OF OTHERS AND CUT DOWN THE BASIC MET TO FOUR YEARS, IN MY OPINION THIS WILL BE A VERY GRAVE MISTAKE. INFACIT WE SHOULD UTILISE THIS ADDITIONAL TIME IN GOING ONE STEP AHEAD OF OTHERS AND GIVE OUR YOUNGER GENERATION A BETTER START THAN WHAT WE WERE GIVEN.

17.4 HENCE THE PROPOSED MET SYSTEM HEAVILY DEPENDS ON THE FIVE YEAR SPAN OF TIME, ENABLING THE GRADUATING CADET TO HOLD AN ENGINEERING DEGREE AND A DUAL WATCH KEEPING OFFICERS CERTIFICATE OF COMPETENCY, (DECK AND ENIGINE). FROM NOW ON THIS GRADUATE WILL BE REFFERED TO AS "MARITIME OFFICER"

MET, ITS ORIGINS AND AREAS OF UTILITY.



17.5 WE ARE ALREADY LATE IN RESPONDING TO THE DEMANDS OF TIME. TO A GREAT EXTENT THE "FRONT ENDED EDUCATION" IS THE SOLUTION TO SEAFARER'S, THE SHIPOWNER'S, AND THE ADMINISTRATION'S PROBLEMS.

17.6 THE IMPROVEMENT OF THE LABORATORIES AND OTHER PRACTICAL TRAINING FACILITIES WAS WELL UNDERWAY IN PMA WHEN I LEFT FOR THIS COURSE AT WORLD MARITIME UNIVERSITY ON 23RD OF MARCH 1985, HENCE THE PROPOSED MET SYSTEM HERE, PRE-SUPPOSES THE AVAILABILITY OF MODERN EQUIPMENT IN THE UNDER MENTIONED AREAS OF PRACTICAL TRAINING FACILITIES.

- .1 THE COMPUTER LABORATORY. (25 SETS)
- .2 THE -ELECTRONICS AND AUTOMATION LABORATORY.(25 ELECTRONIC WORK BENCHES)
- .3 THE MARINE MACHINERY DEMONSTRATION LABORATORY.
- .4 THE AUTOMATIC RADAR PLOTTING AIDS SIMULATOR.
- .5 THE ENGINE ROOM SIMULATOR.
- .6 THE SHIP HANDLING SIMULATOR.
- .7 THE FIRE FIGHTING MOCK-UP AND DEMONSTRATION FACILITY.
- .8 THE LIFE SAVING APPLIANCES PRACTICE FACILITY.
- .9 THE WORKSHOP. (WELDING, BENCHFITTING, MACHINING ETC)
- .10 THE LIFE BOAT,DAVITS AND QUICK RELEASE SYSTEM.

17.7 IN MANY COUNTRIES THE TRAINING SHIP(S) ARE GAINFULLY EMPLOYED IN THE NORMAL TRADES OF THEIR SHIPPING. A FEASIBILITY TO ACQUIRE SUCH FACILITY THROUGH P.N.S.C. IS ALSO A PART OF THIS PAPER.

17.8 TWO CLASSES OF 20 TO 25 CADETS EACH ARE TAKEN AS THE BASIS FOR THE TEACHING AND ADMINISTRATIVE INFRASTRUCTURE OF THE ACADEMY. THIS WAY THE MAXIMUM CADET POPULATION AT ONE TIME ON THE CAMPUS WILL BE 200, (2*25*4) FOR FOUR BATCHES OF CADETS, FIRST TO FOURTH YEAR. FIFTH YEAR BEING AT SEA ON PRACTICAL TRAINING.

17.9 MODULAR COURSES: A MAJOR PROBLEM FACED BY THE PEOPLE WHO PRODUCE SYLLABI IS THE NAMES USED FOR VARIOUS SUBJECTS SPECIALLY WHEN THE COURSE OBJECTIVE DEMANDS A GOOD BLEND OF VARIOUS TOPICS. THE LECTURER'S QUALIFICATIONS, AND HISTORICAL ARTIFICIALITIES AMONG LECTURED SUBJECTS, POSE PROBLEMS IN WAY OF JOB INTEGRATION OF LECTURERS. ANY CHANGE IN THE SYLLABI DEMANDS FAIRLY OPEN MINDED DELIBERATIONS ON THE PART OF THE FACULTY MEMBERS WHO FORM THE "WORKING COMMITTEE" FOR THE REVIEW OF SYLLABI. THE LONG AND CONTINUOUS COURSES ARE NOT EASILY BIFURCATED AS AND WHEN THERE ARISES A NEED FOR A REFRESHER, OR SHORT DIVERSIFIED COURSE. THEREFORE THIS PAPER ADVOCATES SUB-DIVISION OF EACH SUBJECT INTO THREE OR FOUR LEVELS. EACH SO FORMED MODULE SHOULD HAVE ITS PART-OBJECTIVE VERY CLEARLY MENTIONED. I AM SURE THIS WILL BE COMPARATIVELY EASIER TO ACCOMPLISH, THAN WHERE THE WHOLE SUBJECT COVERS A LONGER TIME INTERVAL. THIS TYPE OF APPROACH WILL ALSO FACILITATE THE VERSATILITY OF AN INSTITUTION IN TAILOR MAKING VARIOUS COURSES TO THE REQUIREMENTS OF A CERTAIN LEVEL OF STUDENTS, OTHER THAN THE NORMAL ENTRY LEVEL. AN EXAMPLE OF SUCH A MODULAR COURSE IS PRESENTED ON THE NEXT PAGE. ALL OTHER COURSES OF THE PROPOSED CURRICULUM ARE ALSO AVAILABLE IN SIMILAR FORM BUT WILL NOT BE PRESENTED IN THIS VOLUME.

17.11(A SAMPLE OF MODULAR COURSE)

3RD SEMESTER

E-41 STRENGTH OF MATERIALS

CREDITS-4.5

CONTENT OUTLINE. STRESS AND STRAIN: THIN-WALLED CYLINDERS, POISSON'S RATIO, THERMAL STRESSES, AND MOHR'S CIRCLE. TORSION: SHAFTS, HELICAL SPRINGS, AND ECCENTRIC LOADING. WELDED AND RIVETTED JOINTS. SHEAR AND MOMENTS IN BEAMS. BEAM DEFLECTIONS. COLUMNS: EULER'S FORMULA AND OTHER COLUMN FORMULAE.

PRE-REQUISITE: COURSE E-30 (MECHANICS I)

TEXT BOOK: F.L.SINGER/A.PYTEL, STRENGTH OF MATERIALS. THIRD EDITION. HARPER AND ROW PUBLISHERS. NEWYORK.

REFERENCE: OTHER PUBLISHED STRENGTH OF MATERIAL BOOKS.

COURSE CO-ORDINATOR: ENGINEER INSTRUCTOR S.S.A.ZAIDI.

GOALS: THIS COURSE IS DESIGNED TO PROVIDE MARINE ENGINEERING STUDENTS WITH AN UNDERSTANDING OF STRENGTH OF MATERIALS AND TO APPLY THE CONCEPTS TO SUCCESSFUL MACHINE OR STRUCTURAL DESIGN WORK.

PRE-REQUISITE BY TOPICS: 1. STATICS 2. DYNAMICS 3. PHYSICS.

TOPICS: 1. SIMPLE STRESSES.....5 CLASSES 2. SIMPLE STRAIN.....5 CLASSES 3. TORSION.....4 CLASSES 4. SHEAR AND MOMENTS IN BEAMS....5 CLASSES

CONTINUED

18. COURSE CATEGORISATION

18.1 ALL THE MODULAR COURSES HAVE BEEN CLASSIFIED INTO FOUR CATEGORIES, I.E. SCHOLASTIC (S), MANAGEMENT (M), NAUTICAL (N), AND ENGINEERING (E). THE NUMBERS OF COURSES IN EACH CATEGORY ARE AS UNDER:

- .1 SCHOLASTIC (S),..... 13 COURSES
- .2 MANAGEMENT (M),..... 11 COURSES
- .3 NAUTICAL (N),..... 14 COURSES
- .4 ENGINEERING (E),..... 29 COURSES

ALL THESE COURSES ARE TO BE COVERED WITHIN THE AVAILABLE CLASS ROOM TIME IN THE FIRST FOUR YEARS. THE MANDATORY COURSES PERTAINING TO THE REQUIREMENTS OF STCW CONVENTION OF 1978, WILL BE COVERED IN THE EVENINGS ON THE ALTERNATE DAYS OF THE WEEK, (I.E. SAT, MON & WED) THIS WILL FACILITATE THE PARTICIPATION OF CANDIDATES OTHER THAN CADETS.

18.2 THE MANAGEMENT COURSES WILL BE TAUGHT BY A TEAM OF TEACHERS FROM ALL THE THREE DEPARTMENTS OF PMA. THE STCW COURSES WILL BE TAUGHT BY A TEAM OF TEACHERS FROM THE ENGINEERING AND NAUTICAL DEPARTMENTS OF PMA, ASSISTED BY THE SAME DEPARTMENTS OF STC.

18.3 THE RATIO OF WORK-LOAD BETWEEN ENGINEERING AND NAUTICAL DEPARTMENTS OF PMA WILL REVERSE WHEN THE POST SEA TRAINING IS DISCUSSED. THE CONTENT OF THE POST SEA COURSES WILL LEAN HEAVILY TOWARDS THE NAUTICAL AND MANAGEMENT TOPICS, WITH ONLY FEW ENGINEERING MODULES. THIS IS OBVIOUSLY DUE TO THE COVERAGE OF ENGINEERING DEGREE SYLLABUS IN THE BEGINING. POST SEA COURSES WHETHER THEY BE NAUTICAL OR MANAGEMENT, WILL HEAVILY DEPEND ON THE ENGINEERING BASICS.

19. CREDIT HOUR SYSTEM.

19.1 THE NED ENGINEERING UNIVERSITY AT KARACHI IS USING THE SEMESTER SYSTEM. IT WILL BE CONVENIENT IN UNDERSTANDING LATER DEALINGS WITH THE NATIONAL EDUCATION AUTHORITIES IF PMA ALSO ADOPTS A SIMILAR PATTERN. THE CREDIT HOUR SYSTEM IS ALSO ASSOCIATED WITH SEMESTER SYSTEMS WHICH ARE OF AMERICAN ORIGIN. THIS SYSTEM ALSO MAKES ADMINISTRATION SIMPLER.

