

Bath Iron Works

A GENERAL DYNAMICS COMPANY

Appendix G
Revision U
24 April 24

SUPPLEMENTAL REQUIREMENTS
FOR GENERAL MATERIAL

1.0 SCOPE:

This appendix defines, through the use of SDRL Codes, the supplementary requirements and documentation the Seller must provide the Buyer in the areas of Testing, Certification, Material Safety Data Sheets (MSDS), Qualified Products Listings (QPL), Shock, Vibration, EMI Qualifications, Welding Procedures, Provisioning, Technical Manuals, Drawings, Protection and Preventative Maintenance, and Tools and Test Equipment to support the requirements of the ship construction contract with the U.S. Navy. The SDRL Codes and their definitions are shown in Table I.

2.0 REQUIREMENTS:

The Seller shall comply with the procedures, perform the tests, and provide the documentation required by the SDRL Codes shown on the purchase order. The SDRL Codes required for each of the Buyer's catalog numbers on the purchase order are identified by the four digit alpha-numeric code contained on the purchase order as shown on Figure (1). The description of the tests and documentation required for each SDRL Code is provided within this appendix on the following pages. Most SDRL Code requirements include documentation submittals. Submittals shall be made to the Buyer's Documentation Center utilizing a transmittal letter as a cover sheet in accordance with Figure (2). Documentation for only one SDRL Code shall be submitted with each transmittal letter. Specific submission instruction is provided with the applicable SDRL Code description. Table II provides direction in regards to documentation delivery schedules.

<u>CODES</u>	<u>DEFINITION</u>
Table I LIST OF SDRL CODES	
C031	Software Version Record
E001	Drawings
E011	Welding, Brazing and Allied Process Procedure
E050	Certificate of Identicality
L001	Provisioning Parts List
L002	Statement of Prior Submission (or COI if applicable)
L004	Item List Requirements
L005	Design Change Notice
L006	Tools and Test Equipment
L008	Protection and Preventive Maintenance
L021	Commercial Manual
QCOD	Calibration Certificate
QCOF	ABS Certificate
QCOH	Material Safety Data Sheet
QCOI	Qualified Product Listing
QCOL	Shelf Life Identification
QCOV	Volatile Organic Compounds
QIOT	Packaging and Marking for Titanium
QTOA	Chemical Test Reports
QTOB	Physical Test Reports
QTOC	Compression Test Reports
QTOG	Non-Destructive Test Report
T007	Vibration Test Procedure
T008	Vibration Test Report
T009	Vibration Qualification Extension Request (or COI if applicable)
T011	Grade A Shock Test Procedure
T012	Grade A Shock Test Report
T013	Grade A Shock Test Extension Request (or COI if applicable)
T014	Electromagnetic Interference Qualification Test Plan
T015	Electromagnetic Interference Qualification Test Report
T031	Grade B Shock Test Procedure
T032	Grade B Shock Test Report
T033	Grade B Shock Test Extension Request (or COI if applicable)
T034	Electromagnetic Interference Qualification Extension (or COI if applicable)

PURCHASE ORDER

Appendix G
Revision T

Bath Iron Works
A GENERAL DYNAMICS COMPANY
700 Washington Street Bath, ME 04530

PO number/date:	00091AABUL 11/01/1999
Contact person:	
Authorized Signature:	_____
Prime Contract Number:	
Charge number:	
DPAS RATING:	DOA3
Seller Code:	6955

Mail two copies of invoice to:
Invoice Audit Section
Bath Iron Works
700 Washington Street
Bath, ME 04530

**Attn: SAMPLE
BATH IRON WORKS CORPORATION
700 WASHINGTON STREET
BATH ME 04530**

Deliver to:
BIW CONSOLIDATED WAREHOUSE
MALLET PARK BATH RD.
BRUNSWICK ME 04011

Trans Terms: FOB DEST COLL
Ship via: L. BISSON, INC.
Payment Terms: NO TERMS AVAILABVLE

Important Instructions:
Order number, order line item number, and Material Number (when present on the order); MUST appear on all invoices, packing slips, items shipped, and/or containers.

Tax Code: 3
Material is exempt from Maine state sales tax. NOTE: BIW holds Maine State direct payment permit #40038, issued under rule #308.

Seller Acknowledgement
(Required for orders of \$100.000 or greater) Please sign and return copy to buyer.

Item Mcc	Material Description	Order qty	Unit	Delivery Date	Price	Net Value
00100 111	31263026 COMM RCDVG ANT, AS-3606/URC-109(v) MARCONI PN H33-5500-01	1	EA	03/03/2000	1.000	1.000
00200 111	<u>E001</u> SDRL Code DRAWINGS (COI IF APPLICABLE)	1	LT	12/21/99	0.000	0.000
00300 111	T013 SDRL Code Definition GRADE A SHOCK TEST EXTENSION (COI IF APPLICABLE)	1	LT	12/14/99	0.000	0.000
Total net item val. excl. tax USD						1.000

Certificate of Identity (COI)
May apply to codes E001,
L002, T009, T013, T033 or
T034

Vendor Copy

00091AABUL

Figure (1)
Sample Purchase Order
(3)

TRANSMITTAL LETTER
SELLER FURNISHED DATA
FOR GENERAL MATERIAL

Date _____

FROM: Seller _____
Address _____

TO: BATH IRON WORKS CORPORATION
700 Washington Street
Bath, Maine 04530
ATTN: VFI (Documentation Center), Finast Building, M/S 3220

SUBJ: BIW Purchase Order No. _____
BIW Catalog No. _____
Nomenclature _____

1. The following data is submitted with this transmittal letter:
 - a. SDRL Code _____
 - b. SDRL Title _____

2. This is __ partial, _____ complete (check one) shipment. It contains __ copies of each document and consists of __ packages.

Signed _____
Title _____

DISTRIBUTION:

BIW D/C, BIW Buyer (Transmittal letter only)

Figure (2)

TRANSMITTAL LETTER

3.0 Schedule:

3.1 For bidding purposes, Table II shall be utilized to determine the submittal schedule for documentation.

3.2 After P.O. placement, the documentation delivery schedule shall be as specified herein within the SDRL Code descriptions.

Table II
SDRL DELIVERY SCHEDULE

<u>SDRL Code</u>	<u>Schedule</u>
C031	With Shipment
E001	7 Weeks After P.O.
E011	17 Weeks After P.O.
E050	With Shipment
L001	11 Weeks After P.O.
L002	6 Weeks After P.O.
L004	11 Weeks After P.O.
L005	As Required
L006	11 Weeks After P.O.
L008	13 Weeks After P.O.
L021	3 Weeks After P.O.
QCOD	With Shipment
QCOF	With Shipment
QCOH	With Shipment
QCOI	With Shipment
QCOL	With Shipment
QCOV	With shipment
QIOT	With Shipment
QTOA	With Shipment
QTOB	With Shipment
QTOC	With Shipment
QTOG	With Shipment
T007	4 Weeks After P.O.
T008	16 Weeks After P.O.
T009	6 Weeks After P.O.
T011	4 Weeks After P.O.
T012	16 Weeks After P.O.
T013	6 Weeks After P.O.
T014	4 Weeks After P.O.
T015	12 Weeks After P.O.
T031	4 Weeks After P.O.
T032	16 Weeks After P.O.
T033	6 Weeks After P.O.
T034	6 Weeks After P.O.

4.0 REFERENCED DOCUMENTS:

4.1 Availability. When requesting specifications, standards, drawings and publications, refer to both title and number. Copies of Government specifications required by the Seller in connection with specific procurement functions may be obtained upon application to the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-509. The acquisition of Government and industry specifications, standards, drawings, bulletins, and other publications listed shall be the responsibility of the Seller. Copies of all referenced Buyer's documents required by the Seller in connection with this procurement are available upon request to the Buyer's authorized procurement representative.

4.2 Documents. The following documents contain additional detailed requirements as indicated in the descriptions of SDRL Codes.

4.2.1 Specification 072-04, Rev. F, High Impact Shock Test Requirements for Lightweight and Medium Weight Equipment, (SDRL Codes T011, T012, T013, T031, T032, & T033).

4.2.2 Specification 073-04, Rev. F, Vibration Qualification Requirements, (SDRL Codes T007, T008, & T009).

4.2.3 Specification 406-01, Rev. J, Electromagnetic Interference (EMI) Qualification Requirements, (SDRL Codes T014, T015, & T034).

4.2.4 Section 43, American Bureau of Ships, Rules for Building and Classing Steel Vessels. (SDRL Code QCOF)

4.2.5 MIL-STD-248, Rev. C with Notice 1, Welding and Brazing Procedure and Performance qualification. (SDRL Code E011).

4.2.6 MIL-STD-278, Rev. F, Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping and Pressure Vessels in ships of the United States Navy. (SDRL Code E011).

4.2.7 Not used

4.2.8 MIL-STD-45662 with Notice 1, Military Standard Calibration System Requirements. (SDRL Code QCOD).

4.2.9 Not used.

4.2.10 Not used.

4.2.11 Not used.

4.2.12 NAVSEA TL490-AG-GTP-010, NAVSEA Provisioning Requirements Technical Specification (PRTS) for Shipbuilding and Conversion Contracts for DDG 51 through 67. (SDRL Code L001, L002, & L005).

4.2.13 DID DI-V-7006, Interim Support items List. (SDRL Code L004).

4.2.14 DID DI-V-7004A, Long Lead Time Item List. (SDRL Code L004).

4.2.15 Technical Manual Contract Requirement (TMCR)
No. NDMS-940021-000 for DDG 77 and 81.
No. NDMS-960087-000 for DDG 83 through 87
No. NDMS 970157-000 for DDG 90 and Followships.
(permanent change pages SDRL Code L012)

4.2.16 Technical Manual Contract Requirement (TMCR)
No. NDMS-940014-000 for for DDG 77 and 81
No. NDMS-960080-000 for DDG 83 through 87
No. NDMS-970151-000 for DDG 90 and Followships.
(commercial off-the-shelf technical manuals and supplementary data, SDRL Code L021).

4.2.17 Technical Manual Contract Requirement (TMCR)
No. NDMS-940015-000, for DDG 77 and 81
No. NDMS-960081-000 for DDG 83 through 87
No. NDMS-970152-000 for DDG 90 and Followships
(Hull, Mechanical & Electrical (HM&E) Equipment Technical Manuals, SDRL Codes L010, L013, L014, & L015).

4.2.18 NAVSEA Statement of Work (SOW) for Provisioning Technical Documentation (PTD) Requirements for Contractor Furnished Systems and Equipment in Shipbuilding and Conversion Contracts dated June 1990 for DDG 68 through 84. (SDRL Code L001, L002, & L005).

4.2.19 NAVSEA Technical Specification 9090-1500, Policies and Procedures, Provisioning, Allowance and Fitting Out Support Manual, Chapter 4 (Change C), Program Manager's Guide (PMG) dated August 1999 for DDG 85 and Followships. Available at <http://www.nslc.fmso.navy.mil/TechLog/PAFOS/PAFOS0.htm> and MIL-PRF 49506 Logistic Management Information (LMI). (SDRL Code L001, L002 and L005).

