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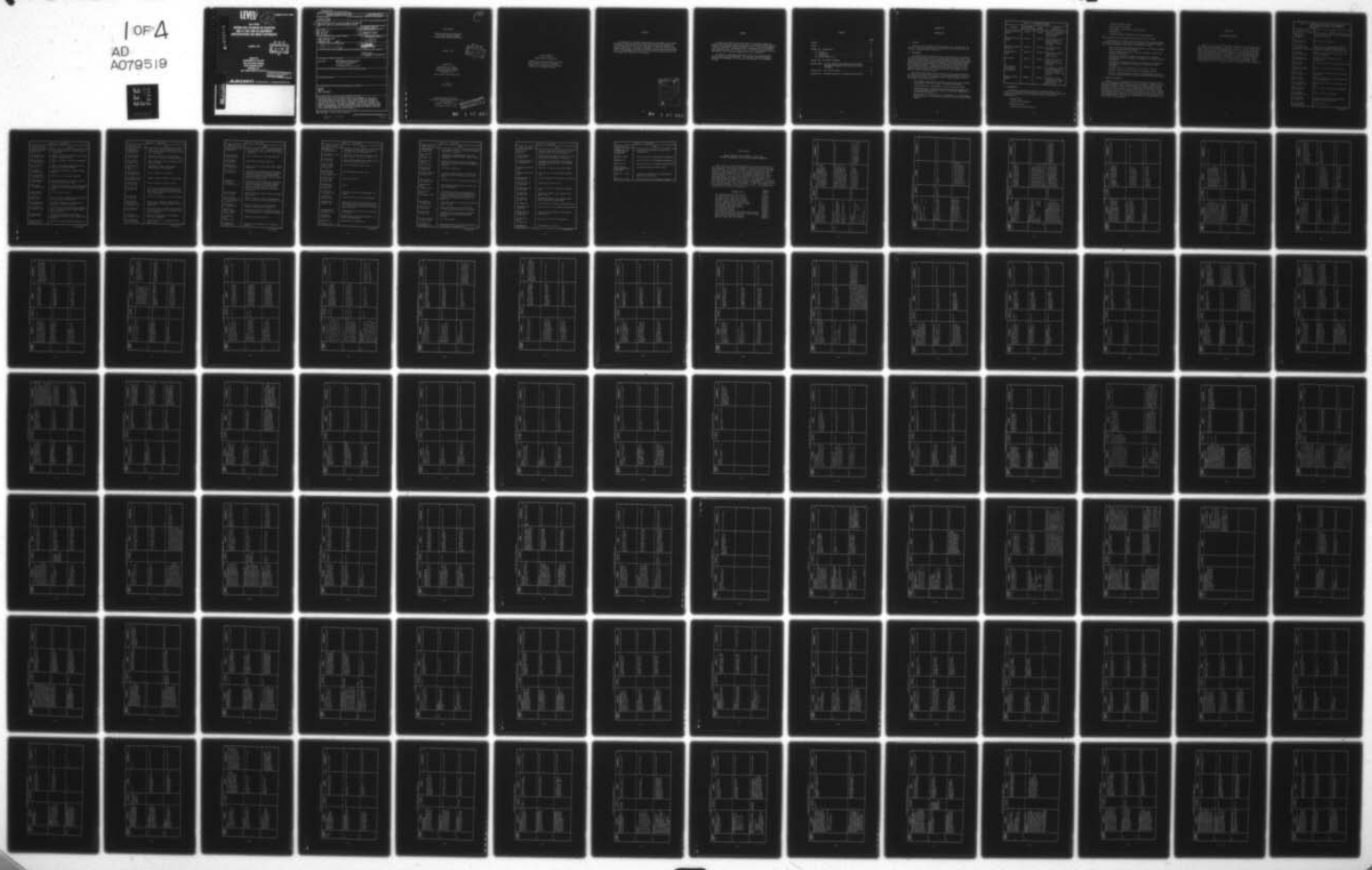

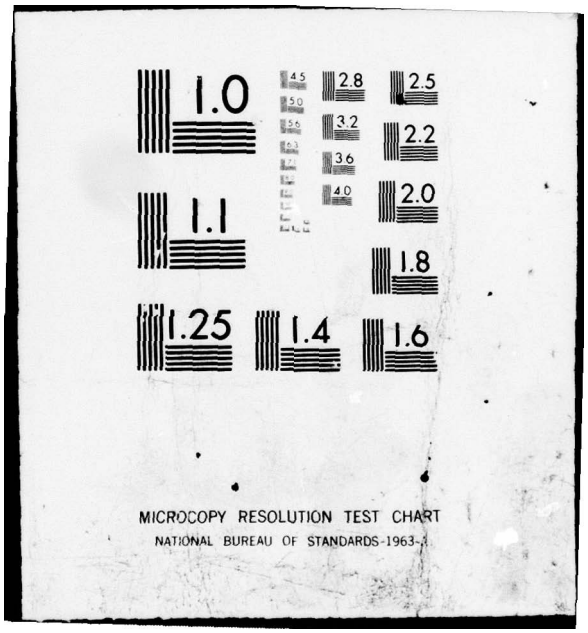
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FINAL REPORT

REVIEW AND TAILORING OF SELECTED DDG-47 AND DDG-48 EQUIPMENT SPECIFICATIONS AND WORK STATEMENTS

December 1979

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Prepared for
DEPARTMENT OF THE NAVY
Naval Sea Systems Command
AEGIS Shipbuilding Project
Washington, D.C.
under Contract N00140-79-D-0119

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DDG-48
WORK STATEMENTS

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THE IMPOSITION OF MILITARY SPECIFICATIONS AND STANDARDS IN THE SYSTEM ACQUISITION PROCESS MAY ADVERSELY AFFECT PROGRAM COSTS AND SCHEDULES IF THE IMPOSED SPECIFICATIONS ARE NOT THOROUGHLY REVIEWED AND TAILORED FOR SPECIFIC APPLICATION. THIS REPORT DESCRIBES A REVIEW AND TAILORING EFFORT CONDUCTED FOR SELECTED EQUIPMENT PROCUREMENT SPECIFICATIONS AND WORK STATEMENTS. RECOMMENDATIONS FOR TAILORING ARE INCLUDED AND POTENTIAL COST AND RISK IMPACTS ARE IDENTIFIED IN THIS REPORT.

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FINAL REPORT

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Under Contract N00140-79-D-0119

by

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ABSTRACT

The imposition of military specifications and standards in the system acquisition process may adversely affect program costs and schedules if the imposed specifications are not thoroughly reviewed and tailored for specific application. This report describes a review and tailoring effort conducted for selected equipment procurement specifications and work statements. Recommendations for tailoring are included and potential cost and risk impacts are identified in this report.

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SUMMARY

A review and tailoring of selected DDG-47 and DDG-48 equipment procurement specifications and work statements were conducted by ARINC Research Corporation for NAVSEA's AEGIS Shipbuilding Project. Tailoring recommendations are presented in this report, which, if implemented, could achieve a total potential saving of $612,000 to $1,134,000. The risk associated with implementing each tailoring recommendation is also identified.

In addition, a comparison analysis was made of all the procurement specifications and work statements. This analysis identified numerous technical and management areas that were not addressed in the documents reviewed.

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CHAPTER ONE

INTRODUCTION

1.1 PURPOSE

This study for the AEGIS Shipbuilding Project was conducted for the purpose of achieving improvements in procurement costs and schedules for the seven equipments shown in Table 1-1.

1.2 BACKGROUND

The tendency toward uncontrolled use of specifications and standards in the system acquisition process increases system life-cycle costs. System costs can be increased, and system development and production schedules slipped unnecessarily by expending resources to satisfy specified requirements that were either misapplied or misinterpreted at some point during the equipment procurement. Recent policy directives issued by the DoD require that all levels of management take constructive action to ensure more cost-effective application of specifications and standards in the military system acquisition process.

Cost and schedule benefits can be realized by the proper application of specification tailoring techniques in the appropriate phase of the system acquisition process. The misapplication of specifications occurs in one or more of the following ways:

- The premature application of military specifications and standards requirements in the early phases of acquisition programs
- The specification of requirements in excess of mission needs
- Total application of referenced specifications and standards that include paragraphs containing obsolete, overlapping, ambiguous, or incompatible requirements
- The application of specifications and standards, or certain requirements thereof, not intended for the purpose for which they have been invoked

Table 1-1. EQUIPMENTS ANALYZED

Equipment	Procurement Specification	Work Statement	General Characteristics
Air Conditioning Plant	G51401-2	G51401-1	200 ton, centrifugal unit with R-114 refrigerant
Sea Water Service Pump	G52102-2	G52102-1	Horizontal, volute-type, flexible coupled; 3000 gpm, 50 psig
Fuel Oil Transfer Purifier	G54106-2	G54106-1	Centrifugal unit, 135 gpm
Chilled Water Pump	G50301-2	G50301-1	Horizontal, centrifugal unit; 720 gpm, 75 psig
Fire Pump	G52101-2	G52101-1	Horizontal, volute-type, flexible coupled; 1,100 gpm, 150 psig
400 Hz Power Distribution Switchboard	G32403-2	G32403-1	Accommodation ratings: 250 kW, 60/400 Hz static converters at 0.8 power factor, 450 volts
AEGIS Sea Water Pumps	G52401-2	G52401-1	Horizontal, close-coupled, centrifugal configuration; 300 gpm, 60 psig

1.3 METHODOLOGY

The direction and guidance provided in MIL-HDBK-248(AS), dated 1 April 1977, were used in conducting this study. The handbook lists nine requirement categories that are considered high-cost drivers in specifications:

- General design
- Configuration management
- Quality assurance
- Reliability and maintainability

- Integrated logistic support
- Human factors and safety
- Environmental requirements and test methods
- Documentation
- Packaging, packing, preservation, and transportation

Each of these areas received particular attention in this study.

The method used to conduct this review and tailoring effort contains the steps listed below. These steps are presented in a logical sequence, but it must be emphasized that they are iterative in nature.

- Review the DDG-47 Shipbuilding Specification to determine equipment mission and top-level requirements.
- Review equipment specification and work statement. Extract each specified requirement.
- Itemize and review each document referenced in the equipment specification and work statement, with emphasis on high-cost-driver requirements.
- Determine and categorize the impact of each direct or referenced requirement and determine the extent of flexibility of each requirement.
- Recommend changes to requirements on the basis of analysis.
- Estimate the potential cost impact of recommended changes.
- Conduct a comparison analysis of all seven procurement specifications and work statements to identify inconsistencies and omissions.

1.4 REPORT ORGANIZATION

Chapter One is an introduction to the review and tailoring of seven DDG-47/-48 equipment specifications and work statements. Chapter Two lists the current documents that are referenced in the specifications and work statements reviewed. Chapter Three provides the complete details of the review and tailoring analysis. This information can be used to check the rationale for each of the recommendations provided in this report. Chapter Four presents estimates of the cost and risk impact of each of the tailoring recommendations. Chapter Five describes the comparison analysis of all the documents reviewed and provides recommendations for improving the content of each of the documents.

CHAPTER TWO

APPLICABLE DOCUMENTS

Table 2-1 is a list of all documents referenced in the equipment specifications and work statements. The issue in effect is listed in this table rather than the exact issue referenced by the specification or work statement. The table lists any documents addressed in any portion of the procurement specifications and work statements, including any documents cited in the data item descriptions. This master list was compiled because most of the specifications and work statements reviewed did not have complete lists of applicable documents, and a complete list is necessary to both reviewers and bidders so that the total scope of the procurement can be visualized and the conflicts among specified requirements can be identified.

Table 2-1. REFERENCES CITED IN THE SPECIFICATIONS AND WORK STATEMENTS REVIEWED (ISSUE CURRENTLY IN EFFECT)

Number and Date	Title
MIL-C-104A Amendment 1 26 March 1962	Crates, Wood; Lumber and Plywood Sheathed, Nailed and Bolted
MIL-P-116G(1) 24 August 1977	Preservation, Methods of
MIL-S-901C(1) 5 September 1963 Modified 15 April 1977	Shock Test HI (High Impact) Mechanical Equipment and Systems Requirements as Modified by NAVSEA for DDG-47 Class Ship
MIL-H-904 6 September 1977	Hoists, Chain, Hand Operated, Hook and Trolly Suspension
MIL-E-917D(1) 16 December 1966	Electronic Power Equipment, Basic Requirements
MIL-D-1000/2 Cancelled	Drawings, Engineering and Associated Lists
MIL-S-00-1222G(1) 14 February 1977	Studs, Bolts, Hex Cap Screws and Nuts
MIL-C-2212E 10 October 1973	Controllers, Alternating Current, Naval Shipboard
MIL-D-5480E 15 June 1970	Data, Engineering and Technical Reproduction Requirements
MIL-T-5624K(1) 12 November 1976	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-M-7298C(2) 15 April 1975	Manual, Technical, Commercial Equipment
MIL-Q-9858A 16 December 1963	Quality Program Requirements
MIL-M-9868D 1 October 1970	Microfilming of Engineering Documents, 35MM for Naval Ship Systems
MIL-C-9877B(1) 15 August 1966	Cards, Aperture

(continued)

Table 2-1. (continued)

Number and Date	Title
MIL-P-15024D SUPP 1 10 May 1971	Plate, Tags and Bands for Identification of Equipment
MIL-M-15071G(1) 19 November 1973	Manuals, Technical; Equipments and Systems, Content, Requirements for
MIL-E-15090B(2) 29 February 1956	Enamel, Equipment, Light-Gray (Formula No. 111)
MIL-C-15730K(1) 5 July 1977	Cooler, Fluid Naval Shipboard Lube Oil, Hydraulic Oil and Fresh Water
MIL-S-16032K 5 December 1969	Switches and Detectors, Shipboard Alarm System
MIL-S-16036H(1) 11 November 1976	Switch Gear, Power, Naval Shipboard
MIL-E-160366D(11) 23 April 1964	Electrical Clamps, Lug Terminals and Conductor Splices-Pressure Grip
MIL-P-16789C 10 September 1964	Preservation, Packaging, Packing and Marking of Pumps, General, and Associated Repair Parts
MIL-F-16884G(1) 22 March 1977	Fuel Oil, Diesel, Marine
MIL-M-17060E 20 May 1977	Motors, 60 Cycle Alternating Current Integral Horsepower (Shipboard Use)
MIL-I-17244E(3) 10 November 1975	Indicator, Temperature, Direct Reading, Bimetallic (3 and 5 Inch Dial)
MIL-M-17508E(2) 22 February 1977	Mount, Resilient, Naval Engineering Experiment Station Types 6E2000, 6E900, 7E450, 6E150, and 6E100
MIL-E-17555C(2) 15 April 1970	Electronic and Electrical Equipment, Accessories and Repair Parts, Packaging and Packing of
MIL-P-17639E(SH) 23 March 1979	Pumps, Centrifugal, Miscellaneous Service

(continued)

Table 2-1. (continued)

Number and Date	Title
MIL-V-18110E INT AMD-1(SH) 20 March 1978	Valve, Gate, Cast or Forged Steel, and Alloy Steel, Outside Screw and Yolk (Sizes 2-1/2" and Larger)
MIL-I-18997C/1 7 March 1967	Indicator, Pressure, Circulator DIAL (3-1/2, 4-1/2, and 8-1/2 Inch Dial Sizes)
MIL-M-19379B 21 March 1961	Mount, Resilient, Mare Island Types 11M15, 11M25 and 10M50
MIL-T-19646(7) SUPP 1 16 April 1970	Thermometers, Remote Reading Self-Indicating Dial, Gas Actuated
MIL-M-19863-C(1) 15 August 1967	Mount, Resilent: Type 5B500H
MIL-G-0021032E(1) 18 November 1975	Gaskets, Metallic-Asbestos, Spiral Wound
MIL-M-21649B 28 March 1966	Mount, Resilient, Type 5M 10,000-H
MIL-V-22052D 20 March 1978	Valve, Stop and Stop-Check, Globe, Angle, and Y Pattern, Cast or Forged Carbon or Alloy Steel, Outside Screw and Yolk (Size 2-1/2" and Larger)
MIL-P-22088 30 June 1959	Purifiers, Centrifugal, Jet Fuel Shipboard
MIL-V-22094D INT AMD 1 (SH) 11 November 1977	Valve, Glove, Stop-Check, Angle and Y, Flanged Bonnet, Manually Operated (Sizes 2" and Below)
MIL-V-22133C(2) 19 June 1970	Valve, Resilient and Metal Seated, Butterfly, Working Pressure Up to 200 psig, 180 Degree F Maximum
MIL-R-22732C 12 November 1973	Reliability Requirements for Shipboard Electronic Equipment
MIL-R-24085A(1) 17 October 1975	Refrigerating Unit, Centrifugal for Air Conditioning

(continued)

Table 2-1. (continued)

Number and Date	Title
MIL-W-24270A,1A,/2A 13 May 1961	Well (for Temp. Ind. or Thermal Elements), Insertion LG-2 Inch, Bore-3/8 Inch, Connection Socket
MIL-V-24332(2) 6 February 1974	Valve, Angle Relief, for Liquid Service
MIL-M-24365A 20 July 1970	Maintenance Engineering Analysis
MIL-M-24476A 10 February 1977	Mount, Resilient, Types 7M50, 6M160, 6M450, and 6M900
MIL-M-38761A 26 August 1977	Microfilming and Photographing of Engineering/Technical Data and Related Documents, FCAM Card Preparation, Engineering Data Micro-Reproduction System, General Requirements for, Preparation of
MIL-M-38761/2 (LC 0793) 13 September 1968	Microfilming and Photographing of Engineering/Technical Data and Related Documents, FCAM Card Preparation, Engineering Data Micro-Reproduction System: Microfilm Aperture and Tabulating Cards for Naval Ship Systems
MIL-M-38784A(5) 24 July 1978	Manual, Technical, General Style and Format Requirements
MIL-P-38790(6) CHG 1-31 August 1977 1 September 1977	Manual, Technical, Printing Production of Technical Manuals, General Requirements for
MIL-M-81203A 12 December 1967	Manual, Technical, In-Process Reviews, Validation Verification, Support of
MIL-STD-12C SUPP 1, NOTICE 2 15 June 1968	Abbreviations for Use on Drawings, Specification Standards and in Technical Documents
MIL-STD-100B CHG 2 15 April 1976	Engineering Drawing Practices
MIL-STD-130E 5 August 1977	Identification, Marking of U.S. Military Property

(continued)

Table 2-1. (continued)

Number and Date	Title
MIL-STD-143B 12 November 1969	Standards and Specifications, Order of Precedence for the Selection of
MIL-STD-167/1 and 2 1 May 1974	Mechanical Vibrations of Shipboard Equipment, Types I, II, III, IV, and V
MIL-STD-242F 1 June 1970	Electronic Equipment Parts [Selected Standards (Foreword and Contents)]
MIL-STD-242F Part I, CHG 1 1 June 1970	R.F. and Acoustical Parts (Part 1)
MIL-STD-242G Part 2, CHG 2 10 September 1975	Electromechanical Parts (Part 2)
MIL-STD-242F Part 4, CHG 1 1 June 1970	Capacitors (Part 4)
MIL-STD-242F Part 5, CHG 1 1 June 1970	Coils
MIL-STD-271E 31 October 1973	Non-Destructive Testing Requirements for Metals
MIL-STD-275D 26 April 1978	Printed Wiring for Electronic Equipment
MIL-STD-278E 29 March 1976	Fabrication, Welding, and Inspection; and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels in Ships of the U.S. Navy
MIL-STD-454F(1) 1 September 1978	Standard General Requirements for Electronic Equipment
MIL-STD-470 21 March 1978	Maintainability Program Requirements (for Systems and Equipments)
MIL-STD-471A CHG 1 10 January 1975	Maintainability Demonstration

(continued)

Table 2-1. (continued)

Number and Date	Title
MIL-STD-480A 12 April 1978	Configuration Control - Engineering Changes, Deviations and Waivers
MIL-STD-721B CHG 1 10 March 1970	Definitions of Effectiveness Terms for Reliability, Maintainability, Human Factors and Safety
MIL-STD-740B CHG 1 22 June 1965	Airborne and Structureborne Noise Measurements and Acceptance Criteria of Shipboard Equipment
MIL-STD-756A 15 May 1963	Reliability Prediction
MIL-STD-777D(SH) 15 April 1977	Schedule of Piping, Valves, Fittings, and Associated Piping Components for Surface Ships
MIL-STD-781C 21 October 1977	Reliability Tests: Exponential Distribution
MIL-STD-785A CHG 1 9 January 1978	Requirements for Reliability Program, Systems and Equipment
MIL-STD-798 CHG 1 27 November 1968	Non-Destructive Testing, Welding Quality Control, Material Control and Identification and HI-Shock Test Requirements for Piping System Components for Naval Shipboard Use
MIL-STD-804B 15 August 1966	Format and Coding of Tabulating and Aperture Cards for EDMS
MIL-STD-847(2) 1 July 1978	Format Requirements for Scientific and Technical Reports Prepared By or For DoD
MIL-STD-882A 28 June 1977	Requirement for System Safety Program for Systems and Associated Subsystems and Equipment
MIL-STD-1304A(AS) 31 October 1969	Reliability Report
MIL-STD-1310C 30 November 1973	Shipboard Bonding and Grounding Methods for Electromagnetic Compatibility

(continued)

Table 2-1. (continued)

Number and Date	Title
MIL-STD-1399 SECT 300	Interface Standard for Shipboard Systems - Electric Power, Alternating Current
MIL-STD-1472B(2) 10 May 1978	Human Engineering Design Criteria for Military Systems, Equipment and Facility
MIL-STD-1629(Ships) 1 November 1974	Procedures for Performing a Failure Mode and Effectiveness Analysis for Shipboard Equipment
NAVSEA 0908-LP-000-3010	Shock Design Criteria for Surface Ships
NAVSEA 0908-LP-000-6010	Title not given in Procurement Documentation
NAVSHIPS Dwg. No. 810-138-5850	Piping Instrument, Pressure for All Service
NAVSHIPS Dwg. No. 810-138-5917	Thermometer Selection Guide
NAVSHIPS Dwg. No. 810-214-5600	Title not given in Procurement Documentation
MIL-HDBK-H4-1 October 1970	Cataloging Handbook, DoD, Manufacturer's Name to Cod
MIL-HDBK-H6-1 January 1968	Cataloging Handbook, DoD, Index of Names, Items, Abbreviations and Symbols
MIL-HDBK-H-28	Screw Threads for Standard Federal Services
NAVSEANOTE 5600 1 May 1977	Title not given in Procurement Documentation
NAVSEC Rept. No. 6113B8-140-177 1 July 1977	General Style and Format for Microfiche Compatibility
MIL-HDBK-217B CHG 2 17 March 1978	Application of Electrical Resolvers
MIL-HDBK-472 24 May 1966	Maintainability Predictions

(continued)

Table 2-1. (continued)	
Number and Date	Title
NAVSEA Rept. No. 6113B8-140-177 1 July 1977	General Style and Format for Microfiche Compatibility
NAVSHIPS 93820	Title not given in Procurement Documentation
NAVEXOS P-35	Title not given in Procurement Documentation
USAS Y32.16	Title not given in Procurement Documentation
York Division Borg-Warner Corp. 707-108-1	Individual Acceptance Tests - Noise
ANSI S1.1 - 1960	Acoustical Terminology (including Mechanical Shock and Vibration)
ANSI S1.2 - 1962	Method for Physical Measurement of Sound

CHAPTER THREE

REVIEW, ANALYSIS, AND TAILORING OF DDG-47/-48 EQUIPMENT PROCUREMENT SPECIFICATIONS AND WORK STATEMENTS

This chapter is a tabular presentation of the review, analysis, and tailoring of the DDG-47 and -48 equipment procurement specifications and work statements. The document reviewed is listed on the top of each page. The first column of the table gives the paragraph number in the specification or work statement that is being reviewed and analyzed. The second column gives the title and a paraphrased statement of the specified requirement. The third column identifies the exact issue of the applicable documents addressed in the text of each requirement. The fourth column provides comments concerning the significance of the particular requirement. The fifth column provides recommendations resulting from the review and analysis of each requirement. A total of 14 documents have been reviewed, analyzed, and tailored in this effort. The documents are listed below in the order of presentation.

Document Title	Document Number
Air Conditioning Plant Specification	G51401-2
Air Conditioning Plant Work Statement	G51401-1
Sea Water Service Pumps Specification	G52102-2
Sea Water Service Pumps Work Statement	G52102-1
Fuel Oil Transfer Purifier Specification	G54106-2
Fuel Oil Transfer Purifier Work Statement	G54106-1
Chilled Water Pump Specification	G50301-2
Chilled Water Pump Work Statement	G50301-1
Fire Pump Specification	G52101-2
Fire Pump Work Statement	G52101-1
400 Hz Power Distribution Switchboard Specification	G32403-2
400 Hz Power Distribution Switchboard Work Statement	G32403-1
AEGIS Sea Water Pump Specification	G52401-2
AEGIS Sea Water Pump Work Statement	G52401-1

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3. 3.1	Requirements Item Definition The plant(s) furnished shall be in accordance with this specification, and shall be Type I, Class 2 packaged centrifugal units per MIL-R-24085A(1) as modified in 3.1 herein.	MIL-R-24085A(1)	This is a general requirement. Conformance with this requirement is critical to the performance, quality and testing of this equipment. The requirements of MIL-R-24085A(1) have been modified in Table 1 of Air Conditioning Plant Procurement Specification, G51401-2.	Do not tailor this requirement.
3.1.1 3.1.1.1 & 3.1.1.2	Equipment Required SELLER & BUYER Furnished Equipment Equipment shall be furnished by the SELLER in accordance with this specification. Equipment shall be furnished by the BUYER in accordance with this specification.	--	Tailoring is not applicable to this requirement. The DDG-47 SHIPBUILDING SPECIFICATION (Paragraph 516b, Page 535, Lines 8-24) contains specific requirements for refrigerant and lubricating oil replacement changes. Since these items do not appear in Paragraph 3.11, how will the requirement for replacement changes be satisfied?	Do not tailor this requirement.
3.2 3.2.1	Characteristics Performance Plant performance shall be IAW MIL-R-24085A(1) as modified herein: Capacity (tons) 200 $^{+10\%}_{-0\%}$ Refrigerant R-114 Chilled Water Flow (gpm) at rated capacity 720 ± 5%	MIL-R-24085A(1)	This is a general requirement of critical importance. Paragraphs 3.1 through 3.36 of MIL-R-24085A(1) could apply, but they are not referenced specifically.	State exactly which paragraphs of MIL-R-24085A(1) form part of this requirement and to what extent. The defined requirement should then be analyzed for possible tailoring.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1	Performance (continued) Outlet Chilled Water Temperature 44 ± 1°F Sea Water Flow (gpm) Max. 1000	-- --	-- --	-- --
3.2.1.1	Noise Level Noise level shall be in accordance with this specification. Terminology used shall be as defined in ANSI S1.1	MIL-R-24085A(1) ANSI S1.1	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
3.2.1.1.1 3.2.1.1.2	Airborne and Structureborne Levels Airborne and structureborne levels for each plant with electric motor integrated shall not exceed limits as specified in Figures 1 and 2 at 15, 50, and 100 percent of rated capacity.	--	Noncompliance with this requirement will adversely affect the ability of personnel in the vicinity to perform their assigned duties, and the ship ASW mission; however, minor deviations from the requirement may be permitted in order to avoid the costs of retest and engineering changes.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2 3.2.2.1	Physical Characteristics Weight The maximum operating weight of each plant including all equipment in 3.1.1.1 but excluding equipment in 3.1.1.2 shall be 22,000 lbs.	--	Non-compliance with this requirement may affect the weight and moment distribution of the ship. This requirement is considered firm.	Do not tailor this requirement.
3.2.2.2	Dimensions The envelope dimensions of each plant with motor and all accessories specified in 3.1.1.1 shall not exceed the following: Length 170.0 in. Width 60.0 in. Height 92.0 in. Tube bundle 148.0 in.	--	Within a certain tolerance, non-compliance with this requirement will have little impact on the equipment to perform effectively. These dimensions could possibly affect access through this area and accessibility to the equipment for maintenance purposes. This requirement is considered flexible. At present there appears to be no cost advantage to tailoring this requirement.	Do not tailor this requirement.
3.2.2.3	Control and Operation The plant shall be designed for local manual and automatic control as specified in MIL-R-24085A(1). In addition remote central control console connections to permit summary fault monitoring shall be made. Summary fault excitation for normally closed contacts on local control panels shall be supplied by the BUYER (28 VDC 1 Amp min, 28 VDC 5 Amp max.)	MIL-R-24085A(1)	This set of requirements contain some requirements which are critical (involving emergency shut-off devices) and some which are of major importance (involving control of equipment output and remote monitoring). These requirements are considered firm.	Do not tailor this requirement. Identify the specific paragraphs of MIL-R-24085A(1) that apply and the extent to which they apply.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2.4	Lifting Provisions Lifting provisions shall be suitable to allow installation and removal in all attitudes but need not be integral parts of castings. Attachment points shall be capable of withstanding weights and torsion forces applied during lifting.	--	This requirement is of major importance for equipment installation and removal. This is a firm requirement. This requirement does not have a significant impact on cost.	Do not tailor this requirement.
3.2.3 3.2.3.1	Reliability and Maintainability Reliability The equipment shall achieve an MTBF of 6600 hours or more when maintained in accordance with recommended maintenance schedules.	--	This requirement is of major importance. Failure to meet this requirement will result in increased operation and maintenance costs and may adversely affect the ship mission.	Do not tailor this requirement.
3.2.3.2	Maintainability The equipment shall achieve an MTTR requirement of 24.6 hours or less.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.3.3	Production Maintainability Demonstration. A maintainability demonstration shall be conducted in accordance with MIL-STD-471A to show achievement of MTTR specified in paragraph 3.2.3.2. This demonstration may be waived if prior documented testing is acceptable to the BUYER. The demonstration shall be conducted in accordance with applicable R&M criteria described in paragraph 3.2.3.1.	MIL-STD-471A	This requirement is essential to the determination of equipment MTBF; however, Section 3 should contain equipment performance requirements. Section 4 should contain all the tests, inspections, demonstrations, etc., required to verify that the equipment satisfies all the specified performance requirements.	Delete this requirement.
3.2.3.4	Maintainability Verification Verification of the maintainability requirement shall be accomplished by a Maintainability Demonstration IAW MIL-STD-471A.	MIL-STD-471A	This requirement appears to be identical to the requirement in paragraph 3.2.3.3.	Delete this requirement.
3.2.4.	Useful Life Service life of the plant shall be 20 years with an 80% duty cycle. Servicing, preventive maintenance, and overhaul is permitted in accordance with BUYER approved procedures furnished by the SELLER.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5	Environmental Conditions The plant shall meet performance requirements specified herein and in MIL-R-24085A(1) during exposure to any possible combination of specified operating environments.	MIL-R-24085A(1)	Conformance with this requirement is critical to the ship mission.	This requirement should include a direct reference to MIL-R-24085A(1) Paragraph 3.1 "General Shipboard Design Conditions", and all other specific requirements for environmental conditions.
3.2.5.1	Design Conditions Design conditions shall be as specified in MIL-R-24085A(1) as modified herein.	MIL-R-24085A(1)	Does this requirement refer to the "General Shipboard Design Conditions" paragraph in the reference? Does this paragraph contain information that is not contained in either Paragraph 3.2.1 or 3.3? Which modifications apply?	Delete this paragraph, or identify specific requirements of MIL-R-24085A(1) that apply.
3.2.5.2	Ship Motion The plant shall meet the ship motion requirements specified in MIL-R-24085A(1).	MIL-R-24085A(1)	This requirement is critical to the equipment performance. This requirement is considered firm; however, it is redundant to Paragraph 3.2.5.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.3	Shock The equipment shall meet shock Grade A requirements of MIL-S-901C IAW Appendix I and II contained herein for Type A, Class II hull mounted heavy equipment. During test the equipment shall be energized in its normal operational mode.	MIL-S-901C	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement. Delete general reference to MIL-S 901C and call out specific paragraphs of MIL-S-901C as appropriate. Document D5381044 should be included as an attachment to the Work Statement.
3.2.5.4	Vibration Externally Generated The equipment shall be capable of withstanding vibration requirements of MIL-STD-167B, Type I, from 4 to 15 Hz.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.2.5.5	Vibration Self Excited Equipment or machinery components rotating parts shall meet balance and vibration requirements of MIL-STD-167B, Type II.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3	Design and Construction The general design and construction requirements are defined in MIL-R-24085A(1) and are modified by Table I of Spec. No. G51401-2.	MIL-R-24085A(1)	This is a general requirement of major importance to the performance, quality, and testing of this equipment. MIL-STD-490 requires that this paragraph specify minimum or essential requirements that are not controlled by performance, characteristics, interface requirements, or referenced documents.	Specific design and construction requirements should be called out in this paragraph in accordance with the guidance provided in MIL-STD-490.
3.3.1	Materials, Processes and Parts Materials, processes and parts shall be IAW MIL-R-24085A(1) with modifications delineated in Table I and Spec. No. G51401-2.	MIL-R-24085A(1)	This is a general requirement of major importance to the performance, quality and testing of this equipment.	Specify exactly which paragraphs of MIL-R-24085A(1) apply to this requirement and to what extent.
3.3.2	Electromagnetic Radiation Grounding and bonding shall be IAW MIL-STD-1310.	MIL-STD-1310	This requirement is of major importance to the functioning of receiving and transmitting equipment aboard ship. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.4.3	Nameplates and Product Marking Parts Identification Information for identification for each unit nameplate shall be in accordance with this specification. Motor nameplates shall be IAW MIL-M-17060.	MIL-M-17060	This requirement is of minor significance to the equipment performance; however, there appears to be little or no potential for cost savings.	Do not tailor this requirement.
3.3.4	Workmanship Workmanship practices shall be in accordance with this specification. Welding shall be IAW MIL-STD-278 Section 7. Electrical/electronic workmanship shall be IAW MIL-STD-454 Section 9.	MIL-STD-278 MIL-STD-454	This requirement is of major importance to the equipment performance. Changes to this requirement could result in degraded performance and reduced reliability; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.3.5	Interchangeability All identically identified components and repair parts shall be functionally and physically interchangeable, without degradation to the system.	--	This requirement is of major importance to the equipment maintenance. Changes to this requirement could result in degraded performance and excessive values of MTTR; therefore, this requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.6	System Safety/Human Factors System safety criteria in accordance with MIL-STD-882A paragraph 5.4.1 and Human Engineering criteria of MIL-STD-1472B paragraphs 4.2 and 4.4 will be incorporated when applicable in the design or modification of this equipment. The order of precedence for incorporation of safety features shall be in accordance with MIL-STD-882A paragraph 5.4.2.	MIL-STD-882A MIL-STD-1472B	This requirement is of major importance to the equipment performance. Changes to this requirement would degrade equipment performance; therefore this requirement is considered firm.	Do not tailor this requirement.
3.3.7	Compressor Motors Compressor motors shall be in accordance with MIL-M-17060E with characteristics as called out in Paragraph 3.16.2 of MIL-R-24085A(1). Motor horsepower shall be 300 (max.) airborne and structureborne noise requirements specified in Specification No. G51401-2 may be more stringent than MIL-M-17060E.	MIL-M-17060E MIL-R-24085A(1) MIL-M-17060E	This requirement is of major importance to the equipment performance. Changes to this requirement would degrade equipment performance; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.4 3.4.1	Technical Manuals Requirements SELLER furnished manuals shall be in accordance with MIL-M-15071. Level of complexity and coverage shall be edited to the education and training level of a third class petty officer having previous experience with similar/related equipment. New and revised technical manuals shall be written to the standards specified in Spec. No. G51401-2.	MIL-M-15071	This requirement is of major importance to equipment operation and maintenance.	This requirement has been modified by Paragraph 3.4.2 of G51401-2. Do not tailor this requirement. This requirement should refer to MIL-M-15071H.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.4.2	Existing Manuals The BUYER shall make maximum use of existing technical manuals, and will accept existing manuals as specified in Spec. No. G51401-2.	--	This paragraph modifies the requirement for technical manuals to take advantage of previously developed manuals.	Do not tailor this paragraph.
3.4.3	Numbering Numbering of technical manuals shall be accomplished IAW NAVSEANOTE 5600 of 17 May 1977. SELLER shall request assignment of NAVSEA numbers IAW Spec. No. G51401-2.	NAVSEANOTE 5600	This requirement has no bearing on equipment performance or cost. This requirement is considered firm.	Do not tailor this requirement.
3.5 3.5.1	Logistics Overhaul Cycle The equipment shall have a minimum time between overhaul (TBO) of 28,000.	--	This requirement requires certification prior to analysis for tailoring.	Add "Hours" after "28,000". Define the 28,000 hours. It could be calendar time, ship operating time, air conditioning plant up time or some other measure. Define how the 28,000 hours will be measured.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.2	Support Supply support shall be in accordance with the provisioning requirements specified in the contract.	--	This requirement is of major importance to the equipment performance; however the Navy probably has adequate supply support information at this time.	Tailor this requirement so that contractor inputs to provisioning technical documentation is obtained only for subsystems and modules which are not currently in Navy inventory.
3.5.3	Standardization The SELLER shall furnish and employ standard components/equipment to the maximum extent possible and include applicable Navy Component Identification (CID) numbers, where known, with proposal.	--	This requirement is of major importance to equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.1	Selection of Components/Equipment The order of precedence for selection of components/equipment is specified in accordance with Spec. No. G51401-2.	--	Changes to this requirement will not have a significant bearing on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.3.2	BUYER Specified Equipment The BUYER may specify to the SELLER certain types or manufacturers of equipments of the categories identified in the MIAPL prior to release for manufacture.	--	This requirement has minor impact on equipment design and has no significant cost impact.	Do not tailor this requirement.
3.5.3.3	Standard Design Equipment Upon establishment of a single source for a component/equipment, SELLER shall purchase same as defined in 3.5.3.4 from the same source.	--	This requirement has major impact on system performance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.4	Identical Design The SELLER shall maintain identical component/equipment design for the total procurement under this contract.	--	This requirement has major impact on system performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.3.5	Non-Standard Components The use of non-standard components/ equipments is prohibited without express written permission of the BUYER after receipt of written rationale.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.5.4	Facilities and Facility Requirements Facilities required to support the equipment shall be within present Navy capabilities.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.6	Personnel Personnel required to operate and maintain the plant will be composed of presently available Navy skills.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.7	Qualification Delivered plants shall be qualified products in accordance with quality conformance tests of MIL-R-24085A(1) which meet, in addition, provisions of Section 4 of Specification No. G51401-2.	MIL-R-24085A(1) MIL-I-45208	This requirement has a major impact on equipment acceptance.	Do not tailor this requirement.
3.8	Precedence In the event of conflict, precedence shall be as follows: a. Spec. No. G51401-2 b. Documents specified herein	--	This requirement has no significant impact on cost. This requirement is considered firm.	Do not tailor this requirement.
4 4.1	Quality Assurance Provisions General The plants shall meet the quality assurance provisions of MIL-R-24085A(1) as specified herein.	MIL-R-24085A(1)	MIL-STD-490 permits the use of Paragraph 4.1.2, titled "Special Tests and Examinations". This paragraph covers the testing routine, sequence of tests, number of items to be tested, and the data required for all testing other than acceptance inspections. It also includes a table correlating each equipment performance requirement, its tests, the type of each unit on which the test shall be performed, and specific references for each test.	Develop Paragraph 4.1.2 with a tabular presentation of all tests and inspections required in Section 4 correlated to the performance requirements of Section 3.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.1.1	Responsibility for Tests Except as otherwise specified, the SELLER is responsible for conduct of all tests specified herein. SELLER may submit data derived from prior testing of comparable equipment subject to BUYERS approval.	--	This requirement is considered firm.	Do not tailor this requirement.
4.2 4.2.1	Quality Conformance Inspections Performance Performance of each plant shall be verified by the tests of MIL-R-24085A(1) as modified herein.	MIL-R-24085A(1)	This requirement is of major importance to the equipment testing and acceptance.	Do not tailor this requirement.
4.2.1.1	Noise Noise measurements shall be made in accordance with MIL-STD-740 and 4.2.1.1.1 and 4.2.1.1.2. Plant and its accessories shall be mounted on a common sub-base supported by required USN resilient mounts (see 3.2.1.1.2).	MIL-STD-740	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.1.1.1	Airborne Noise Tests Airborne noise test measurements shall be made in accordance with procedures of 707-108-1 and as specified in Spec. No. G51401-2.	MIL-STD-740 707-708-1	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.2.1.1.2	Structureborne Noise Tests Structureborne noise tests shall be conducted in accordance with 3.2.6.2 and as specified herein.	MIL-STD-740	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.2.2	Physical Characteristics Physical characteristics shall be verified visual examination and measurement.	MIL-STD-740	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.3	Reliability Reliability shall be verified by analyses required in SOW.	--	This requirement is of major importance to equipment testing and acceptance.	Specify the exact test and test conditions required.
4.2.4	Maintainability Maintainability shall be verified in accordance with 3.2.3.4.	--	This requirement is of major importance to equipment testing and acceptance.	Specify the exact test and test conditions required.
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.5	Environmental Conditions Verification of the environmental conditions shall be in accordance with Spec. No. G51401-2, as described in the following paragraphs.	--	This requirement is of major importance to equipment testing and acceptance.	Reword to state that verification of equipment conformance with requirements shall be in accordance with specification G51401-2, as described in the following paragraphs.
4.2.5.1	Standard Design Conditions The performance tests of the plant shall be done at standard design conditions in MIL-R-24085.	MIL-R-24085A(1)	This requirement is unclear.	The subparagraphs under "Quality Conformance Inspections" are intended to list all examinations and tests required to verify that all requirements of Sections 3 and 5 have been achieved. Restate this requirement to conform with this intent.
4.2.5.2	Ship Motion Verification of the requirements for ship motion in 3.2.5.2 shall be done by analysis and inspection of data.	--	The intent of this paragraph is to require verification that equipment performance will not be degraded under the ship motion conditions specified in MIL-R-24085A(1) for type I units and that the equipment will maintain adequate lubrication, will avoid loss of fluids, and will drain out spillage under these conditions.	Decide which examinations and tests will achieve the intent discussed under "Comments" and require those examinations and tests in this paragraph.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.5.3	Shock The equipment shall have the shock requirements of 3.2.5.3 verified by test or extension in accordance with MIL-S-901C and appendices I and II of Spec. No. G51401-2.	MIL-S-901C	This requirement is of major importance to equipment testing and acceptance.	Reword this requirement to state that verification of equipment conformance with the requirements of paragraph 3.2.5.3 shall be in accordance with MIL-S-901C (Reference Specific Paragraphs) and Appendix I and II of this specification (Reference Specific Paragraphs.
4.2.5.4	Vibration Externally Generated The equipment shall have vibration requirements of 3.2.5.4 verified in accordance with MIL-STD-167B, Type I and/or Appendix II of Spec. No. G51401-2.	MIL-STD-167B	This requirement is of major importance to equipment testing and acceptance. This requirement is flexible; however, there are no apparent cost advantages to tailoring this requirement.	Reword to state that verification of equipment conformance with the requirements of 3.2.5.4 shall be in accordance with MIL-STD-167B, Type I and/or Appendix II of this specification.
4.2.5.5	Vibration Self Excited Capability of the equipment to meet the balance requirements of 3.2.5.5 shall be demonstrated by testing in accordance with MIL-STD-167B Type II. Testing may be waived in accordance with Appendix II. However, all equipment units shall be balanced in accordance with MIL-STD-167B.	MIL-STD-167B	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.6	Material, Processes and Parts Verification of material, processes and parts requirements specified in 3.3.1 herein shall be by inspection of drawings and material certification.	--	This requirement is of major importance to equipment testing and acceptance; however, the requirement is too general as stated.	This requirement does not adequately present the quality assurance provisions needed to cover the full range of materials, processes, and parts presented in MIL-P-17840B and G50401-2. Specify the exact quality assurance provision required and each category of part, process, and material covered in these two specifications. Identify those instances and conditions in which a quality assurance provision is not required.
4.2.7	Electromagnetic Radiation Electromagnetic radiation requirements of 3.3.2 shall be verified by inspection.	--	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement. Reword to state that verification of equipment conformance with requirements of Paragraph 3.3.2 shall be accomplished by inspection.
4.2.8	Nameplate and Product Marking Nameplate and product marking requirements of 3.3.3 shall be verified by inspection.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement. Reword to state that verification of equipment conformance with requirements of Paragraph 3.3.3 shall be accomplished by inspection.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.9	Workmanship Workmanship requirements of 3.3.4 shall be verified by inspection.	--	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement. Reword to state that verification of equipment conformance with requirements of paragraph 3.3.4 shall be accomplished by inspection.
4.2.10	Interchangeability Interchangeability requirements of 3.3.5 shall be verified by inspection.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement. Reword to state that verification of equipment conformance with requirements of Paragraph 3.3.5 shall be accomplished by inspection.
4.2.11	Equipment and Personnel Safety Verification	--	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement. Reword to state that verification of equipment conformance with requirements of Paragraph 3.3.6 shall be accomplished by inspection and tests. Identify the required tests.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.12	Technical Manuals New technical manuals and revisions shall be validated and verified in accordance with 3.4. Validation may be accomplishing during manufacture, assembly installation, or checkout.	--	This requirement is important to equipment testing and acceptance.	Do not tailor this requirement.
4.2.13 & 4.2.13.1	Logistics Overhaul Cycle Overhaul cycle requirements will be verified by analysis during the BUYER maintenance engineering analysis.	--	This requirement is important to equipment acceptance and testing.	Do not tailor this requirement.
4.2.13.2	Supply Adequacy of supply support, including on-board spares, will be evaluated by the BUYER in accordance with the provisioning requirements.	--	This requirement is intended to show that the equipment is capable of being maintained by the standard Navy supply system and that the Navy is officially informed of any unusual or special demands placed on the supply system by the equipment.	If the manufacturer is required to demonstrate that his equipment places no unusual or special demands on the Navy supply system, specify exactly how he is required to demonstrate this. If the manufacturer is not required to demonstrate this, delete this requirement entirely.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.13.3	Standardization Standardization requirements will be verified by analysis during the BUYER maintenance engineering analysis.	--	This requirement is important to the logistic support program.	Do not tailor this requirement.
4.2.13.4	Facilities and Facility Requirements Facilities and facility requirements will be verified by analysis during the BUYER maintenance engineering analysis.	--	This requirement is important to equipment testing and acceptance.	Do not tailor this requirement.
4.2.14	Personnel Personnel requirements of 3.6 shall be verified by analysis during the BUYER maintenance engineering analysis.	--	This requirement is important to equipment testing and acceptance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5 5.1	Preparation for Delivery Storage The A.C. plant shall be stored in accordance with one of the following procedures.	--	This requirement has no significant impact on cost.	Do not tailor this requirement.
5.2	Cleaning Each unit shall be cleaned in accordance with Method C-1 of MIL-P-116.	--	This requirement has no significant impact on cost.	Do not tailor this requirement
5.2.1	Preservative All exterior unpainted ferrous metal surfaces shall be coated with a preservative conforming to P-19 of MIL-P-116.	--	This requirement has no significant impact on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5.2.2	Storage The cleaned and preserved unit shall be mounted on a suitable base, provided with a dust cover (Do Not Seal), and stored indoors.	--	This requirement has no significant impact on cost.	Do not tailor this requirement.
5.3 5.3.1	Cleaning Preservative Cleaning and preservative see Paragraphs 5.2 and 5.2.1, respectively.	--	This requirement has no significant impact on cost.	Delete these paragraphs.
5.3.2	Storage The cleaned and preserved unit shall be packaged in accordance with MIL-R-24085A(1), Level C.	--	This requirement has no significant impact on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5.4	Shipment The A.C. plant shall be prepared for shipment in accordance with the following.	--	This requirement has no significant impact on cost.	Do not tailor this requirement.
5.4.1	Preservation and Packaging The A.C. plant shall be preserved and packaged in accordance with MIL-R-24085A(1), Level C. (Paragraph 5.2.1.1.2)	--	This requirement has no significant impact on cost.	Do not tailor this requirement.
5.4.2	Packing The packaged units shall be packed in a cradle conforming to MIL-C-104 so as to keep shock/vibration loads to specified values, applicable carrier regulations shall also be conformed to.	--	This requirement has no significant impact on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5.5	Marking Marking shall be specified in the procurement document.	--	This requirement has no significant impact on cost.	State the specific requirement in the specification. It may be reiterated or modified by the procurement document, but it should be required by the specification.
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
1 4.1	Program Management Schedule and Status The SELLER shall maintain scheduling and status information for program control at the SELLER's facility. Problem reports shall be furnished in accordance with SDRL MAG.	--	This requirement is important to the successful completion of the program and to Government-contractor-subcontractor interface and communications.	Do not tailor this requirement.
4 4.1	Configuration Management Change Control If SELLER requests BUYER approval of an engineering change, SELLER shall describe the nature of the proposed change and the anticipated contractual impact to the BUYER in accordance with SDRL CAD.	MIL-STD-480A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.1.1	Deviation and Waivers The SELLER shall submit requests for deviations and waivers in accordance with SDRLs CAG and CAH.	MIL-STD-480A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.1.2	Special Requests Special requests, reports and exception reports shall be furnished in accordance with SDRL MAL.	--	This requirement has no impact on equipment performance or costs.	Do not tailor this requirement.
4.2	Configuration Audits The SELLER shall provide the personnel and documentation required for each audit in accordance with SDRL CAM.	--	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
5.	Quality Assurance The SELLER's Quality Assurance (QA) Program shall be in accordance with Quality Requirements Instructions (QRI), Form S-1253c-1-2-3.	QRI-Form S-1253c-1-2-3	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