19.2 ONE CREDIT HOUR IS EQUAL TO ONE CLASS HOUR PER WEEK OR TWO LABORATORY HOURS PER WEEK FOR THE WHOLE SEMESTER. THE TIME SPENT ON THE SUBJECTS IS THEREFORE THE BASIS AND IS IMPORTANT. THE MAIN ADVANTAGE OF CREDIT HOUR SYSTEM IS THE EXTREMELY SIMPLE PROCEDURE OF EVALUATION OR GRADING OF EXAMINATIONS. BASICALLY THE EXAMINATION IS MARKED BY THE EXAMINOR INTO ONE OF THE FIVE GRADES, I.E. A, B, C, D, OR F. THE RANGES OF MARKS FOR EACH GRADE VARIES SLIGHTLY AMONG VARIOUS INSTITUTIONS. THE COMMONLY USED ARE: A(90% TO 100%), B(80% TO 89.9%), C(70% TO 79.9%), D(60% TO 69.9%), AND F(LESS THAN 60%).

19.3 EVALUATION: GRADES A,B,C,D,AND F, HAVE MULTIPLIERS OF 4, 3,2,1,AND 0 RESPECTIVELY. THE FINAL EVALUATION OF AN STUDENT IS BASED ON THE QUALITY POINT AVERAGE. IF A COURSE HAS 3 CREDIT HOURS, THE QUALITY POINTS FOR A TO F GRADES WILL BE AS FOLLOWS:

A GRADE GETS $(4 \times 3) = 12$ QUALITY POINTS.

B GRADE GETS $(3 \times 3) = 9$ QUALITY POINTS.

C GRADE GETS $(2 \times 3) = 6$ QUALITY POINTS.

D GRADE GETS $(1 \times 3) = 3$ QUALITY POINTS.

F GRADE GETS $(0 \times 3) = 0$ QUALITY POINTS.

19.4 SUPPOSING A CANDIDATE TOOK A REFRESHER COURSE COMPRISED OF FOUR MODULAR COURSES, E-30, E-104, E-21, AND E-108. HIS EVALUATION ON THE BASIS OF THE QUALITY POINT AVERAGE WOULD BE AS FOLLOWS:

COURSE.....	CREDIT.....	GRADES.....	QUALITY
TAKEN	HOURS	SCORED	POINTS
E-30.....	3.0.....	A.....	12
E-104.....	4.0.....	B.....	12
E-21.....	3.0.....	C.....	6
E-108.....	4.0.....	D.....	4
=====			
TOTALS.....	14.0.....		34.
=====			

QUALITY POINT AVERAGE = $34/14 = 2.42$

ON A SCALE OF 1 TO 4 THE QPA OF 2.42 WILL BE REGARDED AS ABOVE AVERAGE.

UNIVERSITY OF CALIFORNIA WHICH HAS AROUND 350,000. STUDENTS USES THIS SYSTEM OF EVALUATION.

19.5 OVER ALL GRADES ARE ACCORDING TO QUALITY POINT AVERAGES OF THE ENTIRE COURSE. FOR EXAMPLE:

A QUALITY POINT AVERAGE OF 3.5 TO 4.0 EQUAL AN "A" GRADE.
QUALITY POINT AVERAGE OF 3.0 TO 3.49 EQUALS A "B" GRADE.
QUALITY POINT AVERAGE OF 2.5 TO 2.99 EQUALS A "C" GRADE.
QUALITY POINT AVERAGE OF 2.0 TO 2.49 EQUALS A "D" GRADE.
CANDIDATES BELLOW 2.0 QPA HAVE FAILED AND HAVE TO BE COUNCELLED FOR THEIR WEEKNESSES AND WAYS TO IMPROVE THEIR PERFORMANCE WHILE THEY REPEAT THE SEMESTER OR THE YEAR.

20. PROPOSED CURRICULUM FOR THE MARITIME OFFICER

20.1 FIRST YEAR (MODULAR COURSES)	CREDIT HOURS
S-50 ENGLISH.I.....	3.0
E-10 METAL JOINING PROCESSE[.....	0.75
E-20 INTRODUCTION TO COMPUTER SCIENCE.....	3.0
E-30 ENGINEERING MECHANICS.I.....	3.0
E-31 ENGINEERING MECHANICS.II.....	4.0
E-33 THERMODYNAMICS.I.....	3.0
M-10 AND 11. BUSINESS/MARITIME LAW.....	5.0
M-20 AND 21. ECONOMICS.I AND II.....	6.0
S-20 INTRODUCTION TO LINEAR DIFF.EQUATIONS.....	4.0
S-30 AND 31. PHYSICS.III AND IV.....	7.0
S-21 DIFFERENTIAL EQUATIONS.I.....	4.0
S-40 PAKISTAN STUDIES.I.....	2.0
M-30 ISLAMIC STUDIES.I.....	4.0
S-R REGIMENTAL TRAINING.I.....	4.0
=====	
FOR FIRST TWO SEMESTERS TOTAL CREDIT HOURS.....	52.75
=====	
20.2 SECOND YEAR (MODULAR COURSES)	
N-10 MARINE ELECTRONICS.....	3.0
N-20 MARINE MATERIALS HANDLING.....	3.0
N-30 SEAMANSHIP.I.....	2.0
N-40 METEOROLOGY.....	4.0
N-50 NAVIGATION.I.....	4.0
E-40 INTRODUCTION TO MATERIALS ENGINEERING.....	3.5
E-41 STRENGTH OF MATERIAL.....	4.5
E-50 PRINCIPLES OF NAVAL ARCHITECTURE.....	3.0
E-32 FLUID MECHANICS.....	3.5
E-34 THERMODYNAMICS.II.....	3.5

CONTINUED ON NEXT PAGE

S-R1 REGIMENTAL TRAINING.II.....	2.0
E-35 THERMODYNAMICS.III.....	4.0
E-60 ELECTRIC CIRCUITS.I.....	3.5
E-61 ELECTRIC CIRCUITS.II.....	4.0
N-60 SAFETY OF LIFE AT SEA.....	1.5
S-41 PAKISTAN STUDIES.II.....	2.0
M-31 ISLAMIC STUDIES.II.....	4.0
S-51 ENGLISH.II.....	3.0

3RD AND 4TH SEMESTER TOTAL CREDIT HOURS..... 58.0

20.3 THIRD YEAR (MODULAR COURSES)

S-70 AND 71.ENGINEERING GRAPHICS.....	3.0
M-33 ISLAMIC STUDIES.III.....	4.0
E-100 FUNDAMENTALS OF ENGINEERING DESIGN.....	3.0
E-101 MACHINE DESIGN.....	3.0
E-102 SHIP RESISTANCE AND PROPULSION.....	3.0
E-103 HEAT TRANSFER.....	3.0
E-104 ELECTRONICS.....	4.0
E-105 TO 107.MARINE ENGINEERING SYSTEMS.I,II,III.	13.25
E-108 AUTOMATIC CONTROL SYSTEMS.I.....	4.0
E-109 AUTOMATIC CONTROL SYSTEMS.II.....	3.0
E-110 ELECTRONICS.II.....	3.0
N-80 BRIDGE SIMULATION.....	3.0
E-21 COMPUTER CONTROL SYSTEMS.....	3.0
STCW 78.MANDATORY COURSES.....	6.0

5TH AND 6TH SEMESTER TOTAL CREDIT HOURS..... 58.25

CONTINUED ON NEXT PAGE....

20.4 FOURTH YEAR (MODULAR COURSES) CREDIT HOURS

S-R2	REGIMENTAL TRAINING.....	2.0
E-63	ALTERNATING-CURRENT MACHINERY.....	3.75
E-70	MARINE REFRIGERATION.....	3.75
E-90 AND 91	INTERNAL COMBUSTION ENGINES, I & II.	7.5
M-32	ISLAMIC STUDIES.III.....	4.0
M-40	MARINE TRANSPORTATION.....	3.0
M-50	MANAGERIAL PROCESS.....	3.0
M-41	MARINE INSURANCE.....	3.0
N-61	MARINE SAFETY.....	3.0
N-70	COMMUNICATIONS.....	1.0
N-31	SEAMANSHIP.II.....	3.0
N-51	NAVIGATION.II.....	2.0
N-71	COMMUNICATIONS LABORATORY.....	1.0
N-11 AND 12	MARINE ELECTRONICS.II & III.....	6.0

 THESIS TO BE SUBMITTED AFTER 7TH SEMESTER..... 10.0

7TH AND 8TH SEMESTER TOTAL CREDIT HOURS..... 56.00

20.5 TOTAL CREDIT HOURS REQUIRED FOR ENGINEERING
 DEGREE AND DUAL WATCH KEEPING LICENSE..... 217.00

20.6 FIFTH YEAR WILL BE AT SEA TO FULFILL THE REQUIREMENTS OF
 THE STCW CONVENTION FOR THE NAUTICAL WATCH KEEPER,
 (REG.II/4 AND REG.III/4).

SEA PERIOD DIARY WILL BE EVALUATED TOWARDS THE SUCCESS-
 FULL COMPLETION OF SEA TIME OTHERWISE THE ADMINISTRATION
 WOULD AWARD EXTRA SEA TIME. SEA DIARIES WILL BE PREPARED
 BY PMA AND WILL COVER THE ENTIRE COMMON TASKS OF THE JOB
 PROFILE OF THE MARITIME OFFICER.

TEACHING TIME ANALYSIS

1st Year

JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC.	
WINTER BREAK FRESHERS JOIN.		FIRST SEMESTER.				SUMMER VACATIONS		SECOND SEMESTER.				EXAMINATIONS EXAMINATIONS GRADUATION WINTER BREAK
2 WKS	4 WKS	4 WKS	4 WKS	3 WKS			4 WKS	4 WKS	4 WKS	4 WKS		
AVAILABLE CLASS ROOM TIME-17 WKS @ 5 DAYS PER WK. PUBLIC HOLIDAYS INCLUSIVE												
AVAILABLE CLASS ROOM TIME-16 WKS @ 5 DAYS PER WK. PUBLIC HOLIDAYS INCLUSIVE.												

