

NAVSEA  
STANDARD ITEM

FY-21

ITEM NO: 009-12  
DATE: 01 OCT 2019  
CATEGORY: II

1. SCOPE:

1.1 Title: Weld, Fabricate, and Inspect; accomplish

2. REFERENCES:

2.1 Standard Items

2.2 MIL-STD-1689, Fabrication, Welding, and Inspection of Ships Structure

2.3 American Bureau of Shipping (ABS) Rules for Building and Classing Steel Vessels

2.4 0900-LP-060-4010, Fabrication, Welding, and Inspection of Metal Boat and Craft Hulls

2.5 S9074-AQ-GIB-010/248, Requirements for Welding and Brazing Procedure and Performance Qualification

2.6 0900-LP-001-7000, Fabrication and Inspection of Brazed Piping Systems

2.7 S9074-AR-GIB-010/278, Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels

2.8 MIL-STD-22, Welded Joint Design

2.9 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

2.10 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.11 DOD-STD-2185, Requirements for Repair and Straightening of Bronze Naval Ship Propellers

2.12 S9221-C1-GTP-010/020, Main Propulsion Boilers; Repair and Overhaul

2.13 S9AAO-AB-GOS-010, General Specifications for Overhaul of Surface Ships (GSO)

2.14 MIL-STD-2191, Repair, Welding, Weld Cladding, Straightening, and Cold Rolling of Main Propulsion Shafting

2.15 S9CGO-BP-SRM-010/CG-47CL, Technical Manual for CG-47 Class, Superstructure Cracking Repair

2.16 DM 10-612, SERMC, FFG7 Class Aluminum Deckhouse Critical Welds and Critical Weld Regions

**2.17 TO300-AU-SPN-010, Fabrication, Welding and Inspection of Small Boats and Craft, Aluminum Hulls**

**2.18 S9086-RK-STM-010/CH-505**

**3. REQUIREMENTS:**

3.1 Utilize specific requirements of 2.2 through 2.12 **and 2.17** listed in Tables One, 2, 3, and 4 of this item for determining the welder and brazer qualifications, electrodes, weld design, welding requirements, brazing requirements, welding procedures, brazing procedures, welding parameters and controls, inspection standards, and acceptance criteria.

3.1.1 Maintain a Welding Workmanship Program and a Welding Surveillance Inspection Program if conducting structural and fabrication work in accordance with 2.2.

3.1.2 Maintain a Welding Training Program in accordance with 2.5.

3.1.3 Maintain a Brazing Process Inspection in accordance with 2.6.

3.2 Weld bell-end fittings in accordance with Section 505c8 of 2.13. Nondestructive testing inspection must comply with Class P-2 piping systems as defined by 2.7.

3.3 Ground welding machines, for purposes of providing a return path for welding current, using a grounding bar or lead which must be connected directly from the machine ground return connection to the ship's hull, sized on the basis of 1,000,000 Circular Mils per 1,000 amps per 100 feet, but in no event using less than a Number One cable (85,037 Circular Mils).

3.3.1 Welding machines used for welding on machinery, pressure vessels, or piping, rotating ordnance, electronic, or fire control equipment must have the ground return connection in the immediate vicinity of the work to ensure that current does not flow through bearings, pipe hangers, or other areas where arcing or high resistance paths exist. For ships constructed of non-magnetic materials, the ground return cables must be connected directly to the component being welded - as close to the weld zone as feasible.

3.3.2 Shipboard power distribution system must not be used as the power source for welding equipment unless approved by the SUPERVISOR. External power source must be used.

3.4 Accomplishment of a Process Control Procedure (PCP) for the specific welding, brazing, and inspection operations in 3.4.1 through 3.4.7 must be in accordance with NAVSEA Standard Items (See Note 4.1) and the following:

3.4.1 Class A-F, A-1, A-2, A-3, A-LT, P-1, P-LT, M-1, and T-1 welding, as defined by 2.7. These procedures must include, as a minimum, the information required by Paragraph 4.1.3 of 2.7 and supporting data such as a sketch of the weld repair areas and associated ship components. Joint numbers must not be duplicated on ship during the availability.

3.4.2 Class P-3a special category silver brazing, as defined by 2.6. The procedure must include, as a minimum, the information required by Sections 4 of 2.5.

3.4.2.1 All brazing of steam piping must conform to 2.6, Class P-3a special category, including ultrasonic inspection, for all pipe sizes .840 inch outer diameter or greater including any (existing) copper to (new) copper-nickel transition joints. Brazed joints must not be used in steam pipe sizes less than .840 inch outer diameter.

3.4.2.2 In steam systems, where brazed piping and fittings are to be reused, or piping has to be sized to achieve proper fit-up, the option for a 5X visual inspection for cracks listed in Sections 5.5.3, 5.10.1, and 5.10.2 of 2.6 must not be used; liquid penetrant inspection must be required.

3.4.3 For bronze propellers, using 2.11 for guidance.

3.4.4 For propellers other than bronze, using 2.7 for guidance.

3.4.5 For propulsion shafting and rudder stocks, using 2.14 for guidance.

3.4.6 For titanium-based materials, using 2.7 for guidance.

3.4.7 Accomplish aluminum welding and nondestructive testing for superstructure of CG-47 Class ships in accordance with 2.15 and 5XXX series aluminum structures for CG-47 class ships in accordance with 2.16.

3.5 The use of a permanent backing strap in accordance with Section 11, Paragraph 11.1 of 2.2 is *specifically* prohibited *for ships* unless detailed in the original weld joint design or when authorized by the SUPERVISOR. ***The use of a permanent backing strap is acceptable for small boats and crafts, in accordance with 2.4 and 2.17.***

(I) or (I)(G) “NONDESTRUCTIVE TESTING”

3.6 Accomplish nondestructive testing in accordance with the following:

3.6.1 Manufacture, installation, and repair (welding, brazing, machining, or lapping) of Level I fittings or components:

3.6.1.1 Nondestructive Testing Visual Inspection - (I)

3.6.1.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant and Ultrasonic Testing (Final Only) - (I)(G)

3.6.1.3 Nondestructive Testing Radiographic - (I)

3.6.2 Welding/brazing of **Class** P-1, P-LT, P-3a piping systems or Class A-F, A-1, A-2, A-3, A-LT, M-1, T-1 welding, and **Class** P-2 steam service:

3.6.2.1 Nondestructive Testing Visual Inspection - (I)

3.6.2.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant and Ultrasonic Testing (Final Only) - (I)(G)

3.6.2.3 Nondestructive Testing Radiographic - (I)

3.6.2.4 Nondestructive Testing Visual Inspection (I)(G) materials S-51, S-52, S-53.

3.6.3 Welding on ship/craft listed in Attachment A hull or structure when required by the fabrication document:

3.6.3.1 Nondestructive Testing Visual Inspection - (I)

3.6.3.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant and Ultrasonic Testing (Final Only) - (I)(G)

3.6.3.3 Nondestructive Testing Radiographic - (I)

3.6.4 Weight handling equipment manufacture and repair:

3.6.4.1 Nondestructive Testing Visual Inspection - (I)

3.6.4.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant - (I)(G)

3.6.4.3 Ultrasonic Testing (Final Only) - (I)(G)

3.6.4.4 Nondestructive Testing Radiographic - (I)

3.6.5 Corrective maintenance within the certified boundaries of cranes (as defined in NSTM 589):

3.6.5.1 Nondestructive Testing Visual Inspection - (I)

3.6.5.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant - (I)(G)

3.6.5.3 Ultrasonic Testing (Final Only) - (I)(G)

3.6.5.4 Nondestructive Testing Radiographic - (I)

3.6.6 Maintenance on aircraft launch and recovery equipment:

3.6.6.1 Nondestructive Testing Visual Inspection - (I)

3.6.6.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant and Ultrasonic Testing (Final Only) - (I)(G)

3.6.6.3 Nondestructive Testing Radiographic - (I)

**3.6.7 Invocation of Operational Pressure Test Option for Piping Systems in accordance with 2.18:**

**3.6.7.1 Nondestructive Magnetic Particle and Liquid Penetrant testing accomplished to satisfy Operational Pressure Test Option requirements of 2.18 and not already required by 3.6.2.2. - (I)**

(I)(G) "EVALUATION OF RT FILMS"

3.7 Accomplish RT film interpretation.

3.7.1 Provide the cognizant Government representative designated by the SUPERVISOR the evaluated radiographs and records within 2 days of the (G) point.