AIR CONDITIONING PLANT WORK STATEMENT G51401-1

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5.1	Inspection Milestone Notification For those inspection milestones which the BUYER has indicated an intention to witness, the SELLER Shall notify the BUYER no less than ten days in advance of their occurrence, SDRL PAY.	---	This requirement is important to Government-contractor communication and coordination. This requirement is considered firm.	Do not tailor this requirement.
5.2	Quality Conformance Records The SELLER shall maintain and submit quality conformance data in accordance with SDRL PAV.	MIL-STD-480 MIL-Q-9858A	This requirement is of major importance and is considered.	Do not tailor this requirement.
6 6.1	Engineering General The SELLER shall provide engineering effort and support to meet the requirements of BUYER specification G51401-2 and the requirements of the Work Statement. There shall be no deviations from the requirements of the technical specification without the express written approval of the Buyer.	---	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.2	Detail Design Engineering data shall be documented in accordance with SDRL EBW (Drawings and Drawing Lists). Engineering data shall be documented in accordance with SDRL EHC (Data Lists). Engineering data shall be documented in accordance with SDRL EHB (Microfilm). Engineering data shall be documented in accordance with SDRL EAA (Drawing Schedule and Update Report). Engineering data shall be documented in accordance with SDRL EHD (Index List).	MIL-D-1000B(1) MIL-STD-100B MIL-STD-257B USAS Y32.16 MIL-D 5480E MIL-M 9868D MIL-C 9877B(1) MIL-M-3876 1/2 MIL-STD-804B MIL-STD-12C G-C-116 HNDBK H4-1	This requirement is of critical importance to the control of equipment design and to modifications, maintenance, and overhaul during service life. This requirement is considered firm.	Do not tailor this requirement.
6.2.1	Shelf Life Data required in accordance with SDRL PAV: . Manufacturers Code . Cure Date . Lot Number . Shelf Life Limitations . Storage Condition Requirements This data is to be provided in accordance with SDRL-PAV.	MIL-STD-40BA MIL-Q-9858A	This requirement is important to Government storage and handling of material. This requirement has no impact on cost. There is no mention of shelf life data listed in 6.2.1 in the SDRL or in block of the DID. This is a firm requirement and should be specifically called out.	Do not tailor this requirement. Specify shelf life data as a deliverable in DID/CDRL PAV. Update references in the DID/CDRL to reflect the issue in effect. Change the last sentence of this requirement to: "These data shall be included in the Quality Performance reports in accordance with DID/SDRL PAV.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.3 6.3.1	Electric Motors and Control Electric Motors The SELLER shall be responsible for the suitability of electric motors for each application, for mounting and coupling the motor to the driven unit performance characteristics, design constraints and requirements, and a positive power margin of 5%. The motor drawings shall be in accordance with SDRL EBF. The SELLER shall furnish motor controller interface information in accordance with SDRL ECG. The SELLER shall have the option of supplying motors in accordance with MIL-M-17060.	MIL-M-17060E MIL-C-2212E MIL-M-17060E	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement. However, the positive power margin is an equipment performance requirement and should be required by the specification.
6.3.2	Electric Motor Controllers The SELLER shall be responsible for furnishing the BUYER with motor controller and/or driven equipment control circuit interface requirements. The data furnished shall enable the BUYER to procure motor controllers and push-button stations that will correctly interface with the SELLER's equipment and/or control circuits.	---	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.4	Shock Qualification The SELLER shall provide necessary supplies and services to schedule, evaluate and qualify the specified equipment for the shock test and extension requirements of MIL-S-901C as modified for the DDG-47 in the procurement specification and in accordance with the following SDRLs: SEN Shock Qualification Extension Report TAU Test Reports (Shock) TAQ Test Procedures (Shock)	MIL-S-901C Appendix I to Proc. Spec.	This requirement is critical to the determination of equipment quality conformance.	Do not tailor this requirement.
6.5	Airborne/Structureborne Noise The SELLER shall conduct airborne/structureborne noise tests and provide airborne/structureborne noise data in accordance with SDRL's SBU, TAQ and SCC.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.6	Vibration The SELLER shall provide the necessary supplies and services to schedule, evaluate and qualify the specified equipment for the Type I and II vibration test requirements of MIL-STD-167B and in accordance with the following SDRLs: SCF Vibration Qualification Extension/Exemption Report SCD Vibration Test Reports TAW Test Procedures (Vibration)	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.7	Release for Manufacture (RFM) For identical equipment previously provided by SELLER, RFM may be granted by BUYER after review of SELLER's technical proposal and/or SELLER's certified current Interface Control Drawings. RFM will be mutually agreed to in writing by BUYER and SELLER during final negotiations prior to award of a definitized contract.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.8	Technical Manuals The SELLER shall prepare, validate, and submit technical manuals in accordance with SDRL HAK.	MIL-M-15071G MIL-M-82103A MIL-M-7298B MIL-P-38790 MIL-M-986A/1 NAVSEC Rpt. No. 6113B8-140-177	This requirement is of major importance to equipment operation and maintenance. This requirement is considered firm.	Do not tailor this requirement.
7	Fabrication The SELLER shall provide the required material and services to fabricate one shipset of equipment in support of this program.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
7.1	Deliverable Hardware The SELLER shall fabricate the equipment in the quantities and schedules specified in the contract.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
7.2	Packing Lists and Parts Lists Packing lists and parts lists shall be in accordance with SDRL PCB.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement
8 8.1	Reliability and Maintainability R&M Analysis The SELLER shall perform analysis for R&M prediction and assessment including block diagrams, failure rates and data source in accordance with SDRL RGA. Should the SELLER be unable to achieve the specified MTBF or MTTR, recommendations for corrective action or alternate designs shall be submitted in accordance with SDRL RGB.	--	This requirement is of major importance to assessment of equipment performance. This equipment is identical to or similar to equipment already in fleet service. In this case operational reliability data is available from service reports. If operational reliability has already been measured, there is no need to perform extensive tasks to determine and verify inherent reliability.	Do not perform tasks to determine inherent reliability if service data are available.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.2	Failure Modes Effect Analysis The SELLER shall perform a failure modes effects analysis showing all failure modes of equipment, effects on the functional performance, possible causes and design features to minimize or eliminate effects. The analysis shall be submitted in accordance with SDRL RGF.	---	The equipment to be procured is identical to or similar to equipment already in the fleet. This is probably a duplication of previously procured documentation.	Tailor this requirement to cover only systems, subsystems, or modules that have not been accepted for service use.
8.3	Maintainability Demonstration A Maintainability Demonstration Plan shall be prepared by the SELLER and submitted in accordance with SDRL RGU. The plan shall meet the requirements of MIL-STD-471A. A Maintainability Demonstration Procedure shall be prepared and submitted in accordance with SDRL RGW. A Maintainability Demonstration Report shall be prepared and submitted in accordance with SDRL RGX.	MIL-STD-470 MIL-STD-471A MIL-STD-24365 MIL-STD-847 MIL-HDBK-472 MIL-STD-1304(AS)	This requirement is essential to the determination of equipment maintainability characteristics.	Do not tailor this requirement.
8.4	Reliability and Maintainability Demonstration Criteria Demonstration tests shall be conducted to show achievement of quantitative R&M requirements specified herein. General procedures to be followed during R&M testing are as specified herein.	MIL-STD-788 Paragraph 5.11.2.2	This requirement is important to equipment testing and acceptance.	Expand this requirement to include a discussion of wearout for mechanical components and a statement of how MTbF will be measured.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.5	R&M Design Review R&M Design Review Agendas and Data Packages shall be prepared and submitted in accordance with SDRL RGD. Design Review Reports shall be prepared and submitted in accordance with SDRL RGE.	MIL-STD-785 MIL-STD-470	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
8.6	Failure Reporting and Corrective Action Failure/Malfunction Reports shall be prepared and submitted in accordance with SDRL RGK.	MIL-STD-785	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
9	Human Factors This section is not applicable to this specification.	--	--	--

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
10 10.1	System Safety/Human Factors Preliminary Hazard Analysis The SELLER shall prepare a Preliminary Hazard Analysis on this equipment in accordance with SDRL SGX.	MIL-STD-882A	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
10.2	Subsystem Hazard Analysis The SELLER shall prepare and submit a Subsystem Hazard Analysis on all Category I and II hazards identified in the Preliminary Hazard Analysis in accordance with SDRL SGS.	MIL-STD-882A	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.
11	Integrated Logistic Support Integrated Logistic Support Requirements can be satisfied through compliance with (Statement of Prior Submission) SDRL VAH.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.1	Supply Support The SELLER shall develop inputs to provisioning Technical Documentation in accordance with SDRL VAC, Attachments 1 and II.	--	There is no mention of Attachment III which is used to update previously submitted provisioning technical documentation. This requirement is important in ensuring proper support for the equipment and is considered firm.	Mention Attachment III in requirement. Do not tailor this requirement.
11.2	Standardization The SELLER shall implement a program for monitoring design selections to ensure the employment of standard components/equipments in accordance with the technical specification. Authorization for use of non-standard components/equipments is as specified herein.	--	This requirement is of major importance to the equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
11.3	Maintenance Access Envelope The SELLER shall provide the maintenance access envelope necessary to accomplish all maintenance, repair, and disassembly of the equipment in accordance with SDRL VAM.	--	This requirement is of major importance to equipment performance. The requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.4	Special Tools and Test Equipment The SELLER shall provide a priced list of recommended special tools and test equipment, required for onboard support of the item, in accordance with SDRL VA1.	--	This requirement is of major importance in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.
12. 12.1	Test and Evaluation Product Testing The SELLER shall perform production tests on all items on deliverable equipment in accordance with Buyer Specification G51401-2. Production testing shall be scheduled and documented in accordance with SDRL TAG, test schedule.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
12.2	Test Procedure SELLER testing shall be in accordance with Test Procedure 707-108-1. An approved test procedure is required in accordance with SDRL TAQ.	Appendix I to Proc. Spec. MIL-S-901C	DID does not reference test procedure 707-108-1. This requirement is important to the successful completion of the program. This requirement is considered firm.	Reference TP 707-108-1 in DID. Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
12.3	Test Reports The SELLER shall document all test results in accordance with SDRL TAU.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3. 3.1	Requirements Item Definition The pump furnished under this specification shall be of the horizontal split-casing, single stage, volute-type, double suction, flexible coupled centrifugal configuration in accordance with MIL-P-17639, Class C-2, with modifications, additions, and deletions specified herein.	MIL-P-17639	This is a general requirement. Conformance with this requirement is critical to the performance, quality, and testing of this equipment.	Do not tailor this requirement.
3.1.1 3.1.1.1 & 3.1.1.2	Equipment Required SELLER & BUYER Furnished Equipment Equipment shall be furnished by the SELLER in accordance with this specification. Equipment shall be furnished by the BUYER in accordance with this specification.	--	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
3.2 3.2.1	Characteristics Performance The pump shall meet the performance requirements of MIL-P-17639 as modified herein, while under operating conditions of 3.2.1.1. (Continued)	MIL-P-17639	This is a general requirement of critical importance. Table 1 of G52102-2 requires updating to reflect the recent changes to MIL-P-17639.	Tailor this requirement to read "The pump shall meet the requirements of Paragraphs 3.1 Qualification, 3.2 General Design, 3.3 Detail Requirements, and 3.4 Materials, of MIL-P-17639E (SH), as modified by Table 1 herein."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2 (cont'd)	Characteristics (continued)			
3.2.1.1	Output Characteristics Capacity, gallons per minute (gpm) 3,000 Total discharge head, pounds per square inch gage (psig) 50 Maximum shut-off head (psig) 60 Minimum shut-off head (psig) 55	--	--	--
3.2.1.2	Operating Conditions Liquid pump = seawater Suction lead = flooded Specific gravity of liquid pumped: 1.03, Water temperature range, degree F: +28 to +85, approximate revolutions per minute RPM: 1750	--	This requirement is critical to equipment performance.	Do not tailor this requirement.
3.2.1.3	Noise Noise level shall be in accordance with this specification. Terminology used shall be as defined in ANSI S1.1.	ANSI S1.1	Noncompliance with this requirement will adversely affect the ability of personnel in the vicinity to perform their assigned duties, and the ship ASW mission; however, minor deviations from the requirement may be permitted in order to avoid the costs of retest and engineering changes.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1.3.1 3.2.1.3.2	Airborne and Structureborne Levels Airborne and structureborne noise levels shall not exceed limits as specified in Figures 1 and 2.	--	This requirement is designed to meet ship radiated and sonar self-noise objectives and airborne noise objectives. As such, it is of major importance to the ship mission.	Do not tailor this requirement.
3.2.2	Physical Characteristics Weight The net dry weight shall not exceed 5000 pounds. Dimensions The envelope dimensions shall not exceed the following: Length 90.0 in. Width 40.0 in. Height 43.0 in.	--	Noncompliance with this requirement may impact the weight and moment distribution of the ship. This requirement is considered firm.	Do not tailor this requirement.
3.2.3	Reliability Requirements The equipment shall achieve an MTBF of 6000 hours or more when maintained in accordance with recommended maintenance schedules.	--	The best available 3M data is for the Worthington Marine and Industrial Products, Inc., 1750 gpm, 75 psi pump. This unit is currently exhibiting an MTBF of 9442 hours with 90% confidence interval limits of 6117 and 16825, respectively, for 103,859 hours of operate time. However the mean time between corrective maintenance actions was 3581 with 90% confidence interval limits of 2507 and 5013 hours, respectively.	The current reliability requirement will necessitate over 22,000 hours of testing prior to equipment acceptance. A tailored reliability requirement is recommended to reduce the testing. Recommend the requirement be tailored to: "The equipment shall be capable of achieving an upper test MTBF (θ_0) of 9000 hours and a lower test MTBF (θ_1) of 3000 hours when tested in accordance with 3.2.3.1."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.3.1	Reliability Demonstration A reliability demonstration shall be conducted in accordance with MIL-STD-781B to show achievement of the MTBF specified in Paragraph 3.2.3. This demonstration may be waived if prior documented testing is acceptable to the BUYER. The demonstration shall be conducted in accordance with applicable R&M criteria described in the Statement of Work.	MIL-STD-781B	This requirement is essential to the determination of equipment MTBF.	Recommend tailoring this requirement to the following: "The equipment shall be capable of satisfying the requirements of probability ratio sequential test plan (PRSTP) No. XXIC of MIL-STD-781C. For purposes of this demonstration, test time may be accumulated on up to three different units, provided each unit under test is of identical configuration and that the test configuration is identical to supplied configuration".
3.2.4	Maintainability Requirements The equipment shall achieve an MTTR requirement of 7.1 hours or less.	MIL-STD-781B	This requirement is of major importance to the equipment performance and is considered firm.	Do not tailor this requirement.
3.2.4.1	Production Maintainability Demonstration A maintainability demonstration shall be conducted in accordance with MIL-STD-471A to show achievement of MTTR specified in paragraph 3.2.4. This demonstration may be waived if prior documented testing is acceptable to the BUYER. The demonstration shall be conducted in accordance with applicable R&M criteria described in paragraph 3.2.4. Success criteria shall (Cont'd	MIL-STD-471A	MIL-STD-471A contains many requirements that are costly and time consuming to satisfy; and it is not always applicable to equipment for which faults can be quickly and easily isolated.	Tailor this requirement to the following: "The SELLER shall develop a Maintenance Task Analysis Report consisting of the following: a. Identification of each preventive and corrective maintenance task. b. Identification of the time required to accomplish each maintenance task not including time for fault isolation or time for obtaining parts. (Continued)

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.4.1 (continued)	Production Maintainability Demonstration (continued) utilize a maximum requirement value of 7.1 hours MTTR and design goal of 14.2 MTTR. In case of conflict with delivery, SELLER shall prepare an alternate procedure for BUYER approval.	--	--	c. Skill levels and quantities required for each maintenance task. d. Tools and test equipment required for each task. e. Identification of failure modes by frequency. f. Identification of fault isolation time for each failure mode. g. Identification of each corrective maintenance task required for each failure mode. Upon review and approval of the Maintenance Task Analysis Report, the SELLER shall conduct a demonstration to verify the information and data of said report."
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
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3.2.5	Environmental Conditions The unit shall meet performance requirements specified herein and in MIL-P-17639 during exposure to any possible combination of specified operating environments.	MIL-P-17639	The issue on MIL-P-17639 currently in effect contains requirements for environmental conditions that are redundant to G52102-2 [see MIL-P-17639E(SH), 3.2.11], confusing, strigent, and unnecessary (see 4.2.4.2 and 4.2.4.3).	Delete the reference to MIL-P-17639 for requirements pertaining to environmental conditions.
3.2.5.1	Temperature Ambient temperature range of +40 to +120 degree F.	--	This requirement is essential to equipment performance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.2	Ship Motion The pumps shall meet the ship motion requirements as specified when the ship is permanently trimmed down by the bow or stern as much as 5 degrees from normal horizontal plane, and permanently listed up to 15 degrees to either side of vertical when the ship is pitching up and down with a single amplitude up to 10 degrees from the horizontal, and when the ship is rolling side to side with a single amplitude up to 45 degrees from vertical.	--	This requirement is critical to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.2.5.3	Vibration Externally Generated The equipment shall be capable of withstanding vibration requirements of MIL-STD-167B, Type I, from 4 to 15 Hz.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm. MIL-STD-167B has been superseded by MIL-STD-167-1.	Do not tailor this requirement.
3.2.5.4	Vibration Self Excited Equipment or machinery components rotating parts shall meet balance and vibration requirements of MIL-STD-167B, Type II.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm. MIL-STD-167B has been superseded by MIL-STD-167-1.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.5	Shock The equipment shall meet shock Grade A requirement of MIL-S-901C in accordance with Appendix I, and II contained herein for Type A, Class II hull mounted medium weight equipment. During test the equipment shall be energized in its normal operational mode.	MIL-S-901C	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement. Delete general reference to MIL-S-901C and call out specific paragraphs of MIL-S-901C as appropriate.
3.2.6	Not applicable to this specification	--	--	--
3.3 3.3.1	Design and Construction Materials, Processes and Parts Materials, processes and parts shall be in accordance with MIL-P-17639 with modifications delineated in Table I in Specification G52103-2. Threaded fasteners should comply with MIL-STD-1222, screw threads shall comply with handbook H-28, and internal fasteners in accordance with MIL-N-25027.	MIL-P-17639 MIL-STD-1222 Handbook H-28 MIL-N-25027	This is a general requirement of major importance to the performance, quality, and testing of this equipment.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.2	Electromagnetic Radiation Grounding and bonding shall be in accordance with MIL-STD-1310.	MIL-STD-1310	This requirement is of major importance to the functioning of receiving and transmitting equipment aboard ship. This requirement is considered firm.	Do not tailor this requirement.
3.3.3	Nameplates and Product Marking Information for identification for each unit nameplate shall be in accordance with this specification. Sea water service pumps nameplates shall be in accordance with MIL-P-15024 and MIL-STD-130.	MIL-P-15024 MIL-STD-130	This requirement is of minor significance to the equipment performance; however, there appears to be little or no potential for cost savings.	Do not tailor this requirement.
3.3.4	Workmanship Workmanship practices shall be in accordance with this specification. Welding shall be in accordance with MIL-STD-278, Section 7. Castings and forgings are free of sharp edges, machined surfaces have sharp edges broken or chamfered, openings in hydraulic equipment and piping are sealed and maintained clean during assembly.	MIL-STD-278	This requirement is of major importance to the equipment performance. Changes to this requirement could result in degraded performance and reduced reliability; therefore, this requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.5	Interchangeability All identically identified components and repair parts shall be functionally and physically interchangeable, without degradation to the system.	--	This requirement is of major importance to the equipment maintenance. Changes to this requirement could result in degraded performance and excessive values of MTTR therefore this requirement is considered firm.	Do not tailor this requirement.
3.3.6	System Safety/Human Factors System safety criteria in accordance with MIL-STD-882A paragraph 5.4.1 and Human Engineering criteria of MIL-STD-1472B, paragraphs 4.2 and 4.4, will be incorporated when applicable in the design or modification of this equipment. The order of precedence for incorporation of safety features shall be in accordance with MIL-STD-882A paragraph 5.4.2.	MIL-STD-882A MIL-STD-1472B	This requirement if of major importance to the equipment performance. Changes to this requirement would degrade equipment performance; therefore, this requirement is considered firm.	Do not tailor this requirement.
(NOTE: Paragraph 3.3.7 was not used in this specification)				
3.3.8	Electric Motors Motors shall be in accordance with MIL-M-17060, with characteristics in accordance with 3.2.8 of MIL-P-17639 and as specified in spec. No. G52102-2.	MIL-M-17060 MIL-P-17639	This requirement is essential to equipment performance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.4	Documentation Technical manuals for the audit shall be in accordance with technical manual requirements specified in the Statement of Work.	MIL-M-15071	This requirement is of major importance to equipment operation and maintenance.	Do not tailor this requirement.
3.5 3.5.1	Logistics Overhaul Cycle The equipment shall have a minimum time between overhaul (TBO) of 46 months.	--	TBO requires definition.	Do not tailor this requirement.
3.5.2	Supply Supply Support shall be in accordance with the provisioning requirements specified in the contract.	--	This requirement is of major importance to equipment performance.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.3	Standardization The SELLER shall furnish and employ standard components/equipment to the maximum extent possible and include applicable Navy Component Identification (CID) numbers, where known, with proposal.	--	This requirement is of major importance to equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.1	Selection of Components/Equipment The order of precedence for selection of components/equipment is specified in accordance with Specification No. G52102-2.	--	Changes to this requirement will not have a significant bearing on cost.	Do not tailor this requirement.
3.5.3.2	BUYER Specified Equipment The BUYER may specify to the SELLER certain types of manufacturers of equipments of the categories identified in the MIAPL prior to release for manufacture.	--	This requirement has minor impact on equipment design and has no significant cost impact.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.3.3	Standard Design Equipment Upon establishment of a single source for a specific component/ equipment, the SELLER shall purchase all identical components/ equipments as defined in 3.5.3.4 from the same source.	--	This requirement has major impact on system performance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.4	Identical Design The SELLER shall maintain identical component/equipment design for the total procurement under this contract.	--	This requirement has major impact on system performance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.5	Non-Standard Components The use of non-standard components/ equipments is prohibited without express written permission of the BUYER after receipt of written rationale.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.4	Facilities and Facility Requirements Facilities required to support the equipment shall be within present Navy capabilities.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.6	Personnel Personnel required to operate and maintain the plant will be composed of presently available Navy skills.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.7	Qualification Delivered pumps shall be qualified products in accordance with MIL-P-17639 and the quality [illegible] provisions in Section 4 of this specification.	MIL-P-17639	This requirement has a major impact on equipment acceptance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.8	Precedence In the event of conflict, precedence shall be as follows: a. Spec. No. G52102-2 b. Documents specified herein c. Other referenced documents	--	This requirement has no significant impact on cost.	Do not tailor this requirement.
4. 4.1	Quality Assurance Provisions General The pump shall comply with the requirements of Section 3 of this specification and with MIL-P-17639, as modified herein.	MIL-P-17639	This is a general requirement of major importance.	Do not tailor this requirement.
4.1.1	Responsibility for Tests Except as otherwise specified, the SELLER is responsible for conduct of all tests specified herein. SELLER may submit data derived from prior testing of comparable equipment performed to the requirements of MIL-P-17369 and subject to the BUYERS approval.	MIL-P-17639	This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2 4.2.1	Quality Conformance Inspections Performance Performance of each pump shall be verified by the tests of MIL-P-17639.	MIL-P-17639	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement.
4.2.1.1	Noise Noise measurements shall be made in accordance with MIL-STD-740B and 4.2.1.1.1 and 4.2.1.1.2. The pumps shall be mounted six USN resilient mounts as specified by MIL-M-1750B.	MIL-STD-740B MIL-M-1750B	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.2.1.1.1	Airborne Noise Tests Airborne noise test measurements shall be made in accordance with procedures of ANSI S1.2 and as specified in Specification No. G52102-2.		This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.1.1.2	Structureborne Noise Tests Structureborne noise tests shall be conducted in accordance with 3.2.1.3.2 and as specified herein.	MIL-STD-740	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.2.2	Physical Characteristics Physical characteristics shall be verified by visual examination and measurement.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.2.3	Reliability A demonstration shall be conducted to verify that the reliability criteria of 3.2.3 of Spec. No. G52102-2 have been satisfied.	--	See 3.2.3.1	See 3.2.3.1

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.4.1	Temperature Temperatures shall be verified by test data during pump performance testing INAV MIL-P-17639.	MIL-P-17639	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.4.2	Ship Motion Verification of the requirements for ship motion in 3.2.5.2 shall be done by analysis and inspection of data.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.4.3	Vibration Externally Generated The equipment shall have vibration requirements of 3.2.5.4 verified in accordance with MIL-STD-167B, Type I and/or Appendix II of Specification No. G52102-2.	MIL-STD-167B	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.4.4	Vibration Self Excited Capability of the equipment to meet the balance requirements of 3.2.5.4 shall be demonstrated by testing in accordance with MIL-STD-167B Type II. Testing may be waived in accordance with Appendix II. However, all equipment units shall be balanced in accordance with MIL-STD-167B.	MIL-STD-167B	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.4.5	Shock The equipment shall have the shock requirements of 3.2.5.5 verified by test or extension in accordance with MIL-S-901C and appendices I and II of Specification No. G52102-2.	MIL-S-901C	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.5	Material, Processes and Parts Verification of material, processes and parts requirements specified in 3.3.1 herein shall be by inspection of drawing and material certification.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.6	Electromagnetic Radiation Electromagnetic radiation requirements of 3.3.2 shall be verified by inspection.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.7	Nameplate and Product Marking Verify requirements of 3.3.3 herein by inspection.	--	This requirement is of minor importance.	Do not tailor this requirement.
4.2.8	Workmanship Verify requirements of 3.3.4 herein by inspection.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.9	Interchangeability Verify requirements of 3.3.5 herein by inspection.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.10	Equipment and Personnel Safety Verification Equipment and personnel safety requirements of 3.3.6 shall be verified by inspection and tests by the SELLER. The tests may be conducted in conjunction with other tests.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.11 4.2.11.1	Human Performance/Human Engineering Reliability Verification Verification of the reliability MTBF of Paragraph 3.2.3 shall be accomplished by demonstration test in accordance with one of the test plans of MIL-STD-781B.	--	See 3.2.3.1	See 3.2.3.1

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.11.2	Maintainability Verification Verification of the maintainability requirement shall be accomplished by a Maintainability Demonstration in accordance with MIL-STD-471A.	Delete paragraph 4.2.11.2. See the recommendation for paragraph 3.2.4.1	See 3.2.4.1	See 3.2.4.1
4.2.12	Technical Manuals New technical manuals and revisions shall be validated and verified in accordance with 3.4. Validation may be accomplished during manufacture, assembly installation or checkout.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.13 4.2.13.1	Logistics Overhaul Cycle Overhaul cycle requirements will be verified by analysis during the BUYER maintenance engineering analysis.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.13.2	Supply Adequacy of supply support, including on-board spares, will be evaluated by the BUYER in accordance with the provisioning requirements.	--	This requirement is intended to show that the equipment is capable of being maintained by the standard Navy supply system and that the Navy is officially informed of any unusual or special demands placed on the supply system by the equipment.	If the pump manufacturer is required to demonstrate that his equipment places no unusual or special demands on the Navy supply system, specify exactly how he is required to demonstrate this. If the pump manufacturer is not required to demonstrate this, delete this requirement entirely.
4.2.13.3	Standardization Standardization requirements will be verified by analysis during the BUYER Maintenance engineering analysis.	--	This requirement is of major importance for repair parts support.	Do not tailor this requirement.
4.2.13.4	Facility and Facility Requirements Facilities and facility requirements will be verified by analysis during the BUYER maintenance engineering analysis.	--	This requirement is of major importance for equipment maintenance.	Do not tailor this requirement. Add an additional requirement 4.2.13.5: "Conformance to personnel requirements shall be verified by the BUYER during the BUYER maintenance engineering analysis."

SEA WATER SERVICE PUMPS SPECIFICATION G52102-2

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.14 4.2.14.1 4.2.14.2	Manning and Training Personnel requirements of 3.6 shall be verified by analyses during the BUYER Maintenance engineering analysis	--	This requirement needs clarification prior to tailoring analysis.	Clarify this requirement.
5. 5.1	Preparation for Delivery Preservation, packaging, packing, and marking shall be in accordance with MIL-P-16789, Level C.	MIL-P-16789	This requirement has no significant impact on cost.	Do not tailor this requirement.
5.2	The supplier shall mark the outside of each crate container as follows: Noise Critical Equipment - Handle Carefully	--	This requirement has no significant impact on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3 3.1	Program Management Schedule and Status The SELLER shall maintain scheduling and status information for program control at the SELLER's facility. Problem reports shall be furnished in accordance with SDRL MAG.	--	This requirement is important to the successful completion of the program and to Government-contractor-subcontractor interface and communications.	Do not tailor this requirement.
4 4.1	Configuration Management Change Control If SELLER requests BUYER approval of an engineering change, SELLER shall describe the nature of the proposed change and the anticipated contractual impact to the BUYER in accordance with SDRL CAD.	MIL-STD-480A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.1.1	Deviation and Waivers The SELLER shall submit requests for deviations and waivers in accordance with SDRLs CAG and CAH.	MIL-STD-480A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5	Quality Assurance The SELLER's Quality Assurance (QA) Program shall be in accordance with Quality Requirements Instructions (QRI), Form S-1253C-1-2-3.	QRI Form S-1253C-1-2-3	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
5.1	Nondestructive Test Procedures The SELLER shall submit nondestructive test procedures for review and approval as specified in SDRL Item PAZ.	--	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
5.2	Inspection Milestone Notification For those inspection milestones which the BUYER has indicated an intention to witness, the SELLER shall notify the BUYER no less than ten days in advance of their occurrence, SDRL PAY.	--	This requirement is important to Government-contractor communication and coordination. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5.3	Quality Conformance Records The SELLER shall maintain and submit quality conformance data in accordance with SDRL PAV.	MIL-STD-480 MIL-Q-9858A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
6 6.1	Engineering General The SELLER shall provide engineering effort and support to meet the requirements of BUYER specification G52102-2 and the requirements of the Work Statement. There shall be no deviations from the requirements of the technical specification without the express written approval of the BUYER.	--	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
6.2	Detail Design The SELLER shall perform detailed engineering for manufacturer. Drawing list and Monthly Status Report - SDRL Item EAA. Engineering Drawings and Associated Lists - NAVSHIPS Shipboard Equipment - SDRL Item EBW. SELLER Approved Motor Drawings - SDRL Item EBF. Data List - SDRL Item EHC. Microfilming of Engineering Documents - DID EHB.	--	This requirement is of critical importance to the control of equipment design and to modifications, maintenance, and overhaul during service life. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.2.1	Design Review The SELLER shall schedule design reviews with the BUYER prior to release for manufacturing.	--	This requirement is important for control of equipment design and performance.	Do not tailor this requirement.
6.3	Engineering Analysis and Studies The SELLER shall provide: . Welding, brazing, and allied process procedures, SDRL Item PCD . Weight Verification, SDRL Item EAH . Design Review Data, SDRL Item EAX	--	This requirement is important for verifying equipment design and quality conformance.	Do not tailor this requirement.
6.4	Shelf Life Data The following shelf life data is required in accordance with SDRL PAV: . Manufacturers Code . Cure Date . Lot Number . Shelf Life Limitations . Storage Condition Requirements These data are to be provided in accordance with SDRL PAV.	MIL-STD-408A MIL-Q-9858A	This requirement is important to Government storage and handling of material. This requirement has no impact on cost. There is no mention of the shelf life data listed in 6.2.1 in the SDRL or in block of the DID. This is a firm requirement and should be specifically identified.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.5	Shock Qualification The SELLER shall provide necessary supplies and services to schedule, evaluate and qualify the specified equipment for the shock test and extension requirements of MIL-S-901C as modified for the DDG-47 in the procurement specification and in accordance with the following SDRL's: SBN Shock Qualification Extension Report TMU Test Reports (Shock) TAQ Test Procedures (Shock)	MIL-S-901C	This requirement is critical to the determination of equipment quality conformance.	Do not tailor this requirement.
6.6	Vibration The SELLER shall provide the necessary supplies and services to schedule, evaluate and qualify the specified equipment for the Type I and II vibration test requirements of MIL-STD-167B and in accordance with the following SDRL's: SCF Vibration Qualification Extension/Exemption Report SCD Vibration Test Reports TAQ Vibration Test Procedures	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.7	Release for Manufacture (RFM) For identical equipment previously provided by SELLER, RFM may be granted by BUYER after review of SELLER's technical proposal and/or SELLER's certified current Interface Control Drawings. RFM will be mutually agreed to in writing by BUYER and SELLER during final negotiations prior to award of a definitized contract.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.8	Equipment Manuals The SELLER shall prepare, validate and submit technical manuals in accordance with SDRL HAK.	MIL-M-15071G MIL-M-82103A MIL-M-7298B MIL-P-38790 MIL-M-9868/1 NAVSEC Rpt. No. 6113B8-140-177	This requirement is of major importance to equipment operation and maintenance. This requirement is considered firm.	Do not tailor this requirement.
6.9	Airborne/Structureborn Noise The SELLER shall conduct airborne/structureborne noise tests and provide airborne/structureborne noise data in accordance with SDRL's SBU, TAQ and SCC.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
7.0 7.1	Fabrication The SELLER shall provide the required material and services to fabricate equipment in support of this program. Deliverable Hardware The SELLER shall fabricate the equipment in the quantities and schedules specified in the contract.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
8 8.1	Reliability and Maintainability R&M Analysis The SELLER shall perform analysis for R&M prediction and assessment to the extent necessary to update previously submitted DD-963/DD-993 Class Ship R&M analysis data to reflect the as delivered R&M status of the equipment. Submit report IAW DID RGA. Should the SELLER be unable to achieve the specified MTBF or MTTR, recommendations for corrective action or alternate designs required to achieve the specified MTBF or MTTR shall be documented and submitted in accordance with DID and SDRL RGB.	--	This equipment is identical to or similar to equipment already in fleet service, and operational reliability data are available from service reports. There is no need to perform tasks to determine and verify inherent reliability.	Delete this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.2	Failure Modes Effects Analysis The SELLER shall perform a failure modes effects analysis showing all failure modes of equipment, effects on the functional performance, possible causes and design features to minimize or eliminate effects. The analysis shall be submitted in accordance with DID RGF.	--	The equipment to be procured is identical to or similar to equipment already in the fleet. This is probably a duplication of previously procured documentation and existing 3M data.	Delete this requirement.
8.3	R&M Design Review R&M Design Review Agendas and Data Packages shall be prepared and submitted in accordance with SDRL RGD. Design Review Reports shall be prepared and submitted in accordance with SDRL RGE.	MIL-STD-785 MIL-STD-470	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
8.4	Reliability Demonstration A Reliability Demonstration Plan shall be prepared by the SELLER and submitted in accordance with DID and SDRL RGP. The Reliability Demonstration Plan shall meet the requirements of MIL-STD-781B. A Reliability Demonstration Report shall be prepared and submitted IAW DID and SDRL RGT.	MIL-STD-781B	This requirement is important to the determination of equipment operational reliability.	Delete Items d, e, and h of DID RGT.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.5	Maintainability Demonstration A Maintainability Demonstration Plan shall be prepared by the SELLER and submitted in accordance with SDRL RGU. The plan shall meet the requirements of MIL-STD-471A. A Maintainability Demonstration Procedure shall be prepared and submitted in accordance with SDRL RGW. A Maintainability Demonstration Report will be prepared and submitted in accordance with SDRL RGX.	MIL-STD-470	See comments for Paragraph 3.2.4.1 of specification.	See recommendation for paragraph 3.2.4.1 of specification.
8.6	Reliability and Maintainability Demonstration Criteria Demonstration tests shall be conducted to show achievement of quantitative R&M requirements specified herein. General procedures to be followed during R&M testing are as specified herein.	MIL-STD-781B	This requirement is important to the successful completion of the program. This requirement is considered flexible.	Do not tailor this requirement.
8.7	Failure Reporting and Corrective Action Failure/Malfunction Reports shall be prepared and submitted in accordance with SDRL RGK.	MIL-STD-785	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
9.0	System Safety/Human Factors Engineering			
9.1	System Safety/Human Factors The SELLER shall ensure that System and Human Factors criteria applied to the PDG-47 Class Ship shall be to the level specified in Technical Specification G52102-2	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
9.2	Preliminary Hazard Analysis The SELLER shall prepare a Preliminary Hazard Analysis on this equipment in accordance with SDRL SGX.	MIL-STD-882A	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
9.3	Subsystem Hazard Analysis The SELLER shall prepare and submit a Subsystem Hazard Analysis on all Category I and II hazards identified in the Preliminary Hazard Analysis in accordance with SDRL SGS.	MIL-STD-882A	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.