2nd, 3rd & 4th YEARS

JAN.	FEB	MAR.	APR.	MAY.	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	
WINTER BREAK		3RD, 5TH, AND 7TH SEMESTER				EXAMINATIONS SUMMER		4TH, 6TH, AND 8TH SEMESTER				EXAMINATION EXAMINATION GRADUATION WINTER BREAK
3 WKS	4 WKS	4 WKS	4 WKS	3 WKS	VACATIONS		4 WKS	4 WKS	4 WKS	4 WKS.		

SECOND, THIRD, AND FOURTH YEARS WILL BE IDENTICAL IN AVAILABLE TIME FOR TEACHING.

FIRST SEMESTER TOTAL 40 MINUTE TEACHING HOURS- 17*35- 595
 2ND, 4TH, 6TH, AND 8TH SEMESTER TEACHING HOURS-16*4*35- 2240
 3RD, 5TH, AND 7TH SEMESTER TEACHING HOURS.....-18*3*35- 1890
 TOTAL 40 MINUTES TEACHING HOURS IN 4 YEARS.....- 4725
 ALLOWANCE FOR PUBLIC HOLIDAYS @ 12 DAYS PER YEAR.....- 280

NET AVAILABLE TEACHING TIME..... 4445

TIME REQUIRED FOR PROPOSED CURRICULUM..... 4258
 TIME UTILISED FOR STCM COURSES AND THESES..... 187

21. . FUTURE EXAMINATIONS AND CERTIFICATION

OF MARITIME OFFICERS

21.1 THE PHILOSOPHIES BEHIND THE NEW SYSTEM OF EXAMINATIONS AND CERTIFICATION ARE IN TOTAL HARMONY WITH THE OVER ALL NATIONAL OBJECTIVES AND ALSO WITH THE MACRO AND MICRO OBJECTIVES AT SECTIONS 6 & 7 OF THIS PAPER AND ARE AS FOLLOWS:

- ✓ .1 TO RAISE THE GENERAL STANDARDS OF MET IN ORDER TO HELP IN ACHIEVING THE NATIONAL OBJECTIVES OF SELF SUFFICIENCY IN SCIENCE AND TECHNOLOGY.
- ✓ .2 TO PROVIDE BASIS FOR A SMOOTH CHANGE-OVER FROM THE PRESENT TO THE FUTURE SYSTEM OF SHIP BOARD MANNING.
- ✓ .3 TO MOTIVATE THE PRESENT SEAFARERS TO ENHANCE THEIR LEVEL OF EDUCATION AND TRAINING.
- .4 TO MOTIVATE MARITIME AUTHORITIES TO PROVIDE THE FACILITIES FOR .3 .
- ✓ .5 TO PRODUCE COMPETITIVE SEAFARERS TO SERVE ON FOREIGN FLAG VESSELS IN ORDER TO EARN FOREIGN EXCHANGE FOR THE COUNTRY.
- .6 TO BE ABLE TO CLAIM EQUIVALENCE OF A MASTERS DEGREE TO THE HIGHEST SHIP QUALIFICATION OF "COMMAND CERTIFICATE".
- .7 TO RAISE THE STANDARDS OF MET OF PAKISTAN MERCHANT NAVY SO THAT AN EQUIVALENCE BETWEEN NAVAL AND MERCHANT MARINE RANKS BE FACILITATED AND ESTABLISHED FOR THE POSSIBLE UTILISATION OF MERCHANT NAVY OFFICERS AS PAKISTAN NAVAL RESERVES.

21.2 THE PROPOSED "INTERIM CERTIFICATION PLAN" AT PAGE 82, PRESUPPOSES THAT THE MARITIME OFFICER (GRADUATE OF PMA) MAY STILL HAVE TO SERVE ON EXISTING CONVENTIONAL OR UMS CLASS VESSELS WHICH ARE OPERATING WITH DECK AND ENGINE

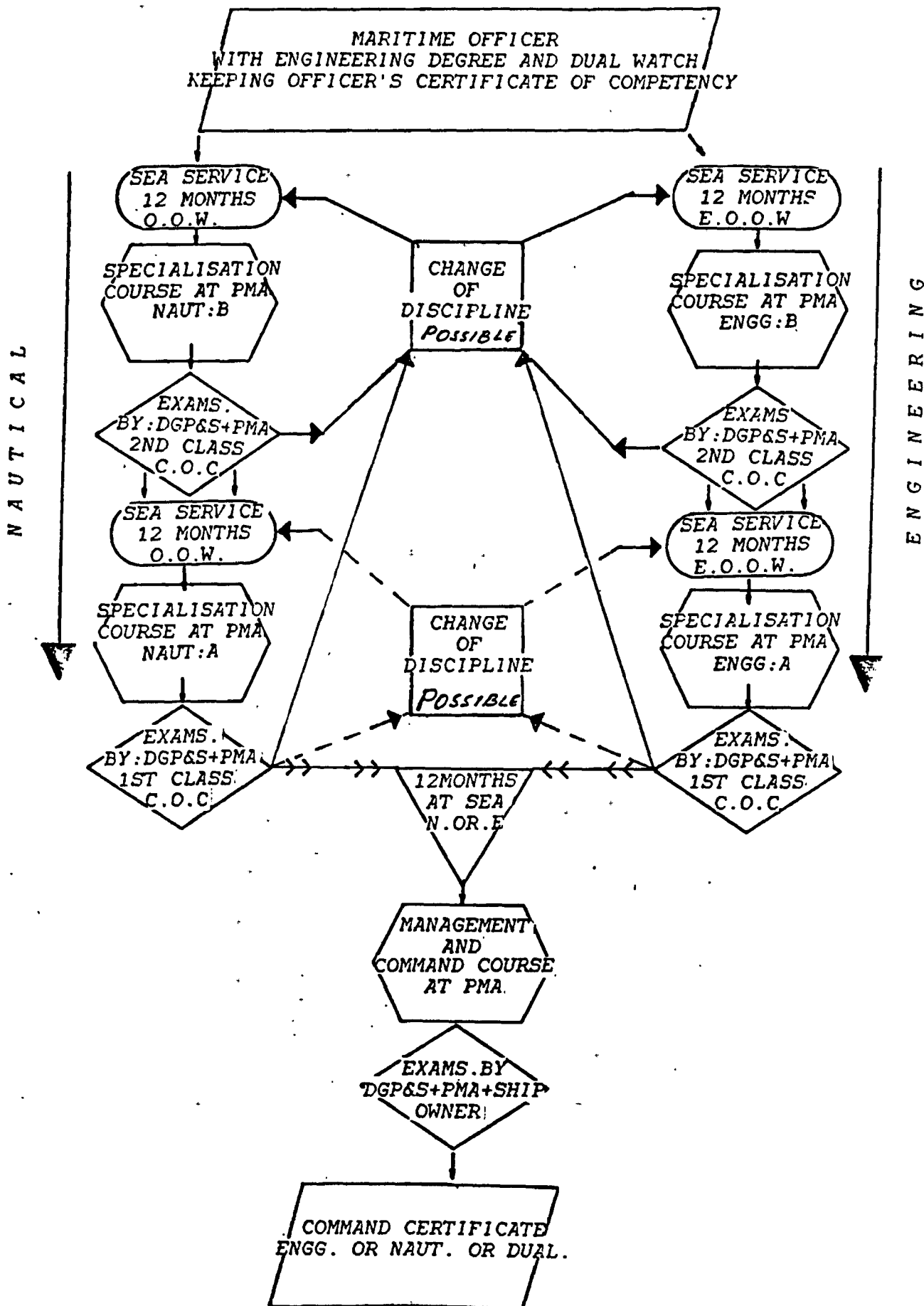
DIVISIONS. IN THIS CASE HE WILL HAVE TO JOIN IN ONE DEPARTMENT EITHER AS NAVIGATING OR ENGINEERING WATCH KEEPING OFFICER. WITH THE EXISTING RULES OF SEATIME ASSESSMENT, HE WOULD BE ABLE TO ACHIEVE THE PROPOSED HIGHEST DUAL CERTIFICATE OF COMPETENCY (COMMAND CERTIFICATE) WITHIN 8 TO 11 YEARS. THIS IS VERY NEAR THE PRESENT AVERAGE JOB MATURITY TIME SPAN OF 7 TO 10 YEARS IN PAKISTAN MERCHANT NAVY.

21.3 THE PROPOSED SYSTEM CAN BE MADE DIFFICULT OR EASY AS REQUIRED BY THE ADMINISTRATION, BY ADOPTING SUCH POLICIES AS DEEMED FIT. FOR EXAMPLE IT COULD BE MADE COMPULSORY TO OBTAIN 1ST CLASS C.O.C. IN BOTH DISCIPLINES OR AT LEAST A 2ND CLASS C.O.C IN THE OTHER DISCIPLINE BEFORE ATTEMPTING FOR THE COMMAND CERTIFICATE. THE POINTS OF CHANGE OF DISCIPLINE CAN ALSO BE MADE RIGID OR FLEXIBLE AS PER ADMINISTRATION'S POLICIES.