5.0 SDRL CODE DESCRIPTIONS

SDRL Code: C031, Software, Version Record:

- a. Submit one copy of the Software, Version Record.
- b. The Seller may select the format for submittal of a Software, Version Record. However, once a selection has been made, the same format shall be used throughout the life of the Purchase Order. Electronic submittal is acceptable if provided in Acrobat (.pdf) format.
- c. The submittal shall provide the identification of the software, including the name, version, and/or date of revision, equipment serial number or electronic control card number on which software is installed, as applicable utilizing Seller's format. If equipment does not have software, send submittal indicating that fact.

SDRL CODE: E001, DRAWINGS:

- a. Provide 2 copies of drawings showing the following for review and approval in accordance with the delivery schedule shown on the P.O.
 - Title block including drawing number, revision, date and manufacturer's name.
 - Outline with overall envelope dimensions.
 - Maintenance access envelopes.
 - Location, type and size of interface connections to piping, cabling, foundation, etc.
 - Weight both with and without operating fluids, if applicable.
 - Center of gravity both with and without operating fluids.
 - List of material with quantity and specifications.
 - Sectional assembly identifying parts.
 - Electrical and hydraulic schematic diagrams.
- b. Drawings shall be 8-1/2" x 11" size or folded individually in accordian pleated form to an 8-1/2" x 11" size with title block exposed in the lower right hand corner.
- c. If for any reason there is a change to the configuration of the material, 2 copies of the revised drawings shall be submitted within 30 days.
- d. For equipment that is identical to equipment previously provided by the Seller, and for which the Seller has previously provided drawings, the Seller may choose to submit a certificate of identity (COI) rather than resubmit the drawings. The COI shall be submitted on the form provided at the end of this appendix.

SDRL CODE: E011, WELDING. BRAZING AND ALLIED PROCESS PROCEDURE:

Welding, brazing and allied processes shall be in accordance with MIL-STD-278F. One (1) Copy of procedures and qualification test data, as required by MIL-STD-248, shall be submitted to the Buyer for review and approval in accordance with the delivery schedule shown on the P.O.

SDRL CODE: E050, CERTIFICATE OF IDENTICALITY

COI shall be submitted with the Seller's equipment as certification equipment delivered is identical in all respects to the previously provided equipment, and that previously provided documentation is applicable.

SDRL CODE: L001, L002, L004 & L005 - PROVISIONING TECHNICAL DOCUMENTATION (PTD):

PTD shall be submitted for equipment on the P.O. For equipment provisioned on a previous procurement, a Statement of Prior submission or Certificate of Identity (COI) may be submitted. For equipment not previously provisioned, a Provisioning Parts List (PPL), Item List Requirement (For DDG 53 through 84) and

Design Change Notice, supported by complete PTD and Supplemental Provisioning Technical Documentation (SPTD) for DDG 53 through 84 and Engineering Data for Provisioning (EDFP) for DDG 85 and Followships shall be submitted as described below:

1. Statement of Prior Submission (SPS) (SDRL Code L002):

SPS shall be completed in accordance with Paragraph 5.4 of the "NAVSEA Provisioning Requirement Technical Specification (PRTS) for Shipbuilding and Conversion Contracts" for DDG 53 through 67 or Paragraph 7.b of the "NAVSEA Statement of Work for Provisioning Technical Documentation (SOW for PTD) Requirements for Contractor Furnished Systems and Equipment in Shipbuilding and Conversion Contracts" for DDG 68 through 84 or paragraph 3.6 of the Program Manager's Guide, Provisioning Statement of Work (SOW) dated 8/99 DDG 85 and Followships. Three (3) copies of the SPS shall be submitted to the Buyer in accordance with the schedule shown on the P.O.

If a COI is provided in lieu of a SPS, the COI must be provided to the Buyer from the Seller and certify that the equipment being furnished under this purchase order is identical in all respects to that previously approved by the Government. The Seller shall complete all applicable lines of the COI using the form provided at the end of this appendix. Part I and Part IV must be completely filled out, signed by the Seller's Engineering Manager, and provided to the Buyer.

2. Provisioning Parts List (PPL) (SDRL Code L001):

PPL shall be completed in accordance with Paragraph 5.3.1 of the PRTS for DDG 53 through 67, or Paragraph 3 of the SOW for PTD for DDG 68 through 84, or Paragraph 3.4 of the PMG for DDG 85 and Followships. Data required for the PPL for DDG 85 and Followships are indicated by an "X" in the LMI Worksheet, Figure (7). An "A" in the LMI Worksheet indicates data are to be entered if applicable. Figure (7) has been reproduced from the PMG and the "Additional Information" column refers to the PMG. Only the DPDN's and SDPDN's that require data have been included in Figure (7), other DPDN's and SDPDN's in the PMG do not require data to be provided. Three (3) copies of the PPL shall be submitted to the Buyer in accordance with the schedule shown on the P.O. Submittals may be made using ICAPS as described in paragraph 4.4.1 of the PMG.

3. Item List Requirement (SDRL Code L004):

The Item List Requirement, consisting of a Long Lead Time Item List (LLTIL) and a Interim Support Items list (ISIL) shall be submitted. The LLTIL shall be completed in accordance with DID DI-V-7004A and the ISIL shall be completed in accordance with DID DI-V-7006. Three (3) copies for each shall be submitted to the Buyer concurrently with the PPL. LLTIL and ISIL are not applicable to DDG 85 and Followships.

4. Design Change Notice (DCN) (SDRL Code L005):

DCN shall be completed in accordance with Paragraph 5.3.16 of the PRTS for DDG 53 through 67 or Paragraph 17 of the SOW for PTD for DDG 68 for DDG 68 through 84 or Paragraph 3.19 of the PMG for DDG 85 and Followships. Data required for the DCN for DDG 85 and Followships are indicated by an "X" in the LMI Worksheet, Figure (7). An "A" in the LMI Worksheet indicates data are to be entered if applicable. Figure (7) has been reproduced from the PMG and the "Additional Information" column refers to the PMG. Three (3) copies shall be submitted to the Buyer in accordance with the schedule shown on the P.O. Submittals may be made using ICAPS as described in paragraph 4.4.1 of the PMG.

5. SDRL CODE: L006, TOOLS AND TEST EQUIPMENT:

Provide one copy of a list which identifies all recommended special and general purpose test, measurements and diagnostic equipment, tools and ancillary items required for the proper operation, maintenance, test and repair of the equipment and/or its subassemblies in accordance with the delivery schedule shown on the P.O. The list shall include the following data for each item listed:

- a) Nomenclature
- b) Manufacturer's Part Number
- c) Quantity required

6. SDRL CODE: L008, PROTECTION AND PREVENTATIVE MAINTENANCE:

Provide one (1) copy of a description of the steps that must be taken by BIW after receipt of equipment to ensure that it is maintained in optimum condition during ship construction. Include periods of warehouse storage, installation, and test and operation of the equipment. Include the frequency of maintenance and all handling and storage requirement (e.g. environmentally controlled warehouse, use of protective covers). Delivery shall be in accordance with the schedule shown on the P.O.

7.SDRL CODE: L021 - DDG 51 Class Commercial "Off-The Shelf" Equipment Technical Manuals:

For DDG 51 Class Ships General Material Equipment, Commercial "Off-the-Shelf Equipment Technical Manuals shall be provided by the seller to the buyer for the equipment in the Purchase Order. Preparation and submittal of a DDG 51 and LCS Class Ships General Material Equipment, Commercial "Off-The-Shelf: Equipment Technical Manual will be in accordance with the Data Item Description (DID) for the SDRL L021. A copy of the DID for SDRL L021 will be provided to the supplier by the buyer upon request.

8.SDRL CODE: L021 - LCS Class Commercial "OFF-The-Shelf" Equipment Technical Manuals:

For LCS Class Ships General Material Equipment, Commercial "Off-The-Shelf" Equipment Technical Manuals shall be provided by the seller to the buyer for the equipment in the Purchase Order. An acceptable "Off-The-Shelf" Equipment Technical Manual for the LCS Class Ships will meet the requirements of Technical Manual Contract Requirements (TMCR) SNIPP-130074-000. A copy of TMCR SNIPP-130074-000 will be provided to the supplier by the buyer upon request.

SDRL CODE: QCOD, CALIBRATION CERTIFICATE:

- a. The Seller shall accomplish the requirement of MIL-STD-45662, Calibration Systems Requirements.

- b. Two legible copies of the Certificate of Calibration, Figure 4, shall be provided with each packing list. Certificate shall be completed and signed by a responsible representative of the Seller.
- c. Two legible copies of the Calibration Data Sheets shall also be provided by Seller with each packing list to indicate functions tested, nominal and measured values, and calibration tolerances.

CALIBRATION CERTIFICATE

I hereby certify that the instrument(s) listed below have been examined, tested and found to be within the manufacturer's published specification when compared with standard instruments.

Calibration of all standard instruments used on performance of the above tests is traceable to the National Bureau of Standards. The standards and instruments used in the calibration are supported by a calibration system that meets or exceeds the requirements of MIL-STD-45662.

Signed _____
Title _____
Company _____

Mfr: _____
Purchase Order # _____
Line Item _____
BIW Catalog # _____
Item Nomen. _____

Item Part # _____
Item Serial # _____
Calibration Data _____
Calibration Due Data _____

National Bureau of Standards Test No. _____

Calibration Certificate

Figure (4)

SDRL CODE: QCOF, AMERICAN BUREAU OF SHIPPING (ABS) CERTIFICATE:

- a. The material on this P.O. is subject to the requirements of Section 43 of the American Bureau of Shipping (ABS) Rules.
- b. Four (4) legible copies of each mill sheet or shipping statement of all accepted plate and shape materials, indicating the grade of steel and heat identification numbers, are to be furnished by the manufacturer to ABS. The manufacturer shall also furnish ABS with a certificate stating that the material has been made by an approved process and that it has withstood satisfactorily each prescribed test. The

manufacturer shall submit two (2) legible copies of the completed Test Reports and the Manufacturer's Certificate to Buyer with, or in advance of, material receipt.

SDRL CODE: QCOH MATERIAL SAFETY DATA SHEETS:

Provide Form OSHA-20 or facsimile of the Occupational Safety and Health Administration with each packing list. For the same material, as provided on previous P.O.'s, affix a Hazardous Material sticker indicating the applicable MSDS number to each shipping container. Stickers will be provided by BIW at Seller's request.

SDRL CODE: QCOI, QUALIFIED PRODUCT LISTING:

- a. Products furnished on this purchase order shall be products which are approved for listing on the applicable qualified products list (QPL). The manufacturer's name and product designation, e.g. model number, shall be indicated on the packing list.
- b. Two (2) legible copies of the shipping invoice, which includes the producer's name, shall also be submitted with the packing list.
- c. For newly qualified products, not yet listed in the QPL, a USN letter of approval shall be provided with the initial shipping invoice.