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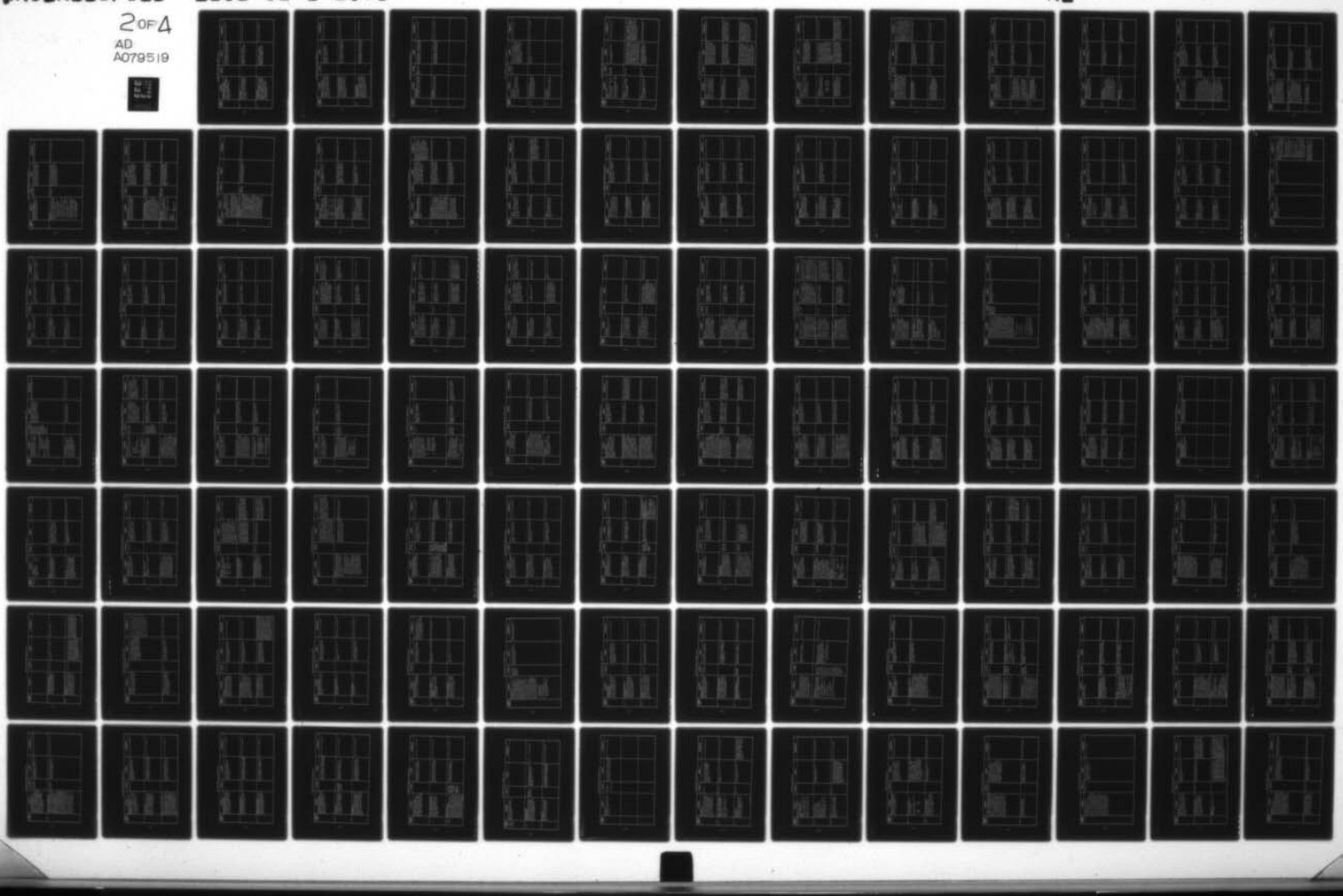

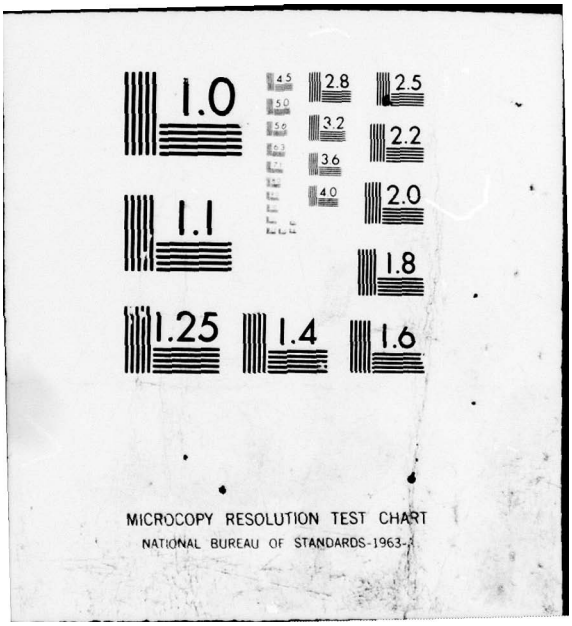
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11	Integrated Logistic Support Integrated Logistic Support Requirements can be satisfied through compliance with (Statement of Prior Submission) SDRL VAH (Dated 29 September 1978).	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
11.1	Supply Support The SELLER shall develop inputs to provisioning Technical Documentation in accordance with SDRL VAC (Dated 29 September 1978). Attachments I, II, and III.	--	This requirement is important in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.
11.2	Standardization The SELLER shall implement a program for monitoring design selections to ensure the employment of standard components/equipments in accordance with the technical specification. Authorization for use of non-standard components/equipments is as specified herein.	--	This requirement is of major importance to the equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.

SEA WATER SERVICE PUMPS WORK STATEMENT G52102-1

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.3	Maintenance Access Envelope The SELLER shall provide the maintenance access envelope necessary to accomplish all maintenance, repair, and disassembly of the equipment in accordance with SDRL VAM (Dated 27 October 1978).	--	This requirement is of major importance to equipment performance. The requirement is considered firm.	Do not tailor this requirement.
11.4	Special Tools and Test Equipment The SELLER shall provide a priced list of recommended special tools and test equipment, required for onboard support of the item, in accordance with SDRL VAI (Dated 29 September 1978).	--	This requirement is of major importance in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.
12 12.1	Test and Evaluation Production Testion The SELLER shall perform production tests on all items on deliverable equipment in accordance with Buyer Specification G52102-2. Production testing shall be scheduled and documented in accordance with SDRL TAG, test schedule. (NOTE: Paragraph 12.2 was not used in this specification).	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
12.3	Test Procedure Test procedures shall be developed and submitted for all SELLER tests in accordance with SDRL Item TAQ.	Appendix I to Proc. Spec. MIL-S-901C	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
12.4	Test Reports The SELLER shall document all test results in accordance with SDRL TAU.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
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FUEL OIL TRANSFER PURIFIER SPECIFICATION G54106-2

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3. 3.1	Requirements Item Definition The purifiers furnished shall be motor driven centrifugal purifers in accordance with MIL-P-22088 as modified herein.	MIL-P-22088	This is a general requirement. Conformance with this requirement is critical to the performance, quality, and testing of this equipment. The requirements of MIL-P-22088 have been modified in Table I of Fuel Oil Transfer Purifier Procurement Specification, G54106-2.	Do not tailor this requirement.
3.1.3. 3.1.3.1 3.1.3.2.	Major Component List SELLER and BUYER Furnished Equipment Equipment shall be furnished by the SELLER and the BUYER in accordance with this specification.	--	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
3.2 3.2.1	Characteristics Performance The purifier shall be capable of meeting the following requirements:	--	--	--

FUEL OIL TRANSFER PURIFIER SPECIFICATION G54106-2

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1.1	Function Design Fuel Marine diesel, MIL-F-16884, influent temperature 85°F., influent viscosity 45 SSU. JP-5 aviation turbine, MIL-T-5624, influent temperature 70°F., influent viscosity 34 SSU.	MIL-F-16884 MIL-T-5624	This is a general requirement of critical importance.	Do not tailor this requirement.
	Capacity 135 gpm (tests for establishing capacities are outlined in para. 4.7 of MIL-P-22088).	MIL-P-22088	The fuel supplied to the purifier should be no greater than 135 gpm. MIL-P-22088 establishes an emergency capacity for purifiers. It states that should the purifier be fed a quantity of 100 percent water, it will handle this quantity without the danger of any water being discharged out of the clean fuel outlet. The water discharge capacity will be 200 gpm of water continuously.	Tailor this requirement to the following: "135 gpm (tests for establishing capacities are outlined in paragraph 4.7 of MIL-P-22088). The purifier shall have an emergency capacity as specified in paragraph 3.2.10.1 of MIL-P-22088, except the water discharge capacity shall be 135 gpm."
3.2.1.2	Noise The purifier shall be as defined in 3.1. Terminology shall be as defined in ANSI S1.1.	ANSI S1.1	This paragraph reiterates the purifier definition and establishes terminology to be used in the specification.	Do not tailor this paragraph.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1.2.1 & 3.2.1.2.2	Airborne and Structureborne Noise Levels Airborne and structureborne noise levels of the purifier and motor shall not exceed the limits of Figures 1 and 2 during full power for all normal modes of operation.	--	Noncompliance with this requirement may adversely affect the ability of personnel in the vicinity to perform their assigned duties and the ship ASW mission; however, minor deviations from the requirement may be permitted to reduce the costs of retest and engineering changes.	Do not tailor this requirement.
3.2.1.3	Control and Operation The purifier shall be designed for local manual control and operation.	--	This is a minimum control requirement for oil and fuel purifiers; however, the DDG-47 Ship Specification requires the purifier to be remotely stopped from the control console.	Tailor this requirement to: "The purifier shall be designed for local manual control and operation but shall be capable of being stopped from a remote location."
3.2.1.3.1	Remote Monitoring Each purifier shall be provided with a flow switch in accordance with MIL-S-16032 to operate an audio-visual alarm at fuel control console in event of water seal breakover. Contacts (normally closed) shall be 28 vdc 2 amp noninductive.	MIL-S-16032	The purpose of this requirement is to provide detection of water seal breakover. Although this requirement is specified in the DDG-47 Ship Specification, it may not be necessary. The fuel purifiers installed in DD-963 Class ships are not equipped with a device to detect water seal breakover. If such a device is necessary the specification of a flow switch may be unnecessarily restrictive.	If there is no evidence that a water seal breakover detection alarm is necessary, delete this requirement. (Modification of the DDG-47 Ship Specification will be required.) If such a device is necessary, modify the specification to make a flow switch optional.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2 3.2.2.1	Physical Characteristics Weight Dry weight of purifier including all equipment in 3.1.1.1 but excluding equipment in 3.1.1.2 shall not exceed 4,275 pounds.	--	Noncompliance with this requirement may have a critical impact on the weight and moment distribution of the ship. Some degree of variance is probably tolerable but will not reduce costs significantly.	Do not tailor this requirement.
3.2.2.2	Dimensions Maximum dimension envelope including motor and all appurtenances in 3.1.1.1 less motor controller shall be: Length - 66 inches Width - 48 inches Height - 84 inches	--	Within a certain tolerance, noncompliance with this requirement will have little impact on the equipment to perform effectively. These dimensions could possibly affect access through this area and accessibility to the equipment for maintenance purposes. This requirement is considered flexible. At present there appears to be no cost advantage to tailoring this requirement.	Do not tailor this requirement.
3.2.3	Reliability Requirements The equipment shall achieve an MTBF of 10,000 hours or more when maintained in accordance with recommended maintenance schedules.	--	This requirement is of major importance. Failure to meet this requirement will result in increased labor and material costs and may adversely affect the ship mission. This requirement is firm.	Tailor this requirement to: "The equipment shall be capable of achieving an upper test MTBF (θ_o) of 15,000 hours and a lower MTBF (θ_1) of 5,000 hours when tested in accordance with 3.2.3.1."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.3.1	Production Reliability Demonstration A reliability demonstration shall be conducted in accordance with one of the test plans of MIL-STD-781B. The requirement is waived if prior testing is documented and is acceptable to the buyer. The discrimination ratio shall be 2:1 (10,000 Hr. MTBF Specified, 5000 Hr. MTBF acceptable).	MIL-STD-781B	This requirement is essential to the determination of equipment MTBF.	Tailor this requirement to the following: "The equipment shall be capable of satisfying the requirements of probability ratio sequential test plan (PRSTP) No. XXIC of MIL-STD-781C. For purposes of this demonstration, test time may be accumulated for up to three different units, provided each unit under test is of identical configuration and that the test configuration is identical to supplied configuration."
3.2.4	Maintainability Requirements The equipment shall achieve an MTTR of 4 hours or less.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.2.5	Environmental Conditions The purifier shall meet performance requirements specified herein and in MIL-P-22088 during exposure to any possible combination of operating environments specified below.	MIL-P-22088	Conformance with this requirement is critical to the ship mission. This requirement cannot be tailored.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.1 3.2.5.2	Temperature and Humidity The purifier shall function to full capacity when subjected to an air temperature of +40 to +122°F. and relative humidity of 0 to 100 percent.	--	This requirement is of major importance to the equipment performance.	Do not tailor this requirement.
3.2.5.3	Shock The equipment shall meet shock Grade A requirements of MIL-S-901C in accordance with Appendix I and II herein for Type A, Class II (Flow Switch Class I), hull mounted medium weight equipment. The equipment shall be operating for Groups I and II blows and standstill during Group II blows. The flow switch may be tested separately.	MIL-S-901C	This requirement is of major importance to the equipment performance.	Do not tailor this requirement.
3.2.5.4 3.2.5.4.1	Vibration Vibration-Externally Generated. The equipment shall be capable of withstanding environmental vibration requirements of MIL-STD-167B, Type I from 4 to 15 Hz.	MIL-STD-167B	This requirement is critical to the equipment performance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.4.2	Vibration Self Excited Equipment or machinery components with rotating parts shall meet balance and vibration requirements of MIL-STD-167B, Type II.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.2.5.5 3.2.5.5.1	Ship's Motion Inclined Operation The purifier shall be capable of proper operation when (1) ship is permanently trimmed down by bow or stern as much as 5 degrees, (2) ship is permanently listed up to 15 degrees to either side, (3) ship is pitching 10 degrees up and down, and (4) ship is rolling up to 45 degrees from side to side.	--	This requirement is critical to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.2.5.5.2	Dynamic Loads Dynamic loading requirements have not been determined.	--	This requirement is critical to the equipment performance.	Determine and specify adequate minimum dynamic loading requirements.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.6	Transportability The purifier shall be designed to be transportable by rail, barge, truck, ship or other common carrier without damage or special handling.	--	This requirement is important to ensure that the equipment can be transported without damage. However, the requirement should include reference to the preparation for delivery requirements.	Add "...when prepared for delivery in accordance with paragraph 5.1."
3.3	Design and Construction The purifier shall be in accordance with this specification and MIL-A-22088 with modifications delineated in Table I. The motor shall be in accordance with MIL-M- 17060. The controller (furnished by the BUYER) will be in accordance with MIL-C-2212. The flow switch shall conform to applicable requirements of MIL-S-16032. Other electrical equipment shall be in accordance with MIL-E-917.	MIL-P-22088 MIL-M-17060 MIL-C-2212 MIL-S-16032 MIL-E-917	This is a general requirement of major importance to the performance, quality, and testing of this equipment.	Do not tailor this requirement.
3.3.1	Materials, Processes, and Parts Materials, processes and parts shall be in accordance with MIL-P-22088 except as modified in Table 1. Threaded fasteners shall comply with MIL-S-1222G. Screw threads and hose threads shall comply with the standards of Handbook H-28.	MIL-P-22088	This is a general requirement of major importance to the performance, quality, and testing of this equipment.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.1.1	Selection of Specifications and Standards Where possible all electrical/ electronic parts shall be selected from parts referenced in MIL-E-917. Specifications and standards not specifically designated herein shall be selected in accordance with the order of precedence requirements of MIL-STD-143.	MIL-STD-143 MIL-E-917	This requirement is important to ensure that standardization requirements are met.	Do not tailor this requirement.
(NOTE: Paragraphs 3.3.1.2 and 3.3.1.3 were not used in this specification)				
3.3.1.4	Protective Coatings Materials shall be corrosion resistant types or shall be suitably processed to resist corrosion. The use of dissimilar metals in direct contact shall be avoided where possible. Where dissimilar metals are used, they shall be protected against electrolytic corrosion in accordance with requirement 16 of MIL-STD-454.	MIL-STD-454	This requirement is of major importance to the reliability and longevity of the equipment.	Do not tailor this requirement.
3.3.2	Electromagnetic Radiation Grounding and bonding shall be in accordance with MIL-STD-1310.	MIL-STD-1310	This requirement is of major importance to the functioning of receiving and transmitting equipment aboard ship. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.3	Identification and Marking The nameplate (identification plate) shall be in accordance with MIL-P-22088 as modified in Table I.	MIL-P-22088	This requirement is of minor significance to the equipment performance; however, there appears to be little or no potential for cost savings.	Do not tailor this requirement.
3.3.4	Workmanship The equipment, including all parts and accessories, shall be fabricated, assembled, and installed, using workmanship practices that ensure: a. Welding is in conformance with the workmanship standards of MIL-STD-278D, Section 7. b. Castings and forgings are free of sharp edges or projections. c. Machined surfaces have sharp edges, are broken, or chamfered. d. All exposed ferrous surfaces are primed and painted. e. Openings in hydraulic equipment and piping are sealed and maintained clean during assembly. f. Electrical/electronic workmanship is in accordance with Section 9 of MIL-STD-454.	MIL-STD-278D MIL-STD-454	This requirement is of major importance to the equipment performance. Changes to this requirement could result in degraded performance and reduced reliability; therefore, this requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.5	Interchangeability All identically identified components and repair parts shall be functionally and physically interchangeable, without degradation to the system.	--	This requirement is of major importance to the equipment maintenance. Changes to this requirement could result in degraded performance and excessive values of MTTR; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.3.6	System Safety/Human Factors. System Safety/Human Factors criteria and considerations of MIL-STD-882A, Paragraph 5.4.1, MIL-STD-1472B, Paragraphs 4.2 and 4.4, and MIL-STD-454, Requirement 1 shall be considered and incorporated when applicable in the design or modification of this equipment. The order of procedure for incorporating safety features shall be as specified in MIL-STD-882A, Paragraph 5.4.2.	MIL-STD-882A MIL-STD-1472B MIL-STD-454	This requirement is of major importance to the equipment performance. Changes to this requirement would degrade equipment performance; therefore, this requirement is considered firm.	Do not tailor this requirement.
(NOTE: Paragraph 3.3.7 was not used in this specification).				
3.3.8	Electric Motors Motors shall be in accordance with MIL-M-17060 with characteristics in accordance with 3.5 of MIL-P-22088 and as specified below: Input power: 440 volts, 3 phase, 60 Hertz Service: A Ambient Temperature: 50°C. Enclosure: TEFC or Totally Enclosed	MIL-M-17060E MIL-P-22088	This requirement is of major importance to the equipment performance. Changes to this requirement would degrade equipment performance; therefore, this requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.8 (continued)	Insulation class: H (subject to Class B temperature rise limits) Thermal protection shall be in accordance with Paragraph 3.1.7.5.1 of MIL-M-17060E. The airborne and structureborne noise requirements specified herein may be more stringent than those of MIL-M-17060. The motors shall be able to handle the peak load horsepower requirements without exceeding the nameplate amperage.	--	--	--
3.3.9	Electric Motor Controls and Associated Devices. All electrical control panels, relay panels, cabling, electrical equipment or similar items required for proper operation of the driven equipment shall be furnished by the SELLER and shall be in accordance with MIL-E-917. Limit switches, pressure switches, temperature switches, or similar devices that form an integral part of the SELLER furnished equipment or system shall be furnished by the SELLER in accordance with MIL-C-2212. Electrical parts utilized by the SELLER shall as far as practical be selected from MIL-STD-242 as invoked by MIL-E-917 and as required by the intended application.	MIL-E-917 MIL-STD-242 MIL-C-2212	This requirement is of critical importance to proper equipment operation and is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.10	Electrical Power Power shall be furnished to the purifier. All elements served or controlled by electricity shall be compatible with the following BUYER supplied power services (MIL-STD-1399, SEC 103): a. 440 Volt, 3 phase, 60 hertz power b. 120 volt, 1 phase, 60 hertz power c. 28 vdc for sensing components	MIL-STD-1399	This requirement is critical to proper equipment operation and is considered firm.	Do not tailor this requirement.
3.3.11	Lifting Fixtures The subject equipment shall have provisions for suitable lifting points such as eyebolts or padeyes, or be provided with slinging arrangements for lifting and transporting.	--	This requirement is of major importance for equipment installation and removal. This is a firm requirement. This requirement does not have a significant impact on cost.	Do not tailor this requirement.
3.4	Documentation Documentation shall be in accordance with the contract. The appropriate top assembly or separate drawing dedicated to handling procedures or techniques shall include provisions for lifting fixtures as specified in 3.3.11.	--	This requirement is of major importance to equipment operation and maintenance.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5 3.5.1 3.5.1.1	Logistics Maintenance Scheduled (Preventive) Maintenance Equipment shall be designed so that it does not require scheduled maintenance.	--	This requirement is of major importance to reducing maintenance but is a potential cost driver. This requirement conflicts with 3.5.1.2 and 3.5.1.3. Minor, easily performed preventive maintenance that increases MTBF may be desirable.	Tailor this requirement to: "Equipment shall be designed to minimize the need for preventive maintenance, but minor preventive maintenance requirements to achieve MTBF are permitted if approved by the BUYER. Approval of the Maintenance Task Analysis Report (See 4.4.1.5) shall be sufficient for approval of preventive maintenance.
3.5.1.2	Service and Access Equipment shall be designed so that any component part which requires frequent maintenance is readily accessible for repair or replacement with minimal disassembly. The installation should not restrict removal of any modules/components provided in the equipment design. Particular attention is required for equipment that require daily maintenance. Interior arrangements shall be accessible for cleaning equipment.	--	This requirement is of critical importance to achievement of the MTTR requirements. Reference to daily maintenance implies preventive maintenance which is in conflict with 3.5.1.1.	Do not tailor this requirement.
3.5.1.3	Useful Life Useful life of the fuel oil purifier shall be 20 years. Service, preventive maintenance and overhaul will be permitted, in accordance with BUYER approved procedures and schedules.	--	This requirement is of major importance to the equipment performance; however, preventive maintenance is not permitted by 3.5.1.1.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.1.4	Storage When the equipment is in a stowed condition, there shall be no movement that could be damaging to parts or that could create noise on a ship.	--	This requirement is of major importance to equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
3.5.1.5	Overhaul Cycle The unit shall have a minimum time between overhaul (TBO) of 46 months	--	This requirement requires certification prior to analysis for tailoring.	If the 46 month's TBO is calendar time, either estimated operating time for 46 months must be specified or the overhaul cycle should be specified in terms of operating time. If the 46 months is operating time, so indicate.
3.5.2	Supply Supply support shall be in accordance with the provisioning requirements specified in the contract.	--	This requirement is of major importance to the equipment performance.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.3	Standardization The SELLER shall furnish and employ standard components/equipment to the maximum extent possible and include applicable Navy Component Identification (CID) numbers, where known, with proposal.	--	This requirement is of major importance to equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.1	Selection of Components/Equipment The order of precedence for selection of components/equipment is specified in accordance with Spec. No. G54106-2.	--	Changes to this requirement will not have a significant bearing on cost.	Do not tailor this requirement.
3.5.3.2	BUYER Recommended Equipment The BUYER may recommend to the SELLER certain types of manufacturers of equipments of the categories identified in the MIAPL prior to release for manufacture.	--	This requirement has minor impact on equipment design and has no significant cost impact.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.3.3	Identical Design The SELLER shall maintain identical component/equipment design for the total procurement under this contract.	--	This requirement has major impact on system performance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.4	Non-Standard Components The use of non-standard components/ equipments is discouraged without express written permission of the BUYER after receipt of written rationale.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.5.4	Facilities and Facility Requirements Facilities required to support the equipment shall be within present Navy capabilities.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.5	Special Tools The requirements for use of special tools shall be minimized. The SELLER shall provide special tools required to perform all adjustments and to install and repair parts provided.	--	This requirement has major impact on equipment performance and maintainability.	Do not tailor this requirement.
3.6 3.6.1 & 3.6.2	Personnel and Training Personnel required to operate and maintain the plant will be composed of presently available Navy skills. A Navy training course is not required to correctly operate and perform maintenance on the purifier.	--	This requirement has major impact on equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
3.7	Qualification Purifiers delivered in compliance with this specification shall be qualified in accordance with the quality assurance provisions in Section 4 of this specification.	--	This requirement is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.8	Precedence In the event of conflict, precedence shall be as follows: a. Spec. No. G54106-2 b. Documents specified herein	--	This requirement has no significant impact on cost. This requirement is considered firm.	Do not tailor this requirement.
4. 4.1	Quality Assurance Provisions Responsibility for Verification Responsibility for verification shall be as specified in the contract statement of work.	--	This requirement will be addressed in statement of work comments.	Do not tailor this requirement.
4.2	Classification of Verification The verification methods specified herein are classified as: a. Production (4.2.1) b. Qualification (4.2.2) c. Special (4.2.3)	--	--	--

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.1	Production Verification Production verification shall be performed on each "pump"(sic) and shall verify conformance with the drawings and data assembled, and that performance as specified in Section 3 of this specification. Requirements to be verified are listed in Table II.	--	This requirement is of major importance to the equipment performance.	Do not tailor this requirement. Change "pump" to purifier.
4.2.2	Qualification Verification Qualification verification shall be performed to verify that the performance requirements are satisfied under specified environmental conditions. Requirements to be verified for qualification are listed in Table II.	--	This requirement is of major importance to the equipment performance.	Do not tailor this requirement.
4.2.3	Special Verification Special verification shall be performed to verify requirements not proved by production or qualification. Requirements to be verified in this category are listed in Table II.	--	This requirement is of major importance to the equipment operation.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4	Verification Method Verification of the requirements of Section 3 shall be determined by one or more of the following methods: a. Inspection (4.4.1) b. Analysis (4.4.2) c. Test (4.4.4)	--	This requirement identifies three methods of verification to be utilized.	Do not tailor this requirement.
4.4.1	Inspection Verification by inspection shall consist of the actual inspection of the purifier and examination of the applicable drawings and engineering data assembled thereunder.	--	This requirement defines inspection.	Do not tailor this requirement.
4.4.1.1	Physical Conformance The purifier shall be inspected to determine conformance to physical characteristics specified in 3.2.2 and to applicable drawings and specifications.	--	This requirement is of major importance to the equipment performance but is redundant to 4.4.1.2 and 4.4.1.3.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.1.2	Weight Compliance with weight requirements shall be verified by physically weighing the unit. A final weight verification report shall be submitted.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.4.1.3	Dimensions Each purifier shall be inspected for delivery to determine conformance to specified and derived dimensions of the unit.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.4.1.4	Product Identification Verification of nameplate and production identification requirements shall be accomplished by inspection.	--	This requirement is of minor importance to the equipment performance but provides little potential for cost savings.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.1.5	Maintenance Compliance to maintenance requirements shall be verified by inspection and analysis.	--	It is assumed that this requirement applies to 3.5.1.1, 3.5.1.2, and 3.5.1.3.	Tailor this requirement to the following: "The SELLER shall develop a Maintenance Task Analysis Report consisting of the following: a. Identification of each preventive and corrective maintenance task. b. Identification of the time required to accomplish each maintenance task but not including time for fault isolation or time for obtaining parts. c. Skill levels and quantities required for each maintenance task. d. Tools and test equipment required for each task. e. Identification of failure modes by frequency. f. Identification of fault isolation time for each failure mode. g. Identification of each corrective maintenance task required for each failure mode. Upon review and approval of the Maintenance Task Analysis Report, the SELLER shall conduct a demonstration to verify the information and data of said report."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.1.6	Supply Adequacy of supply support shall be verified by inspection and analysis.	--	It is assumed that this requirement applies to 3.5.2. What type of analysis is required?	Identify and state specific analysis requirements. If none are applicable, delete reference to analysis.
4.4.1.7	Electromagnetic Compatibility Verification of bonding and grounding conformance to MIL-STD-1310 shall be accomplished by end-product inspection.	MIL-STD-1310	This requirement is of major importance to the functioning of receiving and transmitting equipment aboard ship.	Do not tailor this requirement.
4.4.1.8	Transportability Verification of transportability requirements shall be accomplished by end-product inspection.	--	This requirement is important to ensure that the equipment can be transported without damage.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.1.9	Workmanship Workmanship requirements of 3.3.4 shall be verified by inspection.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.4.1.10	Interchangeability The interchangeability requirements of 3.3.5 shall be verified by inspection.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.4.1.11	Lifting Fixtures The Lifting Fixture requirements of 3.3.11 shall be verified by inspection.	--	This requirement is of major importance for equipment installation and removal.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.2	Analysis Analysis shall consist of extrapolation, calculation, and the analyzing of technical data associated with the purifier.	--	In all cases where verification by analysis is required, additional specific guidance must be given.	Recommendations are given in each case.
4.4.2.1	Reliability Verification of the MTBF requirement of 3.2.3 shall be accomplished by a Reliability Demonstration Test in accordance with one of the test plans of MIL-STD-781B and analysis of operational data.	MIL-STD-781B	This requirement is redundant to the requirement in paragraph 3.2.3.1.	Move requirement 3.2.3.1 with recommendations to this section.
4.4.2.2	Maintainability Verification of maintainability requirements shall be by analysis required in statement of work.	--	Addressed in statement of work.	--