3.8 Provide and maintain a Welding Consumable Control System in accordance with 2.2, 2.3, 2.4, 2.6, 2.7, 2.11, 2.12, 2.14, 2.16, **and 2.17**, which covers the control and issuance of filler materials. The system must be described in a written procedure that must be submitted to the SUPERVISOR for review and approval prior to the initiation of production work. This procedure only requires a one-time submittal/approval unless the Standard Items change and/or references change or are updated. The

Welding Consumable Control System must be subject to periodic conformity audits by the SUPERVISOR throughout the contract period.

3.9 Utilize Attachment A to define combatant and non-combatant vessels and applicable table.

3.10 Where requirements in the repair and testing instructions for propulsion boilers conflict, 2.12 must take precedence.

4. NOTES:

4.1 If a Process Control Procedure (PCP) for all specific welding, brazing, and inspection operations in 3.4.1 through 3.4.7 is required; the use of Category II Standard Item 009-09 "Process Control Procedure (PCP); provide and accomplish" of 2.1 will be specified in the Work Item.

**4.2 For Navy boats and craft all paragraphs apply except the following: 3.4.2.1, 3.4.2.2, 3.4.3, 3.4.4, 3.4.5, 3.4.6, and 3.6.6.**

TABLE 1

WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

| L<br>I<br>N<br>E | COLUMN                          | A                                 | B  | C                                 | D                       |                       | E                         |
|------------------|---------------------------------|-----------------------------------|--|-----------------------------------|-------------------------|-----------------------|---------------------------|
|                  | SITUATION EVOLUTION             | CLASS P-1, P-2 AND P-LT PIPING    | CLASS P-3a SPECIAL CATEGORY, OTHER CLASS P-3a, AND P-3b PIPING | HARD FACING VALVE PARTS           | CLASS A PRESSURE VESSEL | ** PROPULSION BOILERS | *PROPELLERS (BRONZE)      |
| 1                | WELDER AND BRAZER QUALIFICATION | S9074-AQ-GIB-010/248, PARAGRAPH 5 | 0900-LP-001-7000, SECTION 4                                    | S9074-AQ-GIB-010/248, PARAGRAPH 5 |                         | S9221-C1-GTP-010/020  |                           |
| 2                | WELDING PROCEDURE               | S9074-AQ-GIB-010/248, PARAGRAPH 4 | NOT APPLICABLE   | S9074-AQ-GIB-010/248, PARAGRAPH 4 | S9221-C1-GTP-010/020    |                       | DOD-STD-2185, PARAGRAPH 4 |
| 3                | BRAZING PROCEDURE               | NOT APPLICABLE                    | 0900-LP-001-7000, SECTION 4                                    | NOT APPLICABLE                    |                         |                       |                           |
| 4                | WELDING REQUIREMENTS            | S9074-AR-GIB-010/278, PARAGRAPH 6 | NOT APPLICABLE   | S9074-AR-GIB-010/278, PARAGRAPH 6 |                         |                       | MIL-STD-2185, PARAGRAPH 5 |

\* - PARAGRAPH 3.4.4 APPLIES  
 \*\* - PARAGRAPH 3.10 APPLIES

TABLE 1  
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

| L<br>I<br>N<br>E | COLUMN          | A  | B                              | C  | D  |                         | E                         |
|------------------|-----------------|--|--------------------------------|--|--|-------------------------|---------------------------|
|                  |                 | SITUATION EVOLUTION                          | CLASS P-1, P-2 AND P-LT PIPING | CLASS P-3a SPECIAL CATEGORY, OTHER CLASS P-3a, AND P-3b PIPING | HARD FACING VALVE PARTS                      | CLASS A PRESSURE VESSEL | ** PROPULSION BOILERS     |
| 5                | FILLER MATERIAL | S9074-AR-GIB-010/278, PARAGRAPH 5            | 0900-LP-001-7000, SECTION 5    | S9074-AR-GIB-010/278, PARAGRAPH 5                              |  | S9221-C1-GTP-010/020    | DOD-STD-2185, PARAGRAPH 5 |
| 6                | JOINT DESIGN    | S9074-AR-GIB-010/278, PARAGRAPH 9 MIL-STD-22 | 0900-LP-001-7000, SECTION 5    | NOT APPLICABLE   | S9074-AR-GIB-010/278, PARAGRAPH 9 MIL-STD-22 | S9221-C1-GTP-010/020    |                           |

\* - PARAGRAPH 3.4.4 APPLIES  
\*\* - PARAGRAPH 3.10 APPLIES

TABLE 1  
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

|                  | COLUMN                              | A  | B   | C  | D   |                          | E  |
|------------------|-------------------------------------|--|---|--|---|--------------------------|--|
| L<br>I<br>N<br>E | SITUATION<br>EVOLUTION              | CLASS P-1, P-2 AND<br>P-LT PIPING        | CLASS P-3a<br>SPECIAL<br>CATEGORY,<br>OTHER CLASS<br>P-3a, AND P-3b<br>PIPING | HARD<br>FACING<br>VALVE<br>PARTS                       | CLASS A<br>PRESSURE<br>VESSEL                 | ** PROPULSION<br>BOILERS | *PROPELLER<br>S (BRONZE)   |
| 7                | HEAT<br>TREATMENT                   | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 6 | 0900-LP-001-<br>7000,<br>SECTION 5  | S9074-AR-<br>GIB-010/278,<br>PARAGRAPH<br>S 6 AND 11.6 | S9074-AR-<br>GIB-010/278,<br>PARAGRAPH<br>H 6 | S9221-C1-GTP-<br>010/020 | S9074-AR-<br>GIB-010/278,<br>PARAGRAPH<br>6<br><br>DOD-STD-<br>2185,<br>PARAGRAPH<br>5 |
| 8                | WORKMANS<br>HIP<br>REQUIREMEN<br>TS | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 7 | 0900-LP-001-<br>7000, SECTION 5   | S9074-AR-<br>GIB-010/278,<br>PARAGRAPH<br>S 7 AND 11.6 | S9074-AR-<br>GIB-010/278,<br>PARAGRAPH<br>H 7 | S9221-C1-GTP-<br>010/020 | S9074-AR-<br>GIB-010/278,<br>PARAGRAPH<br>7  |

\* - PARAGRAPH 3.4.4 APPLIES  
\*\* - PARAGRAPH 3.10 APPLIES



TABLE 1  
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

|                  | COLUMN                            | A   | B   | C   | D   | E                        |                                     |
|------------------|-----------------------------------|---|---|---|---|--------------------------|-------------------------------------|
| L<br>I<br>N<br>E | SITUATION<br>EVOLUTION            | CLASS P-1, P-2 AND<br>P-LT PIPING   | CLASS P-3a<br>SPECIAL<br>CATEGORY,<br>OTHER CLASS<br>P-3a, AND P-3b<br>PIPING         | HARD<br>FACING<br>VALVE<br>PARTS  | CLASS A<br>PRESSURE<br>VESSEL   | ** PROPULSION<br>BOILERS | *PROPELLER<br>S (BRONZE)            |
| 9                | VISUAL<br>INSPECT<br>JOINT FIT-UP | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 9<br>MIL-STD-22                        | 0900-LP-001-<br>7000, SECTION 7<br><br>FOR CLASS P-3a<br>SPECIAL<br>CATEGORY          | NOT<br>APPLICABLE   | S9074-AR-<br>GIB-010/278,<br>PARAGRAPH<br>9 MIL-<br>STD-22                | S9221-C1-GTP-<br>010/020 | DOD-STD-<br>2185,<br>PARAGRAPH<br>5 |
| 10               | VISUAL<br>INSPECTION              | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 10<br><br>MIL-STD-2035,<br>PARAGRAPH 4 | 0900-LP-001-<br>7000, SECTION 7<br>AND 8<br><br>FOR CLASS P-3a<br>SPECIAL<br>CATEGORY | S9074-AR-<br>GIB-010/278,<br>PARAGRAPH<br>11.6.3<br><br>MIL-STD-<br>2035,<br>PARAGRAPH<br>4 | S9074-AR-GIB-010/278,<br>PARAGRAPH 10<br><br>MIL-STD-2035,<br>PARAGRAPH 4 |                          | MIL-STD-<br>2035,<br>PARAGRAPH<br>4 |

