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COMDTINST M9000.8A

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COMMANDANT INSTRUCTION M9000.8A

Subj: POLAR ICEBREAKER RELIABILITY IMPROVEMENT PROJECT MANAGEMENT PLAN

1. PURPOSE: This instruction promulgates COMDTINST M9000.8A, the Polar Icebreaker Reliability Improvement Project Management Plan (PMP) that defines the organizational framework by which the Reliability Improvement Project (RIP) is managed. This instruction serves as a guidance and reference document for planning, programming and management personnel involved in the RIP; as well as, those personnel requiring information about the RIP.

2. DIRECTIVES AFFECTED: COMDTINST M9000.8 is canceled.

3. DISCUSSION: This reissue is an update made necessary by numerous changes and additions to both the schedule and production phases. The changes are a result of operational requirements, funding considerations and lessons learned from the first RIP availability on Polar Star. Many of these changes document improved methods of doing business that are currently in place. The most significant changes are:

   a. Reallocated the design level responsibilities; removing the detailed design responsibilities from the Coast Guard and reassigning those responsibilities to the installation contractor awarded the contract. Chapter 1, Section A.4 will apply.

   b. Added guidance on conflict resolution and consensus management. Chapter 1, Section B.2.d; Chapter 2 Sections B.2.b and B.3.g apply.

   c. Clarified the priority of RIP relative to other projects and activities. Chapter 1, Section B.2 will apply.

   d. Added Standardization requirements to the project. Chapter 1, Section A.4.a.1.a will apply

   e. Revised provisioning requirements to achievable levels consistent with the needs of the Coast Guard. Chapter 5, Sections C.2 and C.3.f will apply.

   f. Inserted the RIP obligation plan into all financial areas previously addressed by the commitment plan. Chapter 4, Section B.2.c will apply.

DISTRIBUTION – SDL No.

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NON-STANDARD DISTRIBUTION:

g. Changed the project status report frequency from quarterly to annually. Chapter 4, Section C.2.a will apply.

h. Updated enclosure (2) to reflect the most current item priorities as identified by the cutters at the Item Scope Validation meetings.

i. Updated enclosure (3) to reflect the latest phasing of items due to changes to the master schedule and the current cutter needs.

j. Updated enclosure (4) to reflect the most current cutter needs as identified during Item Scope Validation Meetings.

k. Updated enclosure (5) to reflect the most current cutter employment schedule from PACAREA.

l. Updated enclosure (6) to reflect the most recent organizational changes.

m. Updated enclosure (7) to reflect changes to the billet structure.

n. Updated enclosure (8) to reflect he addition of $4M of funding to support the structural repair items.

4. ACTION: Area and district commanders, commanders of maintenance and logistics command, unit commanding officers, chiefs of offices, and special staff divisions of headquarters and engineering logistics command shall ensure compliance with this plan. Headquarters division chiefs, support and facilities managers, MLCPAC, the project manager and the project officer assigned responsibilities by this PMP shall take it as both guidance and tasking.

Signed

POLAR CLASS ICEBREAKER

POLAR ICE BREAKER RELIABILITY IMPROVEMENT PROJECT MANAGEMENT PLAN TABLE OF CONTENTS

CHAPTER 1 SCOPE AND OBJECTIVES

A. PROJECT SCOPE:

1. The POLAR Class Icebreaker Reliability Improvement Project (RIP) is intended to increase reliability and decrease corrective maintenance, and the out of service time of mission essential equipment and systems. RIP will correct items identified as high in maintenance cost and man-hours; and low in supportability.

2. This project was initiated in FY-89 for the Polar Class Icebreakers to correct design deficiencies, which impact reliability and maintainability; and renew equipment nearing the end of its service life. The project is intended to halt the rapid escalation of maintenance hours, costs required to ensure the cutters meet their operational commitments and ensure the ships remain reliable through the end of their designed service life of thirty years. With only two polar icebreakers in service, reliability is essential to the safe and successful completion of their missions.

3. The RIP work items are discussed in enclosures (1) through (4).

4. The project scope is limited to the items listed in enclosure (2). These items were identified by the Machinery Evaluation Board (MEB) on the POLAR SEA in 1986, further refined during a meeting with Commandant (G-OPN-1), (G-SEN), MLCPAC and PACAREA in April 1990. Due to changes in the cutter's operational schedule and resultant equipment deficiencies, further defining was accomplished during subsequent Technical Review Boards held at MLCPAC and NESU Seattle between June 1993 and November 1995. Upon completion of the first RIP availability, on Polar Star, further investigation of the task items was required. In October 1997 a scope validation meeting was held in Seattle with Commandant (G-SEN), MLCPAC, NESU Seattle, Polar Star and Polar Sea.

    a. Design: The performance requirements will be established by the MLCPAC using input from Commandant (G-SEN),(G-OPN-1), Engineering Logistics Command (ELC) and PACAREA.

        (1) MLCPAC will develop the performance package (specifications and drawings) describing items/systems to be removed/modified and suggested equipment to be procured and reinstalled in their place for each of the items listed in enclosure (2) less the CPP System Upgrade.

        (2) MLCPAC shall refine the performance package into a specification suitable for commercial contract. The commercial contractor that is awarded the design/installation contract will develop the final detailed design. For the CPP system, MLCPAC shall perform all the preliminary design work including evaluation of Original Equipment Manufacturer (OEM) recommendations for design and equipment improvements. The final detailed design package will be developed for MLCPAC by the commercial contractor working with the OEM, if necessary, to incorporate the design modifications.

            (a) MLCPAC will develop a performance specification package to obtain a detailed design, the new equipment, and installation of the new equipment in accordance with

the detailed design.

(b) Existing general arrangement drawings and system diagrams will be provided to the commercial contractor to define the performance of the new system configurations. No detailed system arrangement drawings will be provided. The commercial contractor responsible for the equipment installation will accomplish this level of detail. The ship checks required for detailed design will be accomplished through the commercial contractor awarded the installation. RIP personnel located at the Naval Engineering Support Unit (NESU) Seattle will be tasked to assist in these checks.

(c) Standard specifications covering standard work items; such as temporary services, contractor performance, routine welding procedures, etc., will be supplied by MLCPAC. Specific requirements considered to be non-standard; such as special welding procedures, special alignment procedures, test procedures, etc., will be provided by the installation contractor. The commercial contractor performing the installation will develop final design specifications and drawings.

(d) The ELC will be an active member of the Design Review Board for any CPP design changes. MLCPAC will incorporate the results of the DRB into the performance specifications as appropriate. Once finalized, the performance specifications establish the scope and technical content of the work items that will be provided to the commercial contractor for the detailed design development and installation.

b. Execution: Performance specifications shall be used by MLCPAC to develop the procurement package for detailed design, Long Lead Time Materials (LLTM) and installation, on both cutters, corresponding to each phase of the project.

(1) The ILS Manager and his/her support staff will prepare LLTM procurement packages that will be provided as GFE for solicitation with ELC assistance as required.

(2) Any task items scheduled outside of normal project phases and requiring detailed design specifications, will be developed by MLCPAC or commercial firms at the Project Officer's discretion.

B. OBJECTIVES: Project objectives are divided into three categories; cost, schedule and performance.

1. COST:

a. Project costs for the prime contract(s), contract modifications, Government Furnished Equipment (GFE), LLTM, initial spares, project administration, contract escalation and associated contract costs shall not exceed funding provided for executing the RIP. If the actual project costs approach the funding limit of $60M, G-SEN and MLCPAC will re-evaluate the scope of task items with lower priority in order to remain within budget.