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.2.3	Ship's Motion Design verification of the ship motion requirements for inclined service operation and dynamic design integrity shall be by analysis and review of data in accordance with the contract.	--	The intent of this paragraph is to require verification that equipment performance will not be degraded under the ship motion conditions specified in 3.2.5.5 and that the equipment will maintain adequate lubrication, will avoid loss of fluids, and will drain without spillage under these conditions.	Decide which examinations and tests will achieve the intent discussed under "Comments" and require those examinations and tests in this paragraph.
4.4.2.4	Materials, Processes, and Parts Conformance to the requirements of 3.3.1 shall be verified by analysis and review of documentation.	--	This requirement is of major importance to the equipment performance. What type of analysis is required?	Identify and state specific analysis requirements. If none are applicable, delete reference to analysis.
4.4.2.5	Selection of Specifications and Standards Prior to release of drawings for production the SELLER shall certify in writing that all parts meet the selection requirements of 3.3.1.1.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.2.6	System Safety/Human Factors Standards Design verification of 3.3.6 shall be accomplished by analysis and test. Submittal of a hazard analysis report will satisfy the analysis requirement. The test(s) may be conducted in conjunction with other tests.	--	This requirement is of major importance to the equipment performance. What are the requirements for a hazard analysis report? What tests should be conducted?	Specify the analyses and tests that will satisfy this requirement.
4.4.2.7	Technical Manuals New technical manuals and revisions to technical manuals shall be validated and verified to assure conformance to the requirements of MIL-M-15071.	MIL-M-15071	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.4.2.8	Overhaul Cycle Compliance with the overhaul cycle requirements will be verified by analysis during the BUYER maintenance engineering analysis.	--	This requirement needs clarification prior to tailoring analysis. Does this mean the BUYER is responsible for verification or that the SELLER will use the opportunity of the BUYER's MEA to conduct this verification?	Clarify this requirement. When is BUYER MEA scheduled? Reword to state that verification of , equipment conformance with requirements of paragraph 3.5.1.5 shall be accomplished by the BUYER if this is true.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.2.9	Standardization Compliance with standardization requirements will be verified by analysis during the BUYER maintenance engineering analysis.	--	This requirement is unclear. Is this a BUYER or SELLER responsibility? How will compliance with this requirement be documented? When and on what equipments is the buyer going to conduct a maintenance engineering analysis?	Expand this requirement. Reword to state conformance with standardization requirements will be verified by the BUYER. (If this is true).
4.4.2.10	Facilities and Facility Requirements Compliance will be verified by analysis during the BUYER maintenance engineering analysis.	--	See comments for paragraphs 4.4.2.8 and 4.4.2.9	Recommendations for paragraphs 4.4.2.8 and 4.4.2.9 apply.
4.4.2.11	Manning Adherence to the constraints set forth in 3.6.1 shall be verified by BUYER inspection and analysis during maintenance engineering analysis.	--	This requirement is unclear. Is this a BUYER or SELLER responsibility? How will compliance with this requirement be documented? When and on what equipments is the buyer going to conduct a maintenance engineering analysis?	Expand and clarify this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.3	Demonstration This section is not applicable to this specification.	--	--	--
4.4.4	Tests Tests shall consist of operating the purifier and monitoring and recording quantitative outputs in order to evaluate conformance with requirements of Section 3 herein.	--	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.4.4.1	Performance Tests Performance of each purifier shall be verified by the tests of 4.7 of MIL-P-22088 as modified herein. Tests shall include tests of flow switch with purifier to assure conformance with requirements of 3.2.1.3.1	MIL-P-22088	This requirement is of major importance to the equipment performance. What tests are to be made for flow switch and motor? As a minimum, motor winding amperage upon starting must be monitored to ensure maximum amperage is not exceeded. DD-963 Class purifier motors fail after approximately 100 starts because maximum amperage is exceeded upon starting.	Specify specific tests to be conducted for flow switch and motor.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.4.2	Noise Tests Both airborne and structureborne noise tests shall be performed at normal operating conditions determined to produce worst case noise. Measurements shall be made in accordance with the methodology of MIL-STD-740 except as modified herein.	MIL-STD-740 MIL-M-17508	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.4.4.2.1	Airborne Noise Test Measurements and room calibration shall be in accordance with the procedures of ANSI S1.2. Prior to the noise measurement of the unit, the room shall be calibrated with an acoustic source of known power spectrum. The ambient noise spectrum of the room shall also be recorded. Conversion of sound pressure levels to sound power levels shall be done in accordance with ANSI S1.2	ANSI S1.2	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.4.4.2.2	Structureborne Noise Test Acceleration shall be measured above each resilient mount in each of three orthogonal axes. Power-sums in one-third octave bands from 16 Hz to 20 KHz shall be computed in accordance with Figure 3.		This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.4.3 4.4.4.3.1	Environmental Verification of environmental conditions shall be as follows: Temperature and Humidity Test data obtained during purifier performance testing in accordance with MIL-P-22088 shall be used in predicting performance at the conditions specified in 3.2.5.1 and 3.2.5.2. Performance at the temperature and humidity extremes shall be calculated and provided in the performance report.	MIL-P-22088	This requirement is of major importance to the equipment performance. This requirement is considered flexible. On what basis are the data to be extrapolated to the temperature and humidity extremes? It appears that too many variables are involved to validly extrapolate test results at a given temperature and humidity to temperature and humidity extremes.	Reword to state that "verification of equipment conformance with requirements shall be as follows:" Either provide bases for extrapolation of test data at given temperature and humidity to extremes of temperature and humidity, or if this is not feasible and performance at the temperature and humidity extremes is considered critical, require additional testing at those extremes.
4.4.4.3.2	Shock The shock requirements of 3.2.5.3 shall be verified by test or extension in accordance with the procedures of MIL-S-901C and Appendixes I and II. Qualification data which is identical to previously submitted and approved data shall be certified in accordance with Appendix II.	MIL-S-901C	This requirement is of major importance to the equipment performance.	Reword this requirement to state that verification of equipment conformance with the requirements of paragraph 3.2.5.3 shall be in accordance with MIL-S-901C(1) (Reference Specific Paragraphs) and Appendix I and II of this specification (Reference Specific Paragraphs).
4.4.4.3.3 4.4.4.3.3.1	Vibration Vibration-Externally Generated The vibration requirements of 3.2.5.4.1 shall be verified by test, extension or exemption in accordance with the procedures of MIL-STD-167B, Type I, and/or Appendix II. Qualification Data which is identical to previously submitted and approved data shall be certified in accordance with Appendix II.	MIL-STD-167B	This requirement is of major importance to equipment performance. This requirement is flexible; however, there are no apparent cost advantages to tailoring this requirement.	Reword to state that verification of equipment conformance with the requirements of 3.2.5.4.1 shall be in accordance with MIL-STD-167/1, Type I and/or Appendix II of this specification.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4.4.3.3.2	Vibration-Self Excited The capability of the equipment to meet the balance requirements of 3.2.5.4.2 shall be demonstrated by testing in accordance with the procedures of MIL-STD-167B, Type II. Testing may be waived in accordance with Appendix II. All equipment units shall be balanced in accordance with MIL-STD-167B.	MIL-STD-167B	This requirement is of major importance to equipment performance. This requirement is flexible, however there are no apparent cost advantages to tailoring this requirement.	Do not tailor this requirement.
5. 5.1	Preparation for Delivery Preservation, Packaging, Packing, and Marking Preservation, packaging, and marking shall be in accordance with MIL-P-22088, Level A. Equipment shall be mounted on vibration isolators to prevent damage in shipment.	MIL-P-22088	This requirement has no significant impact on cost.	Do not tailor this requirement.
5.1.1	Noise Critical Equipment: The supplier shall mark the outside of each crate or container, "NOISE CRITICAL EQUIPMENT-HANDLE CAREFULLY." Add to rail car: "NO HUMPING"	--	This requirement has no significant impact on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
2.	Responsibilities The SELLER shall be responsible for the engineering, production, delivery, hardware integration, test and technical support of the DDG-47, Fuel Oil Transfer Purifier as defined by this Work Statement and Procurement Specification G54106-2. SELLER shall supply the manpower, materials, facilities, and resources to complete tasks identified by Section 3 through 13 of this Work Statement. Data required by the Subcontractor Data Requirements List, which is certified as being prior submitted by SDRL CRT, shall not be duplicated. If the vender cannot provide a certification of prior approved data, the vendor shall furnish the following data on SDRL EBW: a. Mounting dimensions b. Outline drawings c. Weight (wet or dry) d. Center of gravity e. Special mounting requirements f. All other pertinent data required to foundation/install the equipment.	MIL-D-1000A MIL-STD-100B USAS Y32.16 MIL-STD-275 MIL-S-901C	This requirement is of major importance to successful procurement of the equipment.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3. 3.1	Program Management Schedule and Status The SELLER shall maintain scheduling and status information for program control which shall be available for review at SELLER's facility upon request by the BUYER. Monthly reports shall be furnished to BUYER in accordance with the monthly Progress Report, SDRL MAD; problems shall be reported via telephone or, if necessary, through SDRL MAG.	--	This requirement is important to the successful completion of the program and to Government -contractor-subcontractor interface and communications.	Do not tailor this requirement.
4. 4.1	Configuration Management Change Control If SELLER requests BUYER approval of an engineering change, SELLER shall describe the nature of the proposed change and the anticipated contractual impact to the BUYER in accordance with SDRL CAD.	MIL-STD-480	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.1.1	Deviation and Waivers The SELLER shall submit requests for deviations and waivers in accordance with SDRLs CAG and CAH. Special request reports and exception reports shall be furnished in accordance with SDRL MAL.	MIL-STD-480	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2	Identification Plate Top assembly drawings shall contain the requirement for and define the installation of the identification plate.	--	This requirement has little impact on equipment performance or costs.	Do not tailor this requirement.
5.	Quality Assurance The SELLER's Quality Assurance (QA) Program shall be in accordance with Quality Requirements Instructions (QRI), Form S-1253C-1-2-3.	QRI-Form S-1253C-1-2-3	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
5.1	Nondestructive Test Procedures The SELLER shall submit nondestructive test procedures for review and approval as specified in SDRL PAZ. Submittal of SDRL CRT will satisfy this requirement for equipments identical to those provided DD-963 Class Ships or IIN DD-993 Class Ships.	Appendix II to Proc. Spec. MIL-STD-271	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5.2	Inspection Milestone Notification For those inspection milestones which the BUYER has indicated an intention to witness, the SELLER shall notify the BUYER no less than ten days in advance of their occurrence, SDRL PAY.	--	This requirement is important to Government-contractor communication and coordination. This requirement is considered firm.	Do not tailor this requirement.
5.3	Quality Conformance Records The SELLER shall maintain and submit quality conformance data in accordance with SDRL PAV and PAX.	MIL-STD-480 MIL-Q-9858A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
6. 6.1	Engineering General The SELLER shall provide engineering effort and support to meet the requirements of BUYER specification G54106-2 and the requirements of the Work Statement. There shall be no deviations from the requirements of the technical specification without the express written approval of the BUYER.	--	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.2	Detailed Engineering The SELLER shall perform detailed engineering for manufacture which shall be documented in accordance with: SDRL EBW - Drawing list and monthly status report; engineering drawings and associated lists SDRL EHC - Data List DID EHB - Microfilming of Engineering Documents SDRL EDH - Weight verification SDRL EHD - Index list (IL)	MIL-D-1000A MIL-STD-100B MIL-STD-275 USAS Y32.16 MIL-S-901C MIL-M-9868 MIL-C-9877 MIL-M-38761 MIL-M-38761/2 MIL-STD-804B MIL-STD-12C G-C-116 HNDBK H4-1	This requirement is of critical importance to the control of equipment design and to modifications, maintenance, and overhaul during service life. This requirement is considered firm.	Do not tailor this requirement.
6.2.1	Design Review(s) The SELLER shall participate in a review(s) with BUYER prior to release for manufacturing. SELLER shall fully describe and justify the complete equipment design, including all electrical protections and interfaces, during the reviews.	--	This requirement is of major importance and considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.3	Shelf Life Data The following shelf life data are required in accordance with SDRL PAV: . Manufacturers Code . Cure Date . Lot Number . Shelf Life Limitations . Storage Condition Requirements These data are to be provided in accordance with SDRL PAV.	MIL-STD-480 MIL-Q-9858A	This requirement is important to Government storage and handling of material. This requirement has no impact on cost. There is no mention of the shelf life data listed in the SDRL or in block 10 of the DID. This is a firm requirement and should be specifically addressed.	Do not tailor this requirement. Specify shelf life data as a deliverable in DID/SDRL PAV. Change the last sentence of this requirement to: "These data shall be included in the Quality Performance Reports in accordance with DID/SDRL PAV."
6.4	Equipment Manuals The SELLER shall develop and deliver technical manuals in accordance with the requirements of MIL-M-15071 and SDRL HAK.	MIL-M-15071G MIL-M-81203 MIL-M-7298B MIL-P-38790 MIL-M-9868D NAVSEC Rpt. No. 6113B8-140-177 MIL-P-38784 NAVEXOS P-35	This requirement is of major importance to equipment operation and maintenance. This requirement is considered firm.	Change to read "The SELLER shall develop, validate, and deliver..."
6.5 6.5.1	Electric Motors and Controls Electric Motors The SELLER shall be responsible for the suitability of electric motors for each application, for mounting and coupling the motor to the driven unit. The selected motor manufacturer and performance characteristics of the motor shall be provided. The SELLER is responsible to specify the required motor and to review the motor (Continued)	MIL-M-17060E	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.5.1 (continued)	design drawings. The SELLER shall supply motors in accordance with MIL-M-17060. SELLER approved motor drawings shall be in accordance with SDRL EBF.	--	--	--
6.5.2	Electric Motor Controllers The SELLER shall furnish the BUYER with motor controller and/or driven equipment control circuit interface requirements in accordance with SDRL ECG. The data furnished shall enable the BUYER to procure motor controllers and push-button stations that will correctly interface with the SELLER'S equipment and/or control circuits.	MIL-C-2212	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.6	Engineering Analysis and Studies The SELLER shall provide: a. Engineering analysis in accordance with SDRL EDJ (not required for equipment identical to that provided on DD-963/ DD-993 Class Ships). b. Welding, brazing, and allied process procedures, SDRL PCD. (Continued)	NAVSHIPS 0900-000-1000 MIL-STD-278 MIL-STD-454	This requirement is of major importance to judge suitability of equipment supplied.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.6 (continued)	c. Weight verification, SDRL EDH Submittal of SDRL CRT will satisfy requirements for equipments identical to those provided DD-963 or IIN DD-993 Class Ships.	--	--	--
6.7	Shock Qualification The SELLER shall provide necessary supplies and services to schedule, evaluate and qualify the specified equipment for the shock test and extension requirements of MIL-S-901C as modified for the DDG-47 in the procurement specification and in accordance with the following SDRLs: CRT Certification of Prior Approved Data SWH Shock Qualification Extension Report TAU Test Reports (Shock) TAQ Test Procedures (Shock)	MIL-S-901C MIL-STD-798 (1) Appendix I to Proc. Spec.	This requirement is critical to the determination of equipment quality conformance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.8	Airborne/Structureborne Noise The SELLER shall provide the necessary supplies and services to schedule, evaluate and qualify the equipment for airborne and structureborne noise in accordance with MIL-STD-740 as modified in the procurement specification in accordance with the following SDRLs: SBU - Estimated Noise Spectra (only if not identical to DD 963/DD 993 equipment.) SCC - Airborne and Structureborne Noise Test Reports. TAQ - Test Procedures.	MIL-STD-740	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.9	Vibration The SELLER shall provide the necessary supplies and services to schedule, evaluate and qualify the specified equipment for the Type I and II vibration test requirements of MIL-STD-167B and in accordance with the following SDRLs. CRT - Certification of Prior Approved Data	MIL-STD-167B Appendix II to Proc. Spec. MIL-S-16036	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement. Update references in DID/SDRL to reflect latest issue in effect.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.9 (continued)	SCF - Vibration Qualification Extension/Exemption Report SCD - Vibration Test Reports TAQ - Test Procedures (Vibration)	--	--	--
6.10	Release for Manufacture Release for manufacture may be granted in writing by BUYER after contract award and upon successful completion of design review, which includes review of interface control drawings (see 6.2.1). The design review completion is based on BUYER'S satisfaction that all specification requirements have been met and in no way relieves SELLER of total responsibility for design of the contract products.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.
7.	Fabrication The SELLER shall provide the required material and services to fabricate equipment in support of this program.	--	This requirement is important to the successful completion of the program.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
7.1	Deliverable Hardware The SELLER shall fabricate the equipment in the quantities and schedules specified in the contract. The first production article shall undergo qualification tests as defined in Section 10 unless already qualified.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
7.2	Qualification Hardware Refurbishment The equipment on which qualification tests are performed shall be refurbished and delivered as a deliverable hardware item. As a minimum, the equipment shall be completely dismantled and all parts shall be inspected to determine the extent of damage or deterioration caused by the tests. All parts which have sustained damage or deterioration shall be replaced.	--	This requirement is of major importance to equipment operation.	Require SELLER to provide a list of all parts replaced and the extent/type of damage each sustained with probable cause of damage if not previously reported in test reports.
7.3	Installation and Checkout Spares The SELLER shall develop and provide a price list of recommended installation and checkout spares required to support the delivered equipment. This list shall contain complete identification data including nomenclature, manufacturer's part number, quantity recommended, and unit and extended price, in accordance with SDRL VAO.	--	This requirement is of major importance for adequate supply support of the equipment.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8. 8.1	Reliability/Maintainability R&M Analysis The SELLER shall perform analysis for R&M prediction and assessment including block diagrams, failure rates and data source in accordance with SDRL RGA. Should the SELLER be unable to achieve the specified MTBF or MTTR, recommendations for corrective action or alternate designs required to achieve the specified MTBF or MTTR shall be documented and submitted in accordance with SDRL RGF.	--	Since operational data are available on this or like units and reliability testing will be performed under this contract, a determination of intrinsic reliability is unnecessary.	Delete this requirement entirely.
8.2	Failure Modes Effect Analysis The SELLER shall perform a failure modes effect analysis showing all failure modes of equipment, effects on the functional performance, possible causes and design features to minimize or eliminate defects. The analysis shall be submitted in accordance with SDRL RGF.	MIL-STD-1629 (Ships) MIL-STD-847	The equipment to be procured is identical to or similar to equipment already in the fleet. This is probably a duplication of previously procured documentation.	Tailor this requirement to cover only systems, subsystems, or modules that have not been accepted for service use. Update references in DID/SDRL to reflect latest issue in effect.
8.3	Reliability Demonstration A Reliability Demonstration shall be conducted. A plan shall be prepared by the SELLER and submitted in accordance with DID and SDRL RGP. The plan shall meet the requirements of MIL-STD-781B. The demonstration procedure shall be prepared and submitted in accordance with DID and SDRL RGR. The demonstration report shall be prepared and submitted in accordance with DID and SDRL RGT.	MIL-STD-781B MIL-STD-847	See comments of 3.2.3.1 of procurement specification.	See recommendations of 3.2.3.1 of procurement specification. Update reference in DID/SDRL to reflect latest issue in effect.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.3.1	Reliability and Maintainability Demonstration Criteria Demonstration tests shall be conducted to show achievement of quantitative R&M requirements specified herein. General procedures to be followed during R&M testing are as specified herein.	MIL-STD-781B	This requirement is important to the successful completion of the program. This requirement is considered flexible.	Do not tailor this requirement.
8.4	R&M Design Review R&M Design Review Agendas and Data Packages shall be prepared and submitted in accordance with DID and SDRL RGD. Design Review Reports shall be prepared and submitted in accordance with DID and SDRL RGE.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
8.5	Failure Reporting and Corrective Action Failure/Malfunction Reports shall be prepared and submitted in accordance with DID and SDRL RGK. Failure analysis and corrective action recommendations will be furnished by the vendor on failures of equipment that occur during testing and demonstrations at the BUYER's facility and during the SELLER's warranty guarantee period when requested by the BUYER.	HANDBOOK H4-1	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
10. 10.1	System Safety/Human Factors Preliminary Hazard Analysis The SELLER shall prepare a Preliminary Hazard Analysis on this equipment in accordance with DID SGX, or certify previously submitted DD-963/IIN DD-993 Class Ship Preliminary Hazard Analysis data in accordance with DID CRT.	MIL-STD-882A	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
11.	Integrated Logistic Support Integrated Logistic Support Requirements can be satisfied through compliance with (Statement of Prior Submission) SDRL VAH.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
11.1	Supply Support The SELLER shall develop inputs to provisioning Technical Documentation in accordance with SDRL VAC, Attachments I, II and III, in the event that a Statement of Prior Submission cannot be furnished. The SELLER shall provide support to the BUYER at provisioning conferences as required.	--	This requirement is important in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.2	Standardization The SELLER shall implement a program for monitoring design selections to ensure the employment of standard components/equipments in accordance with the technical specification. Authorization for use of non-standard components/equipments is as specified herein.	--	This requirement is of major importance to the equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
11.3	Maintenance Access Envelope The SELLER shall provide the maintenance access envelope necessary to accomplish all maintenance, repair, and disassembly of the equipment. Submit data in accordance with DID VAM.	--	This requirement is of major importance to equipment performance. The requirement is considered firm.	Do not tailor this requirement.
11.4	Special Tools and Test Equipment The SELLER shall provide a priced list of recommended special tools and test equipment, required for onboard support of the item, in accordance with SDRL VAI.	--	This requirement is of major importance in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
12. 12.1	Test and Evaluation Product Testing The SELLER shall perform production tests on all items on deliverable equipment in accordance with Buyer Specification G54106-2. Production testing shall be scheduled and documented in accordance with SDRL TAG, test schedule.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
(NOTE: Paragraph 12.2 was not used in this specification).				
12.3	Test Procedures Test procedures shall be developed and submitted for all SELLER tests in accordance with SDRL TAQ.	Appendix I to Proc. Spec. MIL-S-901C	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
12.4	Test Reports The SELLER shall document all test results in accordance with SDRL TAU.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
12.5	Qualification/Preproduction/ Verification Testing Previously submitted data, where applicable, shall be certified in accordance with SDRL CRT.	--	This requirement is important to the successful completion of the program This requirement is considered firm.	Do not tailor this requirement.
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3. 3.1	Requirements Item Definition The pump furnished under this specification shall be motor driven, horizontal, volute-type, single stage, centrifugal configuration in accordance with MIL-P-17639D, Class C-2, with modifications specified herein.	MIL-P-17639D	This is a general requirement. Conformance with this requirement is critical to the performance, quality, and testing of this equipment.	Do not tailor this requirement.
3.1.1 3.1.1.1 & 3.1.1.2	Equipment Required SELLER & BUYER Furnished Equipment Equipment shall be furnished by the SELLER in accordance with this specification. Equipment shall be furnished by the BUYER in accordance with this specification.	MIL-M-17508	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
3.2 3.2.1	Characteristics Performance The pump shall meet the performance requirements of MIL-P-17639 as modified herein. a. Flow capacity 720 g.p.m. b. Total differential pressure 75 psi c. Specific gravity of liquid 1.0 d. Liquid pumped Chilled fresh water (Continued)	MIL-P-17639	This is a general requirement of critical importance. Suction pressure and maximum shutoff head should be specified in psig.	Tailor this requirement to read: "The pump shall meet the performance requirements of Paragraphs 3.2, 3.3 and 3.4 of MIL-P-17639D as modified below and by Table 1 herein: a. b. etc."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1 (continued)	e. Liquid operating temperature 40°-55°F. f. Suction pressure 20 psi g. Maximum shutoff head 95 psi	--	--	--
3.2.1.1 3.2.1.1.1 3.2.1.1.2	Noise Airborne and Structureborne Levels Airborne and structureborne noise levels shall not exceed limits as specified in Figures 1 and 2.	MIl-M-17508	This requirement is designed to meet ship-radiated and sonar self-noise objectives and airborne noise objectives. As such, it is of major importance to the ship mission.	Do not tailor this requirement.
3.2.1.2	Useful Life The pumps shall have a satisfactory service life of 20 years with 80 percent duty cycle. Servicing, preventive maintenance, and overhaul will be permitted in accordance with BUYER approved procedures and schedules.	--	This requirement is critical to the equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1.3	Vibration Self-Excited Equipment or machinery components rotating parts shall meet balance and vibration requirements of MIL-STD-167B, Type II.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm. MIL-STD-167B has been superseded by MIL-STD-167-1.	Do not tailor this requirement.
3.2.2 3.2.2.1	Physical Characteristics Weight The maximum dry weight of each pump as specified in 3.1.1.1 shall be 1,800 lbs.	---	Noncompliance with this requirement may affect the weight and moment distribution of the ship. This requirement is considered firm.	Do not tailor this requirement.
3.2.2.2	Lifting Provisions Equipment shall be fitted with suitable lifting provisions to allow installation and removal. Lifting provisions shall be suitable for rigging in all attitudes but need not be integral parts of castings. Attachment points shall be capable of withstanding weights and torsion forces applied during lifting.	--	This requirement is of major importance for equipment installation and removal. This is a firm requirement and does not have a significant impact on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2.3	Dimensions The maximum envelope dimensions of the pump including motor and all appurtenances shall be: a. Length - 65 inches b. Width - 36 inches (target-40" max.) c. Height - 30 inches	--	Within a certain tolerance, non-compliance with this requirement will have little impact on the equipment to perform effectively. These dimensions could possibly affect access through this area and accessibility to the equipment for maintenance purposes. This requirement is considered flexible. At present there appears to be no cost advantage to tailoring this requirement.	Do not tailor this requirement.
3.2.3	Reliability and Maintainability Reliability and maintainability shall be in accordance with paragraphs 4.2.3 and 4.2.4.	--	All performance requirements including reliability and maintainability requirements should be stated in Section 3 of this specification. Section 4 should contain specified provisions for verifying that the equipment satisfies each of the requirements specified in Section 3.	Tailor this requirement to: The equipment shall achieve an MTBF of 4,200 hours or more when maintained in accordance with recommended maintenance schedules. The equipment shall achieve an MTTR of 10.8 hours or less.
3.2.4	Environmental Conditions The unit shall meet performance requirements specified herein and in MIL-P-17639 during exposure to any possible combination of specified operating environments.	MIL-P-17639	This requirement is of major importance to equipment performance.	Tailor this requirement to: The unit shall be capable of meeting all performance requirements specified in 3.2.1 through 3.2.1.3 during exposure to any possible combination of operating environments specified in 3.2.4.1 through 3.2.4.4.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.4.1	Temperature Ambient temperature range of 40 to 140°F.	--	This requirement is essential to equipment performance. The specified ambient temperature range for various equipments varies although it appears that their operating environments will be identical. (Fuel Oil Transfer Purifier - 40 to 120°F; Sea Water Service Pump - 40 to 120°F; Chilled Water Pump - 40 to 140°F). The same is true for humidity range (not included in this specification at all).	Review ambient temperature/humidity range requirement for each equipment and standardize if equipments are expected to operate in identical environments. Specify the humidity conditions in which equipment must be capable of performing.
3.2.4.2 3.2.4.2.1	Ship Motion Angles of Inclination During Service The pumps shall operate satisfactorily, maintain satisfactory lubrication, and avoid loss of lubrication fluid, under each of the following two conditions: a. When the ship is permanently trimmed down by the bow or stern as much as 5 degrees from the normal horizontal plane, and permanently listed up to 15 degrees to either side. b. When the ship is pitching up and down with a single amplitude up to 10 degrees from the horizontal and a period of 6 seconds, and when the ship is rolling side to side with a single amplitude up to 45 degrees from the vertical and a period of 10 seconds.	--	This requirement is critical to the equipment performance. According to the DDG-47 Ship Specification, pitch period shall be 7 seconds and roll period should be 14.5 seconds.	Change pitch period to 7 seconds and roll period to 14.5 seconds.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.4.3	Vibration Externally Generated The equipment shall be capable of withstanding vibration requirements of MIL-STD-167B, Type I, from 4 to 15 Hz.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm. MIL-STD-167B has been superseded by MIL-STD-167-1.	Do not tailor this requirement.
3.2.4.4	Shock The equipment shall meet shock Grade A requirements of MIL-S-901C in accordance with Appendix I, and II contained herein and MIL-P-17639D for Type A, Class II hull mounted medium weight equipment. During test the equipment shall be running during Group I and III blows and standstill during Group II blows.	MIL-S-901C MIL-P-17639D NAVSEA 0908-LP-000-3010 NAVSEA 0908-LP-000-6010 MIL-STD-167B MIL-M-19379 MIL-M-24476 MIL-M-17508 MIL-M-19863 MIL-M-21649 NAVSHIP DWG NO 810-1144-5600	This requirement is of major importance to equipment performance. This requirement is considered firm.	Delete general reference to MIL-S-901C and MIL-P-17639D and call out specific paragraphs of MIL-S-901C and MIL-P-17639D as appropriate.
3.2.5	Standardization The SELLER shall furnish and employ standard components/equipment to the maximum extent possible and include applicable Navy Component Identification (CID) numbers, where known, with proposal.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.1	Selection of Components/Equipment The order of precedence for selection of components/equipment is specified in accordance with Spec. No. G50301-2.	--	Changes to this requirement will not have a significant bearing on cost.	Do not tailor this requirement.
3.2.5.2	BUYER Specified Equipment The BUYER may specify to the SELLER certain types of manufacturers of equipments of the categories identified in the MIAPL prior to release for manufacture.	--	This requirement has minor impact on equipment design and has no significant cost impact.	Do not tailor this requirement.
3.2.5.3	Standard Design Equipment Upon establishment of a single source for a specific component/equipment, the SELLER shall purchase all identical components/equipments as defined in 3.5.3.4 from the same source.	--	This requirement has major impact on system performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.4	Identical Design The SELLER shall maintain identical component/equipment design for the total procurement under this contract.	--	This requirement has major impact on system performance. This requirement is considered firm.	Do not tailor this requirement.
3.2.5.5	Non-Standard Components The use of non-standard components/equipments is prohibited without express written permission of the BUYER after receipt of written rationale.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.3 3.3.1	Design and Construction Materials, Processes and Parts Materials, processes and parts shall be in accordance with MIL-P-17639 with modifications delineated in Table I in Specification G50301-2.	MIL-P-17639 MIL-M-15071 NAVSEC Report No. 6113B8-140-77 NAVSEANOTE 5600	This is a general requirement of major importance to the performance, quality, and testing of this equipment.	3.3 Design and Construction - Each Subparagraph of MIL-P-17639D General Design and Detail Requirements should be reviewed for applicability and cited individually. 3.3.1 Materials, Processes, and Parts - Tailor this requirement to: "Materials, processes, and parts shall be in accordance with Paragraphs 3.2, 3.3 and 3.4 of MIL-P-17639D..."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.2	Electromagnetic Radiation Grounding and bonding shall be in accordance with MIL-STD-1310.	MIL-STD-1310	This requirement is of major importance to the functioning of receiving and transmitting equipment aboard ship. This requirement is considered firm.	Do not tailor this requirement.
3.3.3 3.3.3.1	Identification Motor Nameplates Information for identification for each unit nameplate shall be in accordance with this specification. Chilled water pump nameplates shall be in accordance with MIL-P-15024 and MIL-STD-130. Motor nameplates shall be in accordance with MIL-M-17060.	MIL-P-15024 MIL-STD-130 MIL-M-17060	This requirement is of minor significance tothe equipment performance; however, there appears to be little	Do not tailor this requirement.
3.3.4	Workmanship Workmanship practices shall be in accordance with this specification. Welding shall be in accordance with MIL-STD-278, Section 7. Castings and forgings are free of sharp edges, machined surfaces have sharp edges broken or chamfered. All exposed ferrous surfaces are primed and painted; electrical/electronic workmanship is in accordance with Section 9 of MIL-STD-454.	MIL-STD-278 MIL-STD-454	This requirement is of major importance to the equipment performance. Changes to this requirement could result in degraded performance and reduced reliability; therefore, this requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.5	Interchangeability All identically identified components and repair parts shall be functionally and physically interchangeable, without degradation to the system.	--	This requirement is of major importance to the equipment maintenance. Changes to this requirement could result in degraded performance and excessive values of MTTR; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.3.6	System Safety/Human Factors System safety criteria in accordance with MIL-STD-882A Paragraph 5.4.1 and Human Engineering criteria of MIL-STD-1472B Paragraph 4.2 and 4.4 will be incorporated when applicable in the design or modification of this equipment. The order of precedence for incorporation of safety features shall be in accordance with MIL-STD-882A Paragraph 5.4.2.	MIL-STD-882A MIL-STD-1472B	This requirement of of major importance to the equipment performance. Changes to this requirement would degrade equipment performance; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.3.7	Electric Motors Motors shall be in accordance with MIL-M-17060, with characteristics as follows: Input Power - 440 Volts, 3 phase, 60 Hz Service - A Ambient Temp.- 50°C. Enclosure - Drip-proof Protected Insulation - B or F	MIL-M-17060	This requirement is essential to equipment performance.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.4	Qualification Delivered pumps shall be qualified products in accordance with MIL-P-17639 and the quality assurance provisions in Section 4 of this specification.	MIL-P-17639	This requirement has a major impact on equipment acceptance.	Do not tailor this requirement.
4. 4.1	Quality Assurance Provisions General The pump shall comply with the requirements of this specification and with MIL-P-17639.	MIL-P-17639	This is a general requirement of major importance. As stated, the requirement does not cover quality assurance provisions. This paragraph is intended to provide general information about tests and inspections not covered elsewhere in Section 4, such as location and conditions for testing, requirements for special testing of critical items, etc.	Tailor this requirement to comply with the intent of MIL-STD-490.
4.1.1	Responsibility for Tests Except as otherwise specified, the SELLER is responsible for conduct of all tests specified herein. SELLER may submit data derived from prior testing of comparable equipment performed to the requirements of MIL-P-17639 and subject to the BUYERS approval.	MIL-P-17639	MIL-STD-490 permits the use of para. 4.1.2, titled "Special tests and examinations." This para. covers the testing routine, sequence of tests, number of items to be tested, and the data required for all testing other than acceptance inspection. Para. 4.1.2 should also include a table correlating each equipment performance requirement, its tests, the type of unit on which the test shall be performed, and specific references for each test.	Develop Paragraph 4.1.2 with a tabular presentation of all tests and inspections required in Section 4 correlated to the performance requirements of Section 3.

CHILLED WATER PUMPS SPECIFICATION G50301-2

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2 4.2.1	Quality Conformance Inspections Performance Pump inspection and test shall be conducted in accordance with 4.1, 4.2, and 4.3 of MIL-P-17639.	MIL-P-17639	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement.
4.2.1.1	Noise Noise measurements shall be made in accordance with MIL-STD-740 except as modified herein. The pumps shall be mounted on a common sub-base supported by USN resilient mounts as specified in Figure 2.	MIL-STD-740 MIL-M-17508D	This requirement is of major importance to the equipment performance.	Tailor this requirement to: "Airborne and structureborne noise measurements shall be made in accordance with Section 5 of MIL-STD-740B, except as mofified by 4.2.1.1.1 and 4.2.1.1.2. The pump and motor shall be mounted on a common sub-base supported by resilient mounts as specified in Figure 2 herein."
4.2.1.1.1	Airborne Airborne noise measurements and room calibration shall be made in accordance with procedures of NASI S1.2 and as specified in Spec. No. G50301-2. Airborne noise measurements shall be in accordance with the requirements of 3.2.1.1.1.	ANSI S1.2	This requirement is of major importance to the equipment performance but is redundant to 4.2.1.1.	Change the last sentence to read "Airborne Noise Limits are as specified in 3.2.1.1.1."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.1.1.2	Structureborne Structureborne noise tests shall be conducted as specified herein. Structureborne noise levels shall be in accordance with the requirements of 3.2.1.1.2	MIL-STD-740	This requirement is of major importance but is redundant to 4.2.1.1.	Change the last sentence to: "Structureborne Noise Limits shall be specified in 3.2.1.1.2."
4.2.2	Physical Characteristics Physical characteristics shall be verified by visual examination and measurement.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.2.3	Reliability Requirements The equipment shall achieve an MTBF of 4,200 hours or more when maintained in accordance with recommended maintenance schedules.	--	See 3.2.3.	See 3.2.3. - Delete this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.3.1	Production Reliability Demonstration A reliability demonstration shall be conducted in accordance with MIL-STD-781B to show achievement of the MTBF specified in Paragraph 4.2.3. This demonstration may be waived if prior documented testing is acceptable to the BUYER. The demonstration shall be conducted in accordance with applicable R&M criteria described in the Statement of Work. In determining the type of test plan the discrimination ratio shall be 2:1 (specified MTBF-4,200 hours; minimum acceptable MTBF: 2,100 hours.)	MIL-STD-781B	This requirement is essential to the determination of equipment MTBF.	Change "4.2.3" to "3.2.3" (See 3.2.3 Comments and Recommendations). Specify the exact test in MIL-STD-781B to be performed.
4.2.3.2	Reliability Verification The verification of the MTBF requirement of 4.2.3.1 shall be accomplished by a Reliability Demonstration Test in accordance with one of the test plans of MIL-STD-781B. Verification of the MTBF requirement shall be by analysis of operational data.	MIL-STD-781B	This requirement is essential to the determination of equipment MTBF but is redundant to 4.2.3.1.	Delete this paragraph. The requirement is contained in 4.2.3.1.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.4	Maintainability Requirements The equipment shall achieve an MTTR requirement of 10.8 hours or less.	--	See 3.2.3.	See 3.2.3.
4.2.4.1	Production Maintainability Demonstration A maintainability demonstration shall be conducted in accordance with MIL-STD-471A to show achievement of MTTR specified in paragraph 4.2.4. This demonstration may be waived if prior documented testing is acceptable to the BUYER. Success criteria shall utilize a maximum requirement value of 21.6 hours MTTR and design goal of 10.8 MTTR. In case of conflict with delivery, SELLER shall prepare an alternate procedure for BUYER approval.	MIL-STD-471A	MIL-STD-471A contains many requirements that are costly and time-consuming to satisfy, and ti is not always applicable to equipment for which faults can be quickly and easily isolated.	Specify the exact test method in MIL-STD-471A to be used.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
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4.2.4.2	Maintainability Verification Verification of the maintainability requirement shall be accomplished by a Maintainability Demonstration in accordance with MIL-STD-471A.	MIL-STD-471A	This requirement is redundant to 4.2.4.1	Delete this paragraph.
4.2.5 4.2.5.1	Environmental, Vibration and Shock Temperature Test data obtained during the pump design evaluation test in accordance with MIL-P-17639 shall be used in predicting performance at the conditions specified in 3.2.4.1 with ambient temperature fresh water.	MIL-P-17639	This requirement is of major importance to the equipment performance. This requirement is considered flexible. On what basis is the data to be extrapolated to the temperature extremes? It appears that too many variables are involved to validly extrapolate test results at a given temperature to temperature extremes.	Either provide bases for extrapolation of test data at given temperature to extremes of temperature, or if this is not feasible and performance at the temperature extremes is considered critical, require additional testing at those extremes.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.5.2	Ship Motion Verification of the requirements for ship motion in 3.2.4.? shall be done by analysis and inspection of data gathered during performance testing.	--	This requirement is of major importance to equipment performance and is considered firm. On what basis is the data to be extrapolated to extreme inclinations? It appears that too many variables are involved to validly extrapolate test results from normal orientation to extreme inclinations.	Either provide bases for extrapolation of test data at normal orientation to extreme inclinations, or if this is not feasible and performance require testing of pump and motor in accordance with 4.3.4.18.1 and 4.3.4.18.2 of MIL-M-17060E(SH). The pump shall be operated at maximum rated speed and capacity with pumped fluid at ambient temperature during the test. The pump and motor shall meet all specified performance requirements without damage while operating in the inclined position.
4.2.5.3	Shock The equipment shall have the shock requirements of 3.2.4.4 verified by test or extension in accordance with MIL-S-901C and Appendixes I and II of Spec. No. G50301-2.	MIL-S-901C	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.5.4 4.2.5.4.1	Vibration Vibration Externally Generated The equipment shall have vibration requirements of 3.2.4.3 verified, extended, or exempted in accordance with MIL-STD-167B, Type I and/or Appendix II of Spec. No. G50301-2.	MIL-STD-167B	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.5.4.2	Vibration Self Excited Capability of the equipment to meet the balance requirements of 3.2.1.3 shall be demonstrated by testing in accordance with MIL-STD-167B Type II. Testing may be waived in accordance with Appendix II. However, all equipment units shall be balanced in accordance with MIL-STD-167B.	MIL-STD-167B	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.6	Material, Processes and Parts Verification of material, processes and parts requirements specified in 3.3.1 herein shall be by inspection of drawing and material certification.	--	This requirement is of major importance to equipment performance and is considered firm; however, as stated this requirement is too general.	This requirement does not adequately present the quality assurance provisions needed to cover the full range of materials, processes, and parts presented in MIL-P-17639 and G50301-2. Specify the exact quality assurance provision required for each category of parts, processes, and material covered in these two specifications. Identify those instances and conditions in which a quality assurance provision is not required.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.7	Electromagnetic Radiation Electromagnetic radiation requirements of 3.3.2 shall be verified by inspection.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.8	Identification and Marking Verify requirements of 3.3.3 herein by inspection.	--	This requirement is of minor importance.	Do not tailor this requirement.
4.2.9	Interchangeability Verify requirements of 3.3.5 herein by inspection.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.10 & 4.2.11	Safety and Human Factors The safety and human engineering criteria of 3.3.6 shall be verified by analysis of the equipment design.	--	This requirement is of major importance to equipment performance and is considered firm.	Tailor this requirement to: "Compliance with the safety and human engineering criteria of 3.3.6 shall be verified by analysis of the equipment design and results of tests specified herein."
5. 5.1	Preparation for Delivery Preservation, Packaging, Packing and Marking Preservation, packaging, packing, and marking shall be in accordance with MIL-P-16789.	MIL-P-16789	This requirement has no significant impact on cost.	Do not tailor this requirement.
5.1.1 5.1.1.1	Noise Critical Equipment The supplier shall mark the outside of each crate container as follows: Noise Critical Equipment - Handle Carefully; Add to rail car if shipment is by rail: No Humping.	--	This requirement has no significant impact on cost.	Do not tailor this requirement.

CHILLED WATER PUMPS WORK STATEMENT G50301-1

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
2.	Responsibilities The SELLER shall be responsible for the engineering, production, delivery, hardware integration, test and technical support of the DDG-47, Air Conditioning Plants as defined by this Work Statement and Procurement Specification G50301-2. SELLER shall supply the manpower, materials, facilities, and resources to complete tasks identified by Section 3 through 13 of this Work Statement. Data required by the Subcontractor *Data Requirements* List, which is certified as being prior submitted by SDRL CRT, shall not be duplicated. If the vendor cannot provide a certification of prior approved data, the vendor shall furnish the following data on SDRL EBW: a. Mounting dimensions b. Outline drawings c. Weight (wet or dry) d. Center of gravity e. Special mounting requirements f. All other pertinent data required to foundation/install the equipment.	MIL-D-1000A MIL-STD-100B USAS Y32.16 MIL-STD-275 MIL-S-901C	This requirement is of major importance to successful procurement of the equipment.	Change "Air Conditioning Plants" to "Chilled Water Pumps".

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3 3.1	Program Management Schedule and Status The SELLER shall maintain scheduling and status information for program control at the SELLER's facility. Problem reports shall be furnished in accordance with SDRL MAG.	--	This requirement is important to the successful completion of the program and to Government-contractor-subcontractor interface and communications.	Do not tailor this requirement.
4 4.1	Configuration Management Change Control If SELLER requests BUYER approval of an engineering change, SELLER shall describe the nature of the proposed change and the anticipated contractual impact to the BUYER in accordance with SDRL CAD.	MIL-STD-480	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.1.1 & 4.1.2	Deviation and Waivers and Special Requests The SELLER shall submit requests for deviations and waivers in accordance with SDRLs CAG and CAH. Special request and exception reports shall be furnished in accordance with SDRL MAL.	MIL-STD-480	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5	Quality Assurance The SELLER's Quality Assurance (QA) Program shall be in accordance with Quality Requirements Instructions (QRI), Form S-1253C-1-2-3.	QRI-Form S-1253C-1-2-3	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
5.1	Inspection Milestone Notification For those inspection milestones which the BUYER has indicated an intention to witness, the SELLER shall notify the BUYER no less than ten days in advance of their occurrence, in accordance with SDRL PAY.	--	This requirement is important to Government-contractor communication and coordination. This requirement is considered firm.	Do not tailor this requirement.
5.2	Quality Conformance Records The SELLER shall maintain and submit conformance data in accordance with SDRL PAV.	MIL-STD-480 MIL-Q-9858A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.	Engineering General The SELLER shall provide engineering effort and support to meet the requirements of BUYER specification G50301-2 and the requirements of the Work Statement. There shall be no deviations from the requirements of the technical specification without the express written approval of the BUYER.	--	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
6.2	Detail Design The design engineering including schematics and interface definition shall be documented in accordance with the following: a. Engineering drawings and associated lists-SDRL EBW b. Certification of prior approved data-SDRL CRT c. Data List-SDRL EHC d. Drawing schedule-SDRL EAA e. Index list-SDRL EHD f. Microfilming of documents-SDRL EHB.	Appendix II to Proc. Spec. MIL-D-1000A MIL-STD-100B USAS Y32.16 MIL-STD-275 MIL-S-901C MIL-M-9868 MIL-C-9877 MIL-M-38761 MIL-STD-804B MIL-M-38761/2 MIL-STD-12C Handbook H4-1 G-C-116	This requirement is of critical importance to the control of equipment design and to modifications, maintenance, and overhaul during service life. This requirement is considered firm. NOTE: DID and SDRL EAA are not included in Attachments A and B.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.2.1	Design Review(s) The SELLER shall schedule a design review(s) with the BUYER prior to release for manufacturing.	--	This requirement is important for control of equipment design and performance.	Do not tailor this requirement.
6.3 6.3.1	Electric Motors and Controls Electric Motors The SELLER shall be responsible for the suitability of electric motors for each application, for mounting and coupling the motor to the driven unit. The selected motor manufacturer and performance characteristics of the motor shall be provided. The SELLER is responsible to specify the required motor and to review the motor design drawings. The SELLER shall supply motors in accordance with MIL-M- 17060. SELLER approved motor drawings shall be in accordance with SDRL EBF.	MIL-M-17060E	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.3.2	Electric Motor Controllers The SELLER shall be responsible for furnishing the BUYER with motor controller and/or driven equipment control circuit interface requirements. The data furnished shall enable the BUYER to procure motor controllers and push-button stations that will correctly interface with the SELLER's equipment and/or control circuits. SELLER shall furnish this information in accordance with SDRL ECG.	MIL-C-2212	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.4	Engineering Analysis and Studies The SELLER shall provide: • Welding, brazing and allied process procedures, SDRL Item PCD • Weight Verification, SDRL Item EDH	NAVSHIPS 0900-000-1 00 MIL-STD-278 MIL-STD-454	This requirement is important for verifying equipment design and quality conformance. Note: SDRL EDH is not included in Attachment B. Submittal of Design Review Data is not required.	Add: "Design Review Data, SDRL Item EAX." (Include DID and SDRL EAX in Attachments A and B.)
6.5	Shock Qualification The SELLER shall provide necessary supplies and services to schedule, evaluate and qualify the specified equipment for the shock test and extension requirements of MIL-S-901C as modified for the DDG-47 in the procurement specification and in accordance with the following SDRLs: CRT - Certification of Prior Approved Data; SBN - Shock Qualification Extension Report.	MIL-S-901C Appendix I Proc. Spec. MIL-STD-798(1)	This requirement is critical to the determination of equipment quality conformance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.5 (continued)	TAU Test Reports TAQ Test Procedures	--	--	--
6.6	Airborne/Structureborne Noise The SELLER shall conduct airborne/structureborne noise tests and provide airborne/structureborne noise data in accordance with SDRLs SBU, TAQ, TAU, and SCC.	MIL-STD-798(1) Appendix I to Proc. Spec.	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.7	Vibration The SELLER shall provide the necessary supplies and services to schedule, evaluate and qualify the specified equipment for the Type I and II vibration test requirements of MIL-STD-167B and in accordance with the following SDRLs: CRT Certification of Prior Approved Data SCF Vibration Qualification Extension/Exemption Report (Cont'd)	MIL-STD-167B Appendix II to Proc. Spec. MIL-S-16036	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.7 (continued)	SCD Vibration Test Teports TAQ Vibration Test Procedures	--	--	--
6.8	Release for Manufacture (RFM) For identical equipment previously provided, RFM will be granted by BUYER after review of SELLER's technical proposal and/or certified current Interface Control Drawings. RFM will be mutually agreed to in writing by BUYER and SELLER during final negotiations prior to contract award. For new and/or modified equipment, RFM will be granted after contract award and upon successful completion of design review.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.
7.	Fabrication The SELLER shall provide the required material and services to fabricate equipment in support of this program.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
7.1	Deliverable Hardware The SELLER shall fabricate the equipment in the quantities and schedules specified in the contract. The first production article shall undergo qualification tests as defined in Section 12 unless already qualified.			