\* - PARAGRAPH 3.4.4 APPLIES  
\*\* - PARAGRAPH 3.10 APPLIES

TABLE 1  
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

| L<br>I<br>N<br>E | COLUMN                       | A  | B  | C  | D   | E  |
|------------------|------------------------------|--|--|--|---|--|
|                  |                              | SITUATION EVOLUTION  | CLASS P-1, P-2 AND P-LT PIPING   | CLASS P-3a SPECIAL CATEGORY, OTHER CLASS P-3a, AND P-3b PIPING | HARD FACING VALVE PARTS   | CLASS A PRESSURE VESSEL<br>** PROPULSION BOILERS |
| 11               | RADIOGRAPHIC INSPECTION (RT) | S9074-AR-GIB-010/278 PARAGRAPH 10<br>T9074-AS-GIB-010/271, PARAGRAPH 3<br><br>MIL-STD-2035, PARAGRAPH 5 (NORMALLY ONLY P-1 AND P-LT) | NOT APPLICABLE   |  | S9074-AR-GIB-010/278 PARAGRAPH 10<br>T9074-AS-GIB-010/271, PARAGRAPH 3<br><br>MIL-STD-2035, PARAGRAPH 5 | NOT APPLICABLE                                   |
| 12               | ULTRASONIC INSPECTION (UT)   | NOT APPLICABLE   | 0900-LP-001-7000, SECTIONS 6,7,8 AND 9 FOR CLASS P-3a SPECIAL CATEGORY PIPING ONLY | NOT APPLICABLE   |   | S9245-AR-TSM-010/PROP, PARAGRAPH 5-7.5.2         |

\* - PARAGRAPH 3.4.4 APPLIES  
\*\* - PARAGRAPH 3.10 APPLIES

TABLE 1  
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

| L<br>I<br>N<br>E | COLUMN                                    | A  | B  | C   | D  |                               | E  |
|------------------|---|--|--|---|--|-------------------------------|--|
|                  |   | SITUATION<br>EVOLUTION   | CLASS P-1, P-2 AND<br>P-LT PIPING  | CLASS P-3a<br>SPECIAL<br>CATEGORY,<br>OTHER CLASS<br>P-3a, AND P-3b<br>PIPING               | HARD<br>FACING<br>VALVE<br>PARTS   | CLASS A<br>PRESSURE<br>VESSEL | ** PROPULSION<br>BOILERS   |
| 13               | LIQUID<br>PENETRANT<br>INSPECTION<br>(PT) | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 10<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 5<br><br>MIL-STD-2035,<br>PARAGRAPH 7<br>(NORMALLY ONLY<br>P-1 AND P-LT) | 0900-LP-001-<br>7000, SECTION 7<br>AND 8<br><br>FOR CLASS P-3a<br>SPECIAL<br>CATEGORY<br><br>SEE 3.4.2.2 | S9074-AR-<br>GIB-010/278,<br>PARAGRAPH<br>11.6.3<br><br>MIL-STD-<br>2035,<br>PARAGRAPH<br>7 | S9074-AR-GIB-010/278,<br>PARAGRAPH 10<br>T9074-AS-GIB-010/271,<br>PARAGRAPH 5<br><br>MIL-STD-2035, PARAGRAPH 7 |                               | MIL-STD-<br>2035,<br>PARAGRAPH<br>7<br>T9074-AS-<br>GIB-010/271,<br>PARAGRAPH<br>5 |

\* - PARAGRAPH 3.4.4 APPLIES  
\*\* - PARAGRAPH 3.10 APPLIES

TABLE 1  
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

| L<br>I<br>N<br>E | COLUMN                            | A   | B                              | C  | D   | E  |
|------------------|-----------------------------------|---|--------------------------------|--|---|--|
|                  |                                   | SITUATION EVOLUTION   | CLASS P-1, P-2 AND P-LT PIPING | CLASS P-3a SPECIAL CATEGORY, OTHER CLASS P-3a, AND P-3b PIPING | HARD FACING VALVE PARTS   | CLASS A PRESSURE VESSEL<br>** PROPULSION BOILERS |
| 14               | MAGNETIC PARTICLE INSPECTION (MT) | S9074-AR-GIB-010/278, PARAGRAPH 10<br>T9074-AS-GIB-010/271, PARAGRAPH 4<br><br>MIL-STD-2035, PARAGRAPH 6 (NORMALLY ONLY P-1 AND P-LT) | NOT APPLICABLE                 |  | S9074-AR-GIB-010/278, PARAGRAPH 10<br>T9074-AS-GIB-010/271, PARAGRAPH 4<br><br>MIL-STD-2035 PARAGRAPH 6 | NOT APPLICABLE                                   |

\* - PARAGRAPH 3.4.4 APPLIES  
\*\* - PARAGRAPH 3.10 APPLIES

TABLE 1

WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

| L<br>I<br>N<br>E | COLUMN                                 | F   | G   | H  | I   | J   |
|------------------|--|---|---|--|---|---|
|                  | SITUATION<br>EVOLUTION                 | MACHINERY CLASS<br>M  | TURBINE PARTS                             | CASTINGS   | FORCED DRAFT<br>BLOWERS                   | REDUCTION<br>AND STEAM<br>TURBINE<br>DRIVEN<br>AUXILIARY<br>GEARS |
| 1                | WELDER AND<br>BRAZER<br>QUALIFICATIONS | S9074-AQ-GIB-010/248, PARAGRAPH 5   |   |  |   |   |
| 2                | WELDING<br>PROCEDURE                   | S9074-AQ-GIB-010/248, PARAGRAPH 4   |   |  |   |   |
| 3                | BRAZING<br>PROCEDURE                   | NOT APPLICABLE  |   |  |   |   |
| 4                | WELDING<br>REQUIREMENTS                | S9074-AR-GIB-010/278, PARAGRAPH 6   |   |  |   |   |
| 5                | FILLER MATERIAL                        | S9074-AR-GIB-010/278, PARAGRAPH 5   |   |  |   |   |
| 6                | JOINT DESIGN                           | S9074-AR-GIB-010/278, PARAGRAPH 9, AND MIL-STD-22                         |   |  |   |   |
| 7                | HEAT TREATMENT                         | S9074-AR-GIB-010/278, PARAGRAPHS 6 AND 8                                  |   |  |   |   |
| 8                | WORKMANSHIP<br>REQUIREMENTS            | S9074-AR-GIB-010/278, PARAGRAPH 7   |   |  |   |   |
| 9                | VISUAL INSPECT<br>JOINT FIT-UP         | S9074-AR-GIB-010/278, PARAGRAPH 10, AND MIL-STD-22                        |   |  |   |   |
| 10               | VISUAL<br>INSPECTION                   | S9074-AR-GIB-010/278,<br>PARAGRAPH 10<br><br>MIL-STD-2035,<br>PARAGRAPH 4 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 14 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH<br>13<br><br>MIL-STD-2035,<br>PARAGRAPH 4 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 16 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH<br>15                      |