2. SCHEDULE:

a. The RIP is married to an ambitious and aggressive operational schedule. The RIP availabilities

will be scheduled separate from the normal OE (operating expense) availabilities. Commandant (G-O) has set the priority of RIP installation as being subordinate to scheduled operations, and maintenance to support scheduled operations performed by the unit, Naval Engineering Support Unit (NESU) Seattle, and the Maintenance and Logistics Command Pacific (MLCPAC). It was also subordinate to the installation of the Polar Science Upgrade (PSU) and the Machinery Control Alarm and Monitoring System (MCAMS) projects. The Project Manager (PM), Commandant (G-SEN), along with the Project Officer MLCPAC (v) cannot permit any activities in the RIP installation phase that would adversely impact any of the higher priority activities. RIP work must not exceed allotted time frames in order to avoid negative impact on mission preparation and deployments.

b. The RIP Master Schedule is enclosure (5).

c. Although the work opportunity windows are determined by the operational schedule; the amount of RIP work accomplished in each of these periods will be level loaded to minimize the risk of schedule impacts.

d. Final determination of any changes in RIP regarding when work items will be accomplished will be made by PO, after coordinating with headquarters.

3. PERFORMANCE:

a. The RIP will be accomplished using commercial contracts for GFE, LLTM, installation and detailed design. The contracts will be issued and administered by MLCPAC. The MLCPAC will establish the scope and performance requirements, and will execute contracts to accomplish the detailed design, material procurement and installation phases.

CHAPTER 2 PROJECT MANAGEMENT ORGANIZATION

A. ORGANIZATION:

1. This project represents a complex acquisition requiring special organizational relationships. The matrix organizational interrelations described in this plan supplements the organizational relationships set forth in the Coast Guard Organizational Manual, COMDTINST M5400.7.

2. Enclosure (6) depicts the RIP project management organization. Enclosure (7) identifies the AC&I billets provided for the RIP.

B. RESPONSIBILITIES AND AUTHORITY:

1. PROGRAM MANAGER: The Program Manager, Commandant (G-OPN), is responsible for setting program policy, mission requirements and operational requirements. The Program Manager will coordinate these requirements with the Operational Commander, PACAREA, as necessary and appropriate.

2. PROJECT MANAGER (PM): The PM, Commandant (G-SEN), is responsible for the project scope, RIP preliminary design efforts, resource requests (funding and billets), funding management (macro-level), project status reporting as required by DOT administrative procedures, cutter configuration control, and project policy management.

   a. Cutter configuration control will be maintained through the contract design specifications developed by the MLCPAC. Task configuration control will be maintained through the detailed design and installation specifications; and, is the responsibility of the Project Officer (PO).

   b. Policy management includes any significant changes to the contract design specifications. Changes to the contract design specifications resulting from interpretation, clarification or modifications due to the development of the detailed design require the Project Officer's approval. The PM must be informed of all changes that result from the development of the detailed design and differences will be resolved at the lowest appropriate level for all changes that:

      (1) Alter function, reliability, supportability, configuration, system capabilities or operability.

      (2) May impact Coast Guard operating or engineering philosophy including vessel, machinery and personnel safety, and watch standing or manning policies.

      (3) Affect maintenance support and training.

      (4) Affect project costs or schedule, with the following exception: routine changes due to contract modifications to detailed design efforts and Long-Lead Time Material procurements can be granted to the PO by the PM, without additional concurrence.

      (5) Any other changes which fall under the general description of policy management will be addressed between the PM and PO.

c. The Project Manager shall maintain the RIP financial plan and prepare Resource Change Proposals.

3. PROJECT OFFICER (PO): The Project Officer, MLCPAC (v), is responsible for the RIP planning, coordination, execution, monitoring and status reporting. The Project Chief (PC) will assist the PO and functional staffs. This responsibility requires cooperation, communication and commitment from all parties involved to assure the project proceeds effectively.

a. The PO is the focal point of the RIP organization. The PO shall be accountable for the timely execution of the RIP within scope and budget. The PO is responsible for meeting the schedule in enclosure (5) within the constraints of the higher priority projects and operations identified in Chapter 1.

b. The PO is directly accountable for:

(1) Preparation and maintenance of project item plans.

(2) Contract strategy including coordinating the interaction between RIP tasks and planned maintenance work.

(3) Preparation and execution of commercial contracts for the detailed design development and installation.

(4) Contract change approval (within item scope).

(5) Scheduling required efforts for RIP tasks. The PO is authorized to task functional elements with accomplishing specific tasks within agreed upon cost, time and performance constraints. The PO, MLCPAC (v), shall be assisted by the PM in obtaining task commitments from other commands.

(a) Task Leaders shall be assigned for each task.

(b) The PO and PC shall have direct access to RIP Task Leaders concerning all RIP related work originating from within those functional staffs. The Project Officer or the Project Chief shall be informed, in a timely manner, of any changes that affect cost, schedule or detailed design.

(6) Logistics support planning for the RIP project. The development of the Integrated and Operational Logistics Support Plans and ELC coordination will be the responsibility of the ILS Manager. The ILS Manager will be on-site at ELC.

(7) Maintenance of up-to-date project documentation and drawing files.

c. RIP item configuration control is the responsibility of the PO. Cutter configuration management will be the responsibility of the ELC.

d. The PO will coordinate functional specific issues with the appropriate functional staff to ensure that established Coast Guard policies are followed.

e. The PO is responsible for updating the project Obligation Plan and preparing budgetary documents for the PM as required. The Spend Plan is the master budgetary document and is used for project funding requests and appropriations. The principal budgetary document for the day-to-day operation and commitment of funds will be the Commitment Plan. Commitment of funds is required during the development of the Purchase Request for individual task items and can be associated with the start of the procurement phase. The Commitment Plan is used in determining the current status of funds in process.

f. The PO monitors and reports project progress to higher authority and works to resolve conflicts and other problems arising during execution of the RIP. The PM will assist in these endeavors where necessary to resolve the issues.

g. The PO, or the PC(by direction), is authorized to request and receive summaries of the project information including, but not limited to, task progress reports, financial status, cost accounting and budgetary information. All requests for change in project scope and financial plans will be reviewed by the PO before forwarding to the PM. The resultant changes in scope and financial plans will be resolved by consensus between the PM and PO; the PM will coordinate these changes with the Program Manager.

4. TASK LEADERS: MLCPAC, the ELC, Commandant (G-SLS), Commandant (G-SEN), Commandant, Naval Engineering Support Unit (Seattle) and others performing tasks under the RIP shall designate Task Leaders as key members of the project team to accomplish task commitments. The Task Leaders represent the interface between the functional staffs and the project staff. They coordinate the accomplishment of assigned project work and communicate task performance and problem identification to both their supervisors and the PO/PC. Coast Guard Headquarters, Branch Chiefs and other Commands (Reserve Training Center Yorktown and Engineering Logistics Center, ELC) shall apply adequate resources to accomplish project tasks within time, cost and performance constraints as directed by the PO.

5. TECHNICAL and SUPPORT STAFFS: A technical and support staff shall be assigned to the PO to provide support and advice. The staff shall follow established Coast Guard policy in carrying out their duties. A listing of RIP staff billets is in enclosure (7).

CHAPTER 3 PROJECT MANAGEMENT

A. COST ACCOUNTING AND BUDGET:

1. PROJECT MANAGER: The PM shall maintain the master RCP and funding files and is responsible for managing the project's Financial Plan and providing resources to the PO. The PM and PO will share the necessary information.

    a. The PM shall prepare and maintain the financial plan found in enclosure (8). The PO will provide the necessary information to support that effort.

    b. The PM is responsible for initiating Resource Change Proposals (RCP's). Submission for RCP's shall be timely and in support of the project.

    c. The PM shall maintain complete, up-to-date management documentation. This documentation shall be in sufficient detail to provide a clear audit trail of the RIP. This includes such documentation as the Project Management Plan, RIP Master Schedule and the Financial Plan. In order to maintain the RIP Financial Plan, the PO must provide timely and complete obligation plans, and information. The commitment plan will be used by the PO for daily operation of the project, and to solidify the obligation plan.