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
7.2	Qualification Hardware Refurbishment The equipment on which qualification tests are performed shall be refurbished and delivered as a deliverable hardware item. As a minimum, the equipment shall be completely dismantled and all parts shall be inspected to determine the extent of damage or deterioration caused by the tests. All parts which have sustained damage or deterioration shall be replaced.	--	This requirement is of major importance to equipment operation.	Require SELLER to provide a list of all parts replaced and the extent/type of damage each sustained with probable cause of damage if not previously reported in test reports.
8. 8.1	Reliability and Maintainability R&M Analysis The SELLER shall perform analysis for R&M prediction/assessment, including block diagrams, failure rates and data source, and shall submit in accordance with DID RGA.	MIL-STD-785 Handbook-217 Handbook-472	This equipment is identical to or similar to equipment already in fleet service, and operational reliability data are available from service reports. There is no need to perform tasks to determine and verify inherent reliability.	Delete this requirement.
8.2	Failure Modes Effect Analysis The SELLER shall perform a failure modes effects analysis showing all failure modes of equipment, effects on the functional performance, possible causes and design features to minimize or eliminate effects. The analysis shall be submitted in accordance with DID RGF.	MIL-STD-1629 (Ships) MIL-STD-847	The equipment to be procured is identical to or similar to equipment already in the fleet. This is probably a duplication of previously procured documentation and existing 3M data.	Delete this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.3	Reliability Demonstration A Reliability Demonstration Plan shall be prepared by the SELLER and submitted in accordance with DID and SDRL RGP. The Reliability Demonstration Plan shall meet the requirements of MIL-STD-781B. A Reliability Demonstration Report shall be prepared and submitted in accordance with DID and SDRL RGT.	MIL-STD-781B MIL-STD-847	This requirement is important to the determination of equipment operational reliability.	Delete Items d, e, and h of DID RGT.
8.4	Maintainability Demonstration A Maintainability Demonstration Plan shall be prepared by the SELLER and submitted in accordance with DID and SDRL RGU. The plan shall meet the requirements of MIL-STD-471A. A Maintainability Demonstration Procedure shall be prepared and submitted in accordance with DID and SDRL RGW. A Maintainability Demonstration Report shall be prepared and submitted in accordance with DID and SDRL RGX. This demonstration requirement is waived if prior testing has been documented and is acceptable to the BUYER. If the SELLER is unable to comply with the success criteria of MIL-STD-471A corrective action or design changes to achieve the required MTTR shall be submitted in accordance with DID and SDRL RGB.	MIL-STD-471A MIL-STD-847	This requirement is of major importance to the equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.5	Reliability and Maintainability Demonstration Criteria Demonstration tests shall be conducted to show achievement of quantitative R&M requirements specified herein. General procedures to be followed during R&M testing are as specified herein.	MIL-STD-781B	This requirement is important to the successful completion of the program. This requirement is considered flexible.	Do not tailor this requirement.
8.6	R&M Design Review R&M Design Review Agendas and Data Packages shall be prepared and submitted in accordance with DID and SDRL RGD. Design Review Reports shall be prepared and submitted in accordance with DID and SDRL RGE.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
8.7	Failure Reporting and Corrective Action Failure/Malfunction Reports shall be prepared and submitted in accordance with DID and SDRL RGK. Failure analysis and corrective action recommendations will be furnished by the vendor on failures of equipment that occur during testing and demonstrations at the BUYER's facility and during the SELLER's warranty/guarantee period when requested by the BUYER.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
9.	System Safety/Human Factors The SELLER shall ensure that System and Human Factors criteria applied to the DDG-47 Class Ship shall be to the level specified in Technical Specification G50301-2.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
9.1	Preliminary Hazard Analysis The SELLER shall prepare a Preliminary Hazard Analysis on this equipment in accordance with DID SGX.	MIL-STD-882A	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
9.2	Subsystem Hazard Analysis The SELLER shall prepare and submit a Subsystem Hazard Analysis on all Category I and II hazards identified in the Preliminary Hazard Analysis in accordance with DID SGS.	--	This requirements is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.	Integrated Logistic Support Integrated Logistic Support Requirements can be satisfied through compliance with (Statement of Prior Submission) SDRL VAH (Dated 29 September 1978).	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
11.1	Supply Support The SELLER shall develop inputs to provisioning Technical Documentation in accordance with SDRL VAC (dated 29 September 1978), Attachments I, II, and III.	MIL-D-1000A MIL-STD-100B MIL-M-9868 MIL-D-5480	This requirement is important in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.
11.2	Standardization The SELLER shall implement a program for monitoring design selections to ensure the employment of standard components/equipments in accordance with the technical specification. Authorization for use of non-standard components/equipments is as specified herein.	--	This requirement is of major importance to the equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.3	Maintenance Access Envelope The SELLER shall provide the maintenance access envelope necessary to accomplish all maintenance, repair and disassembly of the equipment. Data shall be submitted in accordance with SDRL VAM (Dated 27 October 1978).	--	This requirement is of major importance to equipment performance. The requirement is considered firm.	Do not tailor this requirement.
11.4	Special Tools and Test Equipment The SELLER shall provide a priced list of recommended special tools and test equipment, required for onboard support of the item, in accordance with SDRL VAI (Dated 29 September 1978).	--	This requirement is of major importance in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.
11.5 11.5.1 11.5.2 & 11.5.3	Equipment Manuals New and Existing Manuals New technical manuals shall be developed in accordance with MIL-M-15071 and SDRL HAK. Existing technical manuals proposed for use in this contract shall contain the data required to permit operation and maintenance of the exact equipment and configuration to be delivered and shall be in accordance with SDRL HAK. All technical manuals shall be validated and verified to assure con- (Cont'd)	MIL-M-15071G MIL-M-38784B MIL-M-7298B NAVSEC Report No. 6113B8-140-77 MIL-M-81203A MIL-P-38790 NAVEXOS P-35	This requirement is of major importance to equipment maintenance and operation and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.5.1, 11.5.2 & 11.5.3 (continued)	formance to MIL-M-15071 during manufacturing, assembly, installation or checkout.	--	--	--
12 12.1	Test and Evaluation Production Testing The SELLER shall perform production tests on all items of deliverable equipment in accordance with Buyer Specification G50301-2. Production testing shall be documented in accordance with SDRL TAU and CRT.	Appendix I to Proc. Spec. MIL-STD-798(1)	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
12.2	Test Procedure Test procedures shall be developed and submitted for all SELLER tests in accordance with SDRL TAQ and CRT.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
12.3	Test Reports The SELLER shall document all test results in accordance with SDRL TAU and CRT.	Appendix I to Proc. Spec. MIL-STD-798 (1)	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3. 4.1	Requirements Item Definition The pump furnished under this specification shall be of the horizontal split-casing, single stage, volute-type, double suction, flexible coupled centrifugal configuration in accordance with MIL-P-17639, Class C-2, with modifications, additions, and deletions specified herein.	MIL-P-17639	This is a general requirement. Conformance with this requirement is critical to the performance, quality, and testing of this equipment.	Do not tailor this requirement.
3.1.1 & 3.1.2	SELLER & BUYER Furnished Equipment Equipment shall be furnished by the SELLER in accordance with this specification. Equipment shall be furnished by the BUYER in accordance with this specification.	MIL-M-17508	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
3.2 3.2.1	Characteristics Performance The pump shall meet the performance requirements of MIL-P-17639 as modified herein, while under specified operating conditions. (Continued)	MIL-P-17639	This is a general requirement of critical importance.	Tailor this requirement to read "The pump shall meet the performance requirements of Paragraphs 3.2, 3.3 and 3.4 of MIL-P-17639D, as modified by 3.2.1.1, 3.2.1.2 and Table 1 herein."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2 (cont'd)	Characteristics (continued)			
3.2.1.1	Output Characteristics Capacity, gallons per minute (gpm) 1,100 Total discharge head, pounds per square inch gage (psig) 150 Maximum shut-off head (psig) 180 Minimum shut-off head (psig) 165	--	--	--
3.2.1.2	Operating Conditions Liquid pumped = seawater Suction lead = flooded Specific gravity of liquid pumped: 1.03, Water temperature range, degree F: +28 to +85, Revolutions per minute RPM: 3550 Rated horsepower (max): 150.	--	This requirement is critical to equipment performance.	Do not tailor this requirement.
3.2.1.3	Noise Noise level shall be in accordance with this specification. Terminology used shall be as defined in ANSI S1.1	ANSI S1.1	Noncompliance with this requirement will adversely affect the ability of personnel in the vicinity to perform their assigned duties and the ship ASW mission; however, minor deviations from the requirement may be permitted in order to avoid the costs of retest and engineering changes.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1.3.1 3.2.1.3.2	Airborne and Structureborne Levels Airborne and structureborne noise levels shall not exceed limits as specified in Figures 1 and 2.	--	This requirement is designed to meet ship-radiated and sonar self-noise objectives and airborne noise objectives. As such, it is of major importance to the ship mission.	Do not tailor this requirement.
3.2.2	Physical Characteristics The net dry weight shall not exceed 4600 pounds. The envelope dimensions shall not exceed the following: Length 88 in. Width 33 in. Height 38 in.	--	Noncompliance with this requirement may affect the weight and moment distribution of the ship. This requirement is considered firm. Within a certain tolerance, non-compliance with these dimension requirements will have little impact on the equipment to perform effectively. At present there appears to be no cost advantage to tailoring this requirement.	Do not tailor these requirements.
3.2.3 3.2.3.1	Reliability/Maintainability Reliability Requirements The equipment shall achieve an MTBF of 3000 hours or more when maintained in accordance with recommended maintenance schedules.		This requirement is essential to equipment performance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.3.1.1	Production Reliability Demonstration A reliability demonstration shall be conducted in accordance with MIL-STD-781B to show achievement of the MTBF specified in Paragraph 3.2.3.1. This demonstration may be waived if prior documented testing is acceptable to the BUYER. The demonstration shall be conducted in accordance with applicable R&M criteria described in paragraph 8.5 of the Statement of Work. The discrimination ratio shall be 2:1 (specified MTBF of 3000 hours; minimum acceptable MTBF of 1500 hours).	MIL-STD-781B	This requirement is essential to the determination of equipment MTBF; however, Section 3 should contain equipment performance requirements. Section 4 should contain all the tests, inspections, demonstrations, etc., required to verify that the equipment satisfies all the specified performance requirements. In addition, this requirement is redundant to 4.2.3.	Delete this requirement.
3.2.3.2	Maintainability Requirements The equipment shall achieve an MTTR requirement of 8.9 hours or less.	--	This requirement is of major importance to the equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.3.2.1	Production Maintainability Demonstration A maintainability demonstration shall be conducted in accordance with MIL-STD-471A to show achievement of MTTR specified in paragraph 3.2.3.2. This demonstration may be waived if prior documented testing is acceptable to the BUYER. The demonstration shall be conducted in accordance with applicable R&M criteria described in paragraph 8.5 of the Statement of Work. Success criteria shall utilize a maximum requirement value of 17.8 hours MTTR and design goal of 8.9 MTTR. In case of conflict with delivery, SELLER shall prepare an alternate procedure for BUYER approval.	MIL-STD-471A	The comment for 3.2.3.1.1 also applies to this requirement. In addition, this requirement is redundant to 4.2.3.1.	Delete this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.4	Useful Life Useful life shall be 20 years with a 50 percent duty cycle. Service, preventive maintenance, and overhaul will be permitted in accordance with BUYER approved procedures and schedules.	--	This requirement is critical to the equipment performance and is considered firm.	Do not tailor this requirement.
3.2.5	Environmental Conditions The unit shall meet performance requirements specified herein and in MIL-P-17639 during exposure to any of the following combinations of operating and non-operating environments.	MIL-P-17639	This requirement is of major importance to equipment performance.	Tailor this requirement to: "The unit shall be capable of meeting all performance requirements specified in 3.2.1 through 3.2.1.3 during exposure to any possible combination of operating environments specified in 3.2.4.1 through 3.2.4.4.
3.2.5.1	Temperature Ambient temperature range of +40 to +120 degree F.	--	This requirement is essential to equipment performance. The specified ambient temperature range for various equipments varies although it appears that their operating environments will be identical. (Fuel Oil Transfer Purifier: 40 to 122°F; Chilled Water Pump: 40 to 140°F). The same is true for humidity ranges (not included in this specification at all).	Review ambient temperature/humidity range requirements for each equipment and standardize if equipments are expected to operate in identical environments. Review the full range of potential environments for temperature, humidity, salt spray and fungus conditions, etc., and include specified units in G52101-2 as appropriate.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.2 3.2.5.2.1	Ship Motion Angles of Inclination The pumps shall meet the ship motion requirements as specified when the ship is permanently trimmed down by the bow or stern as much as 5 degrees from normal horizontal plane, and permanently listed up to 15 degrees to either side of vertical. When the ship is pitching up and down with a single amplitude up to 10 degrees from the horizontal and when the ship is rolling side to side with a single amplitude up to 45 degrees from vertical.	--	This requirement is critical to the equipment performance. According to the DDG-47 ship specification, the pitch period should be 7 seconds and the roll period should be 14.5 seconds.	Tailor this requirement to include a pitch period of 7 seconds and a roll period of 14.5 seconds.
3.2.5.3	Vibration Externally Generated The equipment shall be capable of withstanding vibration requirements of MIL-STD-167B, Type I, from 4 to 15 Hz. During test the equipment shall be hard mounted and running.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.

AD-A079 519 ARINC RESEARCH CORP ANNAPOLIS MD F/G 13/10
REVIEW AND TAILORING OF SELECTED DDG-47 AND DDG-48 EQUIPMENT SP--ETC(U)
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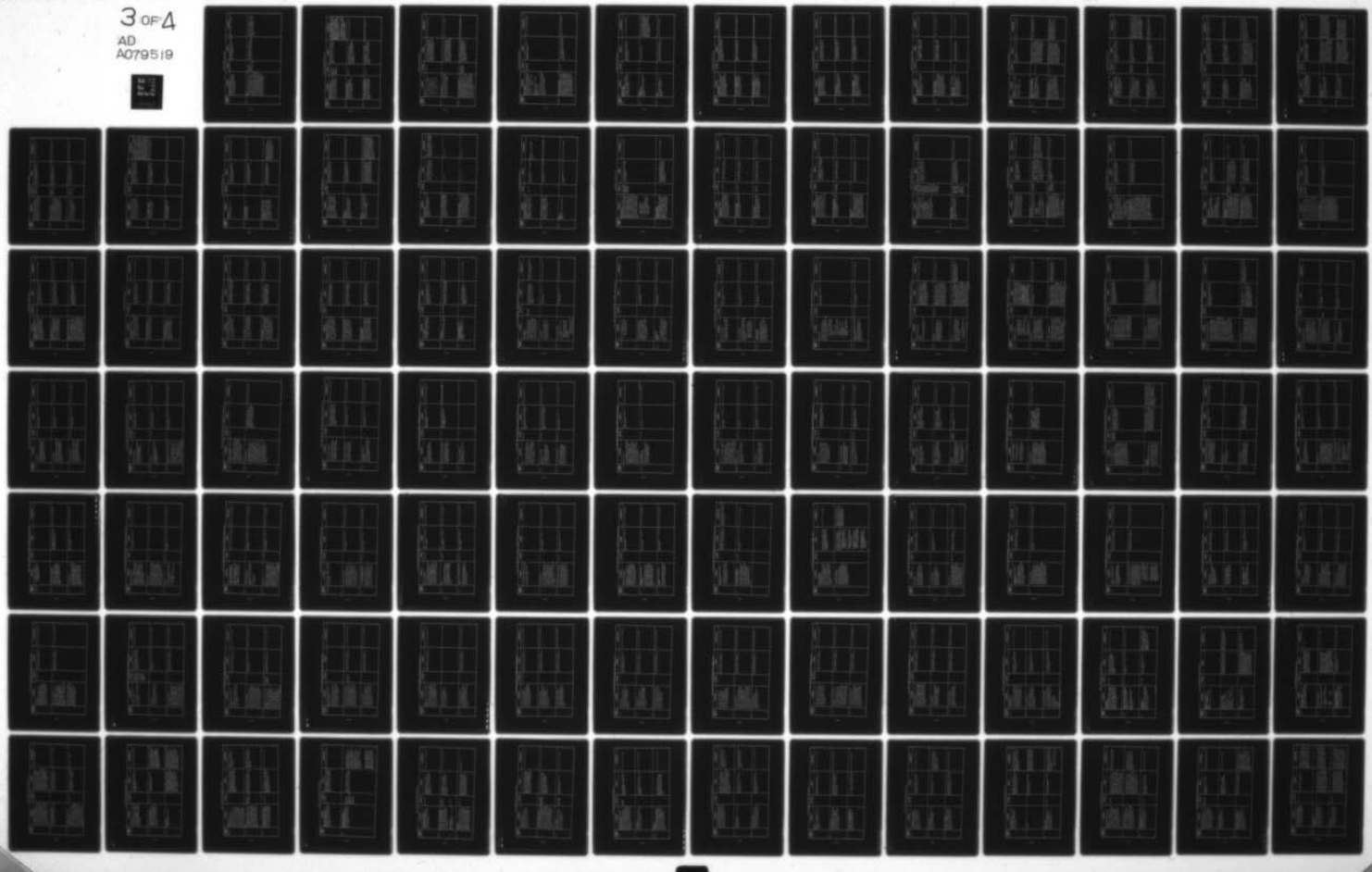

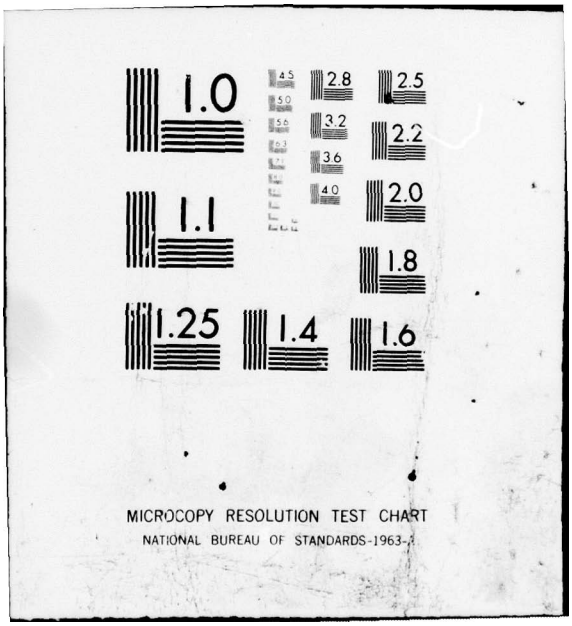
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.4	Vibration Self Excited Equipment or machinery components with rotating parts shall meet balance and vibration requirements of MIL-STD-167B, Type II	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.2.5.5	Shock The equipment shall meet shock grade A requirement of MIL-S-901C in accordance with Appendix I, and II contained herein and MIL-P-17639 as modified herein for Type A, Class II hull mounted medium weight equipment. During the 30° incline portion of the test the equipment shall be oriented with the pump/motor axis parallel to the horizontal. The pump shall be in operation during the first and third blow in each orientation on the medium weight shock machine.	MIL-S-901C MIL-P-17639 Appendix I and II of Proc. Spec.	This requirement is of major importance to equipment performance. This requirement is considered firm.	Delete general reference to MIL-S-901C and MIL-P-17639 and call out specific paragraphs of MIL-S-901C and MIL-P-17639D as appropriate.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3 3.3.1	Design and Construction Materials,Processes and Parts Materials, processes and parts shall be in accordance with MIL-P-17639 with modifications delineated in Table I in Specification G52101-2.	MIL-P-17639 MIL-C-2212 MIL-E-917 MS 16142 Handbook H4-1	This is a general requirement of major importance to the performance, quality, and testing of this equipment.	3.3 Design and Construction - The specific paragraphs of MIL-P-17639D that apply to the procurement of the fire pump should be cited. Each subparagraph of MIL-P-17639D under General Design and Detail Requirements should be reviewed for applicability and cited individually. If each subparagraph applies, it should be so indicated. 3.3.1 Materials, Processes and Parts Tailor this requirement to: "Materials, processes, and parts shall be in accordance with paragraphs 4.2, 3.3 and 3.4 of MIL-P-17639D with..."
3.3.2	Electromagnetic Radiation Grounding and bonding shall be in accordance with MIL-STD-1310 unless an equally effective alternate can be demonstrated.	MIL-STD-1310	This requirement is of major importance to the functioning of receiving and transmitting equipment aboard ship. This requirement is considered firm.	Do not tailor this requirement.
3.3.3	Nameplates and Product Marking The identification nameplate shall be in accordance with MIL-P-17639 as modified in Table I and shall include Contract Number N00024-78-C-2316.	MIL-P-17639	This requirement is of minor significance to the equipment performance; however, there appears to be little or no potential for cost savings.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.4	Workmanship Workmanship practices shall ensure that: Welding is in accordance with MIL-STD-278, Section 7; Castings and forgings are free of sharp edges; machined surfaces have sharp edges broken or chamfered; openings in hydraulic equipment and piping are sealed and maintained clean during assembly.	MIL-STD-278	This requirement is of major importance to the equipment performance. Changes to this requirement could result in degraded performance and reduced reliability; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.3.5	Interchangeability All identically identified components and repair parts shall be functionally and physically interchangeable, without degradation to the system.	--	This requirement is of major importance to the equipment maintenance. Changes to this requirement could result in degraded performance and excessive values of MTTR; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.3.6	System Safety/Human Factors System safety criteria in accordance with MIL-STD-882A paragraph 5.4.1 and Human Engineering criteria of MIL-STD-1472 paragraph 4.2 and 4.4 and MIL-STD-454, Requirement 1, will be incorporated when applicable in the design or modification of this equipment. The order of precedence for incorporation of safety features shall be in accordance with MIL-STD-882A paragraph 5.4.2.	MIL-STD-882 MIL-STD-1472 MIL-STD-454	This requirement is of major importance to the equipment performance. Changes to this requirement would degrade equipment performance; therefore, this requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.7	Electric Motors Motors shall be in accordance with MIL-M-17060, with characteristics in accordance with 3.2.8 of MIL-P-17639 and as specified below: Input power: 440 volts, 3 phase, 60 Hertz Service: A Ambient Temperature: 50 deg C Enclosure: TEFC Insulation: B or F The motors shall have a power margin of 5 percent and be sized to handle peak load horsepower requirements without exceeding nameplate amperage.	MIL-M-17060 MIL-P-17639	This requirement is essential to equipment performance.	Do not tailor this requirement.
3.3.8	Electric Motor Controls The SELLER shall furnish the BUYER with motor controller and/or driven equipment control circuit interface requirements to enable the BUYER to procure motor controllers and push button stations that will correctly interface with the SELLER's equipment. The interface data shall be on a drawing conforming to the drawing requirements of MIL-C-2212.	MIL-C-2212	This requirement is of major importance to equipment operation and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.4 3.4.1	Documentation Technical Manuals Technical manuals for the unit shall be in accordance with technical manual requirements specified in the Statement of Work.	--	This requirement is of major importance to equipment operation and maintenance.	Do not tailor this requirement.
3.5 3.5.1	Logistics Overhaul Cycle The equipment shall have a minimum time between overhaul (TBO) of 46 months.	--	TBO requires definition.	If the 46 month's TBO is calendar time, either estimated operating time for 46 months must be specifie or the overhaul cycle should be specified in terms of operating time. If the 46 months is operating time, indicate so.
3.5.2	Supply Supply support shall be in accordance with the provisioning requirements specified in the contract.	--	This requirement is of major importance to equipment performance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.3	Standardization The SELLER shall furnish and employ standard components/equipment to the maximum extent possible and include applicable Navy Component Identification (CID) numbers, where known, with proposal.	--	This requirement is of major importance to equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.1	Selection of Components/Equipment The order of precedence for selection of components/equipment is specified in accordance with Spec. No. G52101-2.	--	Changes to this requirement will not have a significant bearing on cost.	Do not tailor this requirement.
3.5.3.2	BUYER Specified Equipment The BUYER may specify to the SELLER certain types of manufacturers of equipments of the categories identified in the MIAPL prior to release for manufacture.	--	This requirement has minor impact on equipment design and has no significant cost impact.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.3.3	Standard Design Equipment Upon establishment of a single source for an equipment the SELLER shall purchase same as defined in 3.5.3.4 from the same source.	--	This requirement has major impact on system performance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.4	Identical Design The SELLER shall maintain identical component/equipment design for the total procurement under this contract.	--	This requirement has major impact on system performance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.5	Non-Standard Components The use of non-standard components/ equipments is prohibited without express written permission of the BUYER after receipt of written rationale.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.4	Facilities and Facility Requirements Facilities required to support the equipment shall be within present Navy capabilities.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.6 3.6.1 & 3.6.2	Personnel and Training Personnel and Training Personnel required to operate and maintain the plant will be composed of presently available Navy skills. Training requirements will be determined based on vendor RFP response and established during contract negotiations.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.
3.7 3.7.1	Major Component Characteristics Qualification Delivered pumps shall be qualified products in accordance with MIL-P-17639 and the quality assurance provisions in Section 4 of this specification.	MIL-P-17639	This requirement has a major impact on equipment acceptance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.8	Precedence In the event of conflict precedence shall be as follows: a. Spec. No. G52101-2 b. Documents specified herein	--	This requirement has no significant impact on cost.	Do not tailor this requirement.
4. 4.1 4.1.1	Quality Assurance Provisions Responsibility for Verification General The pump shall comply with the requirements of Section 3 of this specification and with MIL-P-17639, as modified herein.	MIL-P-17639	This is a general requirement of major importance. As stated this requirement does not cover quality assurance provisions. This paragraph is intended to provide general information about tests and inspections not covered elsewhere in section 4, such as location and conditions for testing, requirements for testing of critical items, etc.	Tailor this requirement to comply with the intent of MIL-STD-490.
4.1.1.1	Responsibility for Tests Except as otherwise specified, the SELLER is responsible for conduct of all tests specified herein. SELLER may submit data derived from prior testing of comparable equipment performed to the requirements of MIL-P-17639 and subject to the BUYERS approval.	MIL-P-17639	MIL-STD-490 permits the use of para. 4.1.2, titled "Special Tests and Examinations" covering testing routine, sequence of tests, number of items, required data, and a table correlating each equipment performance requirement, its tests, the type of unit, and specific references for each test.	Develop paragraph 4.1.2 with a tabular presentation of all tests and inspections required in section 4 correlated to the performance requirements of section 3.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2 4.2.1 4.2.1.1	Classification of Verification Quality Conformance Inspections Performance Tests Performance of each pump shall be verified by the tests of MIL-P-17639 as modified herein.	MIL-P-17639	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement.
4.2.1.1.1	Noise Tests Noise measurements shall be made in accordance with MIL-STD-740 except as modified herein. The pumps shall be mounted on six USN resilient mounts as specified by MIL-M-17508.	MIL-STD-740 MIL-M-17508	This requirement is of major importance to the equipment performance.	Tailor this requirement to: "Airborne and structureborne noise measurements shall be made in accordance with Section 5 of MIL-STD-740B except as modified in 4.2.1.1.1.1 and 4.2.1.1.1.2. The pump and motor shall be mounted on a common sub-base supported by six USN resilient mounts as specified in MIL-M-17508."
4.2.1.1.1.1	Airborne Noise Tests Airborne noise test measurements and room calibration shall be made in accordance with procedures of ANSI S1.2 and as specified in Spec. No. G52101-2.	ANSI S1.2	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Add: "Airborne noise limits are as specified in 3.2.1.1.1."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.1.1.2	Structureborne Noise Test Structureborne noise tests shall be conducted as specified herein.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Add: "Structureborne noise limits are as specified in 3.2.1.1.2."
4.2.2	Physical Characteristics Physical characteristics shall be verified by visual examination and measurement.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.2.3	Reliability Verification Verification of the reliability MTBF requirement of 3.2.3.1 shall be by Reliability Demonstration in accordance with one of the test plans of MIL-STD-781. Verification of the MTBF requirement shall be by analysis of operational data.	MIL-STD-781	This requirement is of major importance to the equipment performance. This requirement contains two conflicting statements. It states first that a reliability demonstration will be conducted to verify MTBF achievement, then it states that operational data will be used to verify MTBF achievement.	Determine how achievement of MTBF requirement will be demonstrated and so specify. If MIL-STD-781B is invoked, specify the exact test required.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.3.1	Maintainability Verification Verification of the maintainability requirement shall be accomplished by a Maintainability Demonstration in accordance with MIL-STD-471.	MIL-STD-471	This requirement is important to the assessment of equipment performance characteristics.	Specify the exact test method in MIL-STD-471A to be used.
4.2.4 4.2.4.1	Environmental Tests Temperature Temperatures shall be verified by test data during pump performance testing in accordance with MIL-P-17639.	MIL-P-17639	This requirement is of major importance to equipment performance and is considered flexible. On what basis are the data to be extrapolated to the temperature extremes? It appears that too many variables are involved to validly extrapolate test results at a given temperature to temperature extremes.	Either provide bases for extrapolation of test data at a given temperature to temperature extremes, or if this is not feasible and performance at the temperature extremes is considered critical, require additional testing at those extremes.
4.2.4.2	Ship Motion Verification of the requirements for ship motion in 3.2.5.2 shall be done by analysis and inspection of data.	--	This requirement is of major importance to equipment performance and is considered flexible. On what basis are the data to be extrapolated to extreme inclinations? It appears that too many variables are involved to extrapolate test results from normal orientation to extreme inclinations.	Provide basis for extrapolation of test data at normal orientation to extreme inclinations. If this is not feasible, require testing of pump and motor in accordance with 4.3.4.18.1 and 4.3.4.18.2 of MIL-M-17060E(SH).

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.4.3	Vibration Externally Generated The equipment shall have vibration requirements of 3.2.5.3 verified in accordance with MIL-STD-167, Type 1 and/or Appendix II of Spec. G52101-2	MIL-STD-167 Appendix II of Proc. Spec.	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.4.4	Vibration Self Excited Capability of the equipment to meet the balance requirements of 3.2.5.4 shall be demonstrated by testing in accordance with MIL-STD-167 Type II. Testing may be waived in accordance with Appendix II. However, all equipment units shall be balanced in accordance with MIL-STD-167.	MIL-STD-167 Appendix II of Proc. Spec.	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.4.5	Shock The equipment shall have the shock requirements of 3.2.5.5 verified by test or extension in accordance with MIL-S-901C and Appendices I and II of Spec. No. G52101-2.	MIL-S-901 Appendices I and II of Proc. Spec.	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.5	Material, Processes and Parts Verification of material, processes and parts requirements specified in 3.3.1 herein shall be by inspection of drawing and material certification.	--	This requirement is of major importance to equipment performance and is considered firm; however, as stated, this requirement is too general.	This requirement does not adequately present the quality assurance provisions needed to cover the full range of materials, processes, and parts presented in MIL-P-17639D and G50301-2. Specify the exact quality assurance provision required for each category of part, process, and material covered in these two specifications. Identify those instances and conditions in which a quality assurance provision is not required.
4.2.6	Electromagnetic Radiation Electromagnetic radiation requirements of 3.3.2 shall be verified by inspection.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.7	Nameplate and Product Marking Verify requirements of 3.3.3 herein by inspection.	--	This requirement is of minor importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.8	Workmanship Verify requirements of 3.3.4 herein by inspection.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.9	Interchangeability Verify requirements of 3.3.5 herein by inspection.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.10	Equipment and Personnel Safety Verification Equipment and personnel safety requirements of 3.3.6 shall be verified by inspection and tests by the SELLER. The tests may be conducted in conjunction with other tests.	--	This requirement is of major importance to equipment performance and is considered flexible.	Tailor this requirement to: "Compliance with the safety and human engineering criteria of 3.3.6 shall be verified by analysis of the equipment design and results of tests specified herein."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.12	Technical Manuals New technical manuals and revisions shall be validated and verified to assure conformance to the requirements of MIL-M-15071. Validation may be accomplished during manufacture, assembly installation or checkout.	MIL-M-15071	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.13 4.2.13.1	Logistics Overhaul Cycle Overhaul cycle requirements will be verified by analysis during the BUYER maintenance engineering analysis.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.13.2	Supply Adequacy of supply support, including on-board spares, will be evaluated by the BUYER in accordance with the provisioning requirements.	--	This requirement is intended to show that the equipment is capable of being maintained by the standard Navy supply system and that the Navy is officially informed of any unusual or special demands placed on the supply system by the equipment.	If the pump manufacturer is required to demonstrate that his equipment places no unusual or special demands on the Navy supply system, specify exactly how he is required to demonstrate this. If the pump manufacturer is not required to demonstrate this, delete this requirement entirely.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.13.3	Standardization Standardization requirements will be verified by analysis during the BUYER Maintenance engineering analysis.	--	This requirement is unclear. Is this a BUYER or SELLER responsibility? How will compliance with this requirement be documented?	Expand this requirement. Reword to state conformance with standardization will be verified by the BUYER (if this is true).
4.2.13.4	Facility and Facility Requirements Facilities and facility requirements will be verified by analysis during the BUYER maintenance engineering analysis.	--	See 4.2.13.3.	See 4.2.13.3.
4.2.14 4.2.14.1 4.2.14.2	Manning and Training Personnel requirements of 3.6.1 shall be verified by analyses during the BUYER Maintenance engineering analysis. The adequacy of all crew member training required, developed and conducted shall be verified by personnel performance demonstrations.	--	See 14.2.13.3	See 14.2.13.3

FIRE PUMP SPECIFICATION G52101-2

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5. 5.1	Preparation for Delivery Preservation, Packaging, Packing and Marking Preservation, packaging, packing, and marking shall be in accordance with MIL-P-17639, Level A.	MIL-P-17639	This requirement has no significant impact on cost.	Delete the reference to MIL-P-17639 and cite MIL-P-16789 directly.
5.2	The SELLER shall mark the outside of each crate container as follows: Noise Critical Equipment - Handle Carefully. Add to rail car if shipment is by rail: No Humping.	--	This requirement has no significant impact on cost.	Do not tailor this requirement.
6. 6.1	Notes Quantities Six class C-2 pumps are required per shipset.	--	This requirement is not subject to tailoring.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
2.	Responsibilities The SELLER shall be responsible for the engineering, production, delivery, hardware integration, test and technical support of the DDG-47, Fire Pumps as defined by this Work Statement and Procurement Specification G52101-2. SELLER shall supply the manpower, materials, facilities, and resources to complete tasks identified by Section 3 through 13 of this Work Statement. The vendor shall furnish the following data on SDRL EiW: a. Mounting dimensions b. Outline drawings c. Weight (wet or dry) d. Center of gravity e. Special mounting requirements f. All other pertinent data required to foundation/install the equipment.	MIL-D-1000A MIL-STD-100B USAS Y32.16 MIL-STD-275 MIL-S-901C	This requirement is of major importance to successful procurement of the equipment.	Do not tailor this requirement.
3. 3.1	Program Management Schedule and Status The SELLER shall maintain scheduling and status information for program control at the SELLER's facility. Monthly Progress Reports shall be submitted in accordance with SDRL MAD. Problem reports shall be furnished in accordance with SDRL MAG.	--	This requirement is important to the successful completion of the program and to Government-contractor--subcontractor interface and communications.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4. 4.1	Configuration Management Change Control If SELLER requests BUYER approval of an engineering change, SELLER shall describe the nature of the proposed change and the anticipated contractual impact to the BUYER in accordance with SDRL CAD.	MIL-STD-480	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.1.1	Deviation and Waivers The SELLER shall submit requests for deviations and waivers in accordance with SDRLs CAG and CAH.	MIL-STD-480	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
5	Quality Assurance The SELLER's Quality Assurance (QA) Program shall be in accordance with Quality Requirements Instructions (QRI), Form S-1253C-1-2-3.	QRI-Form S-1253C-1-2-3	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5.1	Inspection Milestone Notification For those inspection milestones which the BUYER has indicated an intention to witness, the SELLER shall notify the BUYER no less than ten days in advance of their occurrence, in accordance with SDRL PAY.	--	This requirement is important to Government-contractor communication and coordination. This requirement is considered firm.	Do not tailor this requirement.
5.2	Quality Conformance Records The SELLER shall maintain and submit quality conformance data in accordance with SDRL PAV.	MIL-STD-480 MIL-Q-9858A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
6. 6.1	Engineering General The SELLER shall provide engineering effort and support to meet the requirements of BUYER specification G52101-2 and the requirements of the Work Statement. There shall be no deviations from the requirements of the technical specification without the express written approval of the BUYER.	--	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.2	Detail Engineering The SELLER shall perform detailed engineering for manufacturer. Drawing List and Monthly Status Report - SDRL Item EAA. Engineering Drawings and Associated Lists - SDRL Item EBW. Data List - SDRL Item EHC Microfilming of Engineering Documents - DID EHB Weight Verification - SDRL EDH Welding, brazing and allied process procedures - SDRL PCD	MIL-D-1000A MIL-STD-100B USAS Y32.16 MIL-STD-275 MIL-S-901C MIL-M-9868 MIL-C-9877 MIL-M-38761 MIL-STD-804B G-C-116 MIL-M-38761/2 MIL-STD-12C Handbook H4-1 NAVSHIPS 0900-000-1000 MIL-STD-278 MIL-STD-454	This requirement is of critical importance to the control of equipment design and to modifications, maintenance, and overhaul during service life. This requirement is considered firm.	Do not tailor this requirement.
6.3	Technical Manuals The SELLER shall prepare, validate and submit technical manuals in accordance with the requirements of SDRL HAK.	MIL-M-15071G MIL-M-38784 MIL-M-7298B NAVSEC Rept. No. 6113B8-140-77 MIL-M-81203 MIL-P-38790 NAVEXOS P-35	This requirement is of major importance to equipment operation and maintenance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.4	Noise The SELLER shall conduct airborne structureborne noise tests and provide airborne/structureborne noise data in accordance with SDRLs SBU, TAQ and SCC (if not identical to DD-963/DD-993 Class Ship equipment).	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.5	Shelf Life Data The following shelf life data is required in accordance with SDRL PAV: ° Manufacturers Code ° Cure Data ° Lot Number ° Shelf Life Limitations ° Storage Condition Requirements These data are to be provided in accordance with SDRL PAV.	MIL-STD-408A MIL-Q-9858A	This requirement is important to Government storage and handling of material. This requirement has no impact on cost. There is no mention of the shelf life data listed in 6.2.1 in the SDRL or in block 10 of the DID. This is a firm requirement and should be specifically addressed.	Specify shelf life data as a deliverable in DID/SDRL PAV. Change the last sentence of this requirement to: "These data shall be included in the Quality performance reports in accordance with DID/SDRL PAV."
6.6	Shock Qualification The SELLER shall provide necessary supplies and services to schedule, evaluate and qualify the specified equipment for the shock test and extension requirements of MIL-S-901C as modified for the DDG-47 in the procurement specification and in accordance with the following SDRLs: SBN Shock Qualification Extension Report TAU Test Reports (Shock) TAQ Test Procedures (Shock)	MIL-S-901C Appendix I to Proc. Spec. MIL-STD-798(1)	This requirement is critical to the determination of equipment quality conformance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.7	Vibration The SELLER shall provide the necessary supplies and services to schedule, evaluate and qualify the specified equipment for the Type I and II vibration test requirements of MIL-STD-167B and in accordance with the following SDRLs: SCF Vibration Qualification Extension/Exemption Report SCD Vibration Test Reports TAQ Vibration Test Procedures	MIL-STD-167B MIL-S-16036	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.8	Release for Manufacture (RFM) For identical equipment previously provided by SELLER, RFM will be granted by BUYER after review of SELLER's technical proposal and/or SELLER's certified current Interface Control Drawings. RFM will be mutually agreed to in writing by BUYER and SELLER during final negotiations prior to award of a definitized contract. For new equipment and/or significantly modified equipment, RFM will be granted in writing by BUYER after contract award and upon successful completion of design reviews. All changes to documentation shall be submitted by Engineering Change Proposal.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
7. 7.1	Fabrication The SELLER shall provide the required material and services to fabricate equipment in support of this program. Deliverable Hardware The SELLER shall fabricate the equipment in the quantities and schedules specified in the contract.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
8. 8.1	Reliability/Maintainability R&M Analysis The SELLER shall perform analysis for R&M prediction and assessment. Submit report in accordance with DID RGA. Should the SELLER be unable to achieve the specified MTBF or MTTR, recommendations for corrective action or alternate designs required to achieve the specified MTBF or MTTR shall be documented and submitted in accordance with DID and SDRL RGB.	MIL-STD-785 Handbook-217B Handbook-472	This equipment is identical to or similar to equipment already in fleet service, and operational reliability data are available from service reports. There is no need to perform tasks to determine and verify inherent reliability.	Delete this requirement.
8.2	Failure Modes Effect Analysis The SELLER shall perform a failure modes effects analysis showing all failure modes of equipment, effects on the functional performance, possible causes and design features to minimize or eliminate effects. The analysis shall be submitted in accordance with DID RGF.	MIL-STD-1629 (Ships)	The equipment to be procured is identical to or similar to equipment already in the fleet. This is probably a duplication of previously procured documentation and existing I-M data.	Delete this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.3	Reliability Demonstration A Reliability Demonstration Plan shall be prepared by the SELLER and submitted in accordance with DID and SDRL RGP. The Reliability Demonstration Plan shall meet the requirements of MIL-STD-781B. A Reliability Demonstration Report shall be prepared and submitted in accordance with DID and SDRL RGT. This requirement shall be waived if prior testing has been documented and is acceptable to the BUYER.	MIL-STD-781B MIL-STD-847	This requirement is important to the determination of equipment operational reliability.	Delete Items d, e, and h of DID RGT.
8.4	Maintainability Demonstration A Maintainability Demonstration Plan shall be prepared by the SELLER and submitted in accordance with SDRL RGU. The plan shall meet the requirements of MIL-STD-471A. A Maintainability Demonstration Procedure shall be prepared and submitted in accordance with DID and SDRL RGW. A Maintainability Demonstration Report shall be prepared and submitted in accordance with SDRL RGX. This requirement shall be waived if prior testing has been documented and is acceptable to the BUYER.	MIL-STD-471A MIL-STD-847	This requirement is of major importance to the equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.5	Reliability and Maintainability Demonstration Criteria Demonstration tests shall be conducted to show achievement of quantitative R&M requirements specified herein. General procedures to be followed during R&M testing are as specified herein.	MIL-STD-781B	This requirement is important to the successful completion of the program. This requirement is considered flexible.	Do not tailor this requirement.
8.6	R&M Design Review R&M Design Review Agendas and Data Packages shall be prepared and submitted in accordance with DID and SDRL RGD. Design Review Reports shall be prepared and submitted in accordance with DID and SDRL RGE.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
8.7	Failure Reporting and Corrective Action Failure/Malfunction Reports shall be prepared and submitted in accordance with DID and SDRL RGK. When requested by the BUYER, failure analysis and corrective action recommendations will be furnished by the vendor on failures of equipment that occur during testing and demonstrations at the BUYER's facility and during the SELLER's warranty/guarantee period.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
9.	System Safety/Human Factors Engineering The SELLER shall ensure that System and Human Factors criteria applied to the DDG-47 Class Ship shall be to the level specified in Technical Specification G52101-2.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
9.1	Preliminary Hazard Analysis The SELLER shall prepare a Preliminary Hazard Analysis on this equipment in accordance with DID SGX.	MIL-STD-882A	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
9.2	Subsystem Hazard Analysis The SELLER shall prepare and submit a Subsystem Hazard Analysis on all Category I and II hazards identified in the Preliminary Hazard Analysis in accordance with SDRL SGS.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11	Integrated Logistic Support Integrated Logistic Support Requirements can be satisfied through compliance with (Statement of Prior Submission) SDRL VAH (Dated 29 September 1978).	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
11.1	Supply Support The SELLER shall develop inputs to provisioning Technical Documentation in accordance with SDRL VAC (Dated 29 September 1978). Attachments I, II, and III.	--	This requirement is important in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.
11.2	Standardization The SELLER shall implement a program for monitoring design selections to ensure the employment of standard components/equipments in accordance with the technical specificiation. Authorization for use of non-standard components/equipments is as specified herein.	--	This requirement is of major importance to the equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.3	Maintenance Access Envelope The SELLER shall provide the maintenance access envelope necessary to accomplish all maintenance, repair, and disassembly of the equipment. Data shall be submitted in accordance with SDRL VAM (Dated 27 October 1978).	--	This requirement is of major importance to equipment performance. The requirement is considered firm.	Do not tailor this requirement.
11.4	Special Tools and Test Equipment The SELLER shall provide a priced list of recommended special tools and test equipment, required for onboard support of the item, in accordance with SDRL VAI (Dated 29 September 1978).	--	This requirement is of major importance in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.
12 12.1	Test and Evaluation Production Testing The SELLER shall perform production tests on all items on deliverable equipment in accordance with Buyer Specification G52101-2. Production testing shall be scheduled and documented in accordance with SDRL TAG, test schedule.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
12.3	Test Procedure Test procedure shall be developed and submitted for all SELLER tests in accordance with SDRL Item TAQ.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
12.4	Test Reports The SELLER shall document all test results in accordance with SDRL TAU.	MIL-STD-798(1)	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
12.5	Qualification/Preproduction/ Verification Testing The SELLER shall submit test schedules in accordance with SDRL Item TAG.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