\* - PARAGRAPH 3.4.4 APPLIES  
 \*\* - PARAGRAPH 3.10 APPLIES

TABLE 1  
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

| L<br>I<br>N<br>E | COLUMN                          | F   | G   | H  | I   | J   |
|------------------|---------------------------------|---|---|--|---|---|
|                  | SITUATION<br>EVOLUTION          | MACHINERY CLASS<br>M  | TURBINE PARTS   | CASTINGS                                     | FORCED DRAFT<br>BLOWERS   | REDUCTION<br>AND STEAM<br>TURBINE<br>DRIVEN<br>AUXILIARY<br>GEARS |
| 11               | RADIOGRAPHIC<br>INSPECTION (RT) | S9074-AR-GIB-010/278,<br>PARAGRAPH 10<br>T9074-AS-GIB-010/271,<br>PARAGRAPH 3<br><br>MIL-STD-2035,<br>PARAGRAPH 5 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 14<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 3<br><br>MIL-STD-2035,<br>PARAGRAPH 5 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH<br>13 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 16<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 3<br><br>MIL-STD-2035,<br>PARAGRAPH 5 | NOT<br>APPLICABLE   |

\* - PARAGRAPH 3.4.4 APPLIES  
\*\* - PARAGRAPH 3.10 APPLIES

TABLE 1  
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

| L<br>I<br>N<br>E | COLUMN                                 | F   | G   | H   | I   | J   |
|------------------|--|---|---|---|---|---|
|                  | SITUATION<br>EVOLUTION                 | MACHINERY CLASS<br>M  | TURBINE PARTS   | CASTINGS  | FORCED DRAFT<br>BLOWERS   | REDUCTION<br>AND STEAM<br>TURBINE<br>DRIVEN<br>AUXILIARY<br>GEARS   |
| 12               | ULTRASONIC<br>INSPECTION (UT)          | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 10<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 6<br><br>MIL-STD-2035,<br>PARAGRAPH 8 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 14   | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 13   | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 16   | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 15   |
| 13               | LIQUID<br>PENETRANT<br>INSPECTION (PT) | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 10<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 5<br><br>MIL-STD-2035,<br>PARAGRAPH 7 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 14<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 5<br><br>MIL-STD-2035,<br>PARAGRAPH 7 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 13<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 5<br><br>MIL-STD-2035,<br>PARAGRAPH 7 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 16<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 5<br><br>MIL-STD-2035,<br>PARAGRAPH 7 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 15<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 5<br><br>MIL-STD-2035,<br>PARAGRAPH 7 |

\* - PARAGRAPH 3.4.4 APPLIES  
\*\* - PARAGRAPH 3.10 APPLIES

TABLE 1  
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

| L<br>I<br>N<br>E | COLUMN                                  | F   | G   | H   | I   | J   |
|------------------|---|---|---|---|---|---|
|                  |   | SITUATION<br>EVOLUTION  | MACHINERY CLASS<br>M  | TURBINE PARTS   | CASTINGS  | FORCED DRAFT<br>BLOWERS   |
| 14               | MAGNETIC<br>PARTICLE<br>INSPECTION (MT) | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 10<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 4<br><br>MIL-STD-2035,<br>PARAGRAPH 6 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 14<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 4<br><br>MIL-STD-2035,<br>PARAGRAPH 6 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 13<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 4<br><br>MIL-STD-2035,<br>PARAGRAPH 6 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 16<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 4<br><br>MIL-STD-2035,<br>PARAGRAPH 6 | S9074-AR-GIB-<br>010/278,<br>PARAGRAPH 15<br>T9074-AS-GIB-<br>010/271,<br>PARAGRAPH 4<br><br>MIL-STD-2035,<br>PARAGRAPH 6 |

\* - PARAGRAPH 3.4.4 APPLIES  
\*\* - PARAGRAPH 3.10 APPLIES



TABLE 2  
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (COMBATANT)

|                  | COLUMN                      | A  | B   | C  | D  | E   | F   |
|------------------|-----------------------------|--|---|--|--|---|---|
| L<br>I<br>N<br>E | MATERIAL<br>EVOLUTION       | CARBON<br>STEEL (MS),<br>ORDINARY<br>STRENGTH<br>STEEL(OS),<br>AND HIGHER<br>STRENGTH<br>STEEL (HSS)   | *<br>(HY-80/100,<br>HSLA-80 AND<br>STS)   | ALUMINUM<br>ALLOY                              | CHROMIUM<br>NICKEL<br>STEEL<br>(STAINLESS)             | COPPER<br>AND/OR<br>NICKEL BASE<br>ALLOYS                 | SILICONE<br>BRONZE<br>ALUMINU<br>M BRONZE |
| 1                | WELDER<br>QUALIFICATION     | S9074-AQ-GIB-010/248, PARAGRAPH 5  |   |  |  |   |   |
| 2                | WELDING<br>PROCEDURE        | S9074-AQ-GIB-010/248, PARAGRAPH 4  |   |  |  |   |   |
| 3                | ELECTRODE                   | MIL-STD-1689,<br>PARAGRAPH<br>10 TABLE X   | MIL-STD-1689,<br>PARAGRAPH 10<br>TABLE XI | MIL-STD-<br>1689,<br>PARAGRAPH<br>10 TABLE XVI | MI-STD-1689,<br>PARAGRAPH<br>10 TABLES XII<br>AND XIII | MIL-STD-<br>1689,<br>PARAGRAPH<br>10 TABLES<br>XIV AND XV | S9074-AR-<br>GIB-<br>010/278,<br>TABLE II |
| 4                | JOINT DESIGN                | MIL-STD-22<br>MIL-STD-1689, PARAGRAPH 11   |   |  |  |   |   |
| 5                | WELDING<br>REQUIREMENTS     | MIL-STD-1689, PARAGRAPH 13   |   |  |  |   |   |
| 6                | WORKMANSHIP<br>REQUIREMENTS | MIL-STD-1689, PARAGRAPHS 12 AND 14   |   |  |  |   |   |
| 7                | VISUAL                      | MIL-STD-1689, PARAGRAPHS 6, 7, AND 8<br>MIL-STD-2035, PARAGRAPH 4<br>T9074-AS-GIB-010/271, PARAGRAPH 8 |   |  |  |   |   |

TABLE 2  
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (COMBATANT)

| COLUMN           | A                                 | B  | C                                 | D              | E                                 | F                                |                                 |
|------------------|-----------------------------------|--|-----------------------------------|----------------|-----------------------------------|----------------------------------|---------------------------------|
| L<br>I<br>N<br>E | MATERIAL EVOLUTION                | CARBON STEEL (MS), ORDINARY STRENGTH STEEL(OS), AND HIGHER STRENGTH STEEL (HSS)                        | *<br>(HY-80/100, HSLA-80 AND STS) | ALUMINUM ALLOY | CHROMIUM NICKEL STEEL (STAINLESS) | COPPER AND/OR NICKEL BASE ALLOYS | SILICONE BRONZE ALUMINUM BRONZE |
| 8                | RADIOGRAPHIC INSPECTION (RT)      | MIL-STD-1689, PARAGRAPHS 6, 7, AND 8<br>MIL-STD-2035, PARAGRAPH 5<br>T9074-AS-GIB-010/271, PARAGRAPH 3 |                                   |                |                                   |                                  |                                 |
| 9                | ULTRASONIC INSPECTION (UT)        | MIL-STD-1689, PARAGRAPHS 6, 7, AND 8<br>MIL-STD-2035, PARAGRAPH 8<br>T9074-AS-GIB-010/271, PARAGRAPH 6 |                                   |                |                                   |                                  |                                 |
| 10               | LIQUID PENETRANT INSPECTION (PT)  | MIL-STD-1689, PARAGRAPHS 6, 7, AND 8<br>MIL-STD-2035, PARAGRAPH 7<br>T9074-AS-GIB-010/271, PARAGRAPH 5 |                                   |                |                                   |                                  |                                 |
| 11               | MAGNETIC PARTICLE INSPECTION (MT) | MIL-STD-1689, PARAGRAPH 6<br>MIL-STD-2035, PARAGRAPH 6<br>T9074-AS-GIB-010/271, PARAGRAPH 4            | NOT APPLICABLE                    |                |                                   |                                  |                                 |