2. PROJECT OFFICER: The PO shall take all action necessary to ensure all acquisitions are completed in accordance with approved scope, work task statements, project directives, and tasks specified in this Project Management Plan.

    a. The PO shall maintain the RIP Obligation Plan. The Obligation Plan will include the planned obligation estimates for the current and following four quarters and is a consolidation of the planned obligation levels approved for each point account. A copy of the RIP Obligation Plan will be furnished to the PM. The RIP Commitment Plan will be utilized by the PO for the daily operation and management of funds in process.

B. SCHEDULING:

1. PROJECT MANAGER: The PM shall be provided with the detailed schedules by the PO to enable the PM to maintain the RIP Master Schedule, enclosure (5).

    a. The RIP Master Schedule shall remain consistent with the Program Manager's and Operational Commander's prepared Employment Schedule.

    b. The RIP must not conflict with the operating schedule, nor other scheduled activities of higher priority. The PM shall advise the Program Manager and Operational Commander of the impact to the RIP, in terms of cost and schedule, of all proposed and actual changes to the employment, maintenance and/or installation schedules. To the maximum extent possible, the Program Manager and Operational Commander shall consult with the RIP PM before making any schedule changes and must fully consider the possible impacts. Any proposed changes will be immediately provided to the PO for consideration of the ramifications such changes will make to the detailed schedule.

c. The PM and PO will evaluate the detailed schedule during their quarterly conferences held at MLCPAC.

2. PROJECT OFFICER: The PO is responsible for developing detailed schedules to accomplish the RIP and coordinating the work of all commands providing input to the RIP.

   a. Interdependent tasks must be coordinated to provide an integrated network. The PO shall utilize task scheduling and management appropriate to the complexity of each phase of the project. The intent is to identify conflicts with higher priority work and/or scheduled maintenance. Critical Path Management, through precedence and dependency, will identify the interrelationships between tasks.

   b. The PO must take necessary action to ensure that the RIP work does not exceed allotted time frames, nor interfere with mission preparation and deployments.

C. TASK MANAGEMENT:

1. Centralized management of the RIP will be the responsibility of the Project Officer. The PO will maintain a complete set of technical files. The planning process, contract strategy, estimates and scheduling of completion of each RIP task will be based on task information provided to the PO by the various Task Leaders. Where adequate Coast Guard resources do not exist or performance can not be attained in a timely manner using the CG matrix organization, the PO shall pursue other means of task accomplishment; such as, contracting for outside services. Critical resource shortages which can not be resolved at the MLCPAC level shall be brought to the attention of the PM for conflict resolution.

2. Technical Review Boards will be convened by the PM and/or the PO, as necessary. Project Task Leaders will be invited to participate in the specific DRB as deemed appropriate.

3. The PM and PO will periodically hold Scope Validation meetings with the Operational Commander and cutter crews to establish the most current needs that impact the scope and priority of the task items.

CHAPTER 4 MONITORING, CONTROL & REPORTING

A. MONITORING:

1. PROJECT MANAGER: The PM shall monitor the RIP to ensure its timely completion within budget. The PM shall ensure time and resource budgets, and project scope are maintained. This will be accomplished by trips to MLCPAC, contractors' facilities and the cutters. Project and task status reports, contract progress reports, E-mail, telecons and other communications with the Program Manager and Project Officer will also be used to monitor the RIP.

2. PROJECT OFFICER: The PO is responsible for monitoring the accomplishment of the RIP.

    a. The PO shall prepare and maintain detailed project and task schedules using appropriate management techniques and processes.

    b. The PO shall maintain complete, up-to-date management documentation for the project. This documentation will provide the current project status and is the baseline for the historical project database. This documentation will consist of project and task status reports, contract status reports, E-mail, telecons and other communications with activities involved with the RIP.

3. TASK LEADERS: The task leaders shall provide the PO/PC copies of all correspondence, all contract status reports and documentation related to or affecting the RIP. Correspondence and documentation shall be detailed enough to provide a clear audit trail.

B. CONTROL:

1. The Project Manager controls the project through the project's financial plan, scope and master schedule.

    a. The RIP Master Schedule, enclosure (5), establishes the overall schedule for the RIP and shall be maintained with input from Commandant (G-OPN-1) and MLCPAC.

    b. The RIP Financial and Spend Plan are controlled by the appropriation of funds by the Congress.

    c. The scope is limited to those items listed in enclosure (2). No growth in the number of items is permitted. Increases to the level of effort for any specific item must be funded by reallocation from within RIP.

2. The Project Officer controls the RIP's execution through the detailed schedule, detailed design and installation contracts, acquisition plan and spend plan.

    a. The detailed schedule shall identify all tasks required to accomplish the project objectives and their completion schedule. The PO will immediately notify the PM and appropriate Task Leaders if the status of any task changes.

    b. The detailed design and installation contracts will be controlled by the PO and integrated with

contract design specifications, the master schedule, project financial and spend plans and the appropriate Federal regulations.

c. The PO will prepare and execute recovery plans, which will be approved by the PM if project costs or performance goals are affected. If recovery plans affect only individual task items, design specific details or schedule integration, the PO will approve them.

C. REPORTING:

1. Each RIP project item has a cost (funds and asset utilization), a schedule (time constraint) and scope. Project reporting will be accomplished by information flow, which reflects these three components projected as a whole. As a minimum, reports shall answer three questions:

   a. To what degree has the scope of the project item been completed? This includes progress of the task work package and associated milestones.

   b. How does actual progress towards the completion date or cost of the project item, compare to the planned progress or cost for that period?

   c. Has the forecast scope, scheduled completion date or cost of the task changed since the last report?

2. Required Reports: The following are the required reports for the RIP:

   a. Project Status Report. The PO shall submit the Project Status Report on a annual basis to the PM. This report shall be in the format of enclosure (9) and shall be submitted at a time agreed upon between the PM and the PO.

   b. Task Status Report. Task leaders, through their Headquarters division chiefs or Commanding Officers, shall make a status report to the PO/PC upon request, and at the time specified by the PO/PC. The report will address the assigned RIP project item(s) or other related subject matter. The critical elements of the RIP Task Status Report are provided as enclosure (10).

3. Additional Reports: Other reports are required on an as needed basis to keep appropriate organizations and project personnel informed of the project's status.

   a. OST Reports. The PM will make all required reports to the Office of the Secretary of Transportation as directed by the Commandant.

   b. Congressional Reports. The PM will make all reports to Congress as directed by the Commandant.

   c. Situation Reports. Any Task Leader or other project management personnel must make a situation report to the PO/PC, immediately, when any action occurs which may impact the scope, schedule or cost of any RIP project item. The PO shall keep the PM informed of any impact on project cost, performance, scope or schedule.

4. Reports are not the only documentation required for the proper maintenance of the project files. Project status documentation includes all of the above reports plus updates to the Master and Detailed Schedules, Financial and Obligation Plans, Integrated Logistics Support Plan (ILSP) and the Operational Logistics Support Plan (OLSP). These plans and schedules will be updated as specific conditions change that would effect their accuracy.

CHAPTER 5 LOGISTICS SUPPORT REQUIREMENTS

A. PURPOSE:

Logistics support is required to insure that equipment and systems installed or modified by the RIP are maintained and supported for the remainder of the ship's life. Inadequate logistics planning and support will result in the goals of the RIP not being achieved.

B. ORGANIZATION:

1. Integrated Logistics Support Manager (ILSM): An ILSM for RIP shall be appointed by the Project Officer and shall report to the Project Chief. Because of the magnitude of the RIP, the ILSM shall be a primary duty, not a collateral duty. The ILSM is responsible for the following items:

   a. Develop the Integrated Logistics Support Plan (ILSP). The ILSM shall be guided by Commandant Instruction 4105.2, Acquisition and Management of Integrated Logistics Support (ILS) for Coast Guard Systems and Equipment, for developing the ILSP.

   b. Incorporate Logistics Support Analysis (LSA) requirements into contracts when cost effective. If the cost of LSA is prohibitive, RIP will utilize other government agencies (OGA's) or commercial firms to develop the support analysis.

   c. Coordinate efforts of Commandant, MLCPAC and the Engineering Logistics Center (ELC) to accomplish requirements of the ILSP.

   d. Convert the ILSP to an Operational Logistics Support Plan (OLSP) at the end of the RIP.