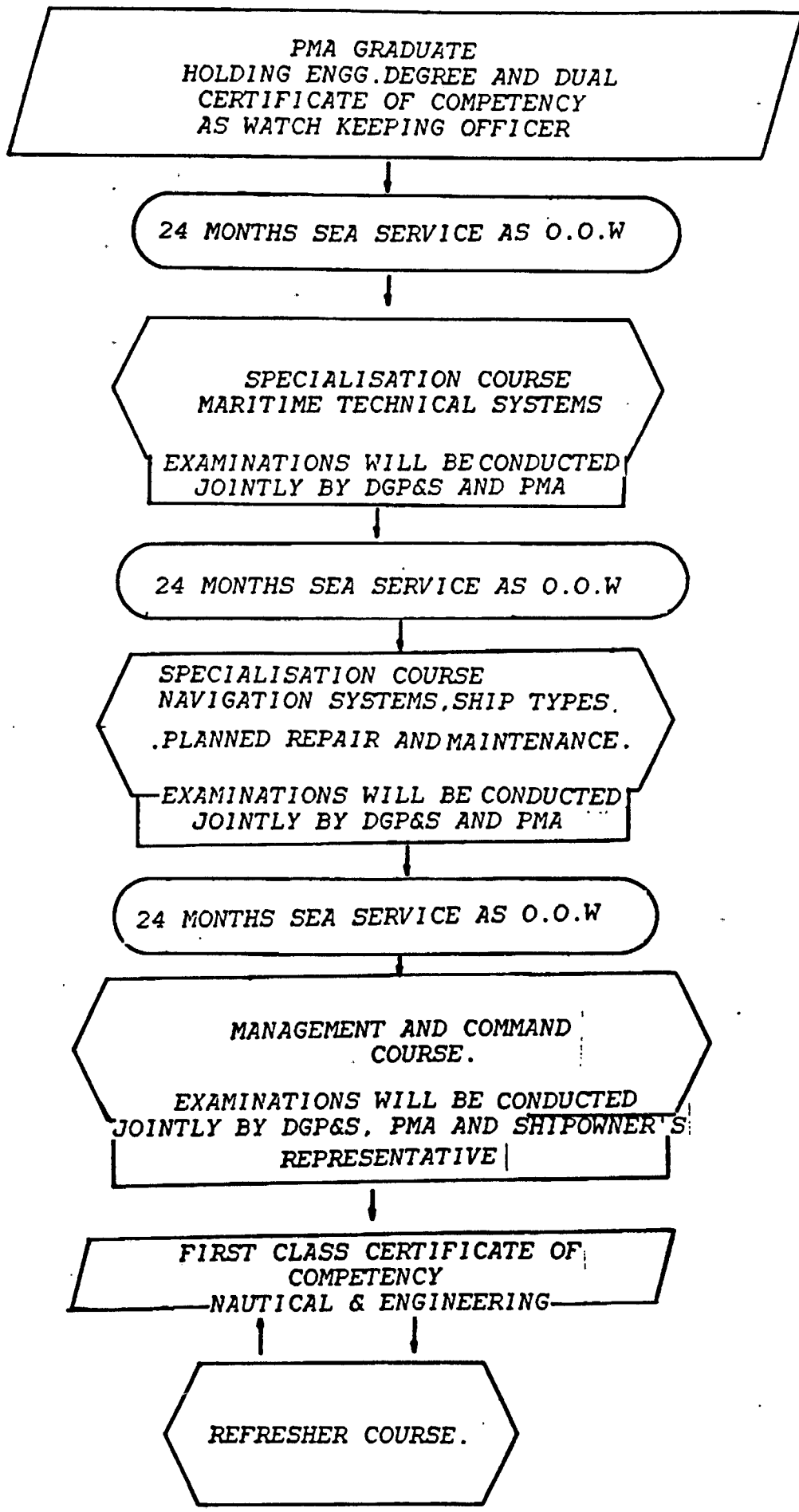
21.4 THE SECOND FLOW CHART ON PAGE 83 IS FOR THE FUTURE SHIP TYPES AND IS FAIRLY SIMPLE. AT THIS LEVEL THERE IS NO CONCEPTION OF DECK OR ENGINE SIDE. THERE ARE NO DIVISIONS AND THE MARITIME OFFICERS ARE PERFORMING THE ENTIRE SHIP'S TASKS DEVIDED AMONG THEM SELVES.

21.5 AT THIS POINT IT IS NECESSARY TO GIVE AN OUTLINE OF THE NAUTICAL SPECIALISATION COURSES "A" AND "B", AND THE ENGINEERING SPECIALISATION COURSES "A" AND "B". SINCE THE MARITIME OFFICERS ALREADY HOLD AN ENGINEERING DEGREE, THE PART A OF THE PRESENT 1ST CLASS AND 2ND CLASS C.O.C ARE EXEMPTED FOR THEM. AS AN EXAMPLE INDIAN MET GIVES SUCH EXEMPTIONS TO THEIR MARINE ENGINEERING CANDIDATES.

INTERIM CERTIFICATION PLAN
FOR CONVENTIONAL/ UMS CLASS SHIPS.



MODERN SHIP (YEAR 2000 AD)
CERTIFICATION OF MARITIME OFFICERS



ON THE NAUTICAL SIDE THE MARITIME OFFICER WILL BE EXEMPTED FROM PAPER 5 (APPLIED SCIENCES) AND PAPER 7 (MATHS PURE AND APPLIED) OF THE 3RD CLASS(2ND MATE) C.O.C. THE MARITIME OFFICER WILL ALSO BE EXEMPTED FROM PAPER 4 (ENGINEERING AND CONTROL SYSTEMS) OF THE 1ST CLASS C.O.C.(MASTER). THE UNITED KINGDOM IS GIVING SUCH EXEMPTIONS TO THEIR NAUTICAL CANDIDATES WHO HAVE RELEVANT TECHNICAL QUALIFICATIONS. KEEPING THIS IN VIEW AND REFERING TO THE U.K. DEPARTMENT OF TRADE SYLLABI FOR CERTIFICATES OF COMPETENCY PRINTED IN THE YEAR 1982, THE SYLLABI FOR THE PROPOSED NAUTICAL AND ENGINEERING SPECIALISATION COURSES "A" AND "B" ARE SUGGESTED AS FOLLOWS:

SPECIALISATION COURSES.	"A"	"B"
ENGINEERING.	EXTRA 1ST CLASS PART B SYLLABUS OF D.O.T. UNITED KINGDOM.	1ST CLASS PART B AND EXTRA FIRST CLASS PART A OF D.O.T. UNITED KINGDOM.
NAUTICAL.	EXTRA MASTER'S C.O.C SYLLABUS OF D.O.T. U.K. (NOTICE NO.M.1126) ONLY LAST 4 PAPERS TO BE PASSED, ALL OTHER REQUIREMENTS EXEMPTED.	3RD, 2ND, AND 1ST CLASS C.O.C. SYLLABI OF D.O.T. U.K. WITH TWO PAPERS OF 3RD, & ONE PAPER OF 1ST CLASS EXEMPTED. (NOTICE NO.M.1060)

21.7 BECAUSE OF THE STRONG BASE ON THE MATHEMATICS, PHYSICS AND OTHER TECHNICAL SUBJECTS THE MARITIME OFFICER WOULD NOT FIND THESE EXAMINATIONS VERY DIFFICULT, AND THE TOPICS OF THE CONCERNED SUBJECTS WOULD BE COVERED IN MUCH LESS TIME THAN THE TRADITIONAL LONG COURSES.

21.8 THE PROPOSED COMMAND CERTIFICATE SYLLABUS WOULD BE COMPRISED OF THE FOLLOWING MAIN TOPICS:

- .1 MANAGEMENT.
- .2 ECONOMICS.
- .3 LAW.
- .4 ISLAMIC STUDIES.
- .5 INTERNATIONAL AFFAIRS.
- .6 MARITIME TRANSPORTATION.
- .7 INTERNATIONAL CONVENTIONS/CONFERENCES.
- .8 CASE STUDIES (PRACTICAL APPLICATION OF .1 TO .7)

21.9 THE VISITING FACULTY WILL BE COMPOSED OF THE HEADS OF VARIOUS DEPARTMENTS OF P.N.S.C , K.S.E.W , K.P.T., PORT QASIM, DIRECTORATE GENERAL PORTS AND SHIPPING AND THE INSTITUTE OF BUSINESS ADMINISTRATION, UNIVERSITY OF KARACHI. THE REPRESENTATIVES OF CLASSIFICATION SOCIETIES WILL ALSO BE INVITED IN ACADEMIC SEMINARS RELATED TO THIS COURSE. ALL THE PROFESSIONAL SUBJECTS OF ENGINEERING AND NAUTICAL DISCIPLINES WILL BE TERMINATED PRIOR TO THIS COURSE. HENCE THIS COURSE WILL TOTALLY BE DEVOTED TO ADMINISTRATION AND BUSINESS SIDES WHICH WILL FACILITATE THE SHIP/SHORE COMMUNICATION AND UNDERSTANDING. THIS WILL ALSO PREPARE A SHIP OFFICER FOR WORKING ASHORE IN A MANAGERIAL CAPACITY IN FUTURE.

21.11 THE EXAMINATIONS: IN COUNTRIES WITH FRONT ENDED MET THE EXAMINATIONS ARE CONDUCTED AT THE EDUCATIONAL INSTITUTIONS, WITH AN EXTERNAL ASSESSOR FROM THE MARITIME ADMINISTRATION. THIS IS ALSO USEFULL IN AVOIDING THE DUPLICATION OF INVESTMENTS ON EXAMINATION HALLS AND OTHER NECESSARY EQUIPMENT AND STAFF.

21.12 HENCE THE INTERIM AND THE FUTURE EXAMINATION AND CERTIFICATION PLANS SUGGEST THAT EXAMINATIONS BE CONDUCTED JOINTLY BY PMA AND DGP&S AT PMA.

21.13 THE COMMAND CERTIFICATE WILL ENABLE A CANDIDATE TO ENTER THE SUPERIOR CADRE OF THE MARITIME PERSONNEL. THIS INVOLVES THE RESPONSIBILITIES OF VERY CAPITAL INTENSIVE NATURE INVOLVING MILLIONS OF DOLLARS OF THE SHIPOWNERS. IT IS THEREFORE SUGGESTED THAT THE REPRESENTATIVE OF THE SHIPOWNERS BE MADE A PARTY TO THE JOINT BOARD OF EXAMINERS FOR THE COMMAND COURSE.

21.14 THE INVOLVEMENT OF NATIONAL EDUCATIONAL AUTHORITIES INTO THESE EXAMINATIONS COULD BE FACILITATED THROUGH PMA, WHICH WOULD BE HELPFULL IN CLAIMING EQUIVALENCE OF VARIOUS CERTIFICATES OF COMPETENCY TO THE POSTGRADUATE DIPLOMAS OR DEGREES.

22. FINANCING OF MET

22.1 INTERNATIONAL LABOUR ORGANISATION'S JOINT MARITIME COMMISSION COLLECTED INFORMATION ON THE MET SYSTEMS OF 55 COUNTRIES, AMONG THESE MET SYSTEMS ONLY UNITED KINGDOM'S SYSTEM WAS NOT GOVERNMENT FINANCED TO A GREAT EXTENT, HOWEVER THIS HAS CHANGED SINCE, AND TODAY WE CAN NOT COUNT UNITED KINGDOM'S MET AS PRIVATELY FINANCED.