TABLE 4  
WELDING, FABRICATION, AND INSPECTION OF  
METAL BOAT AND CRAFT HULLS\*

|                  | COLUMN                                | A  | B   | C  | D  | E   | F                                  |
|------------------|---------------------------------------|--|---|--|--|---|------------------------------------|
| L<br>I<br>N<br>E | MATERIAL<br>EVOLUTION                 | CARBON STEEL<br>(MS)   | **<br><br>(HY-80/100)                                     | <i>ALUMINUM ALLOY</i>  | CHROMIUM<br>NICKEL STEEL<br>(STAINLESS)  | COPPER<br>AND/OR<br>NICKEL<br>BASE                      | SILICON<br>E<br>BRONZE<br>ALUMIN   |
| 1                | WELDER<br>QUALIFICATION               | S9074-AQ-GIB-010/248, SECTION 5  |   | <i>TO300-AU-SPN-010,<br/>SECTION 3.3</i>                                     | S9074-AQ-GIB-010/248, SECTION 5  |   |                                    |
| 2                | WELDING<br>PROCEDURE<br>QUALIFICATION | S9074-AQ-GIB-010/248, SECTION 4  |   | <i>TO300-AU-SPN-010,<br/>SECTION 3.2</i>                                     | S9074-AQ-GIB-010/248, SECTION 4  |   |                                    |
| 3                | ELECTRODE/FILLER<br>MATERIAL          | 0900-060-4010,<br>SECTION 10,<br>TABLE<br>10-1   | 0900-060-4010,<br>SECTION 10,<br>TABLES 10-2 AND 10-<br>3 | <i>TO300-AU-SPN-010,<br/>TABLES I AND II***</i>                              | 0900-060-4010,<br>SECTION 10,<br>TABLE<br>10-4   | 0900-060-4010<br>SECTION 10,<br>TABLES 10-5<br>AND 10-6 | S9074-AR-GIB-<br>010/278, TABLE II |
| 4                | JOINT DESIGN                          | MIL-STD-22<br>0900-060-4010, SECTION 11  |   | <i>TO300-AU-SPN-010,<br/>SECTION 8 AND<br/>APPENDIX A AND<br/>APPENDIX B</i> | MIL-STD-22<br>0900-060-4010, SECTION 11  |   |                                    |
| 5                | WELDING<br>REQUIREMENT<br>S           | 0900-060-4010, SECTION 13  |   | <i>TO300-AU-SPN-010,<br/>SECTION 10</i>                                      | 0900-060-4010, SECTION 13  |   |                                    |
| 6                | WORKMANSHIP<br>REQUIREMENT<br>S       | 0900-060-4010, SECTIONS 12 AND 14  |   | <i>TO300-AU-SPN-010,<br/>SECTION 11</i>                                      | 0900-060-4010, SECTIONS 12 AND 14  |   |                                    |
| 7                | VISUAL                                | 0900-060-4010, SECTIONS 6, 7, AND 8<br>T9074-AS-GIB-010/271, SECTION 8                         |   | <i>TO300-AU-SPN-010,<br/>SECTIONS 3.5.2.1, 5.4.3,<br/>6.2, AND 7.2</i>       | 0900-060-4010, SECTIONS 6, 7, AND 8<br>T9074-AS-GIB-010/271, SECTION 8                         |   |                                    |
| 8                | RADIOGRAPHIC<br>INSPECTION<br>(RT)    | 0900-060-4010, SECTION 6, TABLE 6-1<br>AND SECTIONS 7 AND 8<br>T9074-AS-GIB-010/271, SECTION 3 |   | <i>TO300-AU-SPN-010,<br/>SECTIONS 3.5.2.4, 5.4.5,<br/>6.4, AND 7.4</i>       | 0900-060-4010, SECTION 6, TABLE 6-1 AND SECTIONS<br>7 AND 8<br>T9074-AS-GIB-010/271, SECTION 3 |   |                                    |

|    |                                   |  |   |  |
|----|-----------------------------------|--|---|--|
| 9  | ULTRASONIC INSPECTION (UT)        | T9074-AS-GIB-010/271, SECTION 6<br>T9074-AS-GIB-010/271, SECTION 6     |   |  |
| 10 | LIQUID PENETRANT INSPECTION (PT)  | 0900-060-4010, SECTIONS 6, 7, AND 8<br>T9074-AS-GIB-010/271, SECTION 5 | <b><i>TO300-AU-SPN-010</i></b><br><b><i>SECTIONS 3.5.2.3, 5.5.3.4, 6.3, AND 7.3</i></b> | 0900-060-4010, SECTIONS 6, 7, AND 8<br>T9074-AS-GIB-010/271, SECTION 5 |
| 11 | MAGNETIC PARTICLE INSPECTION (MT) | 0900-060-4010, SECTION 6<br>T9074-AS-GIB-010/271, SECTION 4            | NOT APPLICABLE  |  |

\*- STRUCTURAL FABRICATION AND NON DESTRUCTIVE TESTING REQUIREMENTS FOR PATROL COASTAL (PC) CRAFT (PC-2 THRU PC-14) ARE ADDRESSED IN A SEPARATE TECHNICAL REPAIR STANDARD INVOKED IN STATEMENTS OF WORK (SOW) FOR PC REPAIRS AND MODIFICATIONS.

\*\* PARAGRAPH 3.8 APPLIES.

\*\*\*- SOME CRAFT ARE ORIGINALLY PROCURED WITH 6061 PLATING AND STRUCTURAL MEMBERS IN THE WELDED CONDITION. MODIFICATIONS TO SUBJECT CRAFT INVOLVE WELDING 5000 SERIES TO 6000 SERIES ALUMINUM AND ARE NOT ADDRESSED IN THE REFERENCED DOCUMENTS IN THIS STANDARD ITEM.

TABLE 3

WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (NON-COMBATANT) \* \*\*

| COLUMN                        | A  | B                  | C                  | D  | E  | F  |
|-------------------------------|--|--------------------|--------------------|--|--|--|
| LINE<br>MATERIAL<br>EVOLUTION | CARBON<br>STEEL (MS),<br>ORDINARY<br>STRENGTH<br>STEEL(OS),<br>AND HIGHER<br>STRENGTH<br>STEEL (HSS) | ***<br>(HY-80/100) | ALUMINU<br>M ALLOY | CHROMIUM<br>NICKEL<br>STEEL<br>(STAINLESS) | COPPER<br>AND/OR<br>NICKEL<br>BASE<br>ALLOYS | SILICONE<br>BRONZE<br>ALUMINUM<br>BRONZE |
| 1                             | WELDER<br>QUALIFICATION<br>ABS RULES, PART 2, CHAPTER 4, SECTION 1                                   |                    |                    |  |  |  |
| 2                             | WELDING<br>PROCEDURE<br>ABS RULES, PART 2, CHAPTER 4, SECTION 1                                      |                    |                    |  |  |  |
| 3                             | ELECTRODE<br>ABS RULES, PART 2, CHAPTER 4, SECTION 1   |                    |                    |  |  |  |
| 4                             | JOINT DESIGN<br>ABS RULES, PART 2, CHAPTER 4, SECTION 1  |                    |                    |  |  |  |
| 5                             | WELDING<br>REQUIREMENTS<br>ABS RULES, PART 2, CHAPTER 4, SECTION 1                                   |                    |                    |  |  |  |
| 6                             | WORKMANSHIP<br>REQUIREMENTS<br>ABS RULES, PART 2, CHAPTER 4, SECTION 1                               |                    |                    |  |  |  |
| 7                             | VISUAL<br>ABS RULES, PART 2, CHAPTER 4, SECTION 1  |                    |                    |  |  |  |
| 8                             | RADIOGRAPHIC<br>INSPECTION (RT)<br>ABS RULES, PART 2, CHAPTER 4, SECTION 1                           |                    |                    |  |  |  |