SDRL CODE: QCOL, SHELF LIFE IDENTIFICATION:

- a. Shipping invoices shall indicate the total shelf-life of the material, and the shelf-life expiration date for that shipment. If the shipment includes two (2) or more lots of material which have different expiration dates, the expiration date shall be indicated for each lot. Affix a Shelf-Life label to each shipping container and clearly and legibly print on the label the shelf-life expiration date for the material within.
- b. If a shipping container contains smaller containers having differing expiration dates, affix a label to each container.
- c. Labels shall be requested from the Buyer.
- d. All material shall have at least seventy five (75%) of its shelf-life remaining when shipped.

SDRL CODE: QCOV, VOLATILE ORGANIC COMPOUNDS:

- a. The content of VOC shall not exceed the amount in g/l coating (minus water and exempt compounds) in Table 2 in Subpart II of 40 CFR Part 63.
- b. The Seller shall certify the not-to-exceed, VOC content in g/l coating (minus water and exempt compounds) of each batch supplied to BIW, based on correlating batch formulation data with Method-24 (of appendix A to CFR part 60) test results.
- c. The certification statement shall read as follows:

"The as supplied VOC content is certified not-to-exceed (insert value) g/l coating (minus water and exempt compounds)."

- d. This certification statement shall be contained on either the packing slip or a certification sheet attached to the packing slip.
- e. In addition to the above certification, the Seller shall notify the Buyer of any formulation changes to the VOC content or solids content of the coating. The Seller shall request a "VOC Data Sheet for Thinning Determination" from the Buyer. The new coating characteristics must be entered on the data sheet and submitted to the Buyer within 30 days of the changes, but before receipt of the QCOV certification required above.

SDRL CODE: QIOT, PACKAGING AND MARKING FOR TITANIUM:

- a. Titanium material shall be packaged so that no direct contact with non titanium metallic material occurs.
- b. Titanium material and packing slips for titanium material shall be marked "TITANIUM" in bold letters.

SDRL CODE: QTOA, QTOB, QTOC OR QTOG, TEST REPORTS:

- a. Test Reports or Certificates or Conformance are required to confirm the compliance of material with specification requirements. Reports shall reflect actual test results and not merely that the minimum requirements of the specification have been met. Reports or certificates for any tests described by the procurement specification (MIL-SPEC, ASTM SPEC, ANSI SPEC, etc.) which fall into the categories described by SDRL Codes QTOA, QTOB, QTOC OR QTOG shall be provided when those codes are indicated on the purchase order. Two (2) legible copies of each completed test report or certificate shall be provided with or in advance of, each shipping invoice.
- b. Each Test Report shall be typed on the Seller's form.
- c. Each Test Report shall cover all tests performed, the results of each test and any corrective action required to comply with each specification requirement.

d. Each Test Report shall include:

- (1) Reference to Buyer's purchase order and line item
- (2) Material nomenclature and Buyer's Catalog Number
- (3) Heat numbers, where applicable.

SDRL CODE: T007, T008 & T009, VIBRATION QUALIFICATION:

Comply with the requirements of Specification 073-04, for vibration qualification.

SDRL CODE: T011, T012, T013, SHOCK GRADE A QUALIFICATION:

Comply with the requirements of Specification 072-04, for Grade A shock testing or shock test extension.

SDRL CODE: T014, T015 & T034, ELECTROMAGNETIC INTERFERENCE (EMI) QUALIFICATION

Comply with the requirements of Specification 406-01 for EMI qualification.

SDRL CODE: T031, T032 & T033, SHOCK GRADE B QUALIFICATION:

Comply with the requirements of Specification 072-04, for Grade B shock testing or shock test extension.

DDG 51 CLASS

TECHNICAL MANUAL DEVELOPMENT PLAN (TMDP)

Publication Title:

Technical Manual Identification Number (TMIN): (Buyer will furnish)

Publication Date:

Change No:

Publication Date:

System or Equipment

Type:

Model:

Size:

Part Number:

APL Number:

Purchase Order:

Manufacturer's Name:

Address:

CAGE:

Manual Preparing Activity:

Address:

Applicable TMCR(s):

Classification:

Rights In Data:

Figure (5)

TMDP

DDG 51 CLASS

TECHNICAL MANUAL DEVELOPMENT PLAN

 (Seller's Name) proposes to:

 develop permanent change pages to the above technical manual.

 develop a commercial supplement to the above, off-the shelf commercial manual.

 develop a new commercial manual.

 develop a new technical manual for the above listed equipment.

Nature and extent of proposed change or supplement:

It is hereby certified that:

 The technical manual cited above is applicable to the equipment being procured for DDG 51.

 is not developing the above proposed technical manual under another contract.

 is in the process of developing the above proposed technical manual under the following contract:

Remarks:

Figure (5)

TMDP

DDG 51 CLASS

TECHNICAL MANUAL DEVELOPMENT PLAN

Development Milestones

Schedule

- 1) Technical Manual Development Plan Submitted to BIW.
- 2) Navy Approval and BIW comments back to Seller.
- 3) Manuscript or RDC Copy Submitted to BIW.
- 4) Navy Approval and BIW comments back to Seller.
- 5) Technical Manual Validation Start.
- 6) Technical Manual Validation Complete.

Note: validation required prior to next submittal.
- 7) Preliminary Copy Submitted to BIW.
- 8) Navy Approval and BIW comments back to Seller.
- 9) CRC or FRC Submitted to BIW
NLT 60 days after preliminary approval

Signed

Figure (5)

TMDP

TECHNICAL MANUAL VALIDATION CERTIFICATE
NAVSEA 4160/3 (4-82)

TECHNICAL MANUAL TITLE

NAVSEA TECHNICAL MANUAL NUMBER

DATE

CONTRACT/TMCR NO.

I-VALIDATION

Except as stated in II, the technical manual identified above has been satisfactorily validated in accordance with all requirements of the applicable TMCR and the approved Validation Plan. The technical manual is hereby certified to be accurate and complete, and the information, instruction, text, and illustrations conform in all respects to the applicable general and detailed specifications.

II-EXCEPTIONS

EXCEPTIONS

AUTHORIZED BY

SIGNATURE OF PUBLICATION QUALITY ASSURANCE OFFICER

DATE

Figure (6)

Figure (7)
LMI Worksheet

DPDN	DATA PRODUCT TITLE	DATA PRODUCT DELIVERABLES							ADDITIONAL INFORMATION
		LLTIL	PPL	ISIL	TTEL	SCPL	DCN	SLPPL	
0010	ALLOWANCE ITEM CODE (AIC)		A				A		Record D, Block 50
0020	ALLOWANCE ITEM QUANTITY		A				A		Record D, Block 51
0120	CHANGE AUTHORITY NUMBER						X		Record F, Block 66
0140	COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE		X				X		Record A, Block 5
0230	DEMILITARIZATION CODE (DMIL)		A				A		Record B, Block 23
0280	ESSENTIALITY CODE		X				X		Record A, Block 11
0290	ESTIMATED PRICE		X				X		
0370	INDENTURE CODE		A				A		Record A, Block 4
0430	INTERCHANGEABILITY CODE						A		Record F, Block 67, Part Number Adds, Changes, and Deletes
0480	ITEM NAME		X				X		Record A, Block 12. Change Field Length to 19X
0630	MEAN TIME BETWEEN FAILURES (MTBF)		X				X		
0680	NATIONAL STOCK NUMBER AND RELATED DATA		A				A		Record B, Block 15, Required if Contract Option is exercised.
	COGNIZANCE CODE		A				A		
	MATERIEL CONTROL CODE		A				A		
	FEDERAL SUPPLY CLASSIFICATION		A				A		
	NATIONAL ITEM IDENTIFICATION NUMBER		A				A		
	SPECIAL MATERIEL IDENTIFICATION CODE/MATERIEL MANAGEMENT AGGREGATION CODE		A				A		
0690	NEXT HIGHER ASSEMBLY PROVISIONING LIST ITEM SEQUENCE NUMBER (NHA PLISN)		X				X		Record C, Block 29, Automatically assigned by ICAPS.
0790	PRECIOUS METAL INDICATOR CODE (PMIC)		A				A		Record B, Block 27
0820	PRIOR ITEM PROVISIONING LIST ITEM SEQUENCE NUMBER (PRIOR ITEM PLISN)		X				X		Record C, Block 39, Automatically assigned by ICAPS
0830	PRODUCTION LEAD TIME (PLT)		A				A		Record B, Block 24
0870	PROVISIONING CONTRACT CONTROL NUMBER (PCCN)		X				X		Records A through M, Block 1
0890	PROVISIONING LIST ITEM SEQUENCE NUMBER (PLISN)		X				X		Records A through M, Block 2
0900	PROVISIONING NOMENCLATURE		A				A		Record K, Block 91, Change Field Length to 42X
0930	QUANTITY PER ASSEMBLY (QPA)		X				X		Record C, Block 32
	OPTION 1		X				X		
0950	QUANTITY PER END ITEM (QPEI)		X				X		Record C, Block 33
	OPTION 1		X				X		
1030	REFERENCE DESIGNATION		A				A		Record D, Block 44, Change Field Length to 29X
	OPTION 1		A				A		Required for Electronic Items having Circuit Symbol Numbers
1040	REFERENCE DESIGNATION CODE (RDC)		A				A		Record D, Block 46

Figure (7) (Continued)
LMI Worksheet

DPDN	DATA PRODUCT TITLE	DATA PRODUCT DELIVERABLES							ADDITIONAL INFORMATION
		LLTIL	PPL	ISIL	TTEL	SCPL	DCN	SLPPL	
1050	REFERENCE NUMBER		X				X		Record A, Block 6
1060	REFERENCE NUMBER CATEGORY CODE (RNCC)		X				X		Record A, Block 7
	REFERENCE NUMBER CATEGORY CODE - ARN		A				A		
1070	REFERENCE NUMBER VARIATION CODE (RNVC)		X				X		Record A, Block 8
	REFERENCE NUMBER VARIATION CODE - ARN		A				A		
1150	SAME AS PROVISIONING LIST ITEM SEQUENCE NUMBER (SAME AS PLISN)		X				X		Record G, Block 38, Automatically assigned by ICAPS
1190	SHELF LIFE (SL)		A				A		Record A, Block 13. Required when Source Code = PC
1200	SHELF LIFE ACTION CODE (SLAC)		A				A		Record A, Block 14, Required when there is a Shelf Life
1220	SOURCE, MAINTENANCE AND RECOVERABILITY (SMR) CODE		A				A		Record B, Block 22
1420	TYPE OF CHANGE CODE (TOCC)		A				A		Record A, Block 3
1470	UNIT OF ISSUE (UI)		X				X		Record B, Block 18
1480	UNIT OF ISSUE CONVERSION FACTOR (UI CONVERSION FACTOR)		A				A		Record B, Block 20, Required if UI not equal to EA
1490	UNIT OF ISSUE/UNIT OF MEASURE CODE		A				A		
1500	UNIT OF ISSUE/UNIT OF MEASURE PRICE (UI/UM PRICE)		A				A		Record B, Unit of Issue Price=Block 19. Unit of Measure Price=Block 17 (only if UM is assigned).
1510	UNIT OF MEASURE (UM)		A				A		Record B, Block 16. Guidance for assignment provided at PGC.
1560	USABLE ON CODE (UOC)						A		Record D, Block 43
	USABLE ON CODE - DESIGN CHANGE						A		

SUPPLEMENTAL PROVISIONING DATA PRODUCTS

These Supplemental Data Products are not in the LMI Specification. See the narrative portion of this LMI Worksheet in the PMG for definitions and format requirements.