22.2 IN COUNTRIES LIKE BELGIUM, BRAZIL, BURMA, COLUMBIA, CANADA, DENMARK, FINLAND, FEDERAL REPUBLIC OF GERMANY, JAPAN, HOLLAND, INDIA, ITALY, SWEDEN, SINGAPORE, SPAIN, NORWAY, PAKISTAN, AND U.S.A. GOVERNMENTS ARE TOTALLY RESPONSIBLE FOR MET IN ONE WAY OR THE OTHER. THE SHIPOWNERS DONATE SOME EQUIPMENT OF TRAINING, OR SCHOLAR SHIPS TO STUDENTS OF THEIR FREE WILL.

22.3 THE FRENCH SYSTEM MAKES THE GOVERNMENT FULLY RESPONSIBLE BUT THE SHIPOWNERS PROVIDE AN AMOUNT EQUAL TO 0.4% OF THE TOTAL SALARIES PAID TO THE SEA GOING STAFF EVERY YEAR. GREECE ADOPTS A SIMILAR SYSTEM BUT BASED ON AN AMOUNT OF MONEY PER SHIP PER MONTH.

22.4 PRESENTLY THE COST OF MET HAS GONE VERY HIGH DUE TO ADVANCED TRAINING EQUIPMENTS LIKE SIMULATORS ETCETERA, WHILE THE SHIPPING IS PASSING THROUGH A PERIOD OF DEPRESSION, HENCE ANY SUGGESTIONS REGARDING CAPITAL INVESTMENTS BY SHIPOWNERS IN THE FIELD OF MET WOULD NOT BE APPRECIATED BY THEM, HOWEVER THEY COULD SUPPORT THE MET LIKE THE FRENCH OR THE GREEK SUPPORT SYSTEMS. THEY CERTAINLY COULD SUPPORT THE STUDENTS AT THE PMA BY GIVING SCHOLARSHIPS AND AWARDS ETCETERA.

22.5 COST OF TRAINING A CADET IS ALSO A COMPARATIVE ISSUE. MOST OF THE DEVELOPED COUNTRIES DO NOT TAKE INTO ACCOUNT THE CAPITAL COST OR ITS DEPRECIATION, WHILE CALCULATING THE COST OF TRAINING PER CADET. IN THE U.S.A. THE COST OF FOUR YEARS OF TRAINING OF A CADET RANGES FROM 92000. TO 104000. U.S.\$. THIS ALSO INCLUDES THE COST OF TRANSPORTATION OF CADETS TO THE PORT OF EMBARKATION OF THE SHIPS WHEN THEY GO FOR PRACTICAL TRAINING, (TWICE IN FOUR YEARS) .

22.6 IN PAKISTAN PMA IS ORIGINALLY DESIGNED FOR TRAINING 120 CADETS PER YEAR FOR TWO YEARS COURSE. THIS FIGURE IS NOW REDUCED TO ABOUT 30 CADETS. HENCE THE UTILITY OF THE CAMPUS IS 25% , IF THE PROPOSED SYSTEM IS ADOPTED, THE CAMPUS UTILITY WOULD GO UPTO 100% AGAIN. PMA WOULD PRODUCE VERY USEFUL PERSONNEL WITH MANY CAPABILITIES WHILE THE INTAKE LEVEL (QUANTITATIVE AND QUALITATIVE) REMAINS THE SAME (30 CADETS/YR) .

22.7 THE ADDITIONAL FINANCES WOULD BE REQUIRED IN THE FOLLOWING AREAS:

- .1 VICTUALING.....100% INCREASE (ESTIMATED)
- .2 TEXT BOOKS.....60% INCREASE (ESTIMATED)
- .3 BOOKS (GENERAL).....30% INCREASE (ESTIMATED)
- .4 OFFICE STATIONERY...25% INCREASE (ESTIMATED)
- .5 SPORTS MATERIAL.....60% INCREASE (ESTIMATED)
- .6 TRANSPORT.....25% INCREASE (ESTIMATED)
- .7 MEDICAL SUPPLIES...100% INCREASE (ESTIMATED)
- .8 WATER,ELECTRICITY...25% INCREASE (ESTIMATED)
- .9 TELEPHONE,GAS.....15% INCREASE (ESTIMATED)

22.8 THESE AMOUNTS ARE NOT VERY SIZABLE WHEN COMPARED TO THEIR UTILITY.

22.9 PAKISTAN'S SHIPPING COMPANIES ARE BEING UNDER CONSTANT PRESSURE BY THE GRADUATING CADETS EACH YEAR, SINCE THERE ARE NO VACANCIES FOR THESE YOUNG MEN AND THEY CAN NOT BE EMPLOYED ELSEWHERE. THE ADOPTION OF THE PROPOSED MET SYSTEM ALSO GIVES THEM A RELIEF AS THESE GRADUATES WILL BE USEFUL FOR OTHER INDUSTRY AS WELL.

22.11 A TRAINING SHIP IS THE NEED OF THE PAKISTAN MERCHANT NAVY THERE ARE MANY COUNTRIES OPERATING THEIR TRAINING SHIPS VERY GAINFULLY, MEXICO, ARGENTINA, AND INDIA CAN BE QUOTED FOR EXAMPLE. WE SHOULD ALSO TRY TO PROCURE A TRAINING SHIP AS AND WHEN A NATIONAL SHIPOWNER DECIDES TO BUY A NEW VESSEL. IN BELGIUM THE GOVERNMENT PAID THE ENTIRE EXPENSES OF CONVERSION OF THREE MERCHANT SHIPS TO TRAINING SHIPS, THESE SHIPS ARE PRIVATELY OWNED. CANADA HAS ALSO TAKEN SIMILAR STEPS IN THE PAST.

22.12 THE ADDITIONAL CAPITAL COST FOR ADDING THE TRAINING FUNCTION TO A NORMAL MERCHANT SHIP IS GIVEN IN THE COMPARATIVE FORM ON THE NEXT PAGE, SOME PLANS EXPLAINING THE LAYOUT AND POINTS OF ADDITION ARE ALSO ADDED AND ARE SELF EXPLANATORY.

The excess cost to add the cadet training function to a standard 40 000 DW bulk-carrier

Items	Additional Specifications	Cost of standard ship	Excess cost
Steel materials	additional 100 tons		K¥ 8 000
Pipe materials	additional 10 tons		1 000
Paint and covering			100
Joinery works	cf. attached drawing	K¥ 25 500	14 500
Accommodation Equipmts.	Crew 21 persons, Cadet 48 persons	29 500	34 100
Galley Equipments	necessary additional capacity	4 500	600
Refrigeration Equipmt.	necessary additional capacity	9 000	5 000
Sanitary Equipments	necessary additional capacity		2 000
Air-conditioning equip.	necessary additional capacity	19 400	3 600
Life-saving Appliances	necessary additional capacity for 48 cadets	8 400	6 600
Class-room Equipments	30 persons x 2 room, 16 m/m film projector x 2 loud-speaker x 2		1 000
Engineer cadet mini-factory equipments	2 separate factories(only 1 for standard ship), universal machine (four-in-one) 1 set each, electric welder do. gas flame cutter do. tool glinder do. beam-hoist crane do.	3 200	3 200
Additional Navigation Equipments	gyro-compass/auto pilot, radar x 2 sets & ARPA, Loran, Omega navigator, DF, EM-log, wheel-house control panel, wheel-house meter panel, wheel- house main engine control stand.	53 000	53 000
Sub Total			K¥ 132 700
Design and Overhead Charge			20 000
GRAND TOTAL		K¥ 3 000 000	K¥ 152 700

(This is the cost estimated,
not any commercial price.) K¥ = Yen x 1000.

DM. 28,000 MT TYPE OPEN BULK CARRIER (D.NO. C-1691F)

CARGOES:

Bulk cargo, and steel product, packaged lumber and container

PRINCIPAL DIMENSIONS, ETC.:

Length (O.A.) abt. 165.00 m
Length (B.P.) 157.00 m
Breadth (M/d.) 28.00 m
Depth (M/d.) 15.50 m
Design draft (M/d.) 10.50 m
Scantling draft (M/d.) 11.20 m
Gross tonnage abt. 18,700 T
DM at design draft " 25,500 MT
at assign draft " 28,000 MT
Capacity (100% full)
Cargo hold (Grain) " 35,100 m³
M.B.T. " 10,000 m³
F.O.T. " 1,200 m³
Container " 1,218 TEU

MAIN ENGINE, SPEED, ETC.:

Main engine
Type B&W 5S60MC x 1 set
MCR 10,300 BHP x 102 rpm
CSR 9,270 BHP x 98.6 rpm
Service speed at design draft:
(with 10% S.M.) abt. 16.0 knots
F.O. consumption " 28.0 MT/Day
Endurance " 15,000 S.M.
M/E control

DECK MACHINERY (ELECT-HYD.)

Windlass 20T x 9 m/min 2 sets
with auto-tension drum
M. Winch 10T x 15m/min 2 sets
with auto-tension drum
Steering gear (7.5KMx2) 1 set

PAINT:

Bottom part S.P.C.

COMPLEMENT:

Officer 11 P.
Crew 17 P.
Grand total 28 P

OWNER SUPPLY:

Decca navigator

OPTION:

Main engine Sulzer 5RTA62
Shaft generator

CLASS, REG., FLAG:

Class: LRS, +100A1, Bulk Carrier
"Strengthened for heavy cargoes,
Holds Nos.1, 3 & 5 may be empty",
+LMC, UMS.

CARGO HATCH COVER:

Type: Weathertight folding
Open/Close: Hydraulic cylinder

Flag: Panama



Osaka Shipbuilding Co. Ltd.