TABLE 3  
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (NON-COMBATANT) \* \*\*

| COLUMN           | A  | B  | C                  | D                  | E  | F  |  |
|------------------|--|--|--------------------|--------------------|--|--|--|
| L<br>I<br>N<br>E | MATERIAL<br>EVOLUTION                      | CARBON<br>STEEL (MS),<br>ORDINARY<br>STRENGTH<br>STEEL(OS),<br>AND HIGHER<br>STRENGTH<br>STEEL (HSS) | ***<br>(HY-80/100) | ALUMINU<br>M ALLOY | CHROMIUM<br>NICKEL<br>STEEL<br>(STAINLESS) | COPPER<br>AND/OR<br>NICKEL<br>BASE<br>ALLOYS | SILICONE<br>BRONZE<br>ALUMINUM<br>BRONZE |
| 9                | ULTRASONIC<br>INSPECTION (UT)              | ABS RULES, PART 2, CHAPTER 4, SECTION 1  |                    |                    |  |  |  |
| 10               | LIQUID<br>PENETRANT<br>INSPECTION (PT)     | ABS RULES, PART 2, CHAPTER 4, SECTION 1  |                    |                    |  |  |  |
| 11               | MAGNETIC<br>PARTICLE<br>INSPECTION<br>(MT) | ABS RULES, PART 2, CHAPTER 4,<br>SECTION 1   | NOT APPLICABLE     |                    |  |  |  |

\* - IDENTIFICATION OF "SURVEYOR" IN ABS RULES SIGNIFIES SUPERVISOR OF SHIPBUILDING (SUPERVISOR) ACTION. THE SUPERVISOR MAY USE MIL-STD-1689 FOR GUIDANCE WHERE ADDITIONAL DIRECTION IS NECESSARY. SUCH GUIDANCE MAY BE USED TO: ESTABLISH NDT REQUIREMENTS, ESTABLISH

WELDING/NDT PROCEDURE AND PERSONNEL QUALIFICATION REQUIREMENTS, OR TO DEFINE OTHER ATTRIBUTES LISTED IN THE "MATERIAL EVOLUTION" LINE OF TABLE 3.

\*\* - THE SUPERVISOR MAY ALSO ALLOW THE SHIPBUILDER TO CHOOSE FROM THE FOLLOWING OPTIONS, PROVIDING:

- THE SHIPBUILDER'S UTILIZATION OF THE FOLLOWING OPTIONS MUST RESULT IN NO ADDITIONAL COST TO THE GOVERNMENT.

- THE SHIPBUILDER MUST UTILIZE THE FABRICATION DOCUMENT SELECTED FOR THE ENTIRE AVAILABILITY AND MUST NOT SWITCH BACK AND FORTH BETWEEN DOCUMENTS.

- THE SHIPBUILDER MUST NOTIFY THE SUPERVISOR OF WHICH FABRICATION DOCUMENT HAS BEEN SELECTED.

OPTIONS:

A) MIL-STD-1689 MAY BE UTILIZED BY THE SHIPBUILDER AT THE SHIPBUILDER'S DISCRETION. THE REQUIREMENTS OF TABLE 2 ABOVE WOULD THEN APPLY.

B) FOR DETERMINATION OF NDT METHOD(S) AND EXTENT OF NDT INSPECTION WHEN REPAIRS ARE TO BE ACCOMPLISHED, THE SHIPBUILDER MAY REQUEST TO UTILIZE THE SAME NDT REQUIREMENTS THAT WERE INVOKED IN CONSTRUCTION OF THE VESSEL. IN SUCH CASES, THE SHIPBUILDER MUST BE RESPONSIBLE TO DETERMINE THE ORIGINAL NDT REQUIREMENTS AND SUBMIT EVIDENCE SUCH AS DRAWINGS OR SPECIFICATIONS WHICH DETAIL THE REQUIREMENTS TO THE SUPERVISOR ALONG WITH A REQUEST FOR APPROVAL.

C) THE SHIPBUILDER MAY REQUEST TO UTILIZE PRE-ESTABLISHED WELDING AND/OR NDT PROCEDURES AND PERSONNEL QUALIFICATION PROGRAM(S) WHICH HAVE BEEN PREVIOUSLY UTILIZED IN THE PERFORMANCE OF SIMILAR ABS-ACCEPTED WORK. IN SUCH CASES, THE SHIPBUILDER MUST SUBMIT EVIDENCE OF SUCH ABS ACCEPTABILITY TO THE SUPERVISOR ALONG WITH DESCRIPTIVE DETAILS AND SUPPORTING DOCUMENTATION FOR THE PROPOSED PROGRAM(S). SUCH DOCUMENTATION MUST INCLUDE THE WELDING/NDT PROCEDURES AND METHODS OF WELDING/NDT PERSONNEL QUALIFICATION THAT WERE UTILIZED IN FORMER ABS-ACCEPTED WORK. THE SHIPBUILDER MUST ALSO SUBMIT OTHER SUPPORTING EVIDENCE THAT MAY BE REQUESTED BY THE SUPERVISOR TO

ESTABLISH THAT THE PROPOSED PROGRAMS HAVE BEEN PREVIOUSLY UTILIZED FOR SIMILAR ABS-ACCEPTED WORK.

\*\*\* - PARAGRAPH 3.8 APPLIES.



ATTACHMENT A  
COMBATANT SURFACE SHIPS

WARSHIPS

TABLE

Aircraft Carriers:

|   |           |   |
|---|-----------|---|
| Aircraft Carrier .....                      | CV .....  | 2 |
| Aircraft Carrier (nuclear propulsion) ..... | CVN ..... | 2 |
| Surface Combatants:                         |           |   |
| Guided Missile Cruiser .....                | CG .....  | 2 |
| Guided Missile Destroyer .....              | DDG ..... | 2 |
| Guided Missile Frigate .....                | FFG ..... | 2 |
| Littoral Combat Ship .....                  | LCS ..... | 2 |
| Patrol Combatants:                          |           |   |
| Patrol Coastal .....                        | PC .....  | 4 |

AMPHIBIOUS WARFARE SHIPS

|   |           |   |
|---|-----------|---|
| Amphibious Command Ship .....                   | LCC ..... | 2 |
| Amphibious Assault Ship (general purpose) ..... | LHA ..... | 2 |
| Amphibious Cargo Ship .....                     | LKA ..... | 2 |
| Amphibious Transport Dock .....                 | LPD ..... | 2 |
| Dock Landing Ship .....                         | LSD ..... | 2 |
| Amphibious Assault Ship (general purpose) ..... | LHD ..... | 2 |

AUXILIARY SHIPS

|                                |           |   |
|--------------------------------|-----------|---|
| Oiler .....                    | AO .....  | 2 |
| Fast Combat Support Ship ..... | AOE ..... | 2 |

MINE WARFARE SHIPS

|                                 |           |   |
|---------------------------------|-----------|---|
| Mine Countermeasures Ship ..... | MCM ..... | 2 |
|---------------------------------|-----------|---|

NON-COMBATANT SURFACE SHIPS

AUXILIARY SHIPS

|  |            |   |
|--|------------|---|
| Auxiliary Crane Ship .....               | ACS .....  | 3 |
| Missile Range Instrumentation Ship ..... | AGM .....  | 3 |
| Oceanographic Research Ship .....        | AGOR ..... | 3 |
| Ocean Surveillance Ship .....            | AGOS ..... | 3 |
| Surveying Ship .....                     | AGS .....  | 3 |
| Hospital Ship .....                      | AH .....   | 3 |
| Cargo Ship .....                         | AK .....   | 3 |
| Auxiliary Cargo Barge/Lighter Ship ..... | AKB .....  | 3 |