400 Hz POWER DISTRIBUTION SWITCHBOARDS PROCUREMENT SPECIFICATION G32403-2

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3. 3.1	Requirements Item Definition The switchboard shall be in accordance with the requirements of MIL-S-16036 and MIL-E-917; provide distribution of 400 Hz power, protection of distribution circuits, and monitoring of the static converters output voltage, frequency, watts and amperage.	MIL-S-16036 MIL-E-917	This is a general requirement. Conformance with this requirement is critical to the performance, quality, and testing of this equipment.	Identify the exact requirements of MIL-S-16036 and MIL-E-917 that apply to this equipment.
3.1.1	Item Diagrams One line drawing GS301026 shall be used in the design and construction of the 400 Hz power distribution switchboards.	- - - -	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
3.1.2	Interface Requirements The switchboard interfaces shall be as follows: a. Foundations: Design for deck mounting(3.2.2.4) and sway brace mounting (furnished by shipbuilder). b. Electrical 1. Output Monitoring: Externa interface at terminal boards (3.3.1.2.2). (Cont'd)	- - - -	Tailoring is not applicable to this requirement.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.1.2(Con'd)	Interface Requirements (Con'd) 2. Power distribution: Cable lugs, external interface at the circuit breakers.	- - - -	- - - -	- - - -
3.1.3	SELLER - Furnished Equipment The SELLER shall furnish complete switchboards, including circuit breakers, controls, auxiliary devices, motor operators, current time sensing devices, instrumentation and cable lugs.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.2 3.2.1 3.2.1.1	Characteristics Performance Rating Each switchboard shall be rated to accommodate two 250 kw 60/400 Hz static converters at 0.8 power factor, 450 volt and shall have a main bus rated at 1600 amperes.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1.2	Short Circuit Current The switchboards shall be designed to withstand a short circuit current of 10,000 AMPS, RMS asymmetrical.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.2.1.3	Converter Operation The switchboard shall provide the following converter output metering for each converter connected to the switchboard: Voltmeter: 430-470 volts Frequency Meter: 395-405 Hz Wattmeter: 350 kw full scale Ammeter: 600 AMP full scale	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.2.1.4 3.2.1.4.1	System Monitoring Ground Detection Each switchboard shall contain a ground detection circuit and indicator lights (clear), as shown in drawing GS301026, and provisions for remote ground detection monitoring at the EPCP.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1.4.2	Remote Alarms Each switchboard shall have provisions for the transmission to a remote location the following alarm, control and indication signals for each of two converters. a. EPCC Control (indication) b. Local Control (indication) c. Summary Temperature High (alarm) d. Shutdown (alarm) e. Converter Output Contactor Close/Open (indication and control) f. 400 Hz Power Available (indication) g. 60 Hz Power Available (indication) h. Converter Input Contactor Close/Trip (indication and control)	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.2.1.4.3	Current Time Sensing and Signalling Devices (CTS) CTS devices shall have the capabilities required herein and shall meet all requirements of MIL-S-24561 (SH)	MIL-S-24561 (SH)	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2 3.2.2.1	Physical Characteristics Weight The weight of the switchboards shall not exceed (TBD) pounds each.	- - - -	Noncompliance with the weight requirement may affect the weight and moment distribution of the ship. This requirement is considered firm. When making the final determination of this requirement, the BUYER should ensure that the requirement does not restrict competition.	Do not tailor this requirement.
3.2.2.2	Dimensions The overall dimensions of the switchboards shall be kept to a minimum and shall be as near to the standard dimensions required by MIL-S-16036 as possible.	MIL-S-16036	Within a certain tolerance, noncompliance with dimension requirements will have little impact on the capability of the equipment to perform effectively. There appears to be no cost advantage to tailoring this requirement; however, the BUYER should ensure that this requirement does not restrict competition.	Do not tailor this requirement.
3.2.2.3	Clearance Access to the switchboards shall be from the front. Side access is permitted if required for maintenance. The following clearances will be provided: a. 36 inches from the front to switchboard guardrails to any fixed object. (Continued)	- - - -	The intent of this requirement is not clear. It could be stating that the BUYER will guarantee the SELLER a certain envelope in which the equipment must be capable of being operated and maintained. On the other hand, it could be stating that the SELLER is to design the equipment so that it does not interfere with passageways or other nearby equipment. Combining the clearance requirement (a. through d.) with access	Clarify the intent of this requirement. Separate the required equipment capabilities from the environmental conditions.

(Continued)

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2.3 (Cont'd)	Clearance (Cont'd) b. 24 inches from one end of the switchboards to any fixed object and from the other end 6 inches to any fixed object. c. 24 inches from the rear of the switchboards to any fixed object. d. 6 inches between adjacent switchboard sections.	- - - -	for maintenance requirement (first paragraph, unlettered) makes it even less clear. If a. through d. represent the design envelope permitted by the BUYER, it should not be stated under paragraph 3.2.2 Physical Characteristics, but rather under 3.2.5 Environmental Conditions, and it should be required under paragraph 3.4 Logistics that the equipment should be capable of being maintained within the clearance available within the design envelope.	--
3.2.2.4	Enclosures Each switchboard shall consist of a single switchgear section. The section shall be constructed within a framework to be a free-standing, deck mounted structure. The degree of enclosure shall be drip-proof (45 degrees) as defined in MIL-STD-108.	MIL-STD-108	This is a general requirement of major importance.	Do not tailor this requirement.
3.2.2.4.1	Framework Fabrication The switchboard framework shall be fabricated from angles, channels, or other structural shapes or from formed members. Each edge shall be formed by a length of a structual shape, a formed member, or formed member welded to effect a continuous length. Intermediate vertical supporting members shall be installed to provide additional	--	Does it really matter how the SELLER constructs the equipment? Could these detailed fabrication requirements be converted to functional requirements (load-bearing capability, stiffness, etc.) so that the SELLER would have maximum design flexibility? Also, it is usually better to state a requirement in functional terms because the intent of requirement is more obvious. It is possible that SELLER could	Translate this into a set of functional requirements stated in terms of equipment capabilities.

(Continued)

(Continued)

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2.4.1 (Cont'd)	Framework Fabrication (Cont'd) support when required. Gusset plates shall be welded at the corners of the units in both lengthwise and lateral vertical planes such that each corner shall have a strength not less than the bending strength of the weakest adjoining vertical or horizontal member. Diagonal braces or sheets shall be used for stiffening of units. The framework shall be fabricated by welding except where members must be removed to provide access or component replaceability.	----	fabricate the equipment according to this requirement and still fail to achieve the desired equipment functional capability.	----
3.2.2.4.2	Side and Rear Sheets The sides and back of each switchboard shall be enclosed by solid sheets at least 1/16 inch thick, welded to the switchboard framework, except when the arrangement within the switchboard is such as to require access for maintenance from the sides, in which case the side sheets shall be removable. (Continued)	- - - -	The comment in paragraph 3.2.2.4.1 also applies here. Does it really matter how thick the sheets are? It is more important that they are capable of bearing the loads generated by personnel leaning on them or placing tools and test equipment on them. They should be of a material and finish that is resistant to fire salts, etc. Does it really matter if the side and rear sheets are welded? (Cont'd)	Translate this into a set of functional requirements stated in terms of equipment capabilities.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2.4.2 (Cont'd)	Side and Rear Sheets (Cont'd) Removable side and rear sheets shall be nonstructural members and the test required shall be made with such sheets removed. Non-removable side sheets shall be welded by intermittent or spot welds to all vertical and horizontal frame members. Gusset plates in the plane of the sheet may be omitted, provided the sheet is welded to the frame at the corners with the same length of welding that would be normally employed with a gusset plate. When gusset plates are omitted, plug welding of the side sheets at the top corners of the frame only is permitted. Removable rear and side sheet will be acceptable.	----	Requirements that are this detailed tend to reduce design innovation and competition	----
3.2.2.4.3	Front Panels The front of switchboards shall be enclosed by a hinged or removable panel. The front panel shall be of two or more sections; one hinged section to cover the converter control assembly only and one or more additional removable sections to cover the circuit breakers. Front panel sections shall be less than 60 inches in height. (Continued)	MIL-C-17361	The comment in paragraph 3.2.2.4.1 also applies here. If the front panels can be just less than 60 inches high and if they are hinged (top or bottom), will the equipment be accessible with the clearance requirement stated in paragraph 3.2.2.3a.?	Translate this into a set of functional requirements stated in terms of equipment capabilities.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2.4.3 (Cont'd)	Front Panels(Cont'd) Front panels shall be formed with bent angle or channel edges. Cutouts for circuit breaker handles and escutcheons shall be in accordance with MIL-C-17361. When the strength of the panel is materially weakened by cutouts, it shall be reinforced by suitable stiffening members.	----	----	----
3.2.2.4.3.1	Circuit Breaker Types and Quantities The number and type of circuit breakers on the front panels of the switchboards shall be as shown on Drawing GS301026. Bus-tie circuit breakers shall be AQB-A800 with 115 volt AC motor operated mechanism.	Drawing GS 301026	This is a general requirement of major importance.	Do not tailor this requirement.
3.2.2.4.4	Top Enclosure Switchboard top enclosures shall be in accordance with Paragraph 3.20.2 of MIL-S-16036.	MIL-S-16036	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2.4.5	Ventilation The switchboards shall be provided with ventilation for cooling of equipment. Ventilation shall be in accordance with Paragraph 3.8.9 of MIL-S-16036.	MIL-S-16036	This is a general requirement of major importance.	Do not tailor this requirement.
3.2.2.4.6	Cable Entrance Cables shall enter the switchboards through the bottom. The switchboard's design and arrangement shall provide for cable termination without restriction of access features.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.2.2.4.7	Switchboard Mounting The switchboards shall be designed for deck mounting. The requirements of Paragraph 3.8.6 of MIL-S-16036 for bolting of special switchgear sections to foundations shall apply.	MIL-S-16036	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2.4.8	Protective Coating Painting of the switchboards shall be in accordance with the applicable requirements of Paragraph 3.22 of MIL-S-16036.	MIL-S-16036	This requirement does not have a significant cost impact.	Do not tailor this requirement.
3.2.2.4.9	Guard Rails Each switchboard shall be provided with guard rails in accordance with Paragraph 3.21.1 of MIL-S-16036.	MIL-S-16036	This requirement does not have a significant cost impact.	Do not tailor this requirement.
3.2.2.5	Control, Monitoring and Indication Components Meters, switches, relays, indicators and other equipment shall be installed to the switchboards as necessary to fulfill the intent of Paragraphs 3.2.1.3 and 3.2.1.4 herein. Paragraphs 3.16, 3.17, 3.18 and 3.19 of MIL-S-16036 for control, indication and monitoring equipment shall be followed in the (Continued)	----	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.2.5 (Cont'd)	Control, Monitoring and Indication Components (Cont'd) design, construction and selection of components of the converter control assembly of the switchboards. The information display components listed in 3.2.1.3 and 3.2.1.4 shall be physically located above the controls that require manual operation.	MIL-S-16036	----	----
3.2.2.6	Lifting Provisions The switchboards shall be fitted with suitable lifting means to allow installation and removal. The provisions shall be suitable for rigging in all lifting attitudes. Attachment points for lifting fixtures shall be capable of withstanding weights and torsion forces that may be applied during the lifting process. Attached components shall be fitted with suitable attachment points for listing when weight of the components precludes manual handling.	----	This requirement is of major importance for equipment installation and removal. This is a firm requirement. This requirement does not have a significant impact on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.3	Reliability Requirements The equipment shall achieve a Mean-Time-Between-Failure (MTBF) of 15,000 hours or more when maintained in accordance with recommended maintenance schedules.	----	This is a general requirement of major importance. Failure to meet this requirement will result in increased labor and material costs and may adversely affect the ship mission.	Do not tailor this requirement.
3.2.4	Maintainability Requirements The equipment shall achieve a Mean-Time-To-Repair (MTTR) requirement of 2.0 hours or less.	----	This is a general requirement of major importance.	Do not tailor this requirement.
3.2.5 3.2.5.1	Environmental Conditions Temperature The switchboards shall be designed for satisfactory operation at any ambient air temperature to a maximum of 50 deg C.	----	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.2	Humidity The switchboards shall operate satisfactorily when subjected to a relative humidity of 0 to 95 percent.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.2.5.3	Vibration - Externally Generated The equipment shall be capable of withstanding the environmental vibration requirements of MIL-STD-167B, Type I, from 4 to 15 Hz.	- - - -	This requirement is critical to the equipment performance. It is considered firm.	Do not tailor this requirement.
3.2.5.4	Vibration - Self-Excited This paragraph is not applicable to this specification.	- - - -	- - - -	- - - -

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.5	Shock The equipment shall meet shock Grade A requirements of MIL-S-901C in accordance with Appendix I and II contained herein for Type A, Class I, hull mounted medium weight equipment. During test, equipment shall be energized and loaded (not to exceed 100 kw).	MIL-S-901C	This is a general requirement of major importance. It is considered firm.	Do not tailor this requirement.
3.3 3.3.1	Design and Construction Materials The switchboard structure shall be aluminum in accordance with the requirements of Paragraph 3.8.11 of MIL-S-16036.	MIL-S-16036	This is a general requirement of major importance to the performance, quality, and testing of this equipment.	Do not tailor this requirement.
3.3.1.1	Bus Bars and Terminations Aluminum bus bars shall be provided. The switchboard requirements for bus bars and terminations shall be as specified in Paragraph 3.13 of MIL-S-16036.	MIL-S-16036	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.1.1.1	Bus Bar Stresses As a minimum, the bus work assembly shall be designed to withstand the stresses resulting from a fault current of 10,000 amperes rms asymmetrical: Conditions of high impact shock which may be encountered aboard the ship shall not mechanically damage the bus work or reduce the bus clearance below minimum requirements.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.3.1.2 3.3.1.2.1	Cable Terminations Cable Connector Types Cable lugs for all cables entering or within the switchboard shall be of the solderless type, in accordance with MIL-E-16366.	MIL-E-16366	This requirement does not have any cost impact.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.1.2.2	External Control Cable Terminations External control cables shall terminate at terminal boards accessibly located near the bottom of the switchboard, corresponding to ship's cable entrance. Provisions shall be made for not less than 10 percent spare terminals on the board. The length of terminal boards shall not exceed 12 terminal points.	- - - -	This requirement has no significant cost impact.	Do not tailor this requirement.
3.3.1.3	Insulation Distances Clearance and creepage distances shall conform to the requirements of MIL-S-16036.	MIL-S-16036	This requirement has no significant cost impact.	Do not tailor this requirement.
3.3.1.4	Phase Rotation When facing the front of a section, the phase rotation shall be A,B,C, respectively, from right to left, top to bottom or front to back.	- - - -	This requirement has no significant cost impact.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.1.5	Circuit Breakers Circuit breakers shall conform to MIL-C-17361 and shall be 500 volt, 400 Hertz, 3-phase NQB or AQB unfused types. Circuit breakers shall be of the removable types, with connections being made by use of mounting blocks in accordance with MIL-C-17361.	MIL-C-17361	This requirement is important to equipment performance and maintenance and is considered firm.	Do not tailor this requirement.
3.3.1.5.1	Future Circuit Requirements Spaces for the future installation of circuit breakers shall be blanked off, with busing and mounting blocks installed.	- - - -	This requirement has no cost impact.	Do not tailor this requirement.
3.3.2	MIL-C-17361C (Ships) Modifications MIL-C-17361 shall be modified as shown in Table I.	MIL-C-17361	This requirement is important to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.3	Identification and Marking Identification plates shall be provided at or near the top of the front enclosure of each switchgear section.	- - - -	This requirement is of minor significance to the equipment performance; however, there appears to be little or no potential for cost savings.	Do not tailor this requirement.
3.3.3.1	Torque: Bus bars and circuit breaker connections will be torque sealed or stamped (permanent mark) after torquing and shall be to the values shown herein.	- - - -	This requirement is of minor significance to the equipment performance; however, there appears to be little or no potential for cost savings.	Do not tailor this requirement.
3.3.4	Workmanship The equipment, including all parts and accessories shall be fabricated, assembled and installed, using workmanship practices that ensure: a. Welding is in conformance with the workmanship standards of MIL-STD-278, Section 7. (Continued)	MIL-STD-278 MIL-STD-454	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.4 (cont'd)	b. Machined surfaces have sharp edges broken or chamfered. c. All exposed ferrous surfaces are primed and painted. d. Electrical/electronic workmanship is in accordance with Section 9 of MIL-STD-454.	- - - -	- - - -	- - - -
3.3.5	Interchangeability All identically identified components shall be functionally and physically interchangeable without degradation of performance, reliability, or operating characteristics; and without selective assembly or modification except calibration and adjustment. Repair parts shall be interchangeable with, and identified identically with, the parts they replace.	- - - -	This requirement is of major importance to the equipment maintenance. Changes to this requirement could result in degraded performance and excessive values of MTTR; therefore, this requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.6	System Safety/Human Factors System safety/human factors criteria and considerations of MIL-STD-882A Paragraph 5.4.1, MIL-STD-1472B, Paragraphs 4.2 and 4.4 and MIL-STD-454, Requirement 1 shall be considered, and incorporated when applicable, in the design or modification of this equipment. The order of precedence for incorporation of safety features shall be as specified in MIL-STD-882A, Paragraph 5.4.2.	MIL-STD-882A MIL-STD-1472B MIL-STD-454	This is a general requirement of major importance. Changes to this requirement would degrade equipment performance; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.4 3.4.1 3.4.1.1	Logistics Maintenance Scheduled (Preventive) Maintenance The equipment shall be designed so that it does not require scheduled maintenance more frequently than once per week. The average elapsed time per week for scheduled maintenance shall not exceed 30 minutes.		Under the general heading of "Logistics" there should be a statement to the effect that the equipment should be capable of being operated and maintained with existing Navy capabilities, including facilities, personnel and training, supply, etc.	Expand this paragraph to include all pertinent logistic requirements. The following existing Navy capabilities should be considered: support and test equipment, provisioning, transportation and handling, facilities, personnel skill levels.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.4.1.2	Unscheduled (Corrective) Maintenance The equipment shall be designed so that unscheduled maintenance shall meet as a minimum those values established by the reliability requirements of this specification.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.4.1.3	Overhaul Cycle This paragraph is not applicable to this specification.	- - - -	- - - -	- - - -
3.4.1.4	Service and Access The equipment/component shall be designed to provide accessibility to perform fault detection, preventive and corrective maintenance.	- - - -	This is a general requirement of major importance. The time required for gaining access and fault isolation is included in the MTTR value.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.4.2	Supply Supply support shall be in accordance with the provisioning requirements specified in the statement of work.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.4.3	Standardization It is the BUYER's intention to procure Navy standard equipment/components. The SELLER shall include applicable Navy Component Identification (CID) numbers, where known, for the applicable equipment with proposal. The SELLER shall furnish and employ standard components/equipments to the maximum extent possible.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.4.3.1	Selection of Components/Equipment The order of precedence for selection of components/equipments is as follows: a. Provided previously on DD-963, DD-993 or LHA to Ingalls b. NAVSUP Standard Component List (SCL) c. NAVSUP Master Index of Allowance Parts List (MIAPL) (Continued)	- - - -	Changes to this requirement will not have a significant bearing on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.4.3.1 (continued)	d. Nonstandard components/ equipments that have the highest percentage of National Stock Numbered parts.	- - - -	- - - -	- - - -
3.4.3.2	BUYER-Recommended Equipment The BUYER may recommend to the SELLER certain types of manufacturers of components/equipments of the categories identified in the MIAPL prior to release for manufacture.	- - - -	This requirement has minor impact on equipment design and has no significant cost impact.	Do not tailor this requirement.
3.4.3.3	Identical Design The SELLER shall maintain identical component/equipment design for the total procurement under this contract. For the requirements of standardization "identical component/equipment" is defined as those items that have the same CID Number or Manufacturer Part Number.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.4.3.4	Nonstandard Components The use of nonstandard components/ equipments is discouraged. Authorization for the use of nonstandard components/equipments may be granted by the BUYER only after the receipt of written rationale for each particular case. Nonstandard components are defined in the Statement of Work.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
3.5	Qualification Switchboards delivered in compliance with this specification shall contain qualified products in accordance with paragraph 3.29 of MIL-S-16036. In addition, the switchboard shall meet the requirements of Section 3 and shall be qualified in accordance with the quality assurance provisions of Section 4 of this specification.	MIL-S-16036	This requirement is considered firm.	Do not tailor this requirement.
3.6	Precedence In the event of conflict, the order of precedence shall be as follows: a. This specification b. MIL-S-16036 c. The documents referenced herein	MIL-S-16036	This requirement has no significant cost impact.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4. 4.1	Quality Assurance Provisions Responsibility for Inspection Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein.	- - - -	This requirement is considered firm.	Do not tailor this requirement.
4.2	Classification of Tests The quality assurance requirements specified herein are classified as follows: a. Qualification b. Production	- - - -	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
4.3	Qualification Qualification tests and inspections shall be performed on one switchboard in accordance with a BUYER-approved qualification test plan to verify that the equipment meets all requirements of Section 3 herein. The SELLER may request application approval of data derived from prior testing, of comparable equipment, performed to the requirements (Continued)	MIL-S-16036	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.3 (continued)	of MIL-S-16036. Table I identifies tests for qualification of Section 3 requirements.	- - - -	- - - -	- - - -
4.4	Production Verification Production testing and inspection shall be performed on each switchboard in accordance with the BUYER-approved production test plan to verify that the switchboards are in accordance with Section 3 herein. Table I identifies tests for production verification of Section 3 requirements.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
4.5 4.5.1	Tests, Inspections, and Analyses Vibration-Externally Generated The equipment shall have the vibration requirements of 3.2.5.3 verified by test, extension or exemption in accordance with the procedures of MIL-STD-167B, Type I, and/or Appendix II contained herein.	MIL-STD-167B	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.5.1.1	Vibration Test Units The vibration test shall be conducted on switchboards selected in accordance with the criteria specified in Paragraph 4.3.2 of MIL-S-16036. The SELLER shall provide vibration exemption data in accordance with SDRL SCF for qualification of untested switchboards.	MIL-S-16036	This is a general requirement of major importance.	Do not tailor this requirement.
4.5.2	Shock The equipment shall have the requirements of 3.2.5.5 verified by test or extension, in accordance with the procedures of MIL-S-901C and Appendices I and II, contained herein.	MIL-S-901C	This is a general requirement of major importance.	Do not tailor this requirement.
4.5.3	MIL-C-17361 Circuit Breaker Shock Test Individual circuit breaker shock tests shall be performed and reported as specified in MIL-C-17361 as modified herein.	MIL-C-17361	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.5.4	Electromagnetic Compatibility Tests This paragraph is not applicable to this specification.	- - - -	- - - -	- - - -
4.5.5	General Inspection The equipment shall be given such tests and inspection as will verify and assure conformance with this specification. All materials and components, both electrical and structural, shall be examined and tested in accordance with the applicable specifications either at the various sources or at the place of assembly.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
4.5.6	Examination and Tests of Assembly Switchboards shall be completely assembled and shall be examined to insure compliance with this specification, using for guidance the classification of defects contained in Table VI of MIL-S-16036.	MIL-S-16036	This is a general requirement of major importance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.5.7	Analytical Verification When acceptance or rejection is determined by the analysis of developed data, the developed data with supporting analysis shall be submitted for review in accordance with the contract. Requirements that may be verified by analysis are identified in Table II.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
4.5.7.1	Equipment and Personnel Safety Verification Inspection and tests of the equipment shall be performed by the SELLER to determine that the equipment and personnel safety requirements of Paragraph 3.3.6 have been satisfied. The tests may be conducted in conjunction with other tests.	- - - -	This is a general requirement of major importance.	Do not tailor this requirement.
4.6	Inspection of Preparation for Delivery The packaging, packing, and marking shall be inspected for compliance with Section 5 of this document.	- - - -	This requirement has no significant impact on cost.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.7	Reliability and Maintainability Verification Verification of R & M requirements specified in Paragraphs 3.2.3 and 3.2.4 shall be by analysis required by the statement of work.	- - - -	This requirement is of major importance to equipment performance and quality assurance provisions.	State the detailed requirements for assuring R&M equipment performance in this paragraph.
5. 5.1	Preparation for Delivery Preservation and Packaging The switchboards shall be preserved and packaged in accordance with Level C/Level C of MIL-E-17555, except if the vendor elects to use his corporate trucking capability for delivery to the shipyard, packaging/packing may be in accordance with good commercial practice.	MIL-E-17555	This requirement has no significant cost impact.	Do not tailor this requirement.
- - - -	- - - -	- - - -	- - - -	- - - -

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3 3.1	Program Management Schedule and Status The SELLER shall maintain scheduling and status information for program control at the SELLER's facility. Monthly reports shall be furnished in accordance with SDRL MAO, and problem reports shall be furnished in accordance with SDRL MAG.	- - - -	This requirement is important to the successful completion of the program and to Government-contractor-subcontractor interface and communications.	Do not tailor this requirement.
4	Configuration Management The SELLER shall monitor the identification of engineering drawings, specifications, change documents and related documentation to ensure that the documents are in accordance with the contract requirements and are adequate for their intended use.		This task is unclear because drawings and specifications are not identified. Configuration management consists of four elements 1. Identification of systems/equipment via technical documentation such as drawings and specifications. 2. Control of the changes to all documentation which identifies the system/equipment. 3. Accounting of all changes to documentation to provide a record of the system/equipment design and development history. 4. Reviews and Audits to ensure that the system/equipment supplied matches the technical documentation.	Reword this task description so that the instructions to the SELLER are explicit. State those elements and subelements of configuration management for which the SELLER is tasked.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.1	Release Records The SELLER shall maintain an engineering documentation release system with adequate records to support the configuration management requirements.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.2	Identification Plate Top assembly drawings shall contain the requirement for and define the installation of the Identification Plate.	- - - -	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
4.3	Change Control If SELLER requests BUYER approval of an engineering change, SELLER shall describe the nature of the proposed change and the anticipated contractual impact to the BUYER in accordance with SDRL CAD. The SELLER shall submit requests for deviations and waivers in accordance with SDRLs CAG and CAH.	MIL-STD-480A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.4	SELLER Supplier Configuration Management The SELLER shall maintain configuration management of the manufacture of the subtier supplied items to the extent necessary to comply with the requirements of this contract.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.5	Configuration Audits The SELLER shall provide support for, and participate in, configuration audits conducted by the BUYER on the SELLER's products. The audits shall be scheduled as mutually agreed upon by the BUYER and SELLER and conducted at the SELLER's facility. The SELLER shall provide the personal and documentation required for each audit in accordance with SDRL Item CAM.	- - - -	Tailoring is not applicable to this requirement.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.5.1	Functional Configuration Audit (FCA) The FCA will be performed to validate satisfactory development of a configuration element (CE) or component.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.5.2	Physical configuration Audit (PCA) The PCA (which may be run concurrent with the FCA) will be the means of verifying the product configuration identification used for the production and acceptance of a CE. This audit will assure, via examination of the hardware and/or the documentation that: a. The "as-built" configuration of a CE or component matches the product configuration documentation (or that differences are reconciled); and b. The acceptance testing requirements prescribed by the documentation are adequate for acceptance of the production CE's by the BUYER's quality assurance activities.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5	Quality Assurance The SELLER's Quality Assurance (QA) Program shall be in accordance with Quality Requirements Instructions (QRI), Form S-1253C-1-2-3.	QRI-Form S-1253C-1-2-3	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
5.1	Quality Conformance Records Quality conformance data shall be maintained and submitted as specified by SDRLs PAV and PAY.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
5.2	Welding, Brazing, and Allied Process Procedures Data and procedures shall be submitted in accordance with SDRL Item PCD.	- - - -	This requirement is important to the performance, quality, and testing of the equipment.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6	Engineering The SELLER shall provide engineering effort and support to meet the requirement of BUYER Specification G32403-2 and the requirements of this Work Statement.	- - - -	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
6.1	Detail Engineering The SELLER shall perform detailed engineering for manufacture. The engineering data, including schematics and interface definition shall be documented with schedules, drawings, and specification and a data list in accordance with SDRL: EAA, EBW, EHC, and EBD.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
6.2	Shock Qualification The SELLER shall provide necessary supplies and services to schedule, evaluate and qualify the specified equipment for the shock test and extension requirements of MIL-S-901C as modified and in accordance with SDRLs: SBN, TAQ, TAU and TBD.	MIL-S-901C	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.3	Vibration The SELLER shall provide the necessary supplies and services to schedule, evaluate and qualify the specified equipment for the Type I vibration test requirements of MIL-STD-167B, and in accordance with SDRLs SCD, SCF and TAQ.	MIL-STD-167B	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
6.4	Release for Manufacture For common equipment (equipment identical to other U.S. Navy equipment previously provided by SELLER), release for manufacture will be granted by BUYER after review of SELLER's Technical Proposal and/or review of SELLER's certified current Interface Control Drawings. For new equipment and/or modified equipment, release for manufacture will be granted in writing by BUYER after contract award and upon successful completion of design review, which includes review of Interface Control Drawings.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.5	Technical Manuals The SELLER shall develop and deliver technical manuals in accordance with SDRL HAK.	MIL-M-15071G MIL-M-38784 MIL-M-7298B NAVSEC Rept. No. 6113B8-140-77 MIL-M-81203 MIL-P-38790 NAVEXOS P-35	This requirement is of major importance to equipment operation and maintenance. This requirement is considered firm.	Do not tailor this requirement.
7	Fabrication The SELLER shall provide the required material and services to fabricate the hardware in support of this program.	- - - -	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
7.1	Deliverable Hardware Upon completion of a release for manufacturing design review approved by the BUYER, the SELLER shall fabricate the equipment in the quantities and schedules specified in the contract. Each article shall undergo production tests as defined in Section 12. Packing lists and parts list shall be submitted in accordance with SDRL PCB.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
7.2	Factory Tooling and Support Equipment The SELLER shall be responsible for providing all necessary tooling, transportation, handling, and test support equipment.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
7.3	Production Deliveries SELLER shall deliver production units Free on Board (FOB) destination in accordance with the delivery schedule in the contract. However, the BUYER reserves the right to postpone delivery up to 90 days at no cost or penalty. BUYER will instruct SELLER, giving a minimum of 30 days notice, of actual required in-yard delivery dates.	- - - -	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
8	Reliability and Maintainability Analysis The SELLER shall perform analysis for Reliability/Maintainability Prediction/Assessment including block diagrams, failure rates and data source and shall submit in accordance with SDRL RGA. Should the SELLER be unable to achieve the Mean-Time-Between-Failure (MTBF) or Mean-Time-To-Repair (MTTR) specified in the (Continued)	MIL-STD-785 HDBK-217B HDBK-472	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8 (Cont.d)	Reliability and Maintainability Analysis (Cont'd) technical specifications, recommendations for corrective action or alternate designs required to achieve the specified MTBF and MTTR shall be documented and submitted in accordance with SDRL RGB.	- -	- - - -	- - - -
8.1	Failure Modes Effect Analysis The SELLER shall perform a Failure Modes Effect Analysis showing all failure modes of equipment, effects on the functional performance, possible causes and design features to minimize or eliminate effects. The Analysis shall be submitted in accordance with SDRL RGF.	MIL-STD-1629 MIL-STD-847	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
8.2	R & M Design Review Formal R & M design reviews shall be conducted by the SELLER at planned design, construction and testing checkpoints. Design Review Reports shall be prepared by the SELLER and submitted in accordance with SDRL RGE.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.3	Failure Reporting and Corrective Action The SELLER shall notify the BUYER of equipment failures/malfunctions that occur during vendor production/ qualification and demonstration testing. Failure/malfunction reports shall be prepared and submitted in accordance with SDRL RGK.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
9	Human Factors Engineering This section is not applicable to this specification.	- - - -	- - - -	- - - -
10	System/Safety/Human Factors The SELLER shall ensure that System Safety and Human Factors criteria applied shall be to the level specified in Technical Specification G32401-2.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
10.1	Preliminary Hazard Analysis The SELLER will prepare a Preliminary Hazard Analysis and submit in accordance with SDRL SGX or certify previously submitted data in accordance with SDRL CRT.	MIL-STD-882A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
10.2	Subsystem Hazard Analysis The SELLER shall prepare and submit in accordance with SDRL SGS a Subsystem Hazard Analysis on all Category I and II hazards identified by the Preliminary Hazard Analysis.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
11	Integrated Logistics Support Integrated Logistics Support requirements for this item can be satisfied through compliance with (Statement of Prior Submission) SDRL VAH.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.1	Supply Support In the event that a Statement of Prior Submission cannot be furnished, the SELLER shall develop inputs to provisioning technical documentation established in SDRL VAC.	- - - -	This requirement is important for proper support of the equipment and is considered firm.	Do not tailor this requirement.
11.2	Standardization The SELLER shall implement a program for monitoring design selections to ensure the employment of standard components/equipments in accordance with the technical specification.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
11.3	Special Tools and Test Equipment The SELLER shall provide a priced list of recommended special tools and test equipment required for support of the end item in accordance with SDRL VAI.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.4	Maintenance Access Envelope The SELLER shall provide the maintenance access envelope necessary to accomplish all maintenance, repair, and disassembly of the equipment. Submit data in accordance with SDRL VAH.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
12	Test and Evaluation The SELLER shall provide the materials, services, and facilities required to plan and accomplish the approved test program designed to verify the requirements of the technical specification. The Test and Evaluation Program shall include test planning, test scheduling, conduct of test and preparation of test documentation to fully support the test effort.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
12.1	Qualification Testing The SELLER shall conduct qualification testing according to the BUYER Specification G32403-2.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
12.1.1	Qualification Test Procedures Test procedures shall be developed and submitted in accordance with SDRL TAQ. All test procedures shall be identified in a Test Schedule developed in accordance with SDRL TAG.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
12.1.2	Performance of Qualification Testing The SELLER shall perform and successfully complete, at his facility (or at an independent testing agency approved by the BUYER), all Qualification Testing in accordance with the approved Test Procedures. All tests shall be scheduled and the schedule documented in accordance with SDRL TAG.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
12.1.3	Qualification Test Reports The SELLER shall document test results in a test report prepared in accordance with SDRL TAU. Each test identified in the BUYER Specification G32403-2 shall be subjected to test report documentation or BUYER approved extension by analysis.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
12.2	Production Testing The SELLER shall perform production tests on all items of deliverable equipment in accordance with BUYER Specification G32403-2. All production testing shall be reported in accordance with SDRL TAU. Testing shall be scheduled in accordance with SDRL TAG.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
12.2.1	Test Procedures SELLER's production testing will be accomplished in accordance with BUYER approved test procedures in accordance with SDRL TAQ.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
12.2.2	Production Test Reports The SELLER shall document all production test results in test reports in accordance with SDRL TAU.	- - - -	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
13. 13.1	Data Management Information Source A single source shall be designated by the SELLER for the exchange of information. The SELLER shall keep the BUYER Subcontract Office currently informed of the name, title, mailing address, and telephone number of the information source.	--	This requirement is important to engineering and management information distribution.	Do not tailor this requirement.
13.2	SDRL Data Submission The SELLER shall submit data to BUYER in accordance with the requirements of the applicable SDRL (See Attachments A and B to this Work Statement).	--	This requirement is important to engineering and management information distribution.	Do not tailor this requirement.
13.3	Data Identification Marking If identification marking is not otherwise specified by the applicable DID, data items shall be clearly marked with the following: Subcontractor Name Equipment Name Subcontract Number SDRL Number Data Title Data Date Preliminary (if applicable)	--	This requirement is important to engineering and management information distribution.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3. 3.1	Requirements Item Definition The pump furnished under this specification shall be of the horizontal single-stage, single-suction, close-coupled, centrifugal configuration in accordance with MIL-P-17840, with modifications, additions, and deletions specified herein.	MIL-P-17840	This is a general requirement. Conformance with this requirement is critical to the performance, quality, and testing of this equipment.	Do not tailor this requirement.
3.1.1 & 3.1.2	SELLER & BUYER Furnished Equipment Equipment shall be furnished by the SELLER in accordance with this specification. Equipment shall be furnished by the BUYER in accordance with this specification.	MIL-M-17508	Tailoring is not applicable to this requirement.	Do not tailor this requirement.
3.2 3.2.1	Characteristics Performance The pump shall meet the performance requirements of MIL-P-17840 modified herein, while under operating conditions of 3.2.1.2. (Continued)	MIL-P-17840	This is a general requirement of critical importance.	Tailor this requirement to read "The pump shall meet the requirements of Paragraphs (indicate paragraph numbers) of MIL-P-17840B(1), as modified by Table 1 herein.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2 (cont'd) 3.2.1.1	Characteristics (continued) Output Characteristics Capacity, gallons per minute (gpm) 300 Total discharge head, pounds 60	--	--	--
3.2.1.2	Operating Conditions Liquid pump: seawater Suction lead: flooded Specific gravity of liquid pumped: 1.03 Water temperature range, degree F: +28 to +85, Environmental air temperature: +40 to 140 deg F, Relative humidity: 0 to 100 percent	--	This requirement is critical to equipment performance. Environmental conditions are addressed in 3.2.5.	Delete temperature and humidity requirements here and include them in Paragraph 3.2.5.1.
3.2.1.3	Noise The unit shall meet the airborne noise requirements specified in the following paragraphs.	--	Noncompliance with this requirement will adversely affect the ability of personnel in the vicinity to perform their assigned duties, and the ship ASW mission; however, minor deviations from the requirement may be permitted in order to avoid the costs of retest and engineering changes. Structureborne noise level requirements are not addressed.	Tailor this requirement to include structureborne noise requirements.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.1.3.1	Airborne Noise Levels Airborne noise levels shall not exceed limits as specified in Figure 1 at three foot distances around the unit.	--	This requirement is designed to meet ship-radiated and sonar self-noise objectives and airborne noise objectives. As such, it is of major importance to the ship mission. See 3.2.1.3.	See 3.2.1.3
3.2.2	Physical Characteristics a) Weight: The net dry weight shall not exceed 750 pounds. b) Dimensions: The envelope dimensions shall not exceed the following: Length 38 in. Width 26 in. Height 36 in.	--	Noncompliance with this requirement may affect the weight and moment distribution of the ship. This requirement is considered firm. Within a certain tolerance, noncompliance with these dimension requirements will have little impact on the equipment to perform effectively. At present, there appears to be no cost advantage to tailoring this requirement.	Do not tailor this requirement.
3.2.3 3.2.3.1	Reliability and Maintainability Reliability Requirements The equipment shall achieve an MTBF of 14,000 hours or more when maintained in accordance with recommended maintenance schedules.	--	This requirement is essential to equipment performance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.3.2	Reliability Demonstration A reliability demonstration shall be conducted in accordance with MIL-STD-781B to show achievement of the MTBF specified in Paragraph 3.2.3.1. This demonstration may be waived if prior documented testing is acceptable to the BUYER. The discrimination ratio shall be 2:1 (Specified MTBF of 14,000 hrs; minimum acceptable MTBF of 7,000 hours.)	MIL-STD-781B	This requirement is essential to the determination of equipment MTBF; however, Section 3 should contain equipment performance requirements. Section 4 should contain all the tests, inspections, demonstrations, etc., required to verify that the equipment satisfies all the specified performance requirements. In addition, this requirement is redundant to 4.2.3.	Delete this requirement.
3.2.3.3	Maintainability Requirements The equipment shall achieve an MTTR requirement of 9.1 hours or less.	--	This requirement is of major importance to the equipment performance and is considered firm.	Do not tailor this requirement.
3.2.3.4	Production Maintainability Demonstration A maintainability demonstration shall be conducted in accordance with MIL-STD-471A to show achievement of MTTR specified in Paragraph 3.2.3.3. This demonstration may be waived if prior documented testing is acceptable to the BUYER. The demonstration shall be conducted in accordance with applicable R&M criteria described in the Work Statements.	MIL-STD-471A	The comment for 3.2.3.2 also applies to this requirement. In addition, this requirement is redundant to 4.2.3.2.	Delete this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.4	Useful Life Useful life shall be 20 years with a 50 percent duty cycle. Service, preventive maintenance, and overhaul will be permitted in accordance with BUYER approved procedures and schedules.	--	This requirement is critical to equipment performance and is considered firm.	Do not tailor this requirement.
3.2.5	Environmental Conditions The unit shall meet performance requirements specified herein and in MIL-P-17840 during exposure to any of the following combinations of operating and nonoperating environments.	MIL-P-17840	This requirement is critical to equipment performance.	Reword this requirement to: "The unit shall be capable of meeting all performance requirements specified in 3.2.1 through 3.2.1.3.1 during exposure to any combination of the operating environments specified in 3.2.5.1 through 3.2.5.5."
3.2.5.1	Temperature Ambient temperature range of +40 to 140+ degree F.	--	This requirement is essential to equipment performance. The specified ambient temperature range for various equipments varies although it appears that their operating environments will be identical. (Fuel Oil Transfer Purifier: 40 to 122°F; Chilled Water Pump: 40 to 140°F). The same is true for humidity ranges.	Review ambient temperature/humidity range requirements for each equipment and standardize if equipments are expected to operate in identical environments. Review the full range of potential environments for temperature, humidity, salt spray and fungus conditions, etc., and specify as appropriate.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.2 3.2.5.2.1	Ship Motion Angles of Inclination The pumps shall operate satisfactorily when the ship is trimmed down as much as 5 degrees from horizontal and permanently listed up to 15 degrees to either side of vertical; when the ship is pitching with a single amplitude up to 10 degrees from the horizontal and when the ship is rolling with a single amplitude up to 45 degrees from vertical.	--	This requirement is critical to the equipment performance. According to the DDG-47 ship specification, the pitch period should be 7 seconds and the roll period should be 14.5 seconds.	Tailor this requirement to include a pitch period of 7 seconds and a roll period of 14.5 seconds.
3.2.5.3	Shock The equipment shall meet shock Grade A requirements of MIL-S-901C in accordance with Appendix I, and II contained herein for Type A, Class II hull mounted medium weight equipment. During test, the equipment shall be energized in its normal operational mode, for Group I and III blows and standstill for Group II blows.	MIL-S-901C Appendices I and II to Proc. Spec.	This requirement is of major importance to equipment performance. This requirement is considered firm.	Delete general reference to MIL-S-901C and call out specific paragraphs of MIL-S-901C as appropriate.
3.2.5.4	Vibration (Externally Generated) The equipment shall be capable of withstanding vibration requirements of MIL-STD-167B, Type I, from 4 to 15 Hz. During test, the equipment shall be hard mounted and running.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm. MIL-STD-167B has been superseded by MIL-STD-167-1.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.2.5.5	Vibration (Self Excited) Equipment or machinery components with rotating parts shall meet balance and vibration requirements of MIL-STD-167B, Type II.	MIL-STD-167B	This requirement is critical to the equipment performance. This requirement is considered firm. MIL-STD-167B has been superseded by MIL-STD-167-1.	Do not tailor this requirement.
3.3 3.3.1	Design and Construction Materials, Processes and Parts Materials, processes and parts shall be in accordance with MIL-P-17840 with modifications delineated in Table I herein.	MIL-P-17840 MS 16142 MIL-F-16420 NAVSHIPS 0900-001-7000 MIL-F-220042 MIL-STD-777	This is a general requirement of major importance to the performance, quality, and testing of this equipment.	Design and Construction The specific paragraphs of MIL-P-17840B(1) that apply to the procurement of the pump should be cited. Each subparagraph of MIL-P-1740B(1) addressing general design and detail requirements should be reviewed for applicability and cited individually. If each subparagraph applies, it should be so indicated. Materials, Processes, and Parts Tailor this requirement to: "Materials, processes, and parts shall be in accordance with paragraphs (indicate paragraph numbers) of MIL-P-17840B(1) as modified in Table I."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.2	Electromagnetic Radiation Grounding and bonding shall be in accordance with MIL-STD-1310 unless an equally effective alternate can be demonstrated.	MIL-STD-1310	This requirement is of major importance to the functioning of receiving and transmitting equipment aboard ship. This requirement is considered firm.	Do not tailor this requirement.
3.3.3	Nameplates and Product Marking Information for identification for each unit nameplate shall be in accordance with this specification. AEGIS water pump nameplates shall be in accordance with MIL-P-15024 and MIL-STD-130.	MIL-P-15024 MIL-STD-130	These requirements are of minor significance to the equipment performance; however, there appears to be little or no potential for cost savings.	Do not tailor this requirement.
3.3.3.1	Motor Nameplates Motor nameplates shall be in accordance with MIL-M-17060.	MIL-M-17060		
3.3.4	Workmanship Workmanship practices shall be in accordance with this specification. Welding shall be in accordance with MIL-STD-278. Castings and forgings are free of sharp edges, machined surfaces have sharp edges broken or chamfered, openings in hydraulic equipment and piping are sealed and maintained clean during assembly.	MIL-STD-278	This requirement is of major importance to the equipment performance. Changes to this requirement could result in degraded performance and reduced reliability; therefore, this requirement is considered firm.	Add "Section 7: after "MIL-STD-278".