2. Integrated Logistics Support Management Team (ILSMT): An ILSMT shall be formed by the Project Officer to assist the ILSM in developing the ILSP and accomplishing its requirements. The ILSMT shall be headed by the ILSM and report to the Project Chief.

C. REQUIREMENTS:

1. The definitive logistics guide to be used during this project is COMDTINST 4105.2.

2. Logistics Support Analysis (LSA): All equipment, whether Government or contractor procured, shall incorporate LSA when needed as a part of the contract. Cost will be considered when determining whether LSA should be part of the initial purchase contract. Where the cost is prohibitive, logistic support will be developed outside of the initial material procurement. Commandant (G-SLS) will provide assistance to the ILSM for developing LSA requirements for equipment purchases.

3. ILSP: An ILSP shall be developed and implemented to insure the project's goals are met, and that logistics requirements are consistent with current Coast Guard policies. The ILSP shall be forwarded to Commandant (G-SLS) via the PM for approval prior to completion of the first installed RIP project item. Certain aspects of the ILSP should be established early to guide system development. The following items must be considered when developing the ILSP:

a. Supply Support: Supply support is comprised of several items.

(1) Allowances: This includes the timely provisioning, distribution and inventory replenishment of spares, repair parts and special supplies. Determine shipboard, intermediate facility and depot level allowances.

(2) Repairables Management: Determine who will manage intermediate and depot level spares, and the requirements for their management.

(3) Unit Supply Support: Identify sources for replenishment of unit allowances and supplies.

b. Maintenance Support: Maintenance support includes several items.

(1) Equipment Categories: Separate equipment into recognized categories and develop maintenance support guides for that equipment.

(2) Maintenance Types: Identify the types of maintenance expected and develop required updates to the ship's Preventive Maintenance System publications.

(3) Maintenance Levels: Determine the various levels of maintenance support required.

c. Training Support: Identify all maintenance and support training required as a result of the RIP alterations. This shall include:

(1) Formal Training: Identify formal training requirements.

(2) Master Training List: Make updates required for the Master Training List, as needed.

(3) Training Equipment: Identify new training equipment required as a result of the RIP.

d. Support and Test Equipment: Insure the required test and calibration equipment is available to the operating personnel and support maintenance activities.

e. Manpower and Personnel: Review cutter and NESU Seattle billet structure to insure adequate resources are available to properly maintain the RIP installed equipment.

f. Technical Data: Identify technical publication and drawing requirements to provide documentation necessary for maintenance and operation of the RIP installed and/or modified equipment and systems. Provisioning Technical Data (PTD) shall be considered for purchase with equipment. Cost will be considered when determining whether PTD will be purchased as part of the initial contract, whether PTD will be a separate purchase or whether PTD will be accomplished by an on-site provisioning team established by MLCPAC with other outside agencies.

g. Design Interface: Determine LSA requirements for equipment and systems.

h. Configuration Management: Identify the system for tracking configuration changes before, during and after installation. Changes as a result of the RIP must be controlled and thoroughly

documented for the benefit of future operators and maintenance personnel.

RELIABILITY IMPROVEMENT PROJECT CHARTER

1. SCOPE: The Reliability Improvement Project's work items are based on the Machinery Evaluation Board of 1986 and the RIP conference held in April 1990. Enclosure (2) is a prioritized list of all RIP items.

2. OBJECTIVES: The goal of the RIP is to improve the reliability of the cutter's mission essential equipment to enable the ships to successfully complete all assigned missions.

3. PLANNING: RIP task items have been prioritized and phased to match the availability of maintenance time in the ship's operational schedules. Enclosure (3) identifies the phasing of RIP task items. RIP task item phasing is not necessarily fixed to any one phase. Items are prioritized within each phase. The RIP task items installation will be accomplished during independent RIP availabilities. The RIP will strive to avoid interference with other projects, without suffering schedule and budget overruns. Enclosure (4) is the scope definition of each RIP task item.

4. EXECUTION: The execution of the RIP task items in availabilities is the responsibility of the Project Officer, who will ensure that project planning, resources and scope of work do not jeopardize operation mission schedules and inflate budget and funding constraints.

PRIORITIZED LIST OF RELIABILITY IMPROVEMENT PROJECT TASK ITEMS

1. Main Diesel Engine Upgrades
2. Ship Service Generator Upgrades
3. Sea Water Cooling System Modifications
4. CPP System Upgrade
5. Sewage System Modifications
6. HVAC System upgrades
7. Installation of Standard Boat/Davit System
8. Renew Compressed Air System
9. Upgrade Oily Water Separator
10. Renew Fuel Oil Purifier
11. Upgrade Lube Oil Purifier
12. Upgrade Ballast and Bilge Dewatering System
13. Distilling Plant Renewal
14. Ship Service Boiler Modifications
15. Central Hydraulic System Modifications
16. Gas Turbine Logistics Support
17. Helicopter Hanger Door Modifications
18. Heeling System
19. Structural Repairs

NOTE: Prioritized list was last revised per phonecon and email between Mr. Loran St. Denis, CDR Bill Reichs, and LTJG Peter Fant on 20Feb02.

PHASING OF RELIABILITY IMPROVEMENT PROJECT TASK ITEMS

PHASE I:

1. Renew Compressed Air System
2. Upgrade Oily Water Separator
3. Renew Fuel Oil Purifier
4. Upgrade Lube Oil Purifier
5. Upgrade Ballast and Bilge Dewatering System
6. Gas Turbine Logistics Support
7. CPP (partial)
8. Structural Repairs (partial)

PHASE II:

1. Distilling Plant Renewal
2. S/S Generator Upgrade
3. Sea Water Cooling System Modifications
4. Heeling System (partial)
5. Structural Repairs (partial)

PHASE III:

1. CPP System Upgrade
2. HVAC System Upgrade
3. S/S Boiler Modifications
4. Helo Hanger Door Modifications
5. Heeling System (partial)
6. Structural Repairs (partial)

PHASE IV:

1. Sewage System Modifications
2. Main Diesel Engine Upgrades
3. Central Hydraulics System Modifications
4. Installation of Standard Boat/ Standard Davit System
5. Heeling System (partial)
6. Structural Repairs (partial)

NOTE: Assignment of items to phases was determined by customer priority, completion of prerequisite items, and work distribution in affected areas.

RELIABILITY IMPROVEMENT PROJECT TASK ITEMS SCOPE DEFINITION

1. COMPRESSED AIR SYSTEM - Analyze post-science upgrades and post-RIP upgrades to assess compressed air system load requirements of the cutters new configuration.

    a. Upgrade the existing system to support all ship's service requirements.

    b. Install two new rotary screw type compressors (LEROI model WE75SS or equal), approximately 330 CFM at 125 PSI each. This compressor will have the after-cooler and the oil cooler, water-cooled by a branch connection from the existing sanitary system.

    c. The design/operation of the new compressors will not allow the retention of the existing S/S air flasks in their present location.

2. OILY WATER SEPARATOR - Replace existing units with those more tolerant of ship's vibration and bilge contaminants.

    a. Replace both existing OWS units with two non-cartridge type OWS units. These units will be required to separate all types of diesel fuel and lube oils used onboard the Polar Class cutters. In addition, the new OWS units will also be required to separate various non-biodegradable cleaning chemicals presently used in the machinery spaces by the ships force. Investigate parallel plate type separators as possible solution.

3. FUEL OIL PURIFICATION - Renew existing 35 GPM and 125 GPM fuel oil purifiers located in the gas turbine room, with two identical 72 GPM self-cleaning purifiers (ALFA-LAVAL model WHPX-413 or equal) with heaters.