SDPDN	DATA PRODUCT TITLE	DATA PRODUCT DELIVERABLES							ADDITIONAL INFORMATION
		LLTIL	PPL	ISIL	TTEL	SCPL	DCN	SLPPL	
S005	ALTERNATE NATIONAL ITEM IDENTIFICATION NUMBER (ALTNIIIN)		A				A		1 A/N
S008	COMPONENT IDENTIFICATION DATA (CID) ^A		X				X		See the "Expanded Component Identification Data (CID) Format Table" Provided Below.
S009	CONTROL DATA		X				X		10 A/N
S017	LIST DATE SUBMITTED		X				X		8 N (MMDDYYYY)
S019	MINIMUM REPLACEMENT UNIT (MRU)/FAILURE FACTOR II		X				X		3 N

Figure (7) (Continued)
LMI Worksheet

		DATA PRODUCT DELIVERABLES							
DPDN	DATA PRODUCT TITLE	LLTIL	PPL	ISIL	TTEL	SCPL	DCN	SLPPL	ADDITIONAL INFORMATION
S020	NOMENCLATURE OR MODEL OR TYPE NUMBER		X				X		21 A/N
S021	PROCUREMENT INSTRUMENT IDENTIFICATION (PII INCLUDING PIIN/SPIIN)		X				X		19 A/N
S029	REPAIRABLE IDENTIFICATION CODE (RIC)		A				A		10 A/N

EXPANDED COMPONENT IDENTIFICATION DATA (CID) FORMAT TABLE

		DATA PRODUCT DELIVERABLES									
SDPDN	DATA PRODUCT TITLE	LLTIL	PPL	ISIL	TTEL	SCPL	DCN	SLPPL	SPS	ADV RIC	ADDITIONAL INFORMATION
HEADER DATA											
0870	PROVISIONING CONTRACT CONTROL NUMBER (PCCN)		X				X				6 A/N
S021	PROCUREMENT INSTRUMENT IDENTIFICATION (PII INCLUDING PIIN/SPIIN)		X				X				19 A/N
S020	NOMENCLATURE OR MODEL OR TYPE NUMBER		X				X				21 A/N
S009	CONTROL DATA		X				X				10 A/N
0140	PRIME COMMERCIAL AND GOVERNMENT ENTITY (CAGE CODE)		X				X				5 A/N
S031	SUBMISSION CONTROL CODE (SCC)		X				X				5 N
S017	LIST DATE SUBMITTED		X				X				6 A/N
S013	FORMAT INDICATOR		X				X				2 A/N
S016	1ST KEY PCCN		A				A				6 A/N
S016	2ND KEY PCCN		A				A				6 A/N
S029	REPAIRABLE IDENTIFICATION CODE (RIC)		A				A				10 A/N
S022	PROJECT TYPE		X				X				1 A
S007	CALCULATION		X				X				1 A
S028	REMARKS		A				A				43 X L; For Advance RICs, the submitter must identify Date Advance RIC was requested and Scheduled date for complete PTD to be provided to the NAVSEA TSA.
COMPONENT CHARACTERISTICS FILE (CCF) DATA											
S008	MFR		X				X				56 XL
S008	NAVCOM PLAN		A				A				56 XL

Figure (7) (Continued)
LMI Worksheet

SDPDN	DATA PRODUCT TITLE	DATA PRODUCT DELIVERABLES									ADDITIONAL INFORMATION
		LLTIL	PPL	ISIL	TTEL	SCPL	DCN	SLPPL	SPS	ADV RIC	
S008	MFR DWG		X				X				56 XL(HM&E/ORDNANCE ONLY)
S008	MFR ID		X				X				56 XL(HM&E/ORDNANCE ONLY)
S008	PATTERN NO		A				A				56 XL(HM&E/ORDNANCE ONLY)
S008	EQUIP SPEC		A				A				56 XL(HM&E/ORDNANCE ONLY)
S008	NSN		A				A				56 XL
S008	LAPL		A				A				56 XL (HM&E/ORDNANCE ONLY)
S008	MARK		A				A				56 XL (ORDNANCE ONLY)
S008	MODEL		A				A				56 XL (ORDNANCE ONLY)
S008	NHA		A				A				56 XL (ELECTRONICS ONLY)
S008	EIC		A				A				56 XL (ELECTRONICS ONLY)
S008	COMMERCIAL NOMEN		A				A				56 XL (ELECTRONICS ONLY)
S008	CONTRACT NO		A				A				56 XL (ELECTRONICS ONLY)
S008	SOURCE OF APL INFO		A				A				56 XL (ELECTRONICS ONLY)
S008	TECH MANUAL		A				A				56 XL (ELECTRONICS ONLY)
S008	PROV PARTS LIST		A				A				56 XL (ELECTRONICS ONLY)
S008	CHARACTERISTICS DATA		X				X				56 XL (UNLIMITED ENTRIES)
S008	TECHNICAL MANUAL NUMBER		A				A				56 XL
S008	CERTIFICATION DATA SHEET NO.		A				A				56 XL
	APPLICATION DATA										
S008	NEXT HIGHER ASSEMBLY (NHA)		X				X				25 XL
S008	NEXT LOWER ASSEMBLY (NLA)		A				A				25 XL
S008	NAVY HULL NOS./ACTIVITY UNIT IDENTIFICATION CODE (UIC)		X				X				6 XL
S008	NUMBER OF COMPONENTS		X				X				4 XL
S008	SERVICE APPLICATION DATA		X				X				32 XL
	CERTIFICATION DATA										
S008	POC DATA (NAME)		X				X				15 XL
S008	POC DATA (ORGANIZATION/CODE)		X				X				15 XL
S008	POC DATA (PHONE)		X				X				15 XL

General Material
CERTIFICATE OF IDENTICALITY

Part I. EQUIPMENT NOMENCLATURE _____ BIW VFID Number: _____

MUST fill in all lines marked "Supplier":

I hereby certify that material sold to BIW on:

Purchase Order # _____	P.O. Line Item _____	BIW
BIW Catalog # _____		BIW
Drawing # _____	Rev Level _____	Supplier
Manufacturer Name _____	Manuf P/N _____	Supplier
APL/CID/AEL # _____		Supplier

Applicable Qualification Requirements:

- Shock
 Vibration
 PTD
 EMI
 Eng. Dwgs.

Is **IDENTICAL** to the following items supplied to BIW/ISD on:

Purchase Order # _____	Line Item _____	Supplier
BIW Catalog # _____		Supplier
Ingalls Stock # _____		Supplier

Part II.

Government Shock Approval Letter * _____	Supplier
Government Vibration Approval Letter _____	Supplier
Test Report # _____	Laboratory _____ Supplier

* If the Government approval letter for shock is unknown, certification of the following statement will suffice:

I hereby certify that the above item was approved by the government for actual shock testing (**NOT SHOCK TEST EXTENSION**), but reference to the approval document serial number is unknown

_____ (signed by Eng. Mgr)

The Government approval letter serial number **MUST** be indicated if the item being used as basis of approval was qualified on the basis of shock test extension.

Part III.

Check appropriate block: EMI Qualification accomplished via:

- Exemption
 Extension
 Test
 Waiver

Part IV. MUST check one box:

- Identical in all respects
 Identical in all respects except as noted on reverse
 (attach additional sheets as necessary)

MUST be signed

_____	_____	_____
Date	Engineering Manager	Company

Bath Iron Works

A GENERAL DYNAMICS COMPANY

BIW Specification 072-04

Revision F

16 November 1999

HIGH IMPACT
SHOCK QUALIFICATION REQUIREMENTS
FOR LIGHTWEIGHT AND MEDIUMWEIGHT EQUIPMENT
(FOR GENERAL MATERIAL)

SPECIFICATION 072-04 CHANGE PAGE
DESCRIPTION OF CHANGE

REV		DATE
-	Initial Issue	2/26/86
A	<p>Page 2; Added new paragraph 2.1.4 invoking MIL-STD-789 for valves.</p> <p>Page 3; Added new paragraph 3.1.3 invoking MIL-STD-798 for shock extensions of valves.</p> <p>Page 3; Renumbered old paragraph 3.1.3 to 3.1.4.</p> <p>Page 3; Added new paragraph 3.1.1.1 to explain procedures for filling out Certificate of Identicality.</p> <p>Page 3; Paragraph 3.1.2; Added explanation for applicability of other contract shock approvals.</p> <p>Page 4; Paragraph 5.1; Added requirement for including shock test procedures and post shock test procedures in the shock test report.</p> <p>Page 5; Deleted paragraph 6.5 and renumbered paragraphs 6.6 and 6.7 as 6.5 and 6.6 respectively.</p> <p>Added Page 14 (sample of Certificate of identicality).</p>	1/05/87
B	<p>Page 1; Deleted paragraph 2.1.1 and 2.1.2 and renumbered paragraphs 2.1.3 and 2.1.4 respectively.</p> <p>Page 2; Revised paragraphs 2.1.3 and 3.1 for clarity.</p> <p>Page 3; Revised delivery schedules in paragraphs 3.1.4 and 4.0 for "60 days after contract award" "and not later than 60 days prior to the shock test" respectively to "in accordance with the delivery schedule shown on the P.O.".</p> <p>Page 4; Revised delivery schedule in 5.0 from "not later than 10 calendar days after any required post test but no longer than 30 calendar days after the completion of the shock test" to "in accordance with the delivery schedule shown on the P.O.".</p> <p>Page 4; Deleted paragraph 6.1.</p> <p>Page 4; Revised paragraph 6.2 and 6.3 deleting Buyer responsibility statements and renumbered paragraphs 6.2 through 6.6 respectively.</p> <p>Pages 5 - 42; Revised paragraph 7.0 in its entirety which modifies MIL-S-901.</p>	7/22/91

SPECIFICATION 072-04 CHANGE PAGE
DESCRIPTION OF CHANGE

REV		DATE
C	Page 4; Revised paragraph 5.2. Page 5 - 7; Revised paragraph 7.0.	01/27/92
D	Page 1; Paragraph 3.1.a; deleted last sentence and substituted new last sentence; deleted "(b)" after 3.2.2 and deleted "as modified herein." Page 2; Paragraph 3.1.b deleted "(c)" after 3.2.2 and deleted "as modified herein."; paragraph 3.1.c was deleted in its entirety and a new paragraph 3.1.c was added; and in paragraph 3.1.1 the reference page number for the COI was deleted and Figure 1 was substituted. Page 3; Paragraph 4.1, deleted "4.2.4 and 6.1" and "as modified herein," and substituted "6.2"; and paragraph 4.2 and 4.3 were rewritten in their entirety and paragraph 5.1 was rewritten in its entirety. Page 4; Paragraph 7.0 was rewritten. Page 5, 6, 7 and 8 were deleted in their entirety. Page 9 is renumbered to be Page 5. The word "Seller" was substituted for the word "Supplier".	03/14/95
E	Page 5, Revised COI form to add "Manufacturer Name, Manufacturer P/N, and Eng. Dwgs."	09/29/95
F	Page 2, para. 3.1.1 deleted reference to Figure 1 Page 5, replaced Figure 1 with COI form.	11/16/99

1.0 Shock Objectives

- 1.1 It is the requirement of these specifications to provide equipment for a ship which will complete all assigned missions while operating in the shock environment caused by non-contact underwater explosions. To accomplish this end, many equipments aboard ship are designed either shock Grade A, or Grade B, in accordance with the mission requirements of the ship and qualified to the requirements of MIL-S-901D as modified herein. Where military or other applicable Government specifications require shock protection for other purposes (such as for transportation shock), the requirements of such specifications shall also apply. Where MIL-S-901 is referenced herein, the effective edition is revision D dated 17 March 1989.
- 1.2 In the event of conflict between this specification and the documents referenced in the purchase order, the requirements of this specification shall take precedence.