ATTACHMENT A  
(Con't)  
NON-COMBATANT SURFACE SHIPS

TABLE

|   |           |   |
|---|-----------|---|
| Auxiliary Cargo Float-On/Float-Off Ship ..... | AKF. .... | 3 |
| Transport Oiler .....                         | AOT. .... | 3 |
| Barracks Craft .....                          | APL. .... | 3 |
| Cable Repairing Ship .....                    | ARC. .... | 3 |
| Salvage Ship .....                            | ARS. .... | 3 |
| Submarine Tender .....                        | AS. ....  | 3 |
| Fleet Ocean Tug .....                         | ATF. .... | 3 |
| Aviation Logistic Support Ship .....          | AVB. .... | 3 |

**BOATS AND CRAFTS**

TABLE

|  |              |   |
|--|--------------|---|
| Improved Navy lighterage system .....          | (INLS) ..... | 4 |
| Landing Craft, Air Cushion .....               | LCAC. ....   | 4 |
| Landing Craft, Mechanized .....                | LCM. ....    | 4 |
| Landing Craft, Personnel, Large .....          | LCPL. ....   | 4 |
| Landing Craft, Utility .....                   | LCU. ....    | 2 |
| Light Seal Support Craft .....                 | LSSC. ....   | 4 |
| Amphibious Warping Tug .....                   | LWT. ....    | 4 |
| Maritime Prepositioning Force Utility Boat ... | MPFUB. ....  | 4 |
| Medium Seal Support Craft .....                | MSSC. ....   | 4 |
| <i>SEAL</i> Delivery Vehicle .....             | SDV. ....    | 4 |
| Side Loading Warping Tug .....                 | SLWT. ....   | 4 |
| Special Warfare Craft, Light .....             | SWCL. ....   | 4 |
| Special Warfare Craft, Medium .....            | SWCM. ....   | 4 |
| Mini-Armored Troop Carrier .....               | ATC. ....    | 4 |
| Multi-Use EOD Response Craft .....             | MERC. ....   | 4 |
| Patrol Boat .....                              | PB. ....     | 4 |
| River Patrol Boat .....                        | PBR. ....    | 4 |
| Riverine Assault Boat .....                    | RAB. ....    | 4 |
| Riverine Command Boat .....                    | RCB. ....    | 4 |
| Dive Support Boat .....                        | DSB. ....    | 4 |
| Combatant Craft Assault .....                  | CCA. ....    | 4 |
| Combatant Craft Medium .....                   | CCM. ....    | 4 |
| Combatant Craft Heavy .....                    | CCH. ....    | 4 |
| Seal Delivery Vehicle .....                    | SDV. ....    | 4 |
| Special Operations Craft-Riverine .....        | SOC-R. ....  | 4 |
| Shallow Water Combat Submersible .....         | SWCS. ....   | 4 |
| Surface Support Craft .....                    | SSC. ....    | 4 |

**ATTACHMENT A**  
**(Con't)**  
**BOATS AND CRAFTS**

TABLE

|   |           |   |
|---|-----------|---|
| Small Auxiliary Floating Dry Dock (non-self-propelled) .....    | AFDL..... | 3 |
| Medium Auxiliary Floating Dry Dock (non-self-propelled) .....   | AFDM..... | 3 |
| Medium Auxiliary Repair Dry Dock (non-self-propelled) .....     | ARDM..... | 3 |
| Causeway Section, Powered .....                                 | CSP.....  | 3 |
| Causeway Section (non-self-propelled) .....                     | CSNP..... | 3 |
| Unclassified Miscellaneous .....                                | IX.....   | 3 |
| Open Lighter (non-self-propelled) .....                         | YC.....   | 3 |
| Aircraft Transportation Lighter (non-self-propelled) .....      | YCV.....  | 3 |
| Cargo Semi-Submersible Barge .....                              | YCSS..... | 3 |
| Floating Crane (non-self-propelled) .....                       | YD.....   | 3 |
| Diving Tender (non-self-propelled) .....                        | YDT.....  | 3 |
| Ferryboat or Launch (self-propelled) .....                      | YFB.....  | 3 |
| Covered Lighter (non-self-propelled) .....                      | YFN.....  | 3 |
| Large Covered Lighter (non-self-propelled) .....                | YFNB..... | 3 |
| Dry Dock Companion Craft (non-self-propelled) .....             | YFND..... | 3 |
|   |           |   |
| Lighter (special purpose) (non-self-propelled) .....            | YFNX..... | 3 |
| Floating Power Barge (non-self-propelled) .....                 | YFP.....  | 3 |
| Salvage Lift Craft, Light .....                                 | YLC.....  | 3 |
| Gasoline Barge (non-self-propelled) .....                       | YOGN..... | 3 |
| Fuel Oil Barge (non-self-propelled) .....                       | YON.....  | 3 |
| Oil Storage Barge (non-self-propelled) .....                    | YOS.....  | 3 |
| Patrol Craft (self-propelled) .....                             | YP.....   | 4 |
| Floating Workshop (non-self-propelled) .....                    | YR.....   | 3 |
| Repair and Berthing Barge (non-self-propelled) .....            | YRB.....  | 3 |
| Repair, Berthing and Messing Barge (non-self-propelled) .....   | YRBM..... | 3 |
| Floating Dry Dock Workshop (hull) (non-self-propelled) .....    | YRDH..... | 3 |
| Floating Dry Dock Workshop (machine) (non-self-propelled) ..... | YRDM..... | 3 |
| Radiological Repair Barge (non-self-propelled) .....            | YRR.....  | 3 |
| Seaplane Wrecking Derrick (self-propelled) .....                | YSD.....  | 3 |
| Large Harbor Tug .....  | YTB.....  | 4 |
| Small Harbor Tug .....  | YTL.....  | 4 |
| Torpedo Trials Craft .....                                      | YTT.....  | 4 |
| Water Barge (non-self-propelled) .....                          | YWN.....  | 3 |
|   |           |   |
| Aircraft Rescue Boat .....                                      | AR.....   | 4 |
| Area Search Boat .....  | AS.....   | 3 |
| Armored Troop Carrier.....                                      | AT.....   | 3 |
| Barrier Boat .....  | BB.....   | 3 |
| Boom Platform Boat .....  | BP.....   | 3 |

