NAVSEA
STANDARD ITEM

FY-19 ***CH-3***

ITEM NO: 009-12
DATE: ***30 APR 2018***
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 10-623, SERMC, Quality Assurance Requirements for Welding 5XXX Series Aluminum Structures for CG-47 Class

3. REQUIREMENTS:

3.1 Utilize specific requirements of 2.2 through 2.12 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 shall 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 shall 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 shall 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 shall be connected directly to the component being welded - as close to the weld zone as feasible.

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

3.4 Accomplishment of a Process Control Procedure (PCP) for the specific welding, brazing, and inspection operations in 3.4.1 through 3.4.9 shall 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 shall 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 shall 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 shall include, as a minimum, the information required by Sections 4 of 2.***5***. |

3.4.2.1 All brazing of steam piping shall conform to 2.6, Class P-3a special category, including ultrasonic inspection, ***for all pipe sizes .840 inch outer diameter or grater*** including any (existing) copper to (new) copper-nickel transition joints. ***Brazed joints shall 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 shall not be used; liquid penetrant inspection shall 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.

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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***.

3.4.***8*** The use of a permanent backing strap in accordance with Section 11, Paragraph 11.1 of 2.2 is prohibited unless detailed in the original weld joint design or when authorized by the SUPERVISOR.

(I) or (I)(G) "NONDESTRUCTIVE TESTING"

3.5 Accomplish nondestructive testing in accordance with the following:

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

3.5.1.1 Nondestructive Testing Visual Inspection - (I)

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

3.5.1.3 Nondestructive Testing Radiographic - (I)

3.5.2 Welding/brazing of 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 P-2 steam service:

3.5.2.1 Nondestructive Testing Visual Inspection - (I)

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

3.5.2.3 Nondestructive Testing Radiographic - (I)

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

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

3.5.3.1 Nondestructive Testing Visual Inspection - (I)

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

3.5.3.3 Nondestructive Testing Radiographic - (I)

3.5.4 Weight handling equipment manufacture and repair:

3.5.4.1 Nondestructive Testing Visual Inspection - (I)

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

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

3.5.4.4 Nondestructive Testing Radiographic - (I)

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

3.5.5.1 Nondestructive Testing Visual Inspection - (I)

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

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

3.5.5.4 Nondestructive Testing Radiographic - (I)

3.5.6 Maintenance on aircraft launch and recovery equipment:

3.5.6.1 Nondestructive Testing Visual Inspection - (I)

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

3.5.6.3 Nondestructive Testing Radiographic - (I)

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

3.6 Accomplish RT film interpretation.

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

3.7 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, and 2.***16*** which covers the control and issuance of filler materials. The system shall be described in a written procedure that shall 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 shall be subject to periodic conformity audits by the SUPERVISOR throughout the contract period.

3.***8*** Utilize Attachment A to define combatant and non-combatant vessels and applicable table.

3.***9*** Where requirements in the repair and testing instructions for propulsion boilers conflict, 2.12 shall 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.***8*** 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.

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

LINE	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, ***SECTION*** 5	0900-LP-001-7000, SECTION 4	S9074-AQ-GIB-010/248, ***SECTION*** 5		S9221-C1-GTP-010/020	
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, ***SECTION*** 4	NOT APPLICABLE	S9074-AQ-GIB-010/248, ***SECTION*** 4		S9221-C1-GTP-010/020	DOD-STD-2185, ***SECTION*** 4
3	BRAZING PROCEDURE	NOT APPLICABLE	0900-LP-001-7000, SECTION 4	NOT APPLICABLE			
4	WELDING REQUIREMENTS	S9074-AR-GIB-010/278, ***SECTION*** 6	NOT APPLICABLE	S9074-AR-GIB-010/278, ***SECTION*** 6			MIL-STD-2185, ***SECTION*** 5
5	FILLER MATERIAL	S9074-AR-GIB-010/278, ***SECTION*** 5	0900-LP-001-7000, SECTION 5	S9074-AR-GIB-010/278, ***SECTION*** 5		S9221-C1-GTP-010/020	DOD-STD-2185, ***SECTION*** 5
6	JOINT DESIGN	S9074-AR-GIB-010/278, ***SECTION*** 9 MIL-STD-22	0900-LP-001-7000, SECTION 5	NOT APPLICABLE	S9074-AR-GIB-010/278, ***SECTION*** 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