4. LUBE OIL PURIFICATION - Renew lube oil purifiers in Diesel Space 1, Diesel Space 2, and the Motor & Gear Room.

    a. Replace each existing 250 GPH lube oil purifiers with a new self-cleaning purifier providing 290 OPH (ALFA-LAVAL model WHPX 405 or equal). Provide a smaller (retaining the same BTU rating) but more efficient electric heat exchanger (ALFA-LAVAL HEATPAC heat exchanger or equal) and. a small intermediate sludge tank for each purifier.

    b. Install intermediate sludge tank with small sludge transfer pumps to prevent oil from purifiers entering into the bilges. Sludge will be transferred to ships dirty oil tank.

5. BALLAST/BILGE DEWATERING - Install 3" air operated pumps (AOP)(Sandpiper model 5B3-A or equal) in each of the following locations:

LOCATION	QTY	CAPACITY	AIR CONSUMPTION
MTR Room	01	210 GPM	200 SCFM(replaces 2" AOP)
GTB Room	01	210 GPM	200 SCFM(replaces centri pmp)
Diesel 1	01	210 GPM	200 SCFM(replaces centri pmp)
Diesel 2	01	210 GPM	200 SCFM

a. Add eductors and associated piping to Diesel 1, Diesel 2, MTR Room and Gas Turbine Room in such a way that the eductors can take suction from either the bilge and deballast suction main or directly from the bilge space in which the eductor is located. The discharge from each eductor will be individually piped overboard. Firemain pressure piping (actuating line) will be provided to each eductor with cutout valves and remote mechanical linkage to the second deck.

6. GAS TURBINE LOGISTICS SUPPORT - Review the Machinery Evaluation Board on FT4A supportability. Dependent on the MEB's recommendations, revise gas turbine APL's and procure spares.

7. CPP SYSTEM - Procure a third spare propeller (clockwise).

8. STRUCTURAL REPAIRS

   a. Investigate solutions to erosion/corrosion problems in the stern tubes.

   b. Replace joiner bulkheads where required.

   c. Investigate replacement of seawater strains with supportable units.

9. DISTILLING PLANT - Replace the two existing 8000 GPD, two stage flash evaporators with two 10,000 GPD low pressure steam operated flash type distilling plants.

   a. The new units will be provided complete with supporting equipment (pumps and exchangers) accessible and not located underneath the evaporator shell.

   b. Re-pipe distillate dump valve so that the dump is overboard.

   c. Investigate feasibility of Reverse Osmosis units.

10. SHIP SERVICE GENERATOR/ENGINE - Perform load analysis of post-science upgrades and the anticipated post-RIP configuration of the cutter.

    a. Evaluate transformer burnout problems and recommend the appropriate fix with supportable units.

b. Evaluate supportability/repair spares required to improve supportability, maintainability and reliability.

c. Upgrade ship service and generator sets to increase generator capacity while ensuring compatibility between the sets.

d. Upgrade bus ties on the Master bench board.

e. Investigate seawater-cooling requirements for all- three SSDG's.

f. Provide MCAM capability to monitor electrical load from all three SSDG's.

11. SEA WATER COOLING SYSTEM - Redesign cooling system to alleviate problems with ice and snow ingestion that cause seawater pumps to become air bound.

    a. Investigate feasibility of motor operated valves to improve valve management in the ice.

    b. Investigate the feasibility of creating an organic jacket water heat exchanger system by running the piping through the fuel tanks, ballast tanks or sea chests.

12. HEELING SYSTEM - Investigate reliability arid need for maintaining this system. If the investigation indicates that the system has minimal value added for the cost, remove the system. If removal is not practical, investigate "moth-balling" the system in place. If the investigation demonstrates a need for the system; modify system to facilitate in-place repair without major disassembly.

13. STRUCTURAL REPAIRS
    a. Continue monitoring solution to resolve the erosion/corrosion problems in the stern tubes.

    b. Remove and renew corroded areas in the way of RIP equipment access routes and equipment locations.

14. CPP SYSTEM - Upgrade hydraulic system and install supportable equipment including pumps.

    a. Install two additional hydraulic lube oil purifiers so each system will be served by its own dedicated purifier piping to be cross connected between systems and purifiers with directional (safety lock) valves.

    b. Analyze the hydraulic piping and pipe hanger system and make improvements that will minimize vibration induced pipe failures.

    c. Change the failure-prone hydraulic pressure pumps to a more reliable type of pump of current manufacture.

d. Investigate a more reliable pitch setting control system.

e. Investigate procuring a new stub shaft and spacers to complete the spare ship set, overhaul existing propellers; develop Shoreside Allowance List (SAL) of -propeller overhaul parts, and buy parts to stock and maintain at NESU Seattle.

f. Research historical maintenance data, develop standard using MLCPAC's maintenance procedures, and ensure that new (spare) propeller is built to this new baseline.

g. Evaluate standardizing shaft diameters, including the spare tail shaft.

h. Replace the shaft coupling tapered bolts with straight hydraulic bolts and plan for and stock 20% spares at the NESU level.

i. Investigate the pros and cons of an open loop versus closed loop system; and finalize a decision.

15. HVAC - Perform HVAC load analysis, evaluate findings and balance the system to remove stagnant areas of hot and cold.

    a. Design system to meet the original design standards. The existing system requires renewal to be capable of maintaining habitability requirements, with an outside temperature spread from minus 60° F to plus 95° F including wind chill and humidity factors. Consideration of a "core" scheme whereby certain areas of the ship would be habitable during a wintering over is to be evaluated.

    b. Upgrade chill water system to meet design standards.

    c. Redesign machinery space intake (engine) ventilation to take air from a source that will not adversely affect the machinery space ambient air temperature.

    d. Replace air actuated controllers due to vibration effects on bellows, loss of balance.

16. S/S BOILER MODIFICATIONS - Evaluate systems and incorporate modifications to standardize the two cutters as much as possible.

    a. Modify foc'sle deck intakes to prevent ingestion of water in heavy seas.

    b. Evaluate boiler fire control system, change flame from Infrared to Ultraviolet.

    c. Investigate feasibility of automatic/regulated boiler feed water de-aeration and chemical injection system.

    d. Develop overhaul specification, disassemble/inspect, and replace S/S boiler tubes as

requiring MLCPAC past overhaul specifications.

e. Install cross-connect system for boiler feed pumps.

f. Repipe condensate tank vent with new vent condenser; and modify tank vent arrangement to prevent condensate from draining into the bilge.

g. Renew feed water tank and drain valves.

h. Calibrate and test controls.

i. Update/validate the existing PMS requirements.

17. ACCESS DOOR, HELICOPTER HANGAR - Investigate shaft drive and/or improved chain drive with master link for easy replacement.

a. Investigate replacing the existing door deck mounted dogging arrangement with dogging mechanisms that are welded to the retaining bracket on the bottom of the door; similar to the rotatable cam type dogging mechanism on the 270' WMECs.

b. Replace existing lip seal with a 1/8-inch thick canvas lined compressible seal. This type of seal has proved dependable on the 270' WMECs.

c. Install fluid evacuation trough to preclude flow back into the hangar bay.

d. Add permanent ladder/platform on the side of the hangar next to the door, to facilitate PMS.

18. SEWAGE SYSTEM - Improve reliability/serviceability of the ship's sewage system. Investigate the applicability of a Vacuum Flush system to a Polar Icebreaker.

a. Modify system configuration to separate the black and water into two distinct systems.

b. Hydro Blast entire system to clean and then UT all system piping to identify minimum piping wall thickness and renew piping where required.

c. Develop PMS requirements to Hydro Blast system periodically.

d. Investigate renewal of pumps.

e. Separate deck drain piping and connect to a gray water system and/or install check valves so that the black water doesn't backup.

f. Modify special drains; such as, garbage, sick bay, photo lab, chemical, etc.; and install clean-outs in appropriate locations.

g. Investigate easy connect of fresh water to the fire main to allow fresh water flush of sewage system.