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.5	Interchangeability All identically identified components shall be functionally and physically interchangeable, without degradation to the system.	--	This requirement is of major importance to the equipment maintenance. Changes to this requirement could result in degraded performance and excessive values of MTTR; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.3.6	System Safety/Human Factors System safety/human factors criteria in accordance with MIL-STD-882A paragraph 5.4.1; MIL-STD-1472B paragraph 4.2 and 4.4; and MIL-STD-454, Requirement 1, will be incorporated when applicable in the design or modification of this equipment. The order of precedence for incorporation of safety features shall be in accordance with MIL-STD-882A paragraph 5.4.2.	MIL-STD-882A MIL-STD-1472B MIL-STD-454	This requirement is of major importance to the equipment performance. Changes to this requirement would degrade equipment performance; therefore, this requirement is considered firm.	Do not tailor this requirement.
3.3.7	Electric Motors Motors shall be in accordance with MIL-M-17070E, and paragraphs 3.2.7, 3.2.8, and 3.2.9 of MIL-P-17840. Characteristics shall be as specified.	MIL-M-17060E MIL-P-17840	This requirement is essential to equipment performance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.3.8	Electric Motor Controllers and Associated Devices Motor controllers and pushbutton stations will be procured by the BUYER in accordance with MIL-C-2212. Switches and other electrical devices required for proper operation of the pump shall be furnished by the SELLER in accordance with MIL-C-2212 and MIL-E-917.	MIL-C-2212 MIL-E-917	This requirement is a major importance to equipment operation and is considered firm.	Do not tailor this requirement.
3.4	Documentation Documentation shall be in accordance with the requirements specified in the Statement of Work.	--	This requirement is of major importance to equipment operation and maintenance.	Do not tailor this requirement.
3.5 3.5.1 3.5.1.1	Logistics Maintenance Scheduled (Preventive) Maintenance The equipment shall be designed so that it does not require scheduled maintenance more frequently than once per week. The average elapsed time per week for shceduled maintenance shall not exceed 30 minutes.	--	This requirement is of major importance to equipment operation and maintenance, but there appears to be little opportunity for cost savings.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.1.2	Unscheduled (Corrective) Maintenance The equipment shall be designed so that unscheduled maintenance shall meet as a minimum those values established by the reliability requirements of this specification.	--	This requirement is of major importance to equipment performance, however, it is a restatement of the reliability requirements. This paragraph should cover topics such as the use of multipurpose test equipment, accessibility for maintenance, level of repairability, and skills requirements.	Delete this requirement as it is now stated; expand it if the requirements mentioned in "Comments" are appropriate for this equipment.
3.5.1.3	Overhaul Cycle The equipment shall have an overhaul cycle of 4 years.	--	This requirement is of major importance to equipment performance and maintenance.	Tailor this requirement to include the estimated operating time during the 4 years between overhaul.
3.5.1.4	Service and Access The equipment/component shall be designed to provide accessibility to perform fault detection, preventive and corrective maintenance.	--	This requirement is of major importance to equipment performance and maintenance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.2	Supply Supply support shall be in accordance with the provisioning requirements specified in the Work Statement.	--	This requirement is of major importance to equipment performance.	Do not tailor this requirement.
3.5.3	Standardization The SELLER shall furnish and employ standard components/equipment to the maximum extent possible and include applicable Navy Component Identification (CID) numbers, where known, with proposal.	--	This requirement is of major importance to equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
3.5.3.1	Selection of Components/Equipment The order of precedence for selection of components/equipment is as specified in Spec. NO. 401-2.	--	Changes to this requirement will not have a significant bearing on cost.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.3.2	BUYER Recommended Equipment The BUYER may recommend to the SELLER certain types of manufacturers of equipments of the categories identified in the MIAPL prior to release for manufacture.	--	This requirement has minor impact on equipment design and has no significant cost impact.	Change "recommend" to "specify".
3.5.3.3	Identical Design The SELLER shall maintain identical component/equipment design for the total procurement under this contract.	--	This requirement has major impact on system performance.	Add: "Upon establishment of a single source for an equipment, the SELLER shall purchase the equipment only from the established source."
3.5.3.4	Non-Standard Components The use of non-standard components/equipments is prohibited without express written permission of the BUYER after receipt of written rationale.	--	This requirement has major impact on equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
3.5.4	Lifting Provisions Each component shall be provided with lifting provisions for a capacity equal to four times the dry weight.	--	This requirement is of major importance for equipment installation and removal, but it does not have a significant impact on cost.	Do not tailor this requirement. Add additional requirement 3.5.5: "Facilities required to support the equipment shall be within present Navy capabilities."
--	Personnel --	--	This requirement is not covered in the specification.	Add the following: "The equipment shall be capable of being operated and maintained by personnel at the third class petty officer level."
3.6	Qualification Delivered pumps shall be qualified products in accordance with MIL-P-17840 and the quality assurance provisions in Section 4 of this specification.	MIL-P-17840	This requirement has a major impact on equipment acceptance.	Do not tailor this requirement. Add additional requirement 3.7: "In the event of conflict, precedence shall be as follows: a. Specification No. 52401-2 b. Documents referenced herein"

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
1. 4.1	Quality Assurance Provisions General The pump shall comply with the requirements of Section 3 of this specification and with MIL-P-17840 as modified herein. SELLER may submit data derived from prior testing of comparable equipment performed to the requirements of MIL-P-17840 and subject to the BUYER's approval.	MIL-P-17840	This is a general requirement of major importance. As stated, this requirement does not cover quality assurance provisions. This paragraph is intended to provide general information about tests and inspections not covered elsewhere in Section 4, such as location and contitions for testing, requirements for testing of critical items, etc.	Tailor this requirement to comply with the intent of MIL-STD-490.
4.1.1	Responsibility for Tests Except as otherwise specified, the SELLER is responsible for conduct of all tests specified herein. SELLER may submit data derived from prior testing of comparable equipment performed to the requirements of MIL-P-17840 and subject to the BUYER's approval.	--	MIL-STD-490 permits the use of Paragraph 4.1.2, titled "Special Tests and Examinations", covering the testing routine, sequence of tests, number of items to be tested, required data, and including a table correlating each equipment performance requirement, its tests, the type of unit,and specific references for each test.	Develop Paragraph 4.1.2 with a tabular presentation of all tests and inspections required in Section 4 correlated to the performance requirements of Section 3.
4.2 4.2.1	Quality Conformance Inspections Performance Tests Performance of each pump shall be verified by the tests of MIL-P-17840, as modified herein.	MIL-P-17840	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.1.1	Airborne Noise Testing Noise measurements shall be made in accordance with paragraph 5.2.3.2 of MIL-STD-740B. The pumps shall be mounted on four USN resilent mounts as specified by MIL-M-17508. Airborne noise tests shall be performed at normal operating conditions on each unit.	MIL-STD-740B MIL-M-17508	This requirement is of major importance to the equipment performance.	Tailor this requirement to include structureborne noise testing.
4.2.2	Physical Characteristics Physical characteristics shall be verified by visual examination and measurement.	--	This requirement is of major importance to the equipment performance. This requirement is considered firm.	Do not tailor this requirement.
4.2.3 4.2.3.1	Verification of R&M Requirements Reliability Verification A reliability demonstration in accordance with one of the test plans of MIL-STD-781B shall be conducted to verify that the reliability criteria of 3.2.3 have been satisfied.	--	This requirement is essential to the determination of equipment MTBF.	Tailor this requirement to: "Conformance to the reliability criteria of 3.2.3.1 shall be verified by a Reliability Demonstration in accordance with Test Plan VIII (Test Level A-1) of MIL-STD-781B. The discrimination ratio shall be 2:1 (Specified MTBF of 14,000 hours; minimum acceptable MTBF of 7,000 hours)."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.3.2	Maintainability Verification Verification of maintainability requirement shall be accomplished by a maintainability demonstration in accordance with MIL-STD-471A.	MIL-STD-471A	This requirement is important to system test and evaluation.	Tailor this requirement to: "Conformance to the maintainability criteria of 3.2.3.3 shall be verified by a maintainability demonstration in accordance with test method 8 of MIL-STD-471A. The mean for test method 8 shall be 9.1 hours and the 90th percentile (Mmax) shall be 18.2 hours."
4.2.4 4.2.4.1	Environmental Tests Temperature Temperatures shall be verified by test data obtained during pump performance testing in accordance with MIL-P-17840. Temperature data shall be provided in the performance report.	MIL-P-17840	This requirement is of major importance to equipment performance and is considered flexible. On what basis is the data to be extrapolated to the temperature extremes? It appears that too many variables are involved to validly extrapolate test results at a given temperature to temperature extremes.	Either provide bases for extrapolation of test data at a given temperature to temperature extremes, or if this is not feasible and performance at the temperature extremes is considered critical, require additional testing at those extremes.
4.2.4.2	Ship Motion Verification of the requirements for ship motion in 3.2.5.2 shall be performed during performance testing per MIL-P-17840.	MIL-P-17840	This requirement is of major importance to equipment performance and is considered flexible. On what basis is the data to be extrapolated to extreme inclinations? It appears that too many variables are involved to extrapolate test results from normal orientation to extreme inclinations.	Provide basis for extrapolation of test data to extreme inclinations. If this is not feasible, require testing of pump and motor in accordance with 4.3.4.18.1 and 4.3.4.18.2 of MIL-M-17060E(SH). The pump shall be operated at maximum rated speed and capacity with pumped fluid at ambient temperature during the test.

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REVIEW AND TAILORING OF SELECTED DDG-47 AND DDG-48 EQUIPMENT SP--ETC(U)
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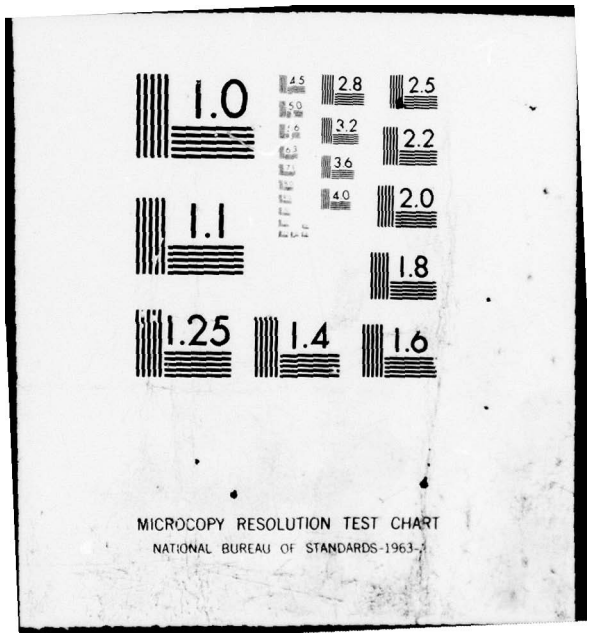
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.4.3	Shock The equipment shall have the requirement of 3.2.5.3 verified by test or extension in accordance with MIL-S-901C and Appendices I and II of Spec. No. G5249102.	MIL-S-901C Appendices I, & II of Proc. Spec.	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.4.4 4.2.4.4.1	Vibration Vibration (Self Excited) Capability of the equipment to meet the vibration requirements of 3.2.5.5 shall be demonstrated by testing or exemption in accordance with MIL-STD-167B Type II and/or Appendix II.	MIL-STD-167B Appendix II to Proc. Spec.	This requirement is of major importance to equipment performance and is considered firm.	Add: "All equipment units shall be balanced in accordance with MIL-STD-167B."
4.2.4.4.2	Vibration Tests The equipment shall have vibration requirements of 3.2.5.4 verified in accordance with MIL-STD-167B, Type I and/or Appendix II of Spec. No. G52401-2.	MIL-STD-167B Appendix II to Proc. Spec.	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.5	Material, Processes and Parts Verification of material, processes and parts requirements specified in 3.3.1 herein shall be by inspection of drawing and material certification.	--	This requirement is of major importance to equipment performance and is considered firm; however, as stated, this requirement is too general.	This requirement does not adequately present the quality assurance provisions needed to cover the full range of materials, processes, and parts presented in MIL-P-17840B and G50401-2. Specify the exact quality assurance provision required for each category of part, process, and material covered in these two specifications. Identify those instances and conditions in which a quality assurance provision is not required.
4.2.6	Electromagnetic Radiation Electromagnetic radiation requirements of 3.3.2 shall be verified by inspection.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement. Reword to state that verification of equipment conformance with requirements of Paragraph 3.3.2 shall be accomplished by inspection.
4.2.7	Nameplate and Product Marking Requirements of 3.3.3 shall be verified by inspection.	--	This requirement is of minor importance.	Do not tailor this requirement. Reword to state that verification of equipment conformance with requirements of Paragraph 3.3.2 shall be accomplished by inspection.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.8	Workmanship Requirements of 3.3.4 shall be verified by inspection.	--	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement. Reword to state that verification of equipment conformance with requirements of Paragraph 3.3.4 shall be accomplished by inspection.
4.2.9	Interchangeability Requirements of 3.3.5 shall be verified by inspection.	--	This requirement is of major importance to equipment testing and acceptance.	Do not tailor this requirement. Reword to state that verification of equipment conformance with requirements of Paragraph 3.3.4 shall be accomplished by inspection.
4.2.10	System Safety/Human Factors Verification of system safety and human factors requirements of 3.3.6 shall be by analysis and tests. The safety analysis specified in the Statement of Work will satisfy the analysis requirement. The tests may be conducted in conjunction with other tests.	--	This requirement is of major importance to equipment performance and is considered flexible.	Tailor this requirement to: "Compliance with the safety and human engineering criteria of 3.3.6 shall be verified by analysis of the equipment design and results of tests specified herein. The safety analysis specified in the Statement of Work will satisfy the analysis requirements."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.11	Human Performance/Human Engineering This paragraph is not applicable.	--	--	--
4.2.12	Technical Manuals New and revised technical manuals shall be validated and verified to ensure conformance to the requirements of MIL-M-15071. Validation may be accomplished during manufacture, assembly, installation or checkout.	MIL-M-15071	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.
4.2.13 4.2.13.1	Logistics Overhaul Cycle Overhaul cycle requirements will be verified by the BUYER during the BUYER maintenance engineering analysis.	--	This requirement is of major importance to equipment performance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4.2.13.2	Supply Adequacy of supply support, including on-board spares, will be evaluated by the BUYER in accordance with the provisioning requirements.	--	This requirement is intended to show that the equipment is capable of being maintained by the standard Navy supply system and that the Navy is officially informed of any unusual or special demands placed on the supply system by the equipment.	If the pump manufacturer is required to demonstrate that his equipment places no unusual or special demands on the Navy supply system, specify exactly how he is required to demonstrate this. If the pump manufacturer is not required to demonstrate this, delete this requirement entirely.
4.2.13.3	Standardization Standardization requirements will be verified by the BUYER during the BUYER maintenance engineering analysis.	--	This requirement is of major importance for repair parts support.	Do not tailor this requirement.
4.2.13.4	Facility and Facility Requirements Facilities and facility requirements will be verified by the BUYER during the BUYER maintenance engineering analysis.	--	This requirement is of major importance for equipment maintenance.	Do not tailor this requirement. Add an additional requirement 4.2.13.5: "Conformance to personnel requirements shall be verified by the BUYER during the BUYER maintenance engineering analysis."

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5. 5.1	Preparation for Delivery Preservation, Packaging, Packing, and Marking Preservation, packaging, packing, and marking shall be in accordance with MIL-P-16789, Level A.	MIL-P-16789	This requirement has no significant impact on cost.	Do not tailor this requirement.
5.1.1	Noise Critical Equipment a. The SELLER shall mark the outside of each crate container as follows: Noise Critical Equipment - Handle Carefully b. The SELLER shall add to rail car for rail shipment: No Humping	--	This requirement has no significant impact on cost.	Do not tailor this requirement.
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PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
2.	Responsibilities The SELLER shall be responsible for the engineering, production, delivery, hardware integration, test and technical support of the DDG-47, AEGIS Sea Water Pumps as defined by this Work Statement and Procurement Specification G52401-2. SELLER shall supply the manpower, materials, facilities, and resources to complete tasks identified by Section 3 through 13 of this Work Statement. The SELLER shall furnish the following data on SDRL. LBU. a. Mounting dimensions b. Outline drawings c. Weight (wet or dry) d. Center of gravity e. Special mounting requirements f. All other pertinent data required to foundation/install the equipment.	MIL-D-1000A MIL-STD-100B USAS Y32.16 MIL-STD-275 MIL-S-901C	This requirement is of major importance to successful procurement of the equipment.	Do not tailor this requirement.
3.	Program Management Schedule and Status The SELLER shall maintain scheduling and status information for program control at the SELLER's facility. Monthly progress reports shall be furnished to the BUYER in accordance with SDRL MAD. Problem reports shall be made by telephone or furnished in accordance with SDRL MAG.	--	This requirement is important to the successful completion of the program and to Government-contractor-subcontractor interface and communications.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
4. 4.1	Configuration Management Change Control If SELLER requests BUYER approval of an engineering change, SELLER shall describe the nature of the proposed change and the anticipated contractual impact to the BUYER in accordance with SDRL CAD.	MIL-STD-480	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
4.1.1	Deviation and Waivers The SELLER shall submit requests for deviations and waivers in accordance with SDRLs CAG and CAH.	MIL-STD-480	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
5.	Quality Assurance The SELLER's Quality Assurance (QA) Program shall be in accordance with Quality Requirements Instructions (QRI), Form S-1253C-1-2-3.	QRI Form S-1253C-1-2-3	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
5.1	Inspection Milestone Notification For those inspection milestones which the BUYER has indicated an intention to witness, the SELLER shall notify the BUYER no less than ten days in advance of their occurrence in accordance with SDRL PAV.	--	This requirement is important to Government-contractor communication and coordination. This requirement is considered firm.	Do not tailor this requirement.
5.2	Quality Conformance Records The SELLER shall maintain and submit quality conformance data in accordance with SDRL PAV.	MIL-STD-480 MIL-Q-9858A	This requirement is of major importance and is considered firm.	Do not tailor this requirement.
6. 6.1	Engineering General The SELLER shall provide engineering effort and support to meet the requirements of BUYER specification G52401-2 and the requirements of the Work Statement. There shall be no deviations from the requirements of the technical specification without the express written approval of the BUYER.	--	This requirement is of major importance and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.2	Detail Design The SELLER shall perform detailed engineering for manufacturer Drawing List and Monthly Status Report - SDRL EAA. Engineering Drawings and Associated Lists - SDRLEBW. SELLER Approved Motor Drawings - SDRL EBF. Data List - SDRL EHC. Microfilming of Engineering Documents - DID EHB. Weight verification - SDRL EDH Welding brazing and allied process procedures - SDRL PCD.	MIL-D-1000A MIL-STD-100B WAS Y32.16 MIL-STD-275 MIL-S-901C MIL-M-17060E MIL-C-9877 MIL-M-9868 MIL-M-38761 MIL-STD-804B G-C-116 MIL-M-38761/2 MIL-STD-12C Handbook H4-1 NAVSHIPS 0900-000-1000 MIL-STD-278 MIL-STD-454	This requirement is of critical importance to the control of equipment design and to modifications, maintenance, and overhaul during service life. This requirement is considered firm.	Do not tailor this requirement
6.3	Technical Manuals The SELLER shall prepare, validate and submit technical manuals in accordance with the requirements of SDRL HAK.	MIL-M-15071G MIL-M-38784B MIL-M-7298B NAVSEC Rept. No. 6113B8-140-77 MIL-M-81203A MIL-P-38790 NAVEXOS P-35	This requirement is important for verifying equipment design and quality conformance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.4	Noise The SELLER shall conduct airborne noise tests and provide noise data in accordance with SDRLs SCL, TAQ, and SBU.	--	This requirement is important for verifying equipment design and quality conformance.	Include structureborne noise tests.
6.5	Shelf Life Data The following shelf life data is required in accordance with SDRL PAV: . Manufacturer's Code . Cure Data . Lot Number . Shelf Life Limitations . Storage Condition Requirements This data is to be provided in accordance with SDRL PAV.	MIL-STD-408 MIL-Q-9858A	This requirement is important to Government storage and handling of material. This requirement has no impact on cost. There is no mention of the shelf life data listed in 6.2.1 in the SDRL or in block of the DID. This is a firm requirement and should be specifically addressed.	Specify shelf life data as a deliverable in DID/SDRL PAV. Change the last sentence of this requirement to: "This data shall be included in the Quality conformance reports in accordance with DID/SDRL PAV."
6.6	Shock Qualification The SELLER shall provide necessary supplies and services to schedule, evaluate and qualify the specified equipment for the shock test and extension requirements of MIL-S-901C as modified for the DDG-47 in the procurement specification and in accordance with the following SDRLs: SSBN Shock Qualification Extension Report TAU Test Reports (shock) TAQ Test Procedures (shock)	MIL-S-901C MIL-STD-798(1) Appendix I to Proc. Spec.	This requirement is critical to the determination of equipment quality conformance.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
6.7	Vibration The SELLER shall provide the necessary supplies and services to schedule, evaluate and qualify the specified equipment for the Type I and II vibration test requirements of MIL-STD-167B and in accordance with the following SDRLs: SCF Vibration Qualification Extension/Exemption Report SCD Vibration Test Reports TAQ Vibration Test Procedures	MIL-STD-167B Appendix II to Proc. Spec. MIL-S-16036	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.
6.8	Release for Manufacture (RFM) For identical equipment previously provided by SELLER, RFM may be granted by BUYER after review of SELLER's technical proposal and/or SELLER's certified current Interface Control Drawings. RFM will be mutually agreed to in writing by BUYER and SELLER during final negotiations prior to award of a definitized contract. For new equipment and/or significantly modified equipment, RFM will be granted in writing by BUYER after contract award and upon successful completion of design reviews.	--	This requirement is of major importance to equipment performance. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
7.0	Fabrication The SELLER shall provide the required material and services to fabricate equipment in support of this program.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
7.1	Deliverable Hardware The SELLER shall fabricate the equipment in the quantities and schedules specified in the contract.			
8. 8.1	Reliability and Maintainability (R&M) R&M Analysis The SELLER shall perform analysis for R&M prediction and assessment to reflect the as delivered R&M status of the equipment and submit in accordance with SDRL RGA. Recommendations for corrective action or alternate designs required to achieve the specified MTBF or MTTR shall be submitted in accordance with SDRL RGB.	MIL-STD-785 Handbook 217B Handbook 472	This equipment is identical to or similar to equipment already in fleet service, and operational reliability data are available from service reports. There is no need to perform tasks to determine and verify inherent reliability.	Delete this requirement.
8.2	Failure Modes Effect Analysis The SELLER shall perform a failure modes effects analysis showing all failure modes of equipment, effects on the functional performance, possible causes and design features to minimize or eliminate effects. The analysis shall be submitted in accordance with SDRL RGF.	MIL-STD-1629 (Ships) MIL-STD-847	The equipment to be procured is identical to or similar to equipment already in the fleet. This is probably a duplication of previously procured documentation and existing 3M data.	Delete this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.3	Reliability Demonstration A reliability demonstration shall be conducted in accordance with MIL-STD-781B Test Plan VIII (Test level A-1). A Reliability Demonstration Plan shall be prepared by the SELLER and submitted in accordance with SDRL RGP. The Reliability Demonstration Plan shall meet the requirements of MIL-STD-781B. A Reliability Demonstration Procedure shall be prepared and submitted in accordance with SDRL RGR and a Reliability Demonstration Report shall be prepared and submitted in accordance with SDRL RGT. Should the SELLER be unable to comply with the success criteria, corrective action or recommended alternate designs to achieve the required MTBF shall be documented and submitted in accordance with SDRL RGB.	MIL-STD-781B MIL-STD-785 MIL-STD-756A MIL-R-22732 MIL-STD-847	This requirement is important to the determination of equipment operational reliability.	Delete items d, e, and h of DID RGT.
8.4	Maintainability Demonstration A Maintainability Demonstration Plan in accordance with MIL-STD-471A, Test Method 8, shall be prepared by the SELLER and submitted in accordance with SDRL RGU. The mean for Test Method 8 is 9.1 hours and the 90th percentile (M.max) is 18.2 hours. The plan shall meet the requirements of MIL-STD-471A. A Maintainability Demonstration Report shall be prepared and (Continued)	MIL-STD-471A MIL-STD-8479	This requirement is important to the determination of equipment maintainability.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.4 (cont'd)	Maintainability Demonstration (cont'd) submitted in accordance with SDRL RGW. A Maintainability Demonstration Report shall be prepared and submitted in accordance with SDRL RGX. If the SELLER is unable to comply with the success criteria corrective action or recommended alternate designs to achieve the required MTTR shall be documented and submitted in accordance with SDRL RGB.	--	--	--
8.5	Reliability and Maintainability Demonstration Criteria Demonstration tests shall be conducted to show achievement of quantitative R&M requirements specified herein. General procedures to be followed during R&M testing are as specified herein.	MIL-STD-781B	This requirement is of major importance to the equipment performance and is considered firm.	Do not tailor this requirement.
8.6	R&M Design Review R&M design review agendas and data packages shall be prepared and submitted in accordance with SDRL RGD. Reports shall be prepared by the SELLER and submitted in accordance with SDRL RGE.	--	--	--

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
8.7	Failure Reporting and Corrective Action Failure/Malfunction Reports shall be prepared and submitted in accordance with DID and SDRL RGK. When requested by the BUYER, failure analysis and corrective action recommendations will be furnished by the vendor on failures of equipment that occur during testing and demonstrations at the BUYER's facility and during the SELLER's warranty/guarantee period.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
8.8	Derating/Stress Analysis Derating of electrical and electronic components in the procured equipment shall be accomplished in accordance with MIL-STD-217B. A derating/stress analysis report shall be provided in accordance with SDRL RGH.	MIL-STD-217B	This requirement is of major importance to equipment reliability.	Do not tailor this requirement.
10.	System Safety/Human Factors The SELLER shall ensure that system safety and human factors criteria applied to the DDG-47 Class Ship shall be to the level specified in Technical Specification G52401-2.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
10.1	Preliminary Hazard Analysis The SELLER shall prepare a Preliminary Hazard Analysis on this equipment in accordance with SDRL SGX.	MIL-STD-882A	This requirement is important to the successful completion of the program. This requirement is considered firm.	Add: "The SELLER shall prepare and submit a Subsystem Hazard Analysis on all Category I and II hazards identified in the Preliminary Hazard Analysis in accordance with SDRL SGS." (Add SDRL and DID SGS to the procurement package).
11.	Integrated Logistics Support Integrated Logistics Support Requirements can be satisfied through compliance with a Statement of Prior Submission, SDRL VAH.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
11.1	Supply Support The SELLER shall develop inputs to provisioning Technical Documentation in accordance with SDRL VAC, Attachments I, II, and III.	MIL-D-1000A MIL-STD-100B MIL-M-9868 MIL-D-5480	This requirement is important in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.2	Standardization The SELLER shall implement a program for monitoring design selections to ensure the employment of standard components/equipments in accordance with the technical specification. Authorization for use of non-standard components/ equipments is as specified herein.	--	This requirement is of major importance to the equipment performance and maintenance. This requirement is considered firm.	Do not tailor this requirement.
11.3	Maintenance Access Envelope The SELLER shall provide the maintenance access envelope necessary to accomplish all maintenance, repair, and disassembly of the equipment. Submit data in accordance with SDRL VAM.	--	This requirement is of major importance to equipment performance. The requirement is considered firm.	Do not tailor this requirement.
11.4	Special Tools and Test Equipment The SELLER shall provide a priced list of recommended special tools and test equipment, required for onboard support of the item, in accordance with SDRL VAI.	--	This requirement is of major importance in ensuring proper support for the equipment and is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
11.5	Installation and Checkout Spares The SELLER shall develop and provide a priced list of recommended installation and checkout spares in accordance with SDRL VAO.	--	This requirement is important to equipment maintenance and support and is considered firm.	Do not tailor this requirement.
12 12.1	Test and Evaluation Production Testing The SELLER shall perform production tests on all items of deliverable equipment in accordance with BUYER Specification G52401-2. Production testing shall be scheduled and documented in accordance with SDRL TAG.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
12.3	Test Procedures Test procedures shall be developed and submitted for all SELLER tests in accordance with SDRL TAQ.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.

PARAGRAPH NUMBER	REQUIREMENT	REFERENCE	COMMENTS	RECOMMENDATION
12.4	Test Reports The SELLER shall document all test results in accordance with SDRL TAU.	Appendix I to Proc. Spec. MIL-STD-798(1)	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
12.5	Qualification/Preproduction/ Verification Testing The SELLER shall submit test schedules in accordance with SDRL TAG.	--	This requirement is important to the successful completion of the program. This requirement is considered firm.	Do not tailor this requirement.
--	--	--	--	--

CHAPTER FOUR

COST AND RISK IMPACT

Rough-order-of magnitude cost and risk impacts are provided in the following pages for each specification and work statement requirement for which tailoring was recommended. The values listed represent a cost benefit or saving to the Navy, unless enclosed by parentheses. Values enclosed by parentheses represent potential additional costs resulting from the tailoring recommendation. The risk cited for each tailoring recommendation represents the potential impact on equipment performance. Table 4-1 summarizes the cost document by each document reviewed.

Table 4-1. COST IMPACT SUMMARY

Document Title	Potential Cost Impact ($ Thousands)
Air Conditioning Plant Specification	41 - 152
Air Conditioning Plant Work Statement	25 - 50
Sea Water Service Pumps Specification	69 - 130
Sea Water Service Pumps Work Statement	30 - 40
Fuel Oil Transfer Purifier Specification	60 - 114
Fuel Oil Transfer Purifier Work Statement	28 - 36
Chilled Water Pump Specification	45 - 85
Chilled Water Pump Work Statement	35 - 50
Fire Pump Specification	55 - 110
Fire Pump Work Statement	32 - 44
400 Hz Power Distribution Switchboards Specification	27 - 54
400 Hz Power Distribution Switchboards Work Statement	40 - 50
AEGIS Sea Water Pump Specification	88 - 165
AEGIS Sea Water Pump Work Statement	37 - 54
Total	612 - 1,134

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE AIR CONDITIONING PLANT SPECIFICATION, G51401-2

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
3.2.1	Performance	10 - 30	None
3.2.3.3	Production Maintainability Demonstration	10 - 50	Minor
3.2.3.4	Maintainability Verification	None	None
3.5.2	Support	8 - 16	Minor
4.1	General	1 - 2	None
4.2.3	Reliability	1 - 2	None
4.2.4	Maintainability	1 - 2	None
4.2.5.1	Standard Design Conditions	Cannot Determine	None
4.2.6	Material, Processes, and Parts	10 - 50	None
4.2.13.2	Supply	Cannot Determine	None

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE AIR CONDITIONING PLANT WORK STATEMENT, G51401-2

Work Statement Paragraph No.	Work Statement Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
8.1	R&M Analysis	15 - 20	Minor
8.2	Failure Modes Effect Analysis	10 - 30	Minor
8.4	Reliability and Maintainability Demonstration Criteria	Covered in Specification	None

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE SEA WATER SERVICE PUMPS SPECIFICATION, G52102-2

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
3.2.1	Performance	4 - 5	None
3.2.3	Reliability Requirements	50 - 100	*
3.2.3.1	Reliability Demonstration	**	*
3.2.4.1	Maintainability Demonstration	10 - 15	Minor
3.2.5	Environmental Conditions	5 - 10	Minor
4.2.3	Reliability	**	*
4.2.11.1	Reliability Verification	**	*
4.2.11.2	Maintainability Verification	**	Minor

* The risk is 30% that an item will be accepted with a true MTBF below 3000 hours.

** Included in the cost impact for paragraph 3.2.3.

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE SEA WATER SERVICE PUMPS WORK STATEMENT, G52102-1

Work Statement Paragraph No.	Work Statement Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
8.1	R&M Analysis	15 - 20	Minor
8.2	Failure Modes Effect Analysis	15 - 20	Minor
8.4	Reliability Demonstration	*	**
8.5	Maintainability Demonstration	***	***

* Included in the cost for paragraph 3.2.2 of the procurement specification.

** The risk is 30% that an item will be accepted with a true MTBF below 3000 hours.

*** Included in cost and risk impacts for paragraph 3.2.4.1 of the procurement specification.

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE FUEL OIL TRANSFER PURIFIER SPECIFICATION, G54106-2

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
3.2.1.1	Function Design-Capacity	(1 -3)	Minor
3.2.1.3	Control and Operation	(5 - 10)	Minor
3.2.3.1	Remote Monitoring	10 - 20	None
3.2.3	Reliability Requirements	50 - 100	*
3.2.3.1	Production Reliability Demonstration	**	*
3.2.5.5.2	Dynamic Loads	N/A	N/A
3.5.1.1	Scheduled (Preventive) Maintenance	10 - 15	None
4.4.1.5	Maintenance	(5 - 10)	Minor
4.4.1.6	Supply	Cannot Determine	None
4.4.2.1	Reliability	**	*
4.4.2.3	Ship's Motion	Cannot Determine	None
4.4.2.4	Materials, Processes, and Parts	(2 - 4)	None
4.4.4.1	Performance Tests	(2 - 4)	Minor
4.4.4.3 & 4.4.4.3.1	Environmental - Temperature Humidity	5 - 10	Minor

* The risk is 30% that an item will be accepted with a true MTBF below 3000 hours.

** Included in the cost impact for paragraph 3.2.3.

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE FUEL OIL TRANSFER PURIFIER WORK STATEMENT, G54106-1

Work Statement Paragraph No.	Work Statement Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
7.2	Qualification Hardware Refurbishment	(2 - 4)	None
8.1	R&M Analysis	15 - 20	Minor
8.2	Failure Modes Effect Analysis	15 - 20	Minor
8.3	Reliability Demonstration	*	**

* Included in the cost for paragraph 3.2.3 of the procurement specification.