2. Shock Qualification Methods

Grade A and B equipment shall be shock qualified by test or extension.

2.1 Test

Unless otherwise specified, Grade A and B items shall be shock qualified by shock testing in accordance with MIL-S-901. The Seller shall submit a shock test report in accordance with MIL-S-901 to the Buyer for approval for all shock tested items.

2.1.1 Resiliently Mounted Systems

Items which were originally shock tested in a rigidly mounted configuration may be installed upon Distributed Isolation Material (DIM) without further testing. The mounting used during the shock test shall be discarded and replaced with new mounts prior to shipboard installation. The resilient mounts used for shock testing shall be furnished by the Seller. Shock mountings (resilient mounts expressly intended to mitigate shock loadings) shall not be employed unless specifically approved by the Buyer. Equipment requiring other resilient mounting integral to the equipment shall be tested as supplied.

2.1.2 Shock testing of valves shall meet the requirement of MIL-STD-798, including sizes to be tested, positions and pressure conditions, and post shock testing.

3.0 Identical and Similar Shock Test Extension

- 3.1 For items which are candidates for either identical or similar extension, the Seller shall provide the proper documentation to the Buyer for approval. The extension request shall include supporting evidence as follows:
- a. In case where an item is certified as identical to a previously shock tested and Government approved item, the extension request shall include the information required by paragraph 3.2.2 of MIL-S-901. In addition, the request for shock test extension shall reference the original shock test report (plus any post test reports), shall identify the facility which conducted the shock test, and shall reference Government correspondence which approved the item from a shock standpoint.

- b. In cases where the design of an items is certified identical to that of an item which was previously approved by the Government on the basis of shock test extension, the request must include the information required by paragraph 3.2.2 of MIL-S-901. To clearly show identity and qualification, the Seller shall provide legible copies of the original test report on which the extension was based, post shock test inspection reports (if applicable), and the Government approval letters for the original test and the extension request.
 - c. In cases where the design of an item is similar but not identical to that of a previously shock tested and approved item, the request for extension of approval shall be accompanied by the following supporting evidence, as appropriate:
 1. Detail drawings of tested and untested items.
 2. A copy of the shock test and post shock test reports upon which the requested extension is based.
 3. A detailed comparison of the difference in material and design showing that the untested item on its foundation has equal or greater shock resistance than the tested item on its foundation.
- 3.1.1 A Certificate of Identity must be provided to the Buyer from the Seller in 3.1 (a), or (b) above, certifying that the equipment being furnished under this purchase order is identical in all respects to that previously approved by the Government. The Seller shall complete all applicable lines of the Certificate of Identity provided at the end of this specification. Where a line is not applicable to the equipment being furnished, "N.A." shall be entered on that line. An original copy of the Certificate of Identity, signed by the Seller's Engineering Manager, shall be provided to the Buyer.
 - 3.1.2 Equipment previously approved for another contract does not necessarily satisfy the requirements of this contract. Variations in hold down means, loading, test conditions, orientation, and post shock reporting requirements may be cause for rejection. Additionally, equipment approved for shock prior to 1 January 1984 may not satisfy the requirements of this contract if revisions to the military specification for the item have occurred subsequent to the approval. Equipment so affected may not be useable as the basis for identical or similar extension requests. If the extension request is inadequate or if the Government disapproves the submittal, qualifications by shock testing will be required.
 - 3.1.3 Shock test extension of valves shall meet the criteria for extension as specified in MIL-STD 798.
 - 3.1.4 The request for similar extension shall be submitted in accordance with the schedule listed on the P.O. and 30 days after any configuration change. It shall be typed in the Seller's format on 8-1/16" x 11" sheets and eight (8) copies submitted.

4.0 Shock test Procedure

If equipment is to be shock qualified by testing, a shock test procedure shall be submitted by the Seller. Two (2) copies of the shock test procedure shall be submitted to the Buyer in accordance with the schedule listed on the P.O. The procedures must be approved by the Buyer prior to testing. The Buyer shall be notified at least fifteen (15) days in advance of shock test.

- 4.1 The shock test procedure shall be in accordance with Paragraph 6.2 of MIL-S-901.
- 4.2 The shock testing facility shall be listed in NAVSEA INST 9491.1.
- 4.3 Post shock test functional testing and inspection procedures shall be submitted with the shock test procedures and shall cover in detail the tests specified in Paragraph 3.1.9.1 and 3.1.9.2 of MIL-S-901. The requirements for post shock test functional testing and inspection of Grade A shock resistant equipment shall be specified in the applicable Military Specification of the item provided the minimum requirements of MIL-S-901 are met. In the event the requirements are not included in the applicable specification, the contractor or Vendor shall prepare such requirements for the equipment and shall include these requirements, including associated acceptance criteria, in the test report.
- 4.4 The procedures shall be in the Seller's format on 8-1/2" x 11" paper.

5.0 Shock Test Report

A shock test report shall be submitted in accordance with MIL-S-901 as modified herein and seven (7) copies submitted to the Buyer in accordance with the delivery schedule shown on the P.O..

- 5.1 A test report of all shock tested equipment shall be in accordance with U.S. Government Data Item Description (DID) form number DI-ENVR-80708 "Shock Test Report" as required by MIL-S-901, and shall be submitted to the Buyer for approval. The shock test report shall not be combined with vibration test reports and shall be submitted as an individual document.
- 5.2 The report shall be in the Seller's format on 8-1/2" x 11" sheets.

6.0 Miscellaneous Information

- 6.1 The fact that Seller furnished equipment may be covered by NAVSEA standard drawings or Government specifications does not exempt the Seller from his responsibility to meet the shock requirements of this specification.
- 6.2 Items listed on "Qualified Products List" (QPL's) do not necessarily satisfy the shock requirements contained herein.
- 6.3 In cases where the purchase order references standard drawings or other approved documents which specifically identify a given design as meeting the shock requirements of this specification, the design may be used as a basis for shock qualification extension action under the procedures herein.
- 6.4 Whenever fitted bolts are employed as the hold down means aboard ship, the use of slightly undersized bolts fitted in undersized holes during the shock test of an item is permitted. Upon completion of a satisfactory shock test, the bolt holes should be enlarged to the proper diameter as shown on the drawings. Hold-down bolts used in a shock test shall be specified by the Buyer.
- 6.5 The mediumweight shock testing machine may be used to shock qualify lightweight equipment and their foundations.

7.0 Modifications to MIL-S-901

MIL-S-901D dated 17 March 1989 shall be modified as follow:

Page 25, Paragraph 3.1.11, Add new subparagraph (d) as follows:

"(d) In cases where corrective design modifications can be demonstrated to correct the deficiencies, the Seller may submit, for acceptance authority approval, a recommendation that the item be accepted as shock qualified without further testing. Approval will be based on a review, by the government acceptance authority, of calculations and rationale provided by the Seller which substantiate the adequacy of the proposed corrective design change(s)."

General Material
CERTIFICATE OF IDENTICALITY

Part I. EQUIPMENT NOMENCLATURE _____ BIW VFID Number: _____

MUST fill in all lines marked "Supplier":

I hereby certify that material sold to BIW on:

Purchase Order #	_____	P.O. Line Item	_____	BIW
BIW Catalog #	_____			BIW
Drawing #	_____	Rev Level	_____	Supplier
Manufacturer Name	_____	Manuf P/N	_____	Supplier
APL/CID/AEL #	_____			Supplier

Applicable Qualification Requirements:

- Shock
- Vibration
- PTD
- EMI
- Eng. Dwgs.

Is **IDENTICAL** to the following items supplied to BIW/ISD on:

Purchase Order #	_____	Line Item	_____	Supplier
BIW Catalog #	_____			Supplier
Ingalls Stock #	_____			Supplier

Part II.

Government Shock Approval Letter *	_____	Supplier
Government Vibration Approval Letter	_____	Supplier
Test Report #	_____	Laboratory _____ Supplier

* If the Government approval letter for shock is unknown, certification of the following statement will suffice:

I hereby certify that the above item was approved by the government for actual shock testing (**NOT SHOCK TEST EXTENSION**), but reference to the approval document serial number is unknown

_____(signed by Eng. Mgr)

The Government approval letter serial number **MUST** be indicated if the item being used as basis of approval was qualified on the basis of shock test extension.

Part III.

Check appropriate block: EMI Qualification accomplished via:

- Exemption
- Extension
- Test
- Waiver

Part IV. MUST check one box:

- Identical in all respects
- Identical in all respects except as noted on reverse
(attach additional sheets as necessary)

MUST be signed

_____	_____	_____
Date	Engineering Manager	Company

Bath Iron Works

A GENERAL DYNAMICS COMPANY

BIW Specification 073-04

Revision F

16 November 1999

VIBRATION (TYPE I) QUALIFICATION REQUIREMENTS
(FOR GENERAL MATERIAL)