19. MAIN PROPULSION DIESEL ENGINE - Improve reliability and safety through the following items:

a. Replace the ALCO 251E engine blocks with the improved ALCO 251F blocks. The ALCO 251F blocks have been redesigned to preclude the current stress cracking problems.

b. Renew engine-mounting blocks as necessary.

c. Investigate upgraded heads, pistons, camshafts and what ALCO has for the 251 Plus package.

d. Renew jacket water temperature regulator valves, Vulkan coupling, flywheel, bearing/labyrinth seals as required.

e. Evaluate propulsion generator cleaning.

f. Investigate new U.S. Navy certified fuel coalescer filter system on all main and S/S diesel engines.

g. Evaluate the Ward-Leonard switching equipment and Westinghouse DC propulsion control printed circuit cards for possible replacement.

20. CENTRAL HYDRAULIC SYSTEM - Analyze system for solution to leakage problems and modify accordingly.

a. Individually isolate drain line valves on the port, -starboard and centerline cranes so they can be maintained without shutting down the entire system.

b. Controllers should be modified if the decision is made to remove the heeling system.

c. Change the bolted pedestal access cover on the foundation to a quick release style access cover.

21. BOAT HANDLING DAVIT SYSTEM - Renew existing system to provide for better safety and ease of operation.

a. Add cleats in the appropriate locations to facilitate operation.

b. Add heaters to the gearboxes.

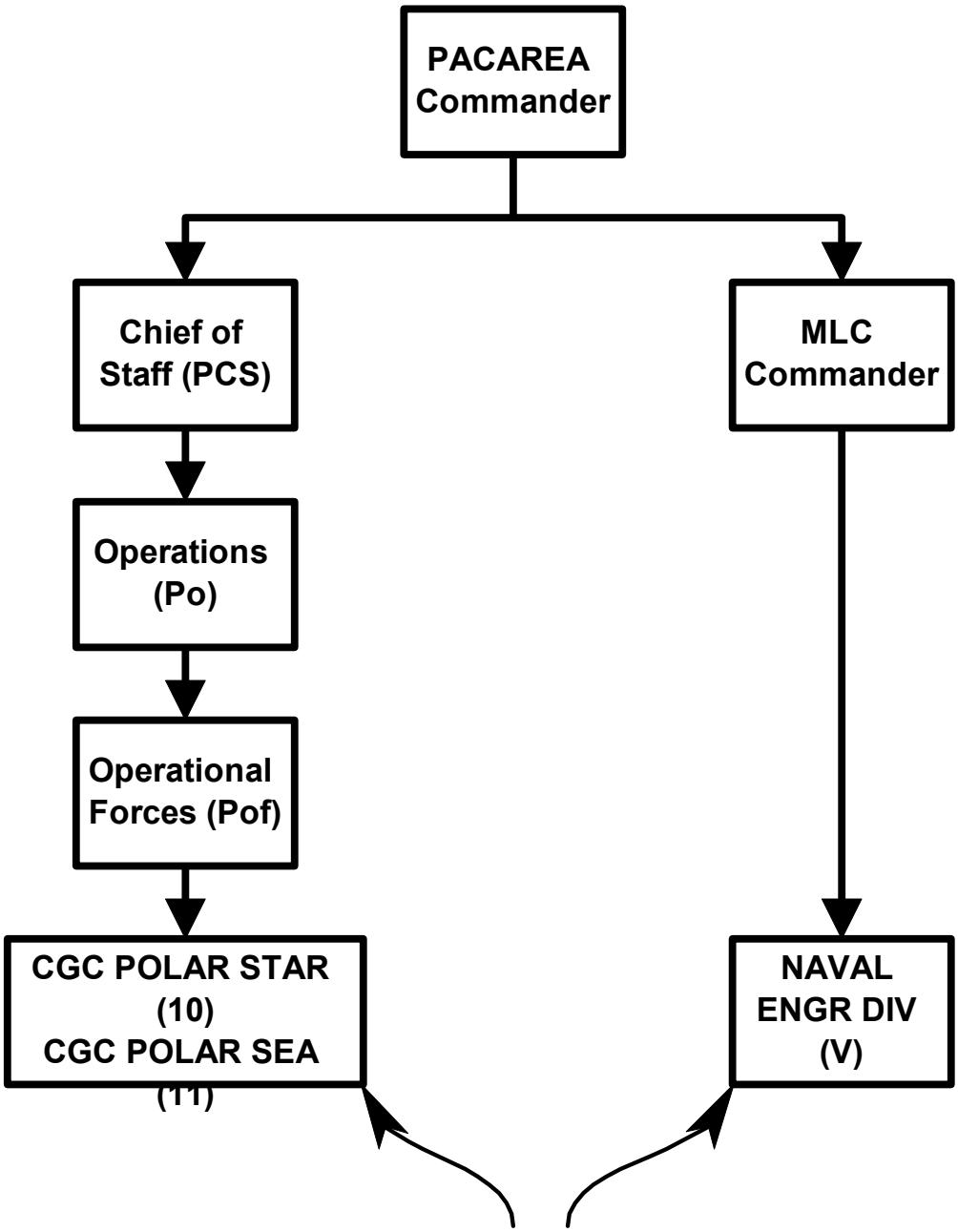
c. Investigate a safe quick release system from the crane for the RHIB.

d. Investigate a roll cage for the RHIB.

NOTE: Due to the fluctuations in funding and operational schedule, the RIP schedule is non-definitive. Based on the current status of both Polar Ice Breakers, the schedule is denoted below.

Polar Sea	DF02	04Dec01	21Apr02
Polar Sea	Inport	22Apr02	14May02
Polar Sea	Drydock	15May02	06Aug02
Polar Sea	Stan	14Aug02	16Aug02
Polar Sea	Shakedown	17Aug02	03Sep02
Polar Sea	Inport	04Sep02	22Sep02
Polar Sea	Trav	23Sep02	29Sep02
Polar Sea	TSTA	30Sep02	18Oct02
Polar Sea	DF03	10Nov02	15Apr03
Polar Sea	RIP III	09Jun03	05Dec03
Polar Sea	RIP IV	06Jun05	05Dec05
Polar Star	DF02	01Nov01	17Apr02
Polar Star	Inport	18Apr02	21Jul02
Polar Star	AWS	22Jul02	07Oct02
Polar Star	Inport	08Oct02	13Oct02
Polar Star	RIP II	14Oct02	18Dec02
Polar Star	Inport	19Dec02	01Jan03
Polar Star	RIP III	07Jun04	03Dec04
Polar Star	RIP IV	05Jun06	04Dec06