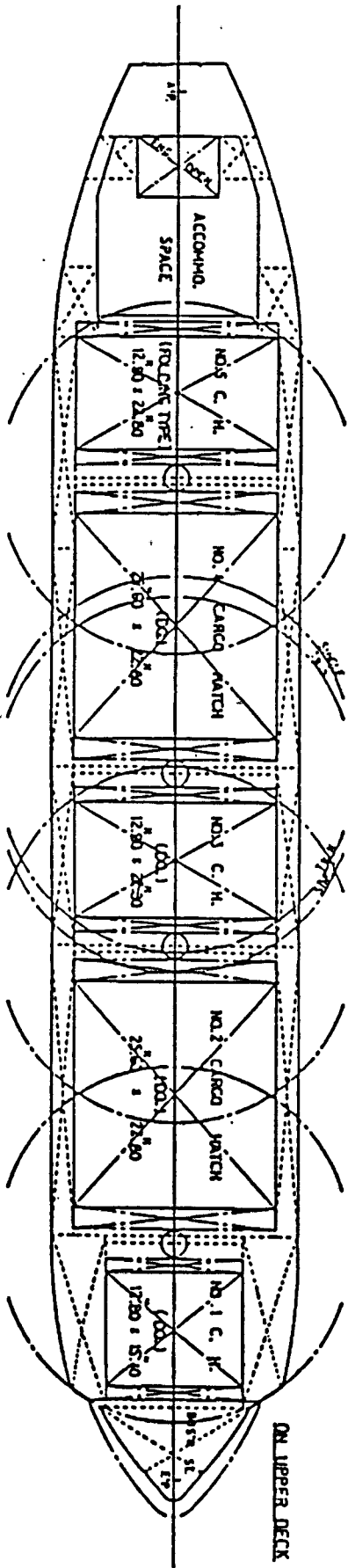
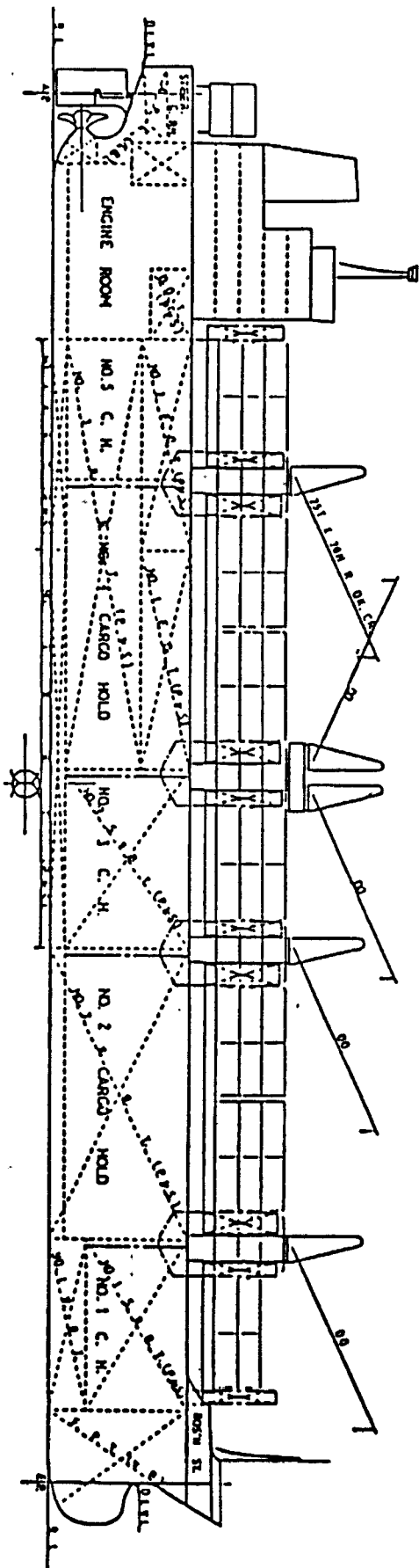
OSAKA STANDARD SHIP NEO-OPEN BULK - 28

Principal Dimensions

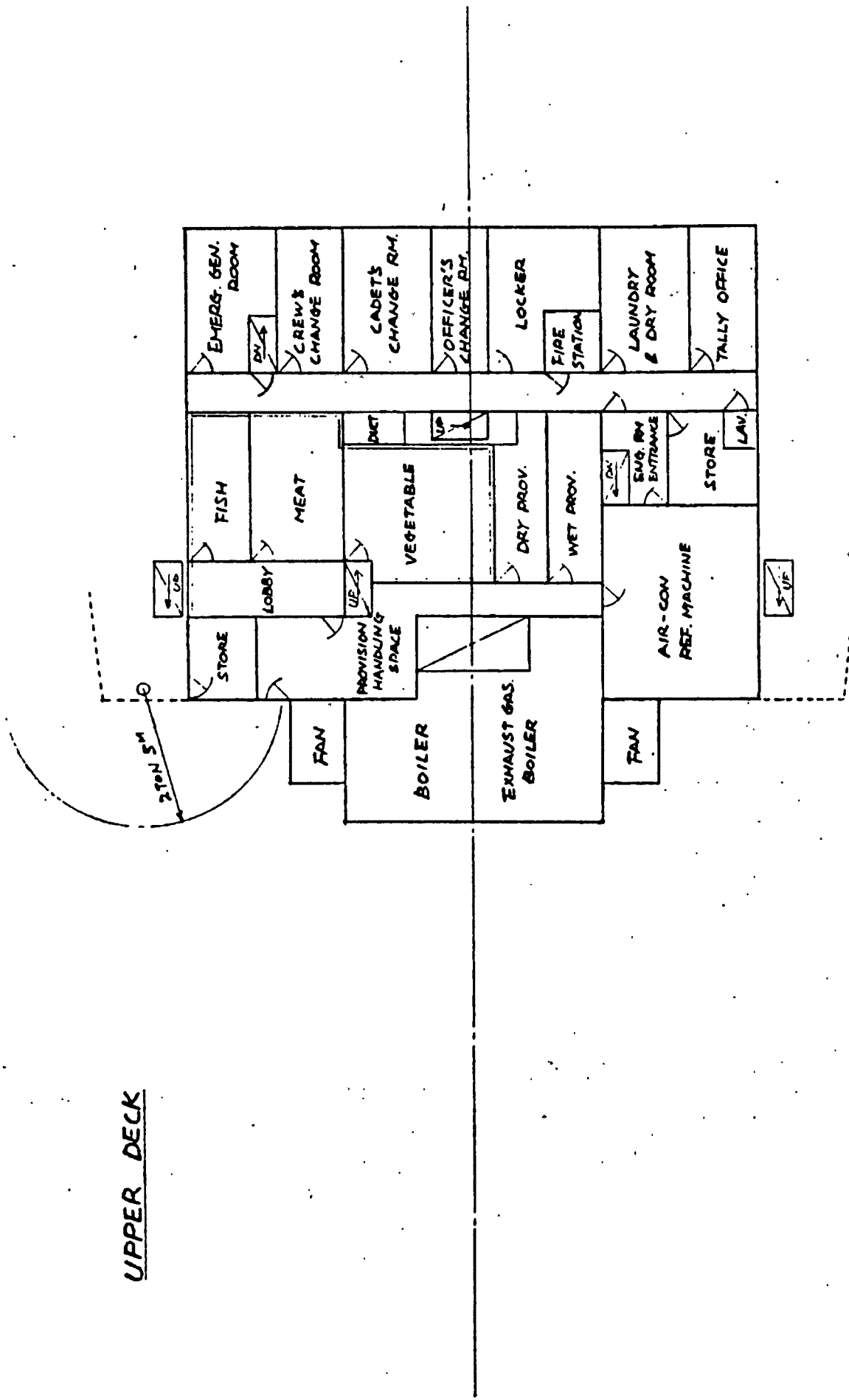
Length	(O.A.)	abt. 165.00 m (abt. 541.3 ft)
Length	(B.P.)	157.00 m (" 515.1 ft)
Breadth	(Mld.)	28.00 m (" 91.9 ft)
Depth	(Mld.)	15.50 m (" 50.9 ft)
Draft	(Mld.)	10.50 m (" 34.4 ft)

Main Engine

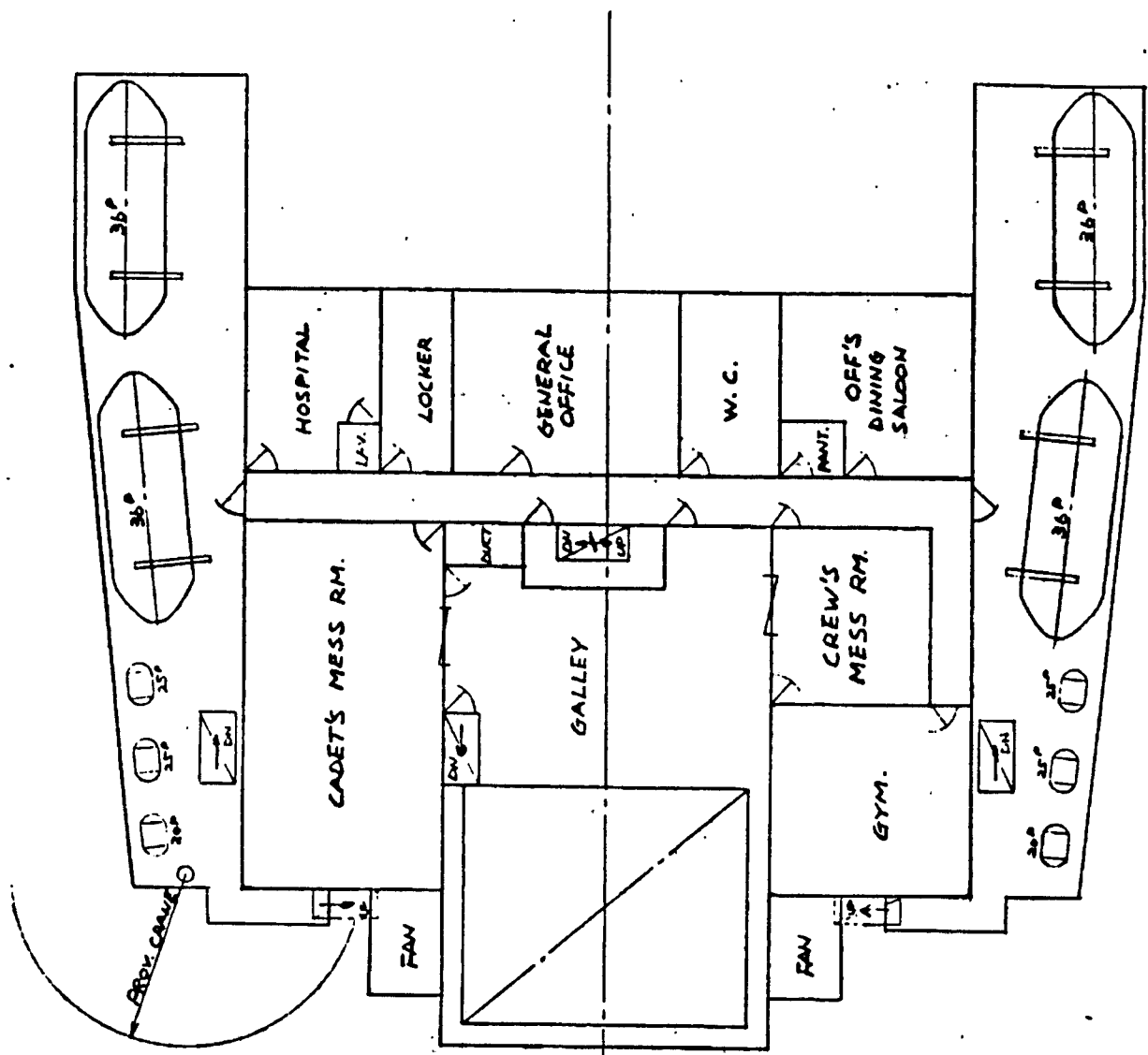
Type	B&W 5560MC
Output	10,300 BHP x 102 rpm
Speed and Fuel Oil Consumption	
Speed	abt. 16.0 knots
F.O.C.	abt. 28.0 MT/day