SPECIFICATION 073-04 CHANGE PAGE
DESCRIPTION OF CHANGE

REV		DATE
-	Initial Issue	
A	<p>Deleted Paragraph 1.2 and renumbered Paragraph 1.3.</p> <p>Paragraph 3.1.3, line 2; substituted "any" for "and" and "the Seller's equipment" for "an assembly".</p> <p>Added new Paragraph 3.1.6</p> <p>Added new Paragraph 3.2.3.1.</p> <p>Deleted Subparagraph 3.5.1.c.</p> <p>Paragraphs 3.6.2, 4.1.d, and 4.2.c; deleted requirement of copies to be sent to Gibbs & Cox.</p> <p>Added new Subsection 4.1.a.6 and renumbered subsequent subsections.</p> <p>Added new Paragraph 6.2.</p>	01/05/87
B	<p>Deleted Paragraph 1.2 and renumbered Paragraph 1.3.</p> <p>Page 1; deleted Paragraph 1.0 and 2.0 and revised Paragraphs 3.1.1 and 3.1.2 for clarity.</p> <p>Page 2; deleted Paragraphs 3.1.2, 3.1.4 and 3.1.6 and revised Paragraphs 3.1.1 and 3.1.2 for clarity.</p> <p>Page 2; deleted Paragraphs 3.1.3, 3.1.4 and 3.1.6 and revised Paragraph 3.1.5 deleting Buyer responsibility statement.</p> <p>Page 3; deleted Paragraphs 3.4 and 3.5.</p> <p>Page 4; revised delivery schedule on Paragraph 3.6.1 from "not later than 45 days after contract award" to "in accordance with the delivery schedule shown on the P.O.".</p> <p>Page 4; deleted Paragraphs 3.7 and 3.8.</p> <p>Page 5; revised delivery schedule on step 15c from "60 days prior to each test" and " due 20 days after receipt of Buyers comments" to "in accordance with the delivery schedule shown on the P.O." and "also due in accordance with the delivery schedule listed on the P.O." respectively.</p> <p>Page 6; deleted steps g and h.</p> <p>Page 7; revised delivery schedule from "not later than 10 calendar days after any required post test evaluations and no longer than 30 calendar days after completion of the vibration test" to "in accordance with the delivery schedule shown on the P.O.".</p> <p>Page 8; deleted Certificate of Identicality figure.</p>	07/22/91

SPECIFICATION 073-04 CHANGE PAGE
DESCRIPTION OF CHANGE (Con't)

REV		DATE
B (Cont.)	Pages 1 - 8; renumbered paragraphs throughout as appropriate.	07/22/91
C	Revised format	1/27/92
D	Revised format from "Wang" to "Word". Page 6, revised the word "Supplier" to "Seller".	03/14/95
E	Page 2, revised the word "Supplier" to "Seller", and revised Paragraph 2.2.3.1 to refer to "Figure 1" in lieu of "Page 6". Page 6, revised COI form to add "Manufacturer Name, Manufacturer P/N, and Eng. Dwgs".	09/29/95
F	Page 2, para. 2.2.3.1 deleted reference to Figure 1 Page 5, replaced Figure 1 with COI form.	11/16/99

1.0 Vibration Type I Requirements

The mechanical vibration requirement for all machinery and equipment shall be as specified in MIL-STD-167-1 (SHIPS). In addition, machinery and equipment shall withstand the effects of the Ship's vibration without suffering any degradation of safety or capability. Where MIL-STD-167-1 is referenced herein, the effective edition is that edition dated 1 May 1974.

2.0 Vibration Qualification Methods

All machinery and equipment will be vibration qualified by test, identical extension, or similar extension.

2.1 Test, Type I Vibration

- 2.1.1 Equipment shall be tested to meet the requirements of MIL-STD-167 for Type I Vibration from 4 to 15 Hz.
- 2.1.2 Equipment shall be vibration tested without the use of resilient mounts.
- 2.1.3 Items listed in "Qualified Products Lists" (QPL's) do not necessarily satisfy the vibration requirements contained herein.

2.2 Identical Extension, Type I Vibration

The request for extension shall be submitted in accordance with one of the following procedures.

- 2.2.1 In cases where an item is certified identical to previously tested and approved item, the extension request shall identify the approved item by assembly drawing number and revision level, shall include a copy of the original test report (plus any post test report), shall identify the facility which conducted the vibration test and shall include the Government correspondence which approved the item for vibration. In cases where the vibration approval for the item was not granted by the Government, the request for extension shall include a copy of the correspondence which approved the item for vibration.
- 2.2.2 In cases where the design of an item is certified identical to that of an item previously approved on the basis of vibration extension, the extension request shall include all of the information required by Paragraph 2.2.1 of this specification and shall include a copy of the original extension approval correspondence. If the original extension approval was granted by the Government, the Government correspondence granting the vibration approval shall be included.
- 2.2.3 A Certificate of Identity must be provided to the Buyer from the Seller when requesting an extension in accordance with the requirements of Paragraphs 2.2.1 or 2.2.2.

2.2.3.1 The Seller shall complete all applicable lines of the Certificate of Identity provided at the end of this specification. Where a line is not applicable to the equipment being furnished, "N/A" shall be entered on that line. An original copy of the Certificate of Identity, signed by the Seller's Engineering Manager, shall be provided to the Buyer.

2.3 Similar Extension, Type I Vibration

In cases where the design of an item is similar but not identical to that of a previously vibration tested and approved design, or in cases where the intended variation in service, or installation is significant from a vibration standpoint, the extension request shall include:

- a. Detail drawings of the tested and untested items.
- b. A copy of the approved report of the vibration test upon which the requested extension is based, and a copy of the Government correspondence which approved the original item for vibration. If the item was never approved by the Government, the correspondence of the activity that approved the item must be submitted.
- c. A detailed comparison of the differences in material and design showing that the untested item on its foundation has equal or greater vibration resistance than the tested item on its foundation.

2.4 Extension Requests, Type I Vibration

2.4.1 In those cases where extension from vibration testing is desired, a request shall be submitted to the Buyer for approval. The request is to be submitted in accordance with the delivery schedule shown on the P.O. or 30 days after any configuration change.

2.4.2 The Seller shall submit to the Buyer two (2) copies of extension requests typed in seller format on 8-1/2" x 11" paper.

3.0 Detail Reporting Requirements

3.1 Test procedures require Buyer approval prior to testing. Test procedures shall be in accordance with MIL-STD-167-1 and as outlined below:

Preparation Instructions

- a. The Seller shall prepare and submit a test procedure for each test to be conducted on the equipment and subsystems under his cognizance. Each test procedure shall provide detailed plans, procedures, and requirements for testing the equipment or subsystem. Spaces shall be provided for recording test results and completion certification. The procedures shall be prepared containing (but not limited to) the following:
1. Title.
 2. Identification number, revision and date of test procedure.
 3. Identification of item(s) being tested by assembly drawing and parts list numbers and revision levels.
 4. Test objectives.
 5. Description of test.
 6. Acceptance and rejection criteria.
 7. Test configuration including a sketch or diagram of the test setups showing connection and input and output conditions.
 8. Detailed step-by-step test procedures including explanation of any deviations from applicable standards.
 9. Instrumentation required.
 10. Data to be recorded and data sheets.
 11. Test equipment required, identified by name, make, and model number.
 12. Logistics equipment required.
 13. Facilities.
 14. Operating conditions of equipment during the test.
- b. If changes occur, the revised test procedure shall be submitted to the Buyer for approval.
- c. Test procedures are to be submitted to the Buyer in accordance with the delivery schedule shown on the P.O.
- d. Two (2) final copies of the approved test procedure shall be submitted to the Buyer prior to testing.
- e. Buyer shall be notified at least 21 working days prior to the actual test date.

- 3.2 Test reports shall be prepared in accordance with MIL-STD-167-1 and as outlined below:
- a. The report shall contain details of the test including but not limited to, the following:
 - 1. Test setup fixtures and special mounting, including clear photographs or sketches of each setup.
 - 2. Instrumentation and calibration dates.
 - 3. Required test levels.
 - 4. Mode of operation.
 - 5. Limiting parameters such as the number of orders of vibration for rotating equipment.
 - b. The report shall contain inspection procedures to ensure that a satisfactory unit was tested and to determine failures, if any, that were caused as a result of testing.
 - c. The report shall describe test induced failures, if any, and corrective actions to the equipment prior to retest, if required.
 - d. The report shall demonstrate that the item was subjected to the prescribed test levels for the appropriate length of time as specified in MIL-STD-167-1.
 - e. The report or report supplements shall document any subsequent vibration testing, if required. This subsequent testing would be caused by equipment or instrumentation malfunction or equipment modification resulting from test failures.
 - f. The modifications and the subsequent vibration testing if required, that demonstrate compliance with the purchase order requirements shall be described in detail.
 - g. The report shall be in the Seller's format on 8-1/2" x 11" sheets. Two (2) copies are to be submitted to the Buyer for each test.
 - h. Reports shall be submitted to the Buyer in accordance with the delivery schedule shown on the P.O.

4.0 Instrumentation Calibration

- 4.1 A laboratory calibration of all instrumentation used in performing vibration tests shall have been performed within one year of performing the tests. The calibration of instrumentation shall be traceable to the National Bureau of Standards.

5.0 Note for Drawing

It is recommended that for equipment which meets the requirements specified herein and has been approved for vibration (Type I), the following notation on the assembly drawing be included:

- (a) "Vibration (Type I) qualified"
- (b) Basis of acceptance (test, extension, or exemption)
- (c) Reference to approval correspondence

General Material
CERTIFICATE OF IDENTICALITY

Part I. EQUIPMENT NOMENCLATURE _____ **BIW** VFID Number: _____

MUST fill in all lines marked "Supplier":

I hereby certify that material sold to BIW on:

Purchase Order #	_____	P.O. Line Item	_____	BIW
BIW Catalog #	_____			BIW
Drawing #	_____	Rev Level	_____	Supplier
Manufacturer Name	_____	Manuf P/N	_____	Supplier
APL/CID/AEL #	_____			Supplier

Applicable Qualification Requirements:

- Shock
- Vibration
- PTD
- EMI
- Eng. Dwgs.

Is **IDENTICAL** to the following items supplied to BIW/ISD on:

Purchase Order #	_____	Line Item	_____	Supplier
BIW Catalog #	_____			Supplier
Ingalls Stock #	_____			Supplier

Part II.

Government Shock Approval Letter *	_____	Supplier
Government Vibration Approval Letter	_____	Supplier
Test Report #	_____	Laboratory _____ Supplier

* If the Government approval letter for shock is unknown, certification of the following statement will suffice:

I hereby certify that the above item was approved by the government for actual shock testing (**NOT SHOCK TEST EXTENSION**), but reference to the approval document serial number is unknown

_____(signed by Eng. Mgr)

The Government approval letter serial number **MUST** be indicated if the item being used as basis of approval was qualified on the basis of shock test extension.

Part III.