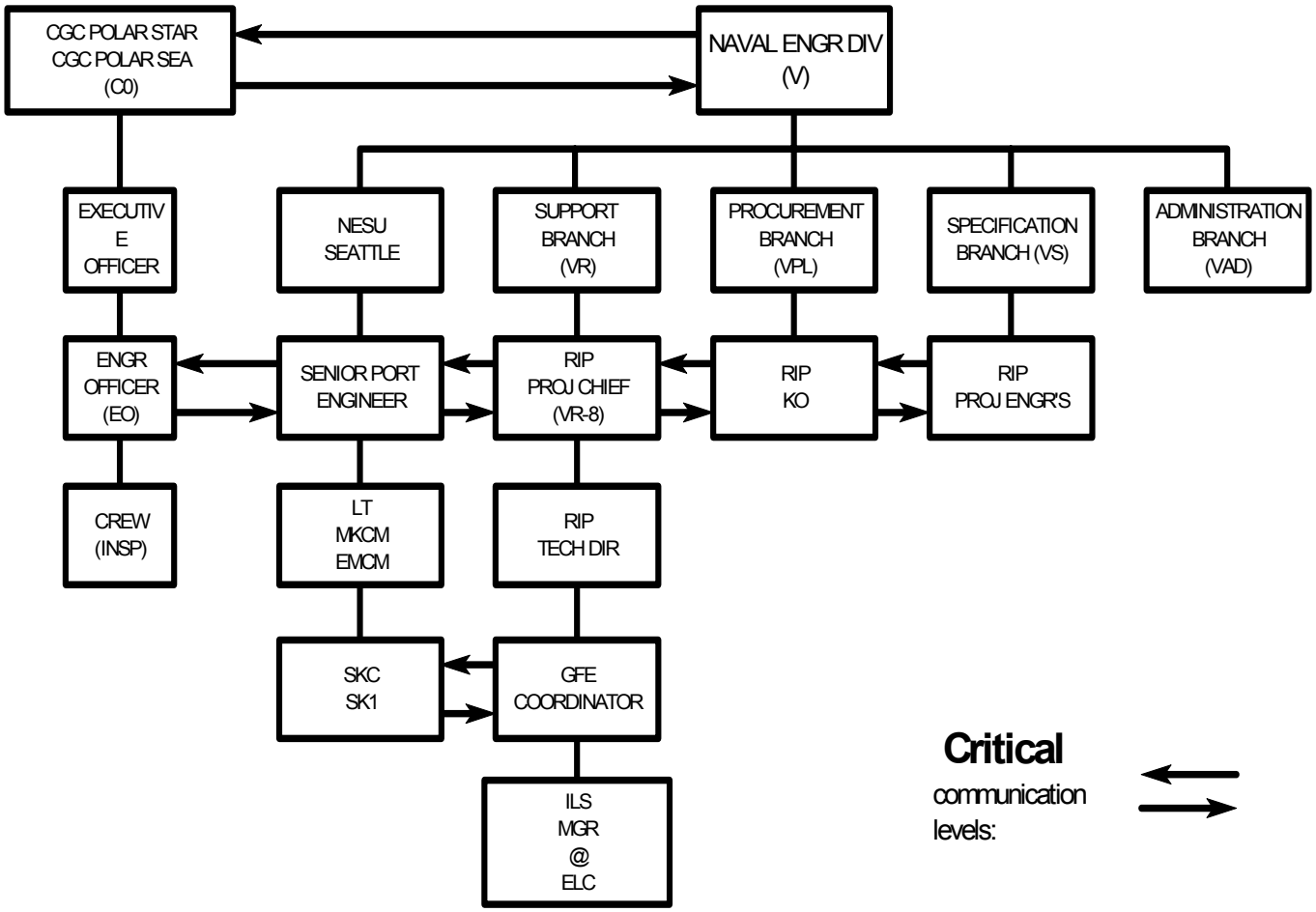
OPERATIONAL CHAIN OF COMMAND



See "RIP Organization Structure" for additional detail

RIP ORGANIZATION STRUCTURE

continued from Figure A



RELIABILITY IMPROVEMENT PROJECT AC&I BILLETS

RANK	FUNCTION	LOCATION
LT	TASK LEADER	COMMANDANT (G-SEN-2)
GS-13	PROJECT CHIEF	MLCPAC
GS-12	ASST PROJECT CHIEF	MLCPAC
LT	ILS MANAGER	ELC
CWO	QAR/GFE COORDINATOR	MLCPAC
GS-13	CONTRACT SUPERVISOR	MLCPAC
GS-12	CONTRACT SPECIALIST	MLCPAC
GS-12	CONTRACT SPECIALIST	MLCPAC
GS-12	MECHANICAL ENGINEER	MLCPAC
LT	PORT ENGINEER	NESU SEATTLE
EMCM	ELECTRICAL SECTION	NESU SEATTLE
MKCM	MP SECTION	NESU SEATTLE
SK1	LOGISTICS SECTION	NESU SEATTLE

NOTE: A GS-12 Electrical Engineer billet at MLCPAC was deleted in 1995 as part of the Naval Engineering Program Reduction of AC&I Billets. In February 2001, two MLC and two NESU Seattle billets were converted to OE. There are 13 of the original 18 AC&I billets remaining.

RELIABILITY IMPROVEMENT PROJECT SPEND PLAN

1. OBJECTIVES: The objectives of the Polar Class Reliability Improvement Project (RIP) Spend Plan are to ensure that:

   A. Adequate financial resources are obtained when required to accomplish the RIP.

   B. Funds are budgeted and obligated on time and as authorized.

   C. Funding carryover will be kept to as low a level as possible.

   D. An audit trail and historical record are maintained.

   E. Adequate project resources are provided.

   F. Reporting requirements are accomplished.

2. PLANNING:

   A. Funds for the RIP are requested through Resource Change Proposals and appropriated by Congress.

   B. The PM will maintain the RIP Spend Plan.

   C. The P0 will maintain the RIP Spend Plan. The Obligation Plan will include the planned obligation estimates for the current and following four quarters. It is a consolidation of the planned obligations approved for each point account. The Commitment Plan is a consolidation of Purchase Requests generated for the daily working of the project and is necessary due to the time lag between committing the funds for contract negotiation and the time the contract is awarded. The following is a list of the cost categories in this plan:

      1. Prime Contract
         a. Basic contract for detailed design
         b. Approved modifications to basic contract
         c. Economic price adjustments (see 4. ESTIMATE)
         d. GFE costs
         e. Basic contract installation cost

2. Related Costs
    a. Contract administration (project office, travel)
    b. Outfit and spares
    c. Personnel support costs; including messing and berthing of crew during off-ship periods when necessary.
    d. Logistics support costs; including any costs incurred when the crew cannot maintain its normal working environment while in a RIP availability
    e. Other costs (training, etc.)

3. EXECUTION:

    A. Project funds will be transferred to Commander, MLCPAC for execution in accordance with the Spend plan.

    B. The P0 shall initiate fund requests to the PM via MLCPAC if funding shortfalls become apparent.

    C. The P0 shall keep a detailed record of all expenditures of the project funds.

    D. The P0 will provide such reports as required concerning financial and obligation planning and expenditures.

4. ESTIMATE:

    A. RIP cost estimates, in thousands (K), by item are attached. The annual totals represent the original projected RP requests for project AC&I funds. These cost estimates are in fiscal year 1992 dollars. The RP requests for funds have been adjusted for inflation in the out years of the project.

    B. Funds for individual task items will vary in actual costs from the estimates attached; the P0 will adjust funds from within the RIP task items to balance the overall Spend plan.

    C. The timeline for the attached cost estimates has been shifted to the right, to fiscal year 2006. This shift was necessitated by operational considerations and out year funding constraints. The project will still complete within the original $60 M appropriation.

Reliability Improvement Project Original Cost Estimates

RIP Task Item	FY-90	FY-91	FY-92	FY-93	FY-94	FY-95	FY-96	FY-97	FY-98	Subtotal	Total
CPP System	$0	$600	$0	$10,502	$2,000	$5,500	$3,981	$0	$0		$22,583
Design	$0	$600	$0	$187	$0	$0	$0	$0	$0	$787	
LLTM	$0	$0	$0	$10,315	$0	$0	$0	$0	$0	$10,315	
Installation	$0	$0	$0	$0	$2,000	$5,500	$3,981	$0	$0	$11,481	
Sewage System	$0	$0	$650	$0	$1,095	$610	$0	$420	$420		$3,195
Design	$0	$0	$150	$0	$100	$0	$0	$0	$0	$250	
LLTM	$0	$0	$500	$0	$200	$0	$0	$0	$0	$700	
Installation	$0	$0	$0	$0	$795	$610	$0	$420	$420	$2,245	
Distiller	$0	$0	$2,005	$0	$200	$210	$0	$0	$0		$2,415
Design	$0	$0	$100	$0	$0	$0	$0	$0	$0	$100	
LLTM	$0	$0	$1,905	$0	$0	$0	$0	$0	$0	$1,905	
Installation	$0	$0	$0	$0	$200	$210	$0	$0	$0	$410	
OWS Renewal	$0	$0	$495	$0	$296	$310	$0	$0	$0		$1,101
Design	$0	$0	$75	$0	$0	$0	$0	$0	$0	$75	
LLTM	$0	$0	$425	$0	$0	$0	$0	$0	$0	$425	
Installation	$0	$0	$0	$0	$296	$310	$0	$0	$0	$606	
HVAC Upgrades	$0	$0	$0	$0	$335	$0	$0	$684	$790		$1,809
Design	$0	$0	$0	$0	$85	$0	$0	$0	$0	$85	
LLTM	$0	$0	$0	$0	$250	$0	$0	$0	$0	$250	
Installation	$0	$0	$0	$0	$0	$0	$0	$684	$790	$1,474	
Structural Repairs	$0	$0	$0	$0	$0	$600	$600	$1,400	$1,400		$4,000
Design	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
LLTM	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Installation	$0	$0	$0	$0	$0	$600	$600	$1,400	$1,400	$4,000	
Sea Chest Mods	$0	$0	$0	$0	$270	$0	$0	$1,908	$2,263		$4,441
Design	$0	$0	$0	$0	$270	$0	$0	$0	$0	$270	
LLTM	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Installation	$0	$0	$0	$0	$0	$0	$0	$1,908	$2,263	$4,171	
Heeling System Mods	$0	$50	$0	$985	$0	$738	$847	$0	$0		$2,620
Design	$0	$50	$0	$160	$0	$0	$0	$0	$0	$210	