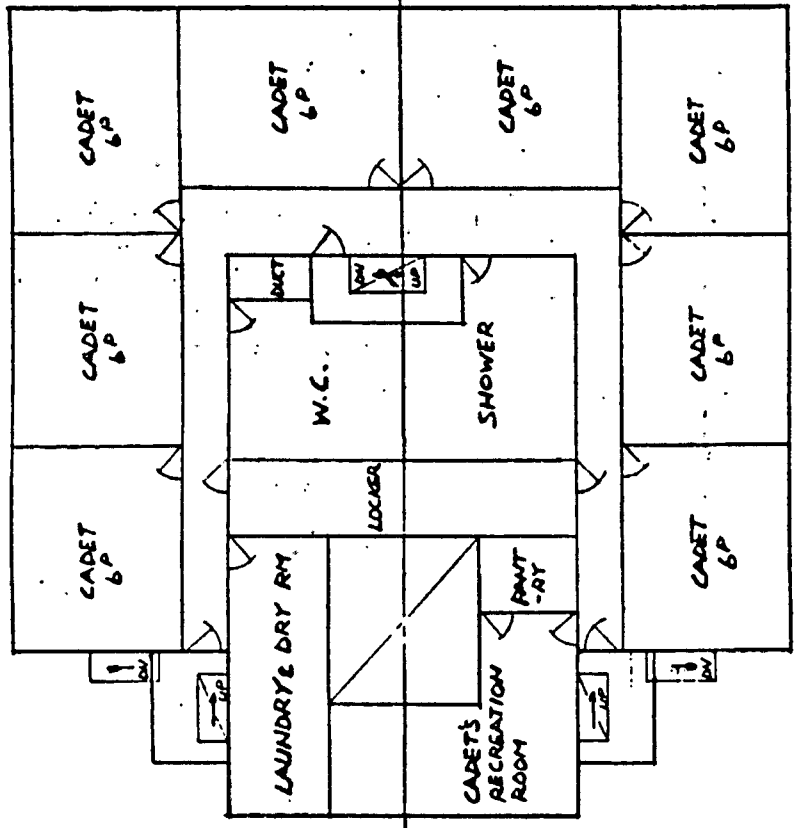
UPPER DECK



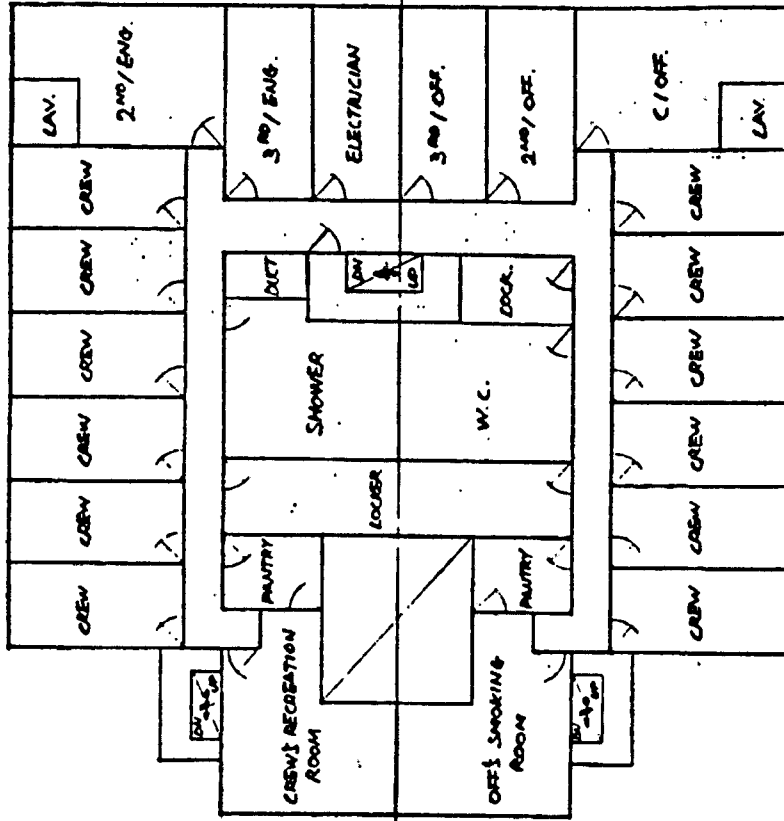
BOAT DECK



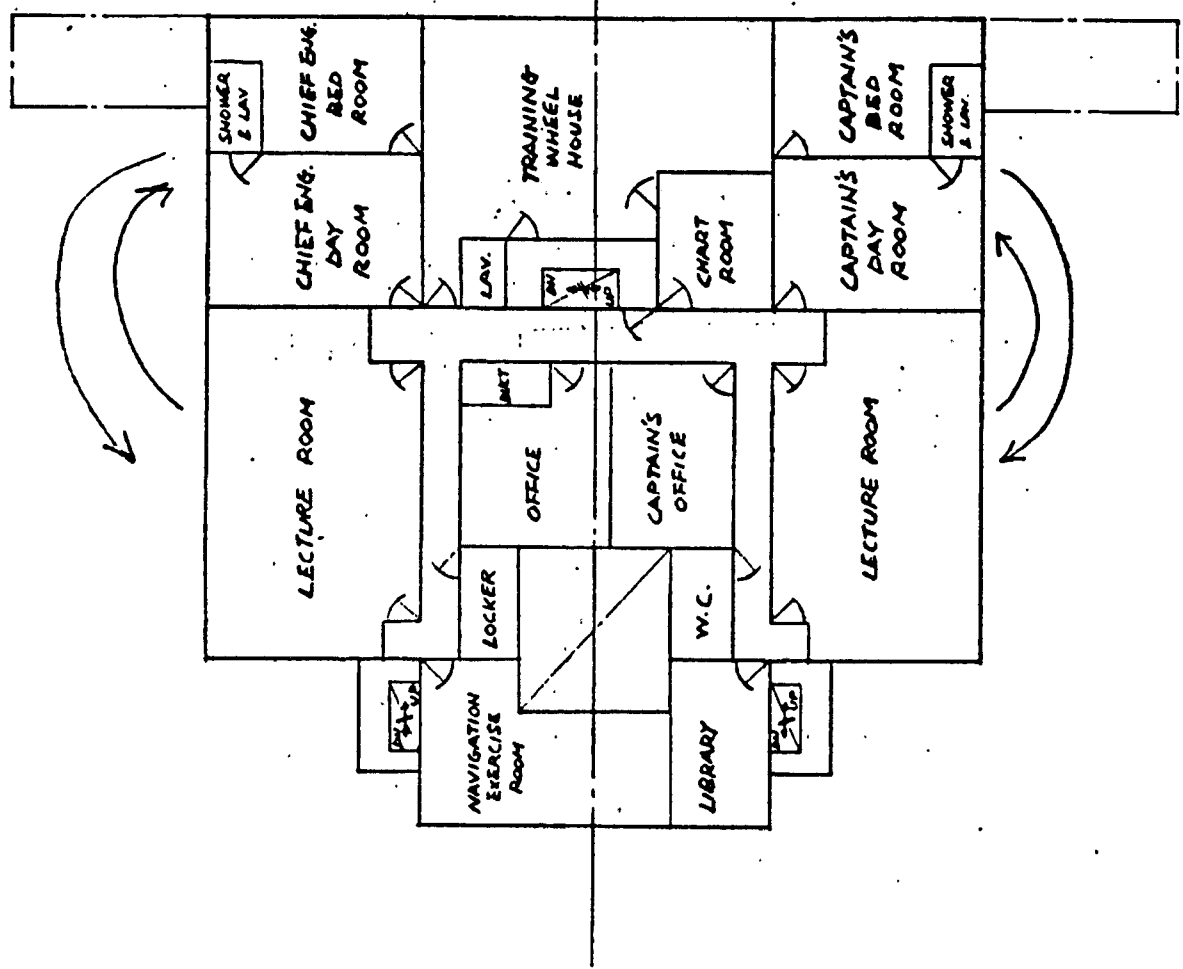
LOWER BRIDGE DECK



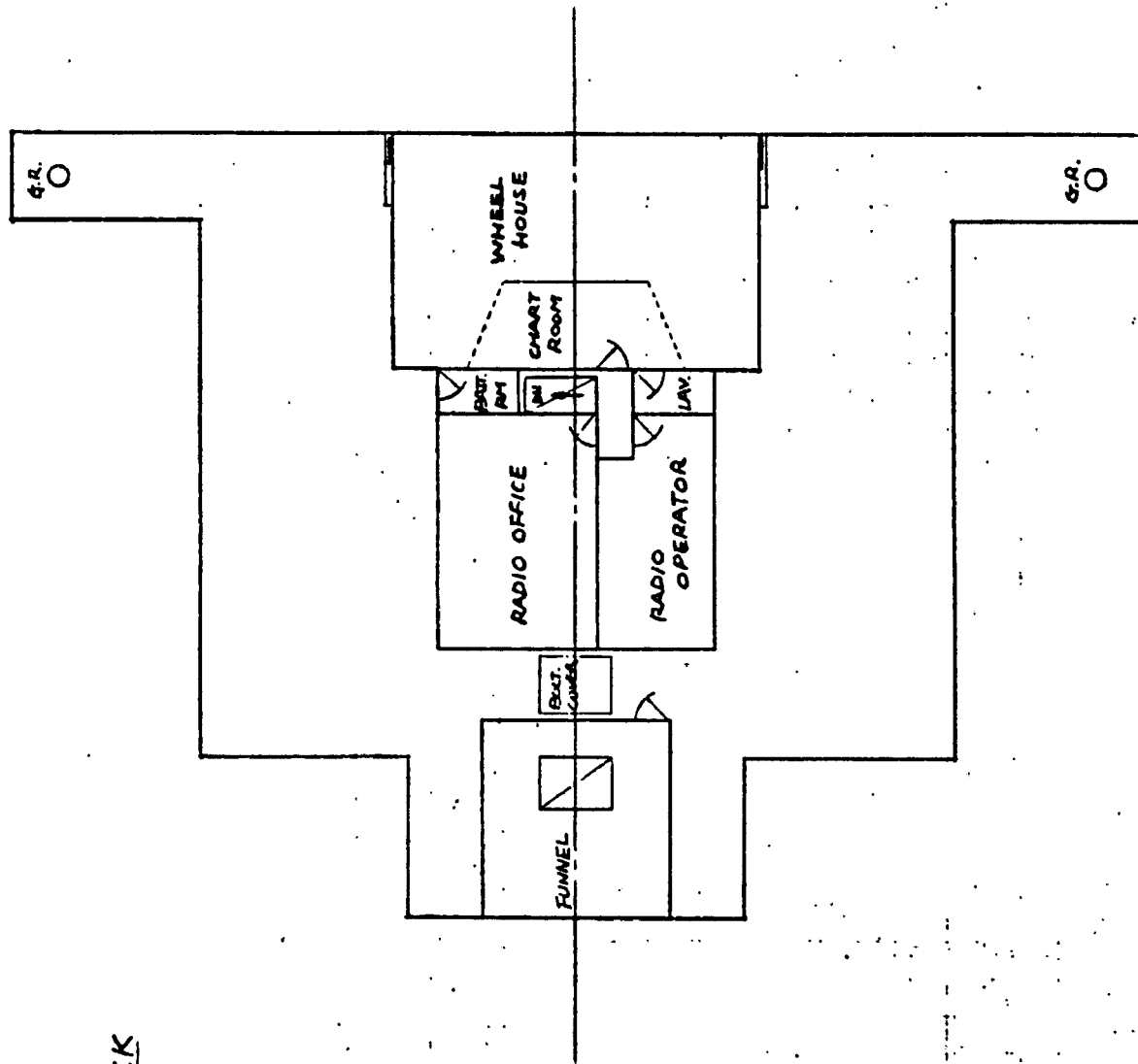
UPPER BRIDGE DECK



TRAINING BRIDGE DECK



NAVIGATION BRIDGE DECK



23.1 CONCLUSIONS.

.1 THE CHANGE IN SHIP'S TECHNOLOGY, (I.E. DESIGN & CONTROL) MODERN EFFECTIVE COMMUNICATIONS, AND ECONOMIC PRESSURES, WILL RESULT IN FURTHER CHANGE IN SHIPBOARD MANNING.

.2 PAKISTAN'S SHIPPING IS MAINLY INTERNATIONAL, (WE HAVE NEGLIGIBLE INLAND/COASTAL SHIPPING). BECAUSE OF THIS WE WILL NOT BE ABLE TO EFFECTIVELY SAVE OUR MARITIME SECTOR FROM THE EFFECTS OF INTERNATIONAL TRENDS OF AUTOMATION AND REDUCED MANNING. TO COMPLEMENT THE NATIONAL POLICIES OF ENCOURAGING THE PRIVATE SECTOR IN SHIPPING PAKISTAN MARINE ACADEMY SHOULD PROVIDE THE MANPOWER OF INTERNATIONAL STANDARDS, COMPATIBLE WITH THE JOB PROFILES OF THE EUROPEAN, AMERICAN, AND JAPANESE SHIPS. THE INTERNATIONAL STANDARDS OF MANPOWER WILL ALSO ATTRACT THE FOREIGN SHIPOWNERS, THEREBY INCREASING THE FOREIGN EXCHANGE EARNING OF THE NATION. FINALLY THIS WILL DEFINITELY RESULT IN COST EFFECTIVE UTILISATION OF THE RESOURCES INVESTED IN PAKISTAN MARINE ACADEMY BY THE GOVT OF PAKISTAN.

.3 IT IS CONCLUDED THAT THE BOARD OF MARITIME EDUCATION AND TRAINING BE ESTABLISHED AT THE EARLIEST AND THE PROPOSED, ENGINEERING BASED DUAL PURPOSE MET SYSTEM BE CONSIDERED TO REPLACE THE PRESENT SYSTEM.

.4 IT IS FURTHER CONCLUDED THAT A TEAM OF HIGHLY QUALIFIED, EXPERIENCED, DEDICATED AND HIGHLY MOTIVATED FACULTY IS OF PARAMOUNT IMPORTANCE FOR THE SUCCESS OF THE PROGRAMME, ALL EFFORTS SHALL BE MADE TO ACHIEVE SUCH A TEAM AT PAKISTAN MARINE ACADEMY.

23.2 RECOMENDAIONS.

- .1 THE BOARD OF MARITIME EDUCATION AND TRAINING BE FORMULATED AS SOON AS POSSIBLE SO THAT THE PROCESS OF REVIEW OF THE MET BE STARTED WITHOUT FURTHER DELAY.

- .2 THE IMPLEMENTATION OF ANY SYSTEM REQUIRES QUALIFIED, DEDICATED AND WILLING WORKERS AMONG THE STAFF OF THE INSTITUTIONS. THE POLICIES OF RECRUITMENT, MOTIVATION, AND ACADEMIC UPGRADING OF THE TEACHING STAFF OF PMA BE REVIEWED AND ESTABLISHED ON A BETTER FOOTING.