Check appropriate block: EMI Qualification accomplished via:

- Exemption
- Extension
- Test
- Waiver

Part IV. MUST check one box:

- Identical in all respects
- Identical in all respects except as noted on reverse
(attach additional sheets as necessary)

MUST be signed

_____	_____	_____
Date	Engineering Manager	Company

Bath Iron Works

A GENERAL DYNAMICS COMPANY

BIW Specification 406-01

Revision J

16 November 1999

ELECTROMAGNETIC INTERFERENCE

(EMI)

QUALIFICATION REQUIREMENTS

(FOR GENERAL MATERIAL)

SPECIFICATION 406-01 CHANGE PAGE
DESCRIPTION OF CHANGE

REV		DATE
-	Initial Issue	12/20/85
A	Add specific equipment	03/28/86
B	Add additional equipment	05/07/87
C	Define UM05 Limits	04/17/89
D	Modify "E" Flag on Catalog Page to Code "4" for Items Requiring EMC Qualification	03/15/90
E	Revised Paragraph 1.0 substituting SDRL Codes for Level Requirement Codes Deleted Paragraph 4.2 in its entirety Revised Paragraph 5.1 for clarity Deleted Paragraph 6.2 in its entirety Revised delivery schedule on Paragraph 7.0 from "within 30 calendar days after the completion of the EMI test" to "in accordance with the schedule listed on the P.O." Revised Paragraph 8.2 deleting the QPL testing in accordance with MIL-STD-461B statement Deleted Paragraph 8.4 and 8.5 in their entirety Deleted definitions page	07/22/91
F	Revised Paragraph 2.0, 4.0, 6.0, 7.0 & Table E3. Revised Paragraph 5.1.4 to allow qualification extensions base on a Certificate of Identicality (COI) and added Figure 1.	01/29/92
G	All pages, substituted the word "Seller" for the word "Supplier". Deleted "B" from the revision of MIL-STD-461. Page numbers were added to all pages. Page 1, Paragraph 1.0, added "Class" after DDG 51, and deleted "A copy of this specification is to become part of the purchase order for those BIW catalog numbers with a T014, T015 or T034 in the SDRL code."; Paragraph 2.0.a, deleted "B, or alternately MIL-STD-461C", and substituted "C, Where 1986."; Paragraph 2.0.a, changed Roman number "II" to "2"; and Paragraph 2.0.c deleted "below" and substituted "of this specification". Page 10, reformatted Table E2 Page 13, added "Figure 1" to the bottom of the page.	03/14/95

SPECIFICATION 406-01 CHANGE PAGE
DESCRIPTION OF CHANGE

REV		DATE
J	Page 3, para. 5.1.4 deleted reference to Figure 1. Page 13, replaced Figure 1 with COI form.	11/16/99

1.0 PURPOSE

This specification defines the Electromagnetic Compatibility (EMC) requirements for DDG 51 Class General Material purchased by BIW. General material required to be EMC qualified is identified by a T014, T015 or T034 SDRL Code on the P.O. The objective of these requirements is to provide equipment for a ship to allow it to complete all assigned missions while operating in a shipboard electromagnetic environment.

2.0 EMI QUALIFICATION METHODS

All electrical and electronic equipment, with the exception of galley and laundry equipment, shall be qualified as meeting the electromagnetic emission and susceptibility requirements of MIL-STD-461C. Where MIL-STD-461 is referenced herein, the effective edition is revision C dated August 4, 1986. The Seller is responsible for all testing, documentation and equipment modifications necessary to meet these requirements. EMI qualification may be obtained as follows:

- a. Qualification by Exemption - The Seller may request qualification by exemption for equipment which is inherently interference free.
(See Table E-2) A written request for qualification by exemption shall be included supporting technical documentation on the proposed equipment and the rationale for exemption.
- b. Qualification by Extension - Equipment which has been previously tested and certified as meeting the EMI test limits or MIL-STD-461C, any previous revision of MIL-STD-461, or the superseded specification MIL-I-16910, may be acceptable without retest. A written request for qualification by extension shall include a copy of the EMI test report and approval.
- c. Qualification by Test - Equipment which can not get approved by exemption or extension shall be tested to demonstrate compliance with the requirements of MIL-STD-461. Equipment which contains solid state devices shall be tested to Part 5. Equipment which does not contain solid state devices may be tested to Part 10 (see Para. 4 of this specification).

Equipment which is required to be built to a Navy supplied drawing, or equipment which is specified by make and model number, shall be tested and the test report furnished. The equipment shall not be modified to pass the specified tests.

In addition to these general requirements, there are additional requirements for specific pieces of equipment as noted in Para. 9.0.

3.0 EMI CATEGORIES

EMI is divided into the two major categories of conduction and radiation. Test may be performed in each category to determine how much energy an equipment emits that could cause EMI to other equipment, and to determine how susceptible a piece of equipment is to interference. Both emission and susceptibility tests are divided into two types; radiated and conducted tests. This classification is thus:

3.1 Emissions Tests

- 3.1.1 Radiated Emissions
- 3.1.2 Conducted Emissions

3.2 Susceptibility Tests

- 3.2.1 Radiated susceptibility
- 3.2.1 Conducted susceptibility

4.0 EMI QUALIFICATION REQUIREMENTS

4.1 Test All electrical and electronic equipment shall meet the requirement of MIL-STD-461 as follow.

4.1.1 Electrical equipment that does not contain solid state components shall meet the requirements of MIL-STD-461 Part 10 (Class C3 Commercial). Equipment is classed in one of three groups. Table E-2 contains examples.

4.1.2 Diodes which are only used for transient, arc, or EMI suppression will not be considered as solid state devices.

4.1.3 Unregulated rectifiers, in which the only solid state devices are the rectifier diodes, will not be considered as containing solid state devices requiring a Part 5 test. Such rectifiers may be tested under Part 10.

Group I - The above equipment must meet the levels of MIL-STD-461 Part 10 Test UM05 for conducted and radiated emissions. Table E-1 describes this test.

Group II - There are no emissions requirements for Group II equipment. However, because this equipment can potentially cause EMI problems with equipment that is susceptible, a label or sign shall be affixed to Group II equipment stating:

WARNING

DO NOT OPERATE WITHIN 30 METERS (100 FEET) OF ELECTRONIC EQUIPMENT OR SUBSYSTEMS OR ASSOCIATED ANTENNAS.

Group III - These are electrical and electromechanical equipments which are usually interference free. Written approval to forego emissions testing may be obtained from the Buyer. Sufficient information on the equipment and reasons for foregoing tests shall be forwarded to the Buyer. If the Buyer determines that the equipment must be tested, then it shall meet the limits of MIL-STD-461 Part 10 Test UM05. (Table E-1 defines UM05 tests for DDG 51 program).

4.1.2 Equipment containing solid state components shall meet the requirements of the following tests of MIL-STD-461, Part 5 (Class A4 Surface Ship):

<u>Emissions</u>	CE01	RE01
	CE03	RE02
<u>Susceptibility</u>	CS01	RS01
	CS02	RS02
	CS06	RS03 (see Note 1 below)

These tests are summarized in Table E-1.

Note 1: The limits for the radiated susceptibility test RS03 of MIL-STD-461 Part 5 Para 18.2 shall be replaced with the limits shown in Table E-3.

5.0 IDENTICAL AND SIMILAR EMI TEST EXTENSIONS

5.1 For items which are candidates for either identical or similar extension, the Seller shall provide the proper documentation to the Buyer for approval. The extension request shall include supporting evidence as follows:

5.1.1 Previously tested and certified equipment that has met the EMI test limits of previous revisions of MIL-STD-461, or the superseded specification MIL-I-16910, may be acceptable without re-test upon delivery of an EMI certification, and a copy of the EMI test report and test plan. Equipment that has been previously deemed acceptable by waiver will not be automatically accepted. The Buyer, in these cases, shall determine if further tests are required.

5.1.2 In cases where an item is certified to be identical to a previously EMI tested and Government approved item, the extension request shall include a copy of the EMI test plan and test report.

5.1.3 In cases where the design of an item is similar but not identical to that of a previously EMI tested and approved item, the request for extension shall include installation drawing, electrical schematic and a copy of the previous EMI test plan, test procedure and a copy of successful EMI qualification test report.

5.1.4 Equipment which is identical to that provided, and EMI qualified on a previous order, will be qualified by extension on all additional orders for the same item. Extensions to a Seller's EMI qualification will be granted by the Buyer based on a Certificate of Identity (COI) for the equipment supplied by the Seller. The COI must be provided to the Buyer from the Seller and certify that the equipment being furnished under this purchase order is identical in all respects to that previously approved by the Government. The Seller shall complete all applicable lines of the COI provided at the end of this specification. Where a line is not applicable to the equipment being furnished, "N.A." shall be entered on the line. An original copy of the COI, signed by the Seller's Engineering Manager, shall be provided to the Buyer.

6.0 EMI TEST PLAN

If equipment is to be EMI qualified by testing, an EMI test plan shall be prepared by the Seller. Four (4) copies of the EMI test plan shall be submitted to the Buyer not later than 60 days prior to the EMI test. Test plans must be approved by the Buyer prior to testing.

- 6.1 The EMI test plan shall be in accordance with MIL-STD-462 and MIL-STD-461 as modified herein.
- 6.2 Where a breakdown in subassemblies for EMI testing is proposed, as opposed to a testing of the complete system or principal unit, the following descriptive data shall be a part of the test plan:
 - 6.2.1 Proposed breakdown of system or principal components.
 - 6.2.2 Proposed method simulation of actual shipboard installations.
 - 6.2.3 Proposed method for analysis of interface items such as conductors and connectors.
 - 6.2.4 The test plan must be approved by the Buyer prior to the test.
- 6.3 In addition, the test plan shall include a complete description of the equipment to be tested, including block and/or circuit diagrams. The Seller shall certify that equipment to be tested to MIL-STD-461 Part 10, does not contain solid state devices. Where the Seller desires to obtain EMI qualification by exemption or extension, a request, with supporting data, may be submitted.

7.0 EMI REPORTS

An EMI test report shall be completed in accordance with MIL-STD-461 and four (4) copies submitted to the Buyer within 30 calendar days after the completion of the EMI test. The Buyer shall be notified at least fifteen (15) working days in advance of EMI tests. The report shall include all the items required by MIL-STD-462 and MIL-STD-461 as modified herein.

- 7.1 Where required the Seller shall provide the Buyer with an Electromagnetic Compatibility (EMC) Control Plan.
- 7.2 The Seller shall provide the Buyer with an EMI test plan prior to conducting any tests. This plan must be approved by the Buyer prior to the tests being conducted.
- 7.3 The Seller shall provide the Buyer with an EMI Test Report on completion of the test.
- 7.4 Where the Seller's equipment is unable to pass required MIL-STD-461 emission testing, the test report shall include a complete discussion of all testing conducted, the efforts made in attempt to pass tests, the rationale for why the proposed equipment cannot meet EMI requirements, and a waiver request in accordance with contract requirement. Failures of susceptibility tests will not be waived. The Buyer reserves the right to reject any EMI test failures.

- 7.5 The test report shall be clearly readable and understandable, including all graphs. Unless copies are clearly readable, photographs shall be original prints.
- 7.6 The test report shall include the Seller's certification that the equipment as furnished to the Buyer is of the same configuration as was EMI tested.

8.0 EMI MISCELLANEOUS INFORMATION

- 8.1 The fact that Seller furnished equipment is designed and built to NAVSEA standard drawings or Government specifications does not exempt the Seller from his responsibility to meet the EMI requirements of this specification. If Government specified equipment or equipment designed and controlled by the Government must be EMI qualified by testing, any modifications necessary to satisfy the test criteria will be incorporated via an ECP.
- 8.2 Items listed on "Qualified Products List" (QPLs) do not necessarily satisfy the EMI requirements contained herein. However, if the QPL requires testing in accordance with MIL-STD-461 then no other EMI testing is required.
- 8.3 In cases where documents identify a given design as meeting the EMI requirements of this specification, this design may be used as a basis for EMI qualification extension action under the provisions of Section 5.0.
- 8.4 EMI qualification data for all equipment and components covered by this specification shall be prepared by the Seller.

9.0 REQUIREMENTS FOR SPECIFIC EQUIPMENT

The following equipment shall meet the requirements of MIL-STD-461 as described in the following paragraphs.