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TABLE

|   |                  |          |
|---|------------------|----------|
| Dynamic Inclined Plane Oil Skimmer Boat .....                     | DP.....          | 3        |
| Dive Support .....  | DS.....          | 3        |
| Dive Workboat.....  | DW.....          | 3        |
| Harbor Security Boat.....   | DW.....          | 3        |
| Marine Mammal Boat.....   | MM.....          | 3        |
| Missile Retriever Boat .....                                      | MR.....          | 3        |
| Non-Standard Boat .....   | NS .....         | 4        |
| Oil Pollution Skimmer Boat .....                                  | OP .....         | 4        |
| Parasail Training Boat .....                                      | PS .....         | 4        |
| Riverine Assault Boat .....                                       | RAB .....        | 4        |
| Riverine Command Boat .....                                       | RCB .....        | 4        |
| Riverine Patrol Boat .....  | RPB .....        | 4        |
| Support Craft .....   | SC .....         | 4        |
| Ships Non-Standard Boat .....                                     | SX.....          | 4        |
| Torpedo Retriever Boat .....                                      | TR.....          | 4        |
| Utility Boat .....  | UB .....         | 4        |
| Unmanned Craft .....  | UC .....         | 4        |
| Work Boat .....   | WB .....         | 4        |
| Work Platform Boat .....  | WP .....         | 4        |
| Warping Tug .....   | WT .....         | 4        |
| <b>PE HV Barge (Self-Propelled) .....</b>                         | <b>AC.....</b>   | <b>3</b> |
| <b>PE HV Barge (Self-Propelled) ....</b>                          | <b>CC.....</b>   | <b>3</b> |
| <b>Large Auxiliary Floating Dry Dock (Self-Propelled) .....</b>   | <b>AFBD.....</b> | <b>3</b> |
| <b>UB Small Dive / EOD MERC SSUB (Self-Propelled) .....</b>       | <b>AP .....</b>  | <b>4</b> |
| <b>UB Small Dive (Self-Propelled) ...</b>                         | <b>MC .....</b>  | <b>4</b> |
| <b>SC HV (Self-Propelled) .....</b>                               | <b>MC .....</b>  | <b>4</b> |
| <b>Deep Submergence Rescue Vehicle (Self-Propelled) .....</b>     | <b>DSRV.....</b> | <b>4</b> |
| <b>Deep Submergence Vehicle (Self-Propelled) .....</b>            | <b>DSV.....</b>  | <b>4</b> |
| <b>Fast Sea Frame (Self-Propelled) .....</b>                      | <b>FSF.....</b>  | <b>4</b> |
| <b>SC Large (Self-Propelled) .....</b>                            | <b>HL .....</b>  | <b>4</b> |
| <b>FP Non-Standard (Self-Propelled) .....</b>                     | <b>HS.....</b>   | <b>4</b> |
| <b>Non-Standard (Self-Propelled) .....</b>                        | <b>ML.....</b>   | <b>4</b> |
| <b>Submersible Research Vehicle (Self-Propelled) .....</b>        | <b>NR.....</b>   | <b>4</b> |
| <b>FP Medium (Self-Propelled) .....</b>                           | <b>HS.....</b>   | <b>4</b> |
| <b>FP Small / FP Non-Standard (Self-Propelled) .....</b>          | <b>HS.....</b>   | <b>4</b> |
| <b>FP Large (Self-Propelled) .....</b>                            | <b>HS.....</b>   | <b>4</b> |
| <b>Unclassified Miscellaneous Submarine(Self-Propelled) .....</b> | <b>SS.....</b>   | <b>3</b> |
| <b>Life Boat (Self-Propelled) .....</b>                           | <b>LB.....</b>   | <b>4</b> |
| <b>Auxiliary Repair Dry Dock (Non-Self-Propelled).....</b>        | <b>ARD.....</b>  | <b>3</b> |
| <b>Mobile Radar Platform (Self-Propelled) .....</b>               | <b>SBX.....</b>  | <b>3</b> |

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|   |                   |   |
|---|-------------------|---|
| <i>Sail STC (Self-Propelled)</i> .....                              | <i>ST</i> .....   | 4 |
| <i>TWR (Self-Propelled)</i> .....                                   | <i>TWR</i> .....  | 3 |
| <i>Submersible Craft (Self-Propelled)</i> .....                     | <i>X</i> .....    | 3 |
| <i>Miscellaneous Auxiliary Service Craft (Self-Propelled)</i> ..... | <i>YAG</i> .....  | 3 |
| <i>Car Float (Self-Propelled)</i> .....                             | <i>YCF</i> .....  | 3 |
| <i>Waste oil barge (Non-Self-Propelled)</i> .....                   | <i>YWO</i> .....  | 3 |
| <i>Water Barge (Self-Propelled)</i> ....                            | <i>YW</i> .....   | 3 |
| <i>Medium Harbor Tug (Self-Propelled)</i> ....                      | <i>YTM</i> .....  | 4 |
| <i>Harbor Tug (Self-Propelled)</i> .....                            | <i>YT</i> .....   | 4 |
| <i>Sludge Removal Barge (Non-Self-Propelled)</i> .....              | <i>YSR</i> .....  | 3 |
| <i>Salvage Craft Tender (Non-Self-Propelled)</i> ....               | <i>YRST</i> ..... | 3 |
| <i>Floating Pile Driver (Non-Self-Propelled)</i> .....              | <i>YPD</i> ....   | 3 |
| <i>Gasoline Barge (Non-Self-Propelled)</i> ....                     | <i>YOGN</i> ..... | 3 |
| <i>Fuel Oil Barge (Self-propelled)</i> ....                         | <i>YON</i> .....  | 3 |
| <i>Gate Craft (Non-Self-Propelled)</i> ....                         | <i>YNG</i> .....  | 3 |
| <i>Dredge (Non-Self-Propelled)</i> ....                             | <i>YMN</i> .....  | 3 |
| <i>Garbage Lighter (Self-Propelled)</i> ....                        | <i>YG</i> .....   | 3 |
| <i>Harbor Utility Craft (Self-Propelled)</i> ....                   | <i>YFU</i> .....  | 3 |
| <i>Range Tender (Self-Propelled)</i> ....                           | <i>YFRT</i> ..... | 3 |
| <i>Covered Lighter (Self-Propelled)</i> .....                       | <i>YF</i> .....   | 3 |
| <i>Refrigerated Covered Lighter (Self-Propelled)</i> ....           | <i>YFR</i> .....  | 3 |
| <i>Refrigerated Covered Lighter (Non-Self-Propelled)</i> .....      | <i>YFRN</i> ..... | 3 |
| <i>Yard Floating Dry Dock (Non-Self-Propelled)</i> .....            | <i>YFD</i> .....  | 3 |
| <i>Aircraft Transportation Lighter (Non-Self-Propelled)</i> .....   | <i>YCV</i> .....  | 3 |
| <i>Paint Float</i> .....  | <i>YR</i> .....   | 3 |
| <i>Barrier Boats (BBs)</i> .....                                    | <i>YTL</i> .....  | 4 |
| <i>CVN Camels and Breasting Camels</i> .....                        | <i>YFNX</i> ..... | 3 |
| <i>Submarine Camels</i> .....                                       | <i>IX</i> .....   | 3 |
| <i>WB Small (Self-Propelled)</i> ....                               | <i>BH</i> .....   | 4 |
| <i>UB Medium (Self-Propelled)</i> ....                              | <i>BH</i> .....   | 4 |
| <i>UB V Small (Self-Propelled)</i> .....                            | <i>BW</i> .....   | 4 |
| <i>Non-Standard (Self-Propelled)</i> .....                          | <i>CA</i> .....   | 4 |
| <i>WB Medium (Self-Propelled)</i> ....                              | <i>CM</i> .....   | 4 |
| <i>NSWCCD (Self-Propelled)</i> .....                                | <i>PE</i> .....   | 4 |
| <i>10MPE (Self-Propelled)</i> .....                                 | <i>PE</i> .....   | 4 |
| <i>PE Boat Medium (Self-Propelled)</i> .....                        | <i>PE</i> .....   | 4 |
| <i>RX Small (Self-Propelled)</i> ....                               | <i>PE</i> .....   | 4 |
| <i>AZ Memorial Ferry (Self-Propelled)</i> ....                      | <i>PE</i> .....   | 4 |
| <i>SC Large (Self-Propelled)</i> .....                              | <i>PE</i> .....   | 4 |
| <i>RX Small (Self-Propelled)</i> ....                               | <i>RB</i> .....   | 4 |
| <i>RX 7M / RIB STD 7M (Self-Propelled)</i> .....                    | <i>RB</i> .....   | 4 |

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|   |                        |                 |
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| <b><i>RX Large (Self-Propelled)</i></b> .....           | <b><i>RB</i></b> ..... | <b><i>4</i></b> |
| <b><i>RX Large / EOD MERC (Self-Propelled)</i></b> .... | <b><i>RX</i></b> ..... | <b><i>4</i></b> |
| <b><i>RX Small (Self-Propelled)</i></b> .....           | <b><i>RX</i></b> ..... | <b><i>4</i></b> |
| <b><i>RX Medium (Self-Propelled)</i></b> .....          | <b><i>RX</i></b> ..... | <b><i>4</i></b> |

NOTES:

Letter prefixes to classification symbols may add identification:

E-- Prototype ship or craft in an experimental or developmental status.

T-- Assigned to MSC (Military Sealift Command)

F-- Being Constructed for a foreign government.

X -- Often added to existing classifications to indicate a new class whose characteristics have not been defined.