LLTM	$0	$0	$0	$825	$0	$0	$0	$0	$0	$825	
Installation	$0	$0	$0	$0	$0	$738	$847	$0	$0	$1,585	
Central Hyd Sys	$111	$65	$0	$330	$0	$525	$605	$0	$0		$1,636
Design	$111	$65	$0	$110	$0	$0	$0	$0	$0	$286	
LLTM	$0	$0	$0	$220	$0	$0	$0	$0	$0	$220	
Installation	$0	$0	$0	$0	$0	$525	$605	$0	$0	$1,130	
L/O Purifiers	$0	$0	$0	$638	$0	$402	$460	$0	$0		$1,500
Design	$0	$0	$0	$110	$0	$0	$0	$0	$0	$110	
LLTM	$0	$0	$0	$528	$0	$0	$0	$0	$0	$528	
Installation	$0	$0	$0	$0	$0	$402	$460	$0	$0	$862	
Bilge Sys Mods	$0	$0	$275	$0	$250	$268	$0	$0	$0		$793
Design	$0	$0	$75	$0	$0	$0	$0	$0	$0	$75	
LLTM	$0	$0	$200	$0	$0	$0	$0	$0	$0	$200	
Installation	$0	$0	$0	$0	$250	$268	$0	$0	$0	$518	

RIP Task Item	FY-90	FY-91	FY-92	FY-93	FY-94	FY-95	FY-96	FY-97	FY-98	Subtotal	Total
MDE Upgrades	$0	$95	$0	$0	$725	$0	$0	$1,110	$1,210		$3,140
Design	$0	$95	$0	$0	$0	$0	$0	$0	$0	$95	
LLTM	$0	$0	$0	$0	$725	$0	$0	$0	$0	$725	
Installation	$0	$0	$0	$0	$0	$0	$0	$1,110	$1,210	$2,320	
S/S Gen Upgrades	$0	$0	$0	$0	$890	$0	$0	$1,365	$1,573		$3,828
Design	$0	$0	$0	$0	$40	$0	$0	$0	$0	$40	
LLTM	$0	$0	$0	$0	$850	$0	$0	$0	$0	$850	
Installation	$0	$0	$0	$0	$0	$0	$0	$1,365	$1,573	$2,938	
F/O Purifiers	$0	$0	$335	$0	$150	$155	$0	$0	$0		$640
Design	$0	$0	$75	$0	$0	$0	$0	$0	$0	$75	
LLTM	$0	$0	$265	$0	$0	$0	$0	$0	$0	$265	
Installation	$0	$0	$0	$0	$150	$155	$0	$0	$0	$305	
Compressed Air	$0	$0	$310	$0	$250	$275	$0	$0	$0		$835
Design	$0	$0	$75	$0	$0	$0	$0	$0	$0	$75	
LLTM	$0	$0	$235	$0	$0	$0	$0	$0	$0	$235	
Installation	$0	$0	$0	$0	$250	$275	$0	$0	$0	$525	
S/S Boiler Mods	$0	$0	$130	$0	$160	$168	$0	$0	$0		$458
Design	$0	$0	$50	$0	$0	$0	$0	$0	$0	$50	
LLTM	$0	$0	$80	$0	$0	$0	$0	$0	$0	$80	
Installation	$0	$0	$0	$0	$160	$168	$0	$0	$0	$328	
MGT spares	$0	$0	$0	$500	$525	$551	$0	$0	$0		$1,576
Design	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
LLTM	$0	$0	$0	$500	$525	$551	$0	$0	$0	$1,576	
Installation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Helo Hangar Doors	$0	$0	$50	$0	$148	$155	$0	$0	$0		$353
Design	$0	$0	$50	$0	$0	$0	$0	$0	$0	$50	
LLTM	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Installation	$0	$0	$0	$0	$148	$155	$0	$0	$0	$303	
Boat Davits	$0	$0	$0	$946	$0	$64	$74	$0	$0		$1,084
Design	$0	$0	$0	$66	$0	$0	$0	$0	$0	$66	
LLTM	$0	$0	$0	$880	$0	$0	$0	$0	$0	$880	
Installation	$0	$0	$0	$0	$0	$64	$74	$0	$0	$138	

Billet Start up	$0	$600	$0	$300	$200	$0	$0	$0	$0		$1,100
SSEB Polar Sea	$0	$300	$0	$0	$0	$0	$0	$0	$0		$300
Annual Totals	$111	$1,710	$4,250	$14,201	$7,494	$10,531	$6,567	$6,887	$7,656		$59,407

Design Cost	$2,699
LLTM Cost	$19,979
Installation Cost	$35,339
Billet and SSEB	$1,400
Total	$59,417

RELIABILITY IMPROVEMENT PROJECT STATUS REPORT

The following format is to be used by the PO when providing the project status report:

A. FORWARDING LETTER FROM THE PO

B. EXECUTIVE SUMMARY

C. INTRODUCTION

D. TABLE OF CONTENTS

E. PROJECT MANAGEMENT ACTIVITIES*

F. TECHNICAL ACTIVITY*

G. SCHEDULE

H. COST

I. RISK ASSESSMENT

J. APPENDIX (other project documentation)

*These two sections are subdivided into the following topics:

1. Summary of Project Activity/Accomplishments – The purpose of this section is to provide feedback data on project activity and accomplishments. Provide descriptive feedback to the following:

   A. Percentage of project completion
   B. Tasks completed since last report
   C. Problems resolved since the last report

2. Summary of Project Shortcomings/Needs - The purpose of this section is to provide feedback data on any significant project shortcomings and/or needs. Provide the following as a minimum:

   A. Problem statement
   B. Analysis of the problem
   C. Why does the problem exist?
   D. Analysis of how the problem is being managed
   E. What are ramifications if problem is unsolved?
      1. Short Term
      2. Long Term
   F. Recommend solutions and impacts on the RIP

3. Planned Project Activity Provide an overview summary of what project tasks will be worked on and the expected accomplishments to those tasks before the next report. Include:

   A. Tasks expected to be completed before the next report.
   B. Major events upcoming before the next report

RELIABILITY IMPROVEMENT PROJECT TASK STATUS REPORT

TSR, INPUT FOR: (Current Date)

Project Task:

Planned Phase:

Project Engineer:

1. Change since last TSR update (Past Date)
   A. Overall direction changes:
   B. Tasks completed:
   C. Milestone changes:
   D. Resolution of discussion issues from last meeting:
   E. Resolution of decision issues from last meeting:

2. Action items:

   A. Due by next meeting (Future Date)
      1. Description: Include responsible party, i.e. who owes what to whom and by when
   B. Future action beyond next meeting this will include all action items and milestones
      1. Description: Include responsible party, i.e. who owes what to whom and by when

3. Discussion issues:

   A. Topic - Brief description of the issue and the parties involved

4. Decision issues:
   A. Topic - Items that require further discussion or guidance from higher management