** The risk is 30% that an item will be accepted with a true MTBF below 3000 hours.

POTENTIAL COST AND RISK IMPACT OF TAILORING CONCERNING THE CHILLED WATER PUMP SPECIFICATION, G50301-2

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
3.2.1	Performance	None	None
3.2.3	Reliability and Maintainability	None	None
3.2.4	Environmental Conditions	None	None
3.2.4.1	Temperature	None	None
3.2.4.2.1	Angles of Inclination During Service	None	None
3.3.1	Materials, Processes, and Parts	5 - 10	None
4.1	Quality Assurance Provisions (General)	None	None
4.1.1	Responsibility for Tests	10 - 20	None
4.2.1.1	Noise	None	None
4.2.1.1.1	Airborne	None	None
4.2.1.1.2	Structureborne	None	None
4.2.3	Reliability Requirements	None	None
4.2.3.1	Production Reliability Demonstration	None	None
4.2.3.2	Reliability Verification	None	None
4.2.4	Reliability Requirements	None	None
4.2.4.1	Production Maintainability Demonstration	10 - 15	None
4.2.4.2	Maintainability Verification	None	None

(continued)

POTENTIAL COST AND RISK IMPACT OF TAILORING CONCERNING THE CHILLED WATER PUMP SPECIFICATION, G50301-2 (continued)

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
4.2.5.1	Temperature	5 - 10	None
4.2.5.2	Ship Motion	5 - 10	None
4.2.6	Material, Processes, and Parts	10 - 20	None
4.2.10 & 11	Safety and Human Factors	None	None

POTENTIAL COST AND RISK IMPACT OF RECOMMENDATIONS CONCERNING
THE CHILLED WATER PUMP WORK STATEMENT, G50301-1

Work Statement Paragraph No.	Work Statement Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
6.4	Engineering Analysis and Studies	5 - 10	None
7.2	Qualification Hardware Refurbishment	(2 - 4)	Minor
8.1	R&M Analysis	15 - 20	Minor
8.2	Failure Modes Effect Analysis	15 - 20	Minor
8.3	Reliability Demonstration	2 - 4	Minor

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE FIRE PUMP SPECIFICATION, G52101-2

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact (Dollars x 1,000)	Potential Risk Impact
3.2.1	Performance	None	None
3.2.3.1.1	Production Reliability Demonstration	None	None
3.2.3.2.1	Production Maintainability Demonstration	None	None
3.2.5	Environmental Conditions	None	Minor
3.2.5.1	Temperature	None	None
3.2.5.2.1	Angles of Inclination	None	None
3.3.1	Materials, Processes, and Parts	5 - 10	None
4.1.1	Responsibility for Verification (General)	None	None
4.1.1.1	Responsibility for Tests	10 - 20	None
4.2.1.1.1	Noise Tests	None	None
4.2.3	Reliability Verification	None	None
4.2.3.1	Maintainability Verification	5 - 10	None
4.2.4.1	Temperature	5 - 10	None
4.2.4.2	Ship Motion	5 - 10	None
4.2.5	Material, Processes, and Parts	5 - 10	None
4.2.10	Equipment and Personnel Safety Verification	None	None
4.2.13.2	Supply	5 - 10	None

(continued)

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE FIRE PUMP SPECIFICATION, G52101-2 (continued)

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
4.2.13.3	Standardization	5 - 10	None
4.2.13.4	Facility and Facility Requirements	5 - 10	None
4.2.14.2	Manning and Training	5 - 10	None

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE FIRE PUMP WORK STATEMENT, G52101-1

Work Statement Paragraph No.	Work Statement Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
6.5	Shelf Life Data	None	None
8.1	R&M Analysis	15 - 20	Minor
8.2	Failure Modes Effect Analysis	15 - 20	Minor
8.3	Reliability Demonstration	2 - 4	Minor

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS CONCERNING
400 Hz POWER DISTRIBUTION SWITCHBOARDS SPECIFICATION, G32403-2

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
3.1	Item Definition	None	None
3.2.2.3	Clearance	5 - 10	None
3.2.2.4.1	Framework Fabrication	5 - 10	None
3.2.2.4.2	Side and Rear Sheets	1 - 2	None
3.2.2.4.3	Front Panels	1 - 2	None
3.4	Logistics	15 - 30	None
4.7	R&M Verification	None	None

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS CONCERNING THE 400 Hz POWER DISTRIBUTION SWITCHBOARDS WORK STATEMENT, G32403-1

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
4	Configuration Management	40 - 50	None

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE AEGIS SEA WATER PUMP SPECIFICATION, G52401-2

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
3.2.1	Performance	None	None
3.2.1.3	Noise	10 - 20	None
3.2.3.2	Reliability Demonstration	None	None
3.2.3.4	Production Maintainability Demonstration	None	None
3.2.5	Environmental Conditions	None	None
3.2.5.1	Temperature	None	None
3.2.5.2.1	Angles of Inclination During Service	None	None
3.2.5.3	Shock	None	None
3.3.1	Materials, Processes, and Parts	5 - 10	Minor
3.5.1.2	Unscheduled Maintenance	20 - 30	None
3.5.1.3	Overhaul Cycle	5 - 10	None
3.5.3.3	Identical Design	None	None
4.1	Quality Assurance Provisions (General)	None	None
4.1.1	Responsibility for Tests	10 - 20	None
4.2.1.1	Noise	(2 - 5)	None
4.2.3.1	Reliability Verification	None	None
4.2.3.2	Maintainability Verification	None	None
4.2.5.1	Temperature	5 - 10	None
4.2.4.2	Ship Motion	5 - 10	None

(continued)

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE AEGIS SEA WATER PUMP SPECIFICATION, G52401-2 (continued)

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
4.2.4.4.1	Vibration	None	None
4.2.6	Materials, Processes, and Parts	10 - 20	None
4.2.10	Safety and Human Factors	None	None
4.2.13.2	Supply	10 - 20	None
4.2.13.4	Facilities	10 - 20	None

POTENTIAL COST AND RISK IMPACT OF TAILORING RECOMMENDATIONS
CONCERNING THE AEGIS SEA WATER PUMPS WORK STATEMENT, G52401-1

Specification Paragraph No.	Specification Paragraph Title	Potential Cost Impact ($ Thousands)	Potential Risk Impact
6.4	Noise	5 - 10	None
6.5	Shelf Life Data	None	None
8.1	R&M Analysis	15 - 20	Minor
8.2	Failure Modes Effect Analysis	15 - 20	Minor
8.3	Reliability Demonstration	2 - 4	Minor

CHAPTER FIVE

COMPARISON ANALYSIS OF EQUIPMENT SPECIFICATIONS

This chapter provides a comparison analysis of the seven procurement specifications and the seven work statements listed in Chapter Three. This analysis was conducted to ensure that each required topic was discussed in the appropriate document. Tables 5-1 and 5-2 present the location of each required topic in each of the documents reviewed. In the tables, an asterisk indicates that the topic should be considered for inclusion in the document under review. "N/A" indicates that the topic does not apply to the document under review. "Optional" indicates that the applicability of the topic is at the option of the author and depends on the structuring of the document and the extent or depth of coverage. "Unnecessary" indicates that the topic is irrelevant to the design, development, fabrication, and delivery of the equipment. In some cases the asterisks in each table are supplemented by recommendations. These recommendations are provided by topic and immediately follow each table.

Table 5-1. COMPARATIVE ANALYSIS OF EQUIPMENT SPECIFICATIONS

Specified Requirement	Equipment Specification and Paragraph Number						
	Air Conditioning Plant Specification G51401-2	Sea Water Service Pump Specification G52102-2	Fuel Oil Transfer Purifier Specification G54106-2	Chilled Water Pump Specification G50301-2	Fire Pump Specification G52101-2	400 Hz Power Distribution Switchboard Specification G32403-2	AEGIS Sea Water Pump Specification G52401-2
Requirements	3	3	3	3	3	3	3
Item Definition	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Item Diagrams	N/A	N/A	N/A	N/A	N/A	3.1.1	N/A
Interface Requirements	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Seller-Furnished Equipment	3.1.1.1	3.1.1.1	3.1.3.1	3.1.1.1	3.1.1	3.1.3	3.1.1
Buyer-Furnished Equipment	3.1.1.2	3.1.1.2	3.1.3.2	3.1.1.2	3.1.2	N/A	3.1.2
Characteristics	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Performance	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1
Function Design	N/A	N/A	3.2.1.1	N/A	N/A	N/A	N/A
Enclosures	N/A	N/A	N/A	N/A	N/A	3.2.2.4	N/A
Output Characteristics	3.2.1	3.2.1.1	3.2.1.1	3.2.1	3.2.1.1	3.2.1	3.2.1.1
Operating Conditions	3.2.1	3.2.1.2	3.2.1.1	3.2.1	3.2.1.2	N/A	3.2.1.2
Noise	3.2.1.1	3.2.1.3	3.2.1.2	3.2.1.1	3.2.1.3	*	3.2.1.3
Airborne Noise Levels	3.2.1.1.1	3.2.1.3.1	3.2.1.2.1	3.2.1.1.1	3.2.1.3.1	*	3.2.1.3.1
Structureborne Noise Levels	3.2.1.1.2	3.2.1.3.2	3.2.1.2.2	3.2.1.1.2	3.2.1.3.2	*	*
Control and Operation	3.2.2.3	N/A	3.2.1.3	N/A	N/A	3.2.2.5	N/A
Remote Monitoring	3.2.2.3	N/A	3.2.1.3.1	N/A	N/A	3.2.2.5	N/A
Physical Characteristics	3.2.2	3.2.2	3.2.2	3.2.2	3.2.2	3.2.2	3.2.2
Weight	3.2.2.1	3.2.2	3.2.2.1	3.2.2.1	3.2.2	3.2.2.1	3.2.2
Dimensions	3.2.2.2	3.2.2	3.2.2.2	3.2.2.3	3.2.2	3.2.2.2	3.2.2
Lifting Provisions	3.2.2.4	*	3.3.11	3.2.2.2	*	3.2.2.6	3.5.4
Reliability Requirements	3.2.3.1	3.2.3	3.2.3	3.2.3	3.2.3.1	3.2.3	3.2.3.1
Production Reliability Demonstration	N/A	3.2.3.1	3.2.3.1	4.2.3.1	3.2.3.1.1	N/A	3.2.3.2
Maintainability Requirements	3.2.3.2	3.2.4	3.2.4	3.2.3	3.2.3.2	3.2.4	3.2.3.3
Production Maintainability Demonstration	3.2.3.3	3.2.3.1	N/A	4.2.4.1	3.2.3.2.1	N/A	3.2.3.4
Environmental Conditions	3.2.5	3.2.5	3.2.5	3.2.4	3.2.5	3.2.5	3.2.5
Temperature	*	3.2.5.1	3.2.5.1	3.2.4.1	3.2.5.1	3.2.5.1	3.2.5.1, 3.2.1.2
Humidity	*	*	3.2.5.2	*	*	3.2.5.2	3.2.1.2
Shock	3.2.5.3	3.2.5.5	3.2.5.3	3.2.4.4	3.2.5.5	3.2.5.5	3.2.5.3
Vibration Externally Generated	3.2.5.4	3.2.5.3	3.2.5.4.1	3.2.4.3	3.2.5.3	3.2.5.3	3.2.5.4
Vibration Self Excited	3.2.5.5	3.2.5.4	3.2.5.4.2	3.2.1.3	3.2.5.4	N/A	3.2.5.5
Transportability	N/A	N/A	3.2.6	N/A	N/A	N/A	N/A
Ship Motion	3.2.5.2	3.2.5.2	3.2.5.5	3.2.4.2	3.2.5.2	*	3.2.5.2
Inclined Operation	3.2.5.2	3.2.5.2	3.2.5.5.1	3.2.4.2.1	3.2.5.2.1	*	3.2.5.2.1
Dynamic Loads	*	*	3.2.5.5.2	*	*	*	*
Design and Construction	3.2.5.1, 3.3	3.3	3.3	3.3	3.3	3.3	3.3
Materials, Processes, and Parts	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1
Electromagnetic Radiation	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	*	3.3.2
Nameplates and Product Marking	3.3.3	3.3.3	3.3.3	3.3.3	3.3.3	3.3.3	3.3.3
Workmanship	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4
Interchangeability	3.3.5	3.3.5	3.3.5	3.3.5	3.3.5	3.3.5	3.3.5
Selection of Specifications and Standards	N/A	N/A	3.3.1.1	N/A	N/A	N/A	N/A
Protective Coatings	*	*	3.3.1.4	*	*	*	*
System Safety/Human Factors	3.3.6	3.3.6	3.3.6	3.3.6	3.3.6	3.3.6	3.3.6
Electric Motor	3.3.7	3.3.8	3.3.8	3.3.7	3.3.7	N/A	3.3.7
Electric Motor Controllers	3.3.7	3.3.9	3.3.9	3.3.7	3.3.8	N/A	3.3.8
Electrical Power	N/A	N/A	3.3.10	N/A	N/A	N/A	N/A
Documentation (Technical Manuals)	3.4, 3.4.2, 3.4.3	3.4	3.4	Optional	3.4, 3.4.1	Optional	3.4
Logistics	3.5	3.5	3.5	N/A	3.5	3.4	3.5
Maintenance	N/A	N/A	3.5.1	N/A	N/A	3.4.1	3.5.1
Useful Life	3.2.4	*	3.5.1.3	3.2.1.2	3.2.4	*	3.2.4
Unscheduled Maintenance	Unnecessary	Unnecessary	Unnecessary	Unnecessary	Unnecessary	3.4.1.2	3.5.1.2
Scheduled Maintenance	*	*	3.5.1.1	*	*	3.4.1.1	3.5.1.1
Service and Access	*	*	3.5.1.2	*	*	3.2.2.3	3.5.1.4
Storage	N/A	N/A	3.5.1.4	N/A	N/A	N/A	N/A
Overhaul Cycle	3.5.1	3.5.1	3.5.1.5	*	3.5.1	3.4.1.3	3.5.1.3
Supply (Support)	3.5.2	3.5.2	3.5.2	*	3.5.2	3.4.2	3.5.2
Standardization	3.5.3	3.5.3	3.5.3	3.5.3	3.5.3	3.4.2	3.5.3
Selection of Components/ Equipments	3.5.3.1	3.5.3.1	3.5.3.1	3.5.2.1	3.5.3.1	3.4.3.1	3.5.3.1

*This requirement should be considered for inclusion in the document indicated. See following recommendations.

(Continued)

Table 5-1. (continued)

Specified Requirement	Equipment Specification and Paragraph Number						
	Air Conditioning Plant Specification G51401-2	Sea Water Service Pump Specification G52102-2	Fuel Oil Transfer Purifier Specification G54106-2	Chilled Water Pump Specification G50301-2	Fire Pump Specification G52101-2	400 Hz Power Distribution Switchboard Specification G32403-2	ABGIS Sea Water Pump Specification G52401-2
Buyer-Specified Equipment	3.5.3.2	3.5.3.2	3.5.3.2	3.2.5.2	3.5.3.2	3.4.3.2	3.4.3.2
Standard Designed Equipment	3.5.3.3	3.5.3.3	Not Used	3.2.5.3	3.5.3.3	Not Used	3.5.3
Identical Design	3.5.3.4	3.5.3.4	3.5.3.3	3.2.5.4	3.5.3.4	3.4.3.3	3.5.3.3
Nonstandard Components	3.5.3.5	3.5.3.5	3.5.3.4	3.2.5.5	3.5.3.5	3.4.3.4	3.5.3.4
Facilities and Facility Requirements	3.5.4	3.5.4	3.5.4	•	3.5.4	•	•
Special Tools	•	•	3.5.5	•	•	•	•
Personnel and Training	3.6	3.6	3.6	•	3.6	•	•
Qualification	3.7	3.7	3.7	3.4	3.7.1	3.5	3.6
Precedence	3.8	3.8	3.8	•	3.8	3.6	•
Quality Assurance Provisions - General	4, 4.1	4, 4.1	4	4, 4.1	4, 4.1, 4.1.1	4	4, 4.1
Responsibility for Tests	4.1.1	4.1.1	4.1	4.1.1	4.1.1.1	4.1	4.1.1
Classification of Verification	N/A	N/A	4.2	N/A	4.2	4.2	N/A
Production Verification	N/A	N/A	4.2.1	N/A	N/A	4.4	N/A
Qualification Verification	N/A	N/A	4.2.2	N/A	N/A	4.3	N/A
Special Verification	N/A	N/A	4.2.3	N/A	N/A	N/A	N/A
Verification Method	N/A	N/A	4.4	N/A	N/A	4.5.7	N/A
Quality Conformance Inspections	4.2	4.2	4.4.1	4.2	4.2.1	4.5.5	4.2
Performance Tests	Unnecessary	Unnecessary	4.4.4.1	Unnecessary	Unnecessary	Unnecessary	Unnecessary
Performance	4.2.1	4.2.1	Unnecessary	4.2.1	Unnecessary	Unnecessary	Unnecessary
Tests	Unnecessary	Unnecessary	4.4.4	Unnecessary	Unnecessary	4.5.6	Unnecessary
Noise	4.2.1.1	4.2.1.1	4.4.4.2	4.2.1.1	4.2.1.1.1	•	4.2.1.1
Airborne Noise Tests	4.2.1.1.1	4.2.1.1.1	4.4.4.2.1	4.2.1.1.1	4.2.1.1.1.1	•	4.2.1.1
Structureborne Noise Tests	4.2.1.1.2	4.2.1.1.2	4.4.4.2.2	4.2.1.1.2	4.2.1.1.1.2	•	4.2.1.1
Physical Characteristics	4.2.2	4.2.2	4.4.1.1	4.2.2	4.2.2	•	4.2.2
Reliability	4.2.3	4.2.3, 4.2.11.1	4.4.2.1	4.2.3, 4.2.3.1, 4.2.3.2	4.2.3	4.7	4.2.3.1
Environmental Tests	4.2.5	N/A	4.4.4.3	4.2.5	4.2.4	N/A	4.2.4
Maintainability	4.2.4	N/A	4.4.2.2	4.2.4	4.2.3.1	4.7	4.2.3.2
Temperature and Humidity	•	4.2.4.1	4.4.4.3.1	4.2.5.1	4.2.4.1	•	4.2.4.1
Standard Design Conditions	4.2.5.1	Unnecessary	Unnecessary	Unnecessary	Unnecessary	Unnecessary	Unnecessary
Ship Motion	4.2.5.2	4.2.4.2	4.4.2.3	4.2.5.2	4.2.4.2	•	4.2.4.2
Shock	4.2.5.3	4.2.4.5	4.4.4.3.2	4.2.5.3	4.2.4.5	4.5.2, 4.5.3	4.2.4.3
Vibration Externally Generated	4.2.5.4	4.2.4.3	4.4.4.3.3.1	4.2.5.4.1	4.2.4.3	4.5.1, 4.5.1.1	4.2.4.4.2
Vibration Self Excited	4.2.5.5	4.2.4.4	4.4.4.3.3.2	4.2.5.4.2	4.2.4.4	N/A	4.2.4.4.1
Material, Processes, and Parts	4.2.6	4.2.5	4.4.2.4	4.2.6	4.2.5	N/A	4.2.5
Electromagnetic Radiation	4.2.7	4.2.6	4.4.1.7	4.2.7	4.2.6	4.5.4	4.2.6
Nameplate and Product Marking	4.2.8	4.2.7	4.4.1.4	4.2.8	4.2.7	3.3.3	4.2.7
Transportability	N/A	N/A	4.4.1.8	N/A	N/A	N/A	N/A
Workmanship	4.2.9	4.2.8	4.4.1.9	•	4.2.8	•	4.2.8
Interchangeability	4.2.10	4.2.9	4.4.1.10	4.2.9	4.2.9	•	4.2.9
Lifting	•	•	4.4.1.11	•	•	•	•
Analysis	Unnecessary	Unnecessary	4.4.2	Unnecessary	Unnecessary	Unnecessary	Unnecessary
System Safety/Human Factors	4.2.11	4.2.10	4.4.2.6	4.2.10, 4.2.11	4.2.10	4.5.7.1	4.2.10
Technical Manuals	4.2.12	•	4.4.2.7	N/A	4.2.12	N/A	4.2.12
Logistics	4.2.13	N/A	N/A	N/A	4.2.13	•	4.2.13
Overhaul Cycle	4.2.13.1	•	4.4.2.8	•	4.2.13.1	•	4.2.13.1
Supply	4.2.13.2	4.2.13.2	4.4.1.6	•	4.2.13.2	•	4.2.13.2
Standardization	4.2.13.3	4.2.13.3	4.4.2.9	•	4.2.13.3	•	4.2.13.3
Selection of Specification and Standards	•	•	4.4.2.5	•	•	•	•
Facilities and Facility Requirements	4.2.13.4	4.2.13.4	4.4.2.10	•	4.2.13.4	•	4.2.13.4
Personnel and Training	4.2.14	4.2.14	•	•	4.2.14	•	•
Preparation for Delivery and Storage	5, 5.1	5, 5.1	5	5	5	5	•
Cleaning	5.2, 5.3	•	•	•	•	•	•
Preservative	5.2.1, 5.3.1	•	•	•	•	•	•
Storage	5.2.2, 5.3.2	•	•	•	•	•	•
Shipment	5.4	•	•	•	•	•	•
Preservation and Packaging	5.4.1	•	5.1	5.1	5.1	5.1	5.1
Packing	5.4.2	5.1	5.1	5.1	5.1	--	5.1
Marking	5.5	5.1	5.1	5.1	5.1	--	5.1
Noise Critical Equipment	Unnecessary	5.2	5.11	5.11, 5.1.1	5.2	N/A	5.1.1

•This requirement should be considered for inclusion in the document indicated. See following recommendations.

ADDITIONAL PROCUREMENT SPECIFICATION RECOMMENDATIONS
(See Table 5-1)

Airborne and Structureborne Noise Levels - Add requirements for maximum airborne and structureborne noise levels to Specification G32403-2. Add requirement for structureborne noise level to Specification G52401-2.

Lifting Provisions - Add requirements for lifting provisions to Specifications G52102-2 and G52101-2.

Production Reliability Demonstration - Production Reliability Demonstration should be discussed only in Section 4 of Specifications G52102-2, G54106-2, G52101-2, and G52401-2, and should be deleted from Section 3.

Production Maintainability Demonstration - Production Maintainability Demonstration should be discussed only in Section 4 of each specification.

Temperature - In Specification G51401-2, specify the temperature range in which the equipment must be capable of operating.

Humidity - In Specifications G51401-2, G52102-2, G50301-2, and G52101-2, specify the humidity conditions under which the equipments must be capable of operating.

Ship Motion, Inclined Operation, and Dynamic Loads - Review all specified requirements related to ship motion to ensure conformance with Shipbuilding Specification. Add ship motion-related requirements to Specifications G51401-2, G52102-3, G50301-2, G32403-2, and G52401-2 as appropriate.

Protective Coatings - Add requirements for protective coatings to Specifications G51401-2, G52102-2, G50301-2, G52101-2, G32403-2, and G52401-2.

Electric Motor Controllers - Add requirements for electric motor controllers to Specifications G50401-2 and G50301-2, or if not applicable, so indicate.

Useful Life - Add requirements for useful life to Specifications G52102-2 and G32403-2.

Scheduled Maintenance - Add requirement for scheduled maintenance to Specifications G51401-2, G52102-2, G50301-2, and G52101-2.

Service and Access - Add requirements for service and access to Specifications G51401-2, G52102-2, G50301-2, and G52101-2. Service and access requirements should be closely related to or made part of maintainability requirements. If service and access requirements are fully covered under the maintainability requirements, it is not necessary to reiterate them in a separate section.

Overhaul Cycle - Add requirement for overhaul cycle to Specification G50301-2.

Supply Support - Add requirement for supply support and any other appropriate logistic support considerations to Specification G50301-2.

Facilities and Facility Requirements - Add the requirement to Specifications G50301-2, G32403-2, and G52401-2 that the equipment shall be capable of being operated, maintained, and provisioned with existing Navy facilities.

Special Tools - Add requirements governing special tools to Specifications G51401-2, G52102-2, G50301-2, G52101-2, G32403-2, and G52401-2. Requirements should discourage the use of special tools and test equipment. However, if special tools or test equipment are necessary, it should be specified that:

1. They are delivered with the hardware.
2. Their operation and maintenance is fully documented.
3. Design and reprocurement data is furnished to the Navy.

Personnel and Training - Add requirements to Specifications G50301-2, G32403-2, and G52401-2, specifying that the equipment shall be capable of being operated and maintained by personnel at the third class petty officer level and that no special or extended training shall be required to operate and maintain the equipment. In addition, specify the maximum number of personnel required for equipment operation for Specification G32403-2.

Precedence - Add the precedence requirement to Specifications G50301-2 and G52401-2.

Airborne and Structureborne Noise - Add quality assurance provisions to Specifications G32403-2 and G52401-2 to be compatible with specified noise requirements in Section 3.

Physical Characteristics - Add a quality assurance provision for physical characteristics to Specification G32403-2 for physical characteristics.

Reliability - The requirements of ECP E-47-139 should be incorporated into the appropriate specifications subsequent to its approval.

Maintainability - The requirements of ECP E-47-139 should be incorporated into the appropriate specifications subsequent to its approval.

Temperature and Humidity - Add a quality assurance provision for temperature and humidity to Specifications G51401-2 and G32403-2.

Ship Motion - Add ship motion requirements to Specification G32403-2.

Materials, Processes, and Parts - Add a quality assurance provision for materials, processes, and parts to Specification G32403-2.

Workmanship - Add workmanship requirements to Specifications G50301-2 and G32403-2.

Interchangeability - Add interchangeability requirement to Specification G32403-2.

Lifting Fixtures - Add a quality assurance provision for lifting fixtures to Specifications G51401-2, G52102-3, G50301-2, G52101-2, G32403-2, and G52401-2.

Technical Manuals - Add a quality assurance provision for technical manuals to Specification G52102-2.

Logistics - Add a quality assurance provision for logistics to Specification G32403-2.

Overhaul Cycle - Add a quality assurance provision for overhaul cycle to Specifications G52102-2, G50301-2, and G32403-2.

Supply - Add a quality assurance provision for supply to Specifications G50301-2 and G32403-2.

Standardization - Add a quality assurance provision for standardization to Specifications G50301-2 and G32403-2.

Selection of Specifications and Standards - Add a quality assurance provision for selection of specifications and standards to Specifications G51401-2, G52102-3, G50301-2, G52101-2, G32403-2, and G52401-2.

Facilities and Facility Requirements - Add a quality assurance provision for facilities and facility requirements to Specifications G50301-2 and G32403-2.

Personnel and Training - Add a quality assurance provision for personnel and training to Specifications G54106-2, G50301-2, and G32403-2.

Preparation for Delivery - Refer to MIL-STD-490 for requirements related to preparation for delivery. Specify complete set of requirements for Specifications G52102-2, G54106-2, G50301-2, G52101-2, G32403-2, and G52401-2.

Vibration - Add SDRL CRT, Certification of prior approved data, to Paragraph 6.6 of Work Statement G51401-1, 6.6 of G52102-1, 6.7 of G52101-1, 6.3 of G32403-1, and 6.7 of G52401-1.

Release for Manufacture (RFM) - Modify Paragraph 6.7 of Work Statements G51401-1 and G52102-1 and 6.10 of G54106-1 to state:

> "For identical equipment previously provided by SELLER, RFM will be granted by BUYER after review of SELLER's technical proposal and/or SELLER's certified current interface control drawings. RFM will be mutually agreed to in writing by BUYER and SELLER during final negotiations prior to award of a definitized contract. For new and/or modified

equipment, RFM will be granted by BUYER after contract award and upon successful completion of design review."

Technical Manuals - Modify Paragraph 6.8 of Work Statement G51401-1, 6.8 of G52102-1, 6.4 of G54106-1, 6.3 of G52101-1, 6.5 of G32403-1, and 6.3 of G52401-1 to state:

"New technical manuals shall be developed in accordance with MIL-M-15071 and SDRL HAK. Existing technical manuals proposed for use in this contract shall contain the data required to permit operation and maintenance of the exact equipment and configuration to be delivered and shall be in accordance with SDRL HAK. All technical manuals shall be validated and verified to assure conformance to MIL-M-15071 during manufacturing, assembly, installation, or checkout."

Table 5-2. COMPARATIVE ANALYSIS OF WORK STATEMENTS

Task Requirement	Equipment Specification and Paragraph Number						
	Air Conditioning Plant Work Statement G51401-1	Sea Water Service Pump Work Statement G52102-1	Fuel Oil Transfer Purifier Work Statement G54106-1	Chilled Water Pump Work Statement G50301-1	Fire Pump Work Statement G52101-1	400 Hz Power Distribution Switchboard Work Statement G32403-1	AEGIS Sea Water Pump Work Statement G52401-1
Responsibilities	2	2	2	2	2	2	2
Program Management	3	3	3	3	3	3	3
Schedule and Status	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Configuration Management	4	4	4	4	4	4, 4.4	4
Identification Plate	*	*	4.2	*	*	4.2	*
Release Records	4.1	4.1	4.2	4.1	4.1	4.1	4.1
Change Control	4.1	4.1	4.1	4.1	4.1	4.3	4.1
Deviation and Waivers	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.3	4.1.1
Special Requests	4.1.2	*	4.1.1	4.1.2	*	*	*
Configuration Audits	4.2	*	*	*	*	4.5	*
Quality Assurance	5	5	5	5	5	5	5
Nondestructive Test Procedures	*	5.1	5.1	*	*	*	*
Inspection Milestone Notification	5.1	5.2	5.2	5.1	5.1	*	5.1
Quality Conformance Records	5.2	5.3	5.3	5.2	5.2	5.1	5.2
Engineering - General	6, 6.1	6, 6.1	6, 6.1	6, 6.1	6, 6.1	6	6, 6.1
Detail Design	6.2	6.2	6.2	6.2	6.2	6.1	6.2
Design Review	*	6.2.1	6.2.1	6.2.1	*	*	*
Engineering Analysis and Studies	*	6.3	6.6	6.4	*	*	*
Shelf-Life Data	6.2.1	6.4	6.3	*	6.5	*	6.5
Electric Motors and Controls	6.3	*	6.5	6.3	*	N/A	*
Electric Motors	6.3.1	*	6.5.1	6.3.1	*	N/A	*
Electric Motor Controllers	6.3.2	*	6.5.2	6.3.2	*	N/A	*
Shock Qualification	6.4	6.5	6.7	6.5	6.6	6.2	6.6
Airborne/Structureborne Noise	6.5	6.9	6.8	6.6	6.4		6.4
Vibration	6.6	6.6	6.9	6.7	6.7	6.3	6.7
Release for Manufacture (RFM)	6.7	6.7	6.10	6.8	6.8	6.8	6.8
Technical Manuals	6.8	6.8	6.4	11.5	6.3	6.5	6.3
Fabrication	7	7	7	7	7	7	7
Welding, Brazing, and Allied Process Procedures	N/A	N/A	N/A	N/A	N/A	5.2	N/A
Deliverable Hardware	7.1	7.1	7.1	7.1	7.1	7.1	7.1
Qualification Hardware Refurbishment	*	*	7.2	7.2	*	*	*
Installation and Checkout Spares	*	*	7.3	*	*	*	11.5
Packing Lists and Parts Lists	7.2	*	*	*	*	*	*
Reliability and Maintainability Prediction/ Assessment	8	8	8	8	8	N/A	8
Production Deliveries						7.3	
R&M Analysis	8.1	8.1	8.1	8.1	8.1	8.1	8.1
Failure Modes Effect Analysis	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Reliability Demonstration		8.4	8.3	8.3	8.3	*	8.3
Maintainability Demonstration	8.3	8.5	*	8.4	8.4	*	8.4
Reliability and Maintainability Demonstration Criteria	8.4	8.6	8.3.1	8.5	8.5	*	8.5
R&M Design Review	8.5	8.3	8.4	8.6	8.6	8.2	8.6
Derating/Stress Analysis	N/A	*	N/A	N/A	N/A	N/A	8.8
Failure Reporting and Corrective Action	8.6	8.7	8.5	8.7	8.7	8.3	8.7
Human Factors	9	9	10	9	9	9	10
System Safety/Human Factors	10	9.1	10	9	9	10	10
Preliminary Hazard Analysis	10.1	9.2	10.1	9.1	9.1	10.1	10.1
Subsystem Hazard Analysis	10.2	9.3	*	9.2	9.2	10.2	*
Integrated Logistics Support	11	11	11	11	11	11	11
Supply Support	11.1	11.1	11.1	11.1	11.1	11.1	11.1
Standardization	11.2	11.2	11.2	11.2	11.2	11.2	11.2
Maintenance Access Envelope	11.3	11.3	11.3	11.3	11.3	11.3	11.3
Special Tools and Test Equipment	11.4	11.4	11.4	11.4	11.4	7.2, 11.3	11.4
Test and Evaluation	12	12	12	12	12	12	12
Product Testing	12.1	12.1	12.1	12.1	12.1	12.1	12.1
Test Procedure	12.2	12.3	12.3	12.2	12.3	12.1	12.3
Test Reports	12.3	12.4	12.4	12.3	12.4	12.1.3, 12.2.2	12.4
Qualification/ Production/ Verification Testing	*	*	12.5	*	12.5	*	12.5

*This requirement should be considered for inclusion in the document indicated. See following recommendations.

ADDITIONAL WORK STATEMENT RECOMMENDATIONS
(See Table 5-2)

Schedule and Status - Add requirement to furnish monthly progress reports to the buyer in accordance with SDRL MAD in Paragraph 3.1 of Work Statements G54106-1, G52101-1, and G32403-1 and Paragraph 3 of Work Statement G52401-1.

Identification Plate - Add paragraph in Section 4 of Work Statements G51401-1, G52102-1, G50301-1, G52101-1, and G52401-1 to require top assembly drawings to contain the requirement for and define the installation of the equipment identification plate.

Special Requests - Add paragraph in Section 4 of Work Statements G52102-1, G52101-1, G32403-1, and G32401-1 to require special request reports and exception reports to be furnished in accordance with SDRL MAL.

Configuration Audits - Add paragraph in Section 4 of Work Statements G52102-1, G54106-1, G50301-1, G52101-1, and G52401-1 to require the SELLER to provide the personnel and documentation required to conduct configuration audits in accordance with SDRL CAM.

Nondestructive Test Procedures - Add paragraph to Section 5 of Work Statements G51401-1, G50301-1, G52101-1, G32403-1, and G52401-1 to require the SELLER to submit nondestructive test procedures for review and approval as specified in SDRL PAZ. Indicate in each work statement that submittal of SDRL CRT will satisfy this requirement for equipments identical to those procured for the DD-963 Class ships or DD-993 Class ships.

Inspection Milestone Notification - Add a paragraph to Section 5 of Work Statement G32402-1 indicating, for those inspection milestones which the BUYER has indicated an intention to witness, that the SELLER shall notify the BUYER no less than ten days in advance of their occurrence in accordance with SDRL PAY.

Quality Conformance Records - Indicate in Paragraph 5.2 of Work Statement G51401-1, 5.3 of G52102-1, 5.3 of G54106-1, 5.2 of G50301-1, 5.2 of G52101-1, 5.1 of G32403-1, and 5.2 of G52401-1 that quality conformance data shall be maintained and submitted in accordance with SDRLs PAV, PAX, and PAY.

Engineering - General - Change Paragraph 6 of Work Statement G32403-1 to:

> "The SELLER shall provide engineering effort and support to meet the requirements of BUYER Specification G32403-2 and the requirements of the Work Statement. There shall be no deviations from the requirements of the technical specification without the express written approval of the BUYER."

Detail Engineering/Design - Modify Paragraph 6.2 of Work Statements G51401-1, G52102-1, G54106-1, G50301-1, G52101-1, and G52401-1, and Paragraph 6.1 of Work Statement G32403-1 to reference DIDs/SDRLs EBW, EHC, EHB, EAA, EHD, EBF, EDH, CRT, PCD, and EBD.

Design Review - Modify Paragraph 6.2.1 of Work Statements G52102-1 and G50301-1, and add a paragraph in Section 6 of Work Statements G51401-1, G52101-1, G32403-1, and G52401-1 to state that the SELLER shall participate in a review(s) with BUYER prior to release for manufacturing. The SELLER shall fully describe and justify the complete equipment design, including all electrical protections and interfaces during the review(s).

Engineering Analysis and Studies - Modify Paragraph 6.3 of Work Statement G52102-1, 6.6 of G54106-1, and 6.4 of G50301-1, and add a paragraph in Section 6 of the other Work Statements to state:

"The SELLER shall provide:

a. Engineering analysis in accordance with SDRL EDJ (not required for equipment identical to that provided on DD-963/DD-993 Class ships).

b. Welding, brazing, and allied process procedures, SDRL PCD.

c. Weight verification, SDRL EDH

d. Design review data, SDRL EAX"

Shelf Life Data - Modify Paragraph 6.2.1 of Work Statement G51401-1, 6.4 of G52102-1, 6.3 of G54106-1, 6.5 of G52101-1, and 6.5 of G52401-1, and add a paragraph in Section 6 of Work Statements G50301-1 and G32403-1 to state:

"The following shelf life data are required in accordance with SDRL PAV:

- Manufacturers' Codes
- Cure Date
- Lot Number
- Shelf Line Limitations
- Storage Condition Requirements

These data shall be included in the Quality Performance Reports in accordance with DID/SDRL PAV.

Electric Motors - Modify Paragraph 6.3.1 of Work Statements G51401-1 and G50301-1 and 6.5.1 of G54106-1, and add a paragraph in Section 6 of the other Work Statements (except G32403-1) to state:

"The SELLER shall be responsible for the suitability of electric motors for each application, for mounting and coupling the motor to the driven unit performance characteristics,

design constraints, and requirements providing a power margin of 5%. The motor drawings, shall be in accordance with SDRL EBF. The motors shall be in accordance with MIL-M-17060 as modified in the specification."

(NOTE: The power margin is a performance requirement and should also be included in the equipment specification.)

Electric Motor Controllers - Modify Paragraph 6.3.2 of Work Statements G51401-1 and G50301-1, and Paragraph 6.5.2 of G54106-1, and add a paragraph in Section 6 of the other Work Statements (except G32403-1) to state:

"The SELLER shall be responsible for furnishing the BUYER with requirements for motor controller and/or driven equipment control circuit interfaces in accordance with SDRL ECG. The data furnished shall enable the BUYER to procure motor controllers and push-button stations that will correctly interface with the SELLER'S equipment and/or control circuits."

Shock Qualification - Modify Paragraph 6.4 of Work Statement G51401-1, 6.5 of G52102-1, 6.5 of G50301-1, 6.6 of G52101-1, 6.2 of G32403-1, and 6.6 of G32401-1 to reference DIDs/SDRLs TAU, TAO, SD, and CRT.

Airborne and Structureborne Noise - Modify Paragraph 6.5 of Work Statement G51401-1, 6.9 of G52102-1, 6.6 of G50301-1, 6.4 of G52101-1, and 6.4 of G52401-1, and add a paragraph to Section 6 of G32403-1 to state:

"The SELLER shall provide the necessary supplies and services to schedule, evaluate, and qualify the equipment for airborne and structureborne noise in accordance with MIL-STD-740 as modified in the procurement specification in accordance with the following SDRLs:

SBU - Estimated Noise Spectra (only if not identical to DD-963/DD-993 equipment).

SCC - Airborne and Structureborne Noise Test Reports

TAQ - Test Procedures"

Vibration - Add SDRL CRT, Certification of prior approved data, to Paragraph 6.6 of Work Statement G51401-1, 6.6 of G52102-1, 6.7 of G52101-1, 6.3 of G32403-1, and 6.7 of G52401-1.

Release for Manufacture (RFM) - Modify Paragraph 6.7 of Work Statements G51401-1 and G52102-1 and 6.10 of G54106-1, 6.3 of G52101-1, 6.5 of G32403-1, and 6.3 of G52401-1 to state:

"New technical manuals shall be developed in accordance with MIL-M-15071 and SDRL HAK. Existing technical manuals proposed for use in the contract shall contain the date required to permit

operation and maintenance of the exact equipment and configuration to be delivered and shall be in accordance with SDRL HAK. All technical manuals shall be validated and verified to assure conformance to MIL-M-15071 during manufacturing, assembly, installation, or checkout."

Welding, Brazing, and Allied Process Procedures - Delete Paragraph 5.2 in Work Statement G32403-1. The requirement should be covered in Section 6 (see comment under "Engineering Analysis and Studies").

Qualification Hardware Refurbishment - Add a paragraph in Section 7 to Work Statements G51401-1, G52102-1, G52101-1, G42403-1, and G52401-1 to state:

"The equipment on which qualification tests are performed shall be refurbished and delivered as a deliverable hardware item. As a minimum, the equipment shall be completely dismantled, and all parts shall be inspected to determine the extent of damage or deterioration caused by the tests. All parts which have sustained damage or deterioration shall be replaced."

Installation and Checkout Spares - Add a paragraph in Section 7 of each Work Statement (except Work Statement G54106-1) to state:

"The SELLER shall develop and provide a priced list of recommended installation and checkout spares required to support the delivered equipment. This list shall contain complete identification data, including nomenclature, manufacturer's part number, quantity recommended, and unit and extended price, in accordance with SDRL VAO."

Packing Lists and Parts Lists - Add a paragraph to all Work Statements to state that packing lists and parts lists shall be submitted in accordance with SDRL PCB.

R&M Analysis - Review each Work Statement to conform with the requirements of the procurement specification after ECP-47-139 has been approved and incorporated into each procurement specification.

R&M Design Review - Modify Paragraph 8.2 of Work Statement G32403-1 to include:

"R&M Design Review agendas and data packages shall be prepared and submitted in accordance with SDRL RGD."

Derating/Stress Analysis - Add a new paragraph to Section 8 of Work Statement G52102-1 to require derating and stress analysis and to require documentation submittal in accordance with SDRL RGH.

Failure Reporting and Corrective Action - Modify Paragraph 8.6 of Work Statement G51401-1, 8.7 of G52102-1, and 8.3 of G32403-1 to require the SELLER to conduct failure analysis and furnish corrective action

recommendations for failures of equipment that occur during testing and demonstration at the BUYER's facility and during the SELLER's warranty/ guarantee period.

Preliminary Hazard Analysis - Modify Paragraph 10.1 of Work Statement G51401-1, 9.2 of G52102-1, 9.1 of G50301-1 and G52101-1, and 12.1 of G52401-1 to include reference to SDRL CRT as in Paragraph 10.1 of G54106-1.

Subsystem Hazard Analysis - Add a new paragraph in Section 10 of Work Statements G54106-1 and G52401-1 to require subsystem hazard analysis.

Test and Evaluation - Expand Paragraph 12 of Work Statement G32403-1 and 12.1 of the other Work Statements to state:

> "The SELLER shall perform production tests on all items of deliverable equipment in accordance with SDRL TAG. All production testing shall be reported in accordance with SDRL TAU or SDRL CRT."

Test Procedure - Replace Paragraph 12.2 of Work Statements G54101-1 and G50301-1 and 12.3 of G52102-1, G54106-1, G52101-1, and G52401-1 with Paragraphs 12.1, 12.1.1, 12.1.2, and 12.2.1 of G32403-1.

Qualification/Production/Verification Testing - Modify Paragraph 12.5 of G54106-1, G52101-1, and G52401-1, and add a new paragraph in Section 12 of the other Work Statements to require that test schedules be submitted in accordance with SDRL TAC and that previously submitted data be certified in accordance with SDRL CRT.