- .3 THE PARTICIPATION OF TEACHING STAFF IN NATIONAL / INTERNATIONAL EDUCATIONAL AND PROFESSIONAL CONFRENCES, SEMINARS, AND SYMPOSIA BE ENCOURAGED AND FINANCIALLY PROVIDED FOR.

- .4 THE LINKS BETWEEN PMA AND OTHER NATIONAL / INTERNATIONAL EDUCATIONAL ORGANISATIONS/AUTHORITIES BE ESTABLISHED AND STRENGTHENED. THE FACULTY OF PMA BE ENCOURAGED TO JOIN PAKISTAN NAVAL RESERVES IN ORDER TO STIMULATE FURTHER CO-OPERATION WITH EDUCATIONAL UNITS OF PAKISTAN NAVY.

- .5 A SYSTEM OF CONTINUOUS INDUSTRIAL INPUT TO THE ACADEMIC SYSTEM OF PMA BE ESTABLISHED THROUGH PARTICIPATION OF SHIPPING PERSONNEL IN THE ACADEMIC ACTIVITIES OF PMA.

(CONTINUED ON NEXT PAGE)

- .6 ALL MET PRE-SEA AND POST-SEA ACTIVITIES BE CENTRALISED IN ONE PLACE SO THAT DUPLICATION OF INVESTMENTS IS AVOIDED AND RESOURCES ARE POOLED TOGETHER FOR BETTER UTILISATION
- .7 ALL CERTIFICATE OF COMPETENCY EXAMINATIONS BE ORGANISED AND HELD AT PMA, WITH PARTICIPATION OF EXAMINORS FROM DGP&S (SIMILAR TO THE DECISION OF UNITEDED KINGDOM. REF. M.1242).
- .8 THE SHIPOWNERS SHALL BEAR THE COST OF LODGING, BOARDING, AND OTHER EXPENSES, OF ONE CADET FOR EACH SHIP OF THEIR FLEET. I.E. IF A SHIPOWNER HAS THREE SHIPS HE SHOULD SUPPORT THREE CADETS AT PMA EVERY YEAR .
- .9 WHEN EVER THE DECISION TO BUY THE NEXT SHIP IS MADE IN PAKISTAN, A SERIOUS THOUGHT SHALL BE GIVEN FOR ACQUISITION AND INSTALLATION OF THE REQUISITE TRAINING FACILITIES ON THIS SHIP, AT EXTRA COST.
- .11 TWO MEMBERS OF THE TEACHING STAFF OF PMA BE EXCHANGED EACH YEAR WITH TWO MEMBERS OF THE FLOATING STAFF OF THE NATIONAL SHIPS, ON CONTINUING BASIS.
- .12 TWO MEMBERS OF THE TEACHING STAFF OF EDUCATION DEPARTMENT OF PMA BE TAKEN FROM PAKISTAN NAVY ON DEPUTATION FOR ONE YEAR DURATIONS ON CONTINUING BASIS.
- .13 THE REMUNERATIONS AND FACILITIES OFFERED TO THE TEACHING STAFF OF PMA BE BROUGHT IN PARALLEL WITH THE SHORE STAFF OF OTHER MARITIME ORGANISATIONS LIKE KPT, PNSC, OR PQA.
- .14 ALL THE NEW ENTRANTS FOR THE PROPOSED MARITIME OFFICER'S COURSE SHALL GIVE AN UNDERTAKING THAT THEY WILL, AFTER SUCCESSFUL COMPLETION OF THE COURSE, APPLY FOR A COMMISSION IN PAKISTAN NAVAL RESERVES AND ACCEPT IF OFFERED.

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