- 9.1 Electric Temperature Indicators: Devices that contain solid state components shall meet the requirements of MIL-STD-461, Part 5 (Class A4 Surface Ships) for the following tests:

Emissions

CE01	RE01
CE03	RE02

Susceptibility

CS01	RE01
CS02	RE02
CS06	RS01
CS09	RS02
	RS03

In addition, for RS03 and between frequencies of 14 kHz and 18 GHz, the electric field strength test level shall be 10 v/m. Also CS02 shall be met as specified except as follow:

- 9.1.1 At frequencies between 2 MHz and 30 MHz the full output of the generator (source impedance of 50 ohms, and an output capability of 12.25 volts rms or 3 watts when connected to 50 ohms) shall be applied to all power and signal leads of the test sample.
 - 9.1.2 The calibrating resistor or 50-ohm load, shown in the CS02 test block diagram of MIL-STD-462, shall not be connected during the test.
 - 9.1.3 The test sample output signal shall not vary, more than an amount equal to the static error associated with the accuracy of the transducer under test.
- 9.2 Electrical Pressure Transducers - These devices shall meet the requirements of MIL-STD-461, Part 5, (Class A4 Surface Ships), and Part 6 (Class A5 Submarines) for the following test.

Emissions

CE01	RE01
CE03	RE02

Susceptibility

CS01	RS01
CS02	RS02
CS06	RS03
CS09	

In addition, for RS03 and between frequencies of 14 kHz and 18GHz, the electric field strength test level shall be 10 v/m. Also CS02 shall be met as specified except as follow:

- 9.2.1 At frequencies between 2 MHz and 30 MHz the full output of the generator (source impedance of 50 ohms, and an output capability of 12.25 volts rms or 3 watts when connected to 50 ohms) shall be applied to all power and signal leads of the test sample.
- 9.2.2 The calibrating resistor or 50-ohm load, shown in the CS02 test block diagram of MIL-STD-462, shall not be connected during the test.
- 9.2.3 The test sample output signal shall not vary, more than an amount equal to the static error associated with the accuracy of the transducer under test.

- 9.3 Current Time Sensing and Signaling Devices: CTS's shall meet the requirements of MIL-STD-461, Part 5, (Class A4 Surface Ships) for the following test.

Emissions

CE01	RE01
CE03	RE02

Susceptibility

CS01	RS01
CS02	RS02
CS06	RS03

- 9.3.1 Compliance with requirements shall be demonstrated by performing these tests in accordance with an approved EMI test plan. All interface cables shall be simulated using system integration configuration and length. The output control lines are defined as critical test points and shall be monitored during all susceptibility tests. To verify that proper EMI considerations have been incorporated in the current time sensing device, an EMI control plan shall be submitted to the Buyer by the Seller.

- 9.4 Spinning Windows - These devices shall meet the requirements of MIL-STD-461, Part 5 (Class A4 Surface Ships) for the following tests:

Emissions

CE03	RE01
	RE02

- 9.4.1 Compliance to requirements shall be demonstrated by performing these tests in accordance with an approved EMI test plan.

- 9.5 Fixed, non-icing windows including temperature controllers: These windows and temperature controllers shall meet the requirements of MIL-STD-461, Part 5 (Class A4 Surface Ships) for the following tests:

CE01	RE02	CS06	RS03
CE03	CS01	RS01	
RE01	CS02	RS02	

- 9.5.1 Test RS03 as defined in MIL-STD-461 shall be conducted on the window and temperature controllers with an E-Field intensity of 25 volts per meter.

- 9.5.2 Compliance to requirements shall be demonstrated by performing these tests in accordance with an approved EMI Test Plan.

TABLE E-1

SUMMARY OF MIL-STD-461 REQUIRED TESTS

The following is a brief summary of the applicable MIL-STD-461 tests. Greater details on these tests can be found in MIL-STD-461 Part 5, 9, and 10, and in MIL-STD-462 which describes the methods used for each test.

- CE01 - Conducted Emissions. Measure narrowband emissions on AC and DC power leads from 30 Hz to 15 kHz.
- CE03 - Conducted Emissions. Measures narrowband and broadband emissions on AC and DC power leads, from 15 kHz to 50 MHz.
- CS01 - Conducted Susceptibility. Measures susceptibility of equipment to energy injected on power leads (30 Hz to 50 kHz).
- CS02 - Conducted Susceptibility. Measures susceptibility of equipment to energy injected on power leads (50 kHz to 400 MHz).
- CS06 - Conducted Susceptibility. Measures susceptibility of equipment to transients injected on AC and DC power lines.
- RE01 - Radiated Emission. Measures magnetic field emissions from equipment, cables, and interconnecting wiring (30 Hz to 50 kHz).
- RE02 - Radiated Emissions. Measures electric field emissions narrowband (14 kHz to 10 GHz) and broadband (14 kHz to 1 GHz) from equipment, cables, and interconnecting wiring.
- RS01 - Radiated Susceptibility. Tests susceptibility of equipment and associated cabling to magnetic fields (30 Hz to 50 kHz).
- RS02 - Radiated Susceptibility. Tests susceptibility of equipment to transients, magnetic induction fields, and power frequencies.
- RS03 - Radiated Susceptibility. Tests electrical field susceptibility of equipment from 14 kHz to 10 GHz, and 10.125 GHz.

- UM04 - Radiated and conducted emissions and susceptibility. Broadband power line conducted emissions from 15 kHz to 50 MHz. Broadband radiated emissions from power lines from 15 kHz to 1 GHz. Radiated electric field susceptibility from 2 MHz to 10 GHz. This test is not used for DDG 51 program.
- UM05 - Radiated and Conducted Emissions. Applicable for equipment without solid state components. Tests emissions on power leads. Test defined for DDG 51 Program as follows:

CE03 as defined in MIL-STD-462 shall be used to test for conducted emissions. The limits shall be in accordance with MIL-STD-461 Part 5. Frequency range from 20 kHz to 50 MHz.

RE02 as defined in MIL-STD-462 shall be used to test for radiated emissions. The limits shall be in accordance with MIL-STD-461 Part 5. Frequency range;

Electronic

Narrowband 14 kHz to 10 GHz
Broadband 14 kHz to 1 GHz

Electrical Class IIB

150 kHz to 400 MHz
150 kHz to 30 MHz (Hand tools only)

Electrical Class IIC

150 kHz to 1 GHz

TABLE E2 Grouping of Class C3 Equipment

GROUP I	GROUP II	GROUP III
Portable - electric tools, both double insulated and metal case, such as sabre saws, drills, impact wrenches, rivet guns, nut drivers and so forth.	Machine and semi-portable tools, such as lathes, ring grinders, welders, stamping presses and so forth.	Inherently interference-free items, such as: Ammeter
Repair and maintenance shop equipment	Arc welders	Antennas, passive
Facilities equipment installed in buildings or at sites such as air conditions, generators, elevators, exhaust fans	Engine generators used for construction or shop support	Controller, motor manual (except those using electronic components)
Reperforators		Cubicle, Power
Projectors and flash units		Distribution Networks, passive
Heaters (all types)		Incandescent Lighting Fixture
Lithographic and photoprocessing equipment		Maine Line Switch
Battery Chargers		Motor, induction
Fixed garrison Type kitchen and commissary equipments		Panel, welding
Office equipment		Regulator, passive element line
Vending machines		Starter, motor, manual
Laundry and dry cleaning equipments		Switchboard, power
		Transformer used below saturation level
		Voltmeter

TABLE E-3

REVISED MIL-STD-461-PART 5 TEST RS-03 LEVELS

Frequency	E-Field level (volt/meter) at anticipated location of equipment or subsystem		
14 kHz to 10 GHz and 10.125 GHz	Areas not exposed to the weather (i.e., below deck)	Pilot House, Chart Room, Signal Shelter	Areas exposed to the weather (i.e., above deck)
	10	25	200

DEFINITIONS

Crosstalk - An undesired signal disturbance introduced in a transmission circuit by mutual electric or magnetic coupling of signals from other transmissions circuits.

Emissions, Broadband - An emission which has spectral energy distribution sufficiently broader than the bandwidth of the measuring equipment.

Emissions, Conducted - Electromagnetic energy propagated along a power or signal conductor.

Emissions, Narrowband - An emission which has its principal spectral energy lying within the passband of the measuring equipment.

Emissions, Radiated - Electromagnetic energy which is propagated through space.

Electromagnetic Compatibility (EMC) - The capability of equipment or systems to be operated in their intended operational environment to designed levels of efficiency without causing or receiving degradation owing to EMI. EMC is the result of an engineering planning process applied during the life cycle of equipment. The process involves careful consideration of frequency allocation, design, procurement, production, site selection, installation, operation, and maintenance.

Electromagnetic Interference (EMI) - Any electrical or electronic disturbance, which causes degradation of performance of electronic equipments.

Electromagnetic Pulse (EMP) - An electromagnetic disturbance consisting of intense electric and magnetic fields, with very short rise times and a frequency spectrum extending from almost zero to more than 100 MHz, generated by a nuclear detonation.

Susceptibility, Conducted - A measure of the interference signal current or voltage required on power, control, and signal leads to cause degradation of performance.

Susceptibility, Electromagnetic - The degree to which an equipment, subsystem or system evidences undesired responses caused by electromagnetic radiation to which it is exposed.

Susceptibility, Radiated - A measure of radiated interference field required to cause equipment degradation.

General Material
CERTIFICATE OF IDENTICALITY

Part I. EQUIPMENT NOMENCLATURE _____ BIW VFID Number: _____

MUST fill in all lines marked "Supplier":

I hereby certify that material sold to BIW on:

Purchase Order #	_____	P.O. Line Item	_____	BIW
BIW Catalog #	_____			BIW
Drawing #	_____	Rev Level	_____	Supplier
Manufacturer Name	_____	Manuf P/N	_____	Supplier
APL/CID/AEL #	_____			Supplier

Applicable Qualification Requirements:

- Shock
- Vibration
- PTD
- EMI
- Eng. Dwgs.

Is **IDENTICAL** to the following items supplied to BIW/ISD on:

Purchase Order #	_____	Line Item	_____	Supplier
BIW Catalog #	_____			Supplier
Ingalls Stock #	_____			Supplier

Part II.

Government Shock Approval Letter *	_____	Supplier
Government Vibration Approval Letter	_____	Supplier
Test Report #	_____	Laboratory _____ Supplier

* If the Government approval letter for shock is unknown, certification of the following statement will suffice:

I hereby certify that the above item was approved by the government for actual shock testing (**NOT SHOCK TEST EXTENSION**), but reference to the approval document serial number is unknown

_____(signed by Eng. Mgr)

The Government approval letter serial number **MUST** be indicated if the item being used as basis of approval was qualified on the basis of shock test extension.

Part III.

Check appropriate block: EMI Qualification accomplished via:

- Exemption
- Extension
- Test
- Waiver

Part IV. MUST check one box:

- Identical in all respects
- Identical in all respects except as noted on reverse
(attach additional sheets as necessary)

MUST be signed

_____	_____	_____
Date	Engineering Manager	Company