LINE	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)
7	HEAT TREATMENT	S9074-AR-GIB-010/278, ***SECTION*** 6	0900-LP-001-7000, ***SECTION*** 5	S9074-AR-GIB-010/278, ***SECTIONS*** 6 AND 11.6	S9074-AR-GIB-010/278, ***SECTION*** 6	S9221-C1-GTP-010/020	S9074-AR-GIB-010/278, ***SECTION*** 6 DOD-STD-2185, ***SECTION*** 5
8	WORKMANSHIP REQUIREMENTS	S9074-AR-GIB-010/278, ***SECTION*** 7	0900-LP-001-7000, ***SECTION*** 5	S9074-AR-GIB-010/278, ***SECTIONS*** 7 AND 11.6	S9074-AR-GIB-010/278, ***SECTION*** 7	S9221-C1-GTP-010/020	S9074-AR-GIB-010/278, ***SECTION*** 7
9	VISUAL INSPECT JOINT FIT-UP	S9074-AR-GIB-010/278, ***SECTION*** 9 MIL-STD-22 ***Not Required for P2***	0900-LP-001-7000, SECTION 7 FOR CLASS P-3a SPECIAL CATEGORY	NOT APPLICABLE	S9074-AR-GIB-010/278, ***SECTION*** 9 MIL-STD-22	S9221-C1-GTP-010/020	DOD-STD-2185, ***SECTION*** 5
10	VISUAL INSPECTION	S9074-AR-GIB-010/278, ***SECTION*** 10 MIL-STD-2035, ***SECTION*** 4	0900-LP-001-7000, SECTION 7 AND 8 FOR CLASS P-3a SPECIAL CATEGORY	S9074-AR-GIB-010/278, ***SECTION*** 11.6.3 MIL-STD-2035, ***SECTION*** 4	S9074-AR-GIB-010/278, ***SECTION*** 10 MIL-STD-2035, ***SECTION*** 4		MIL-STD-2035, ***SECTION*** 4
11	RADIOGRAPHIC INSPECTION (RT)	S9074-AR-GIB-010/278 ***SECTION*** 10 T9074-AS-GIB-010/271, ***SECTION*** 3 MIL-STD-2035, ***SECTION*** 5 (NORMALLY ONLY P-1 AND P-LT)	NOT APPLICABLE		S9074-AR-GIB-010/278 ***SECTION*** 10 T9074-AS-GIB-010/271, ***SECTION*** 3 MIL-STD-2035, ***SECTION*** 5		NOT APPLICABLE

* - PARAGRAPH 3.4.4 APPLIES
** - PARAGRAPH 3.***10*** APPLIES

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

LINE	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)
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, ***SECTION*** 5-7.5.2
13	LIQUID PENETRANT INSPECTION (PT)	S9074-AR-GIB-010/278, ***SECTION*** 10 T9074-AS-GIB-010/271, ***SECTION*** 5 MIL-STD-2035, ***SECTION*** 7 (NORMALLY ONLY P-1 AND P-LT)	0900-LP-001-7000, ***SECTION*** 7 AND 8 FOR CLASS P-3a SPECIAL CATEGORY SEE 3.4.2.2	S9074-AR-GIB-010/278, ***SECTION*** 11.6.3 MIL-STD-2035, P ***SECTION*** 7	S9074-AR-GIB-010/278, ***SECTION*** 10 T9074-AS-GIB-010/271, ***SECTION*** 5 MIL-STD-2035, ***SECTION*** 7		MIL-STD-2035, PARAGRAPH 7 T9074-AS-GIB-010/271, ***SECTION*** 5
14	MAGNETIC PARTICLE INSPECTION (MT)	S9074-AR-GIB-010/278, ***SECTION*** 10 T9074-AS-GIB-010/271, ***SECTION*** 4 MIL-STD-2035, ***SECTION*** 6 (NORMALLY ONLY P-1 AND P-LT)	NOT APPLICABLE		S9074-AR-GIB-010/278, ***SECTION*** 10 T9074-AS-GIB-010/271, ***SECTION*** 4 MIL-STD-2035 ***SECTION*** 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

LINE	COLUMN	F	G	H	I	J
	SITUATION EVOLUTION	MACHINERY CLASS M	TURBINE PARTS	CASTINGS	FORCED DRAFT BLOWERS	REDUCTION AND STEAM TURBINE DRIVEN AUXILIARY GEARS
1	WELDER AND BRAZER QUALIFICATIONS	S9074-AQ-GIB-010/248, ***SECTION*** 5				
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, ***SECTION*** 4				
3	BRAZING PROCEDURE	NOT APPLICABLE				
4	WELDING REQUIREMENTS	S9074-AR-GIB-010/278, ***SECTION*** 6				
5	FILLER MATERIAL	S9074-AR-GIB-010/278, ***SECTION*** 5				
6	JOINT DESIGN	S9074-AR-GIB-010/278, ***SECTION*** 9, AND MIL-STD-22				
7	HEAT TREATMENT	S9074-AR-GIB-010/278, ***SECTIONS*** 6 AND 8				
8	WORKMANSHIP REQUIREMENTS	S9074-AR-GIB-010/278, ***SECTION*** 7				
9	VISUAL INSPECT JOINT FIT-UP	S9074-AR-GIB-010/278, ***SECTION*** 10, AND MIL-STD-22				
10	VISUAL INSPECTION	S9074-AR-GIB-010/278, ***SECTION*** 10 MIL-STD-2035, ***SECTION*** 4	S9074-AR-GIB-010/278, ***SECTION*** 14	S9074-AR-GIB-010/278, ***SECTION*** 13 MIL-STD-2035, ***SECTION*** 4	S9074-AR-GIB-010/278, ***SECTION*** 16	S9074-AR-GIB-010/278, ***SECTION*** 15
11	RADIOGRAPHIC INSPECTION (RT)	S9074-AR-GIB-010/278, ***SECTION*** 10 T9074-AS-GIB-010/271, ***SECTION*** 3 MIL-STD-2035, ***SECTION*** 5	S9074-AR-GIB-010/278, ***SECTION*** 14 T9074-AS-GIB-010/271, ***SECTION*** 3 MIL-STD-2035, ***SECTION*** 5	S9074-AR-GIB-010/278, ***SECTION*** 13	S9074-AR-GIB-010/278, ***SECTION*** 16 T9074-AS-GIB-010/271, ***SECTION*** 3 MIL-STD-2035, ***SECTION*** 5	NOT APPLICABLE

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

	COLUMN	F	G	H	I	J
LINE	SITUATION EVOLUTION	MACHINERY CLASS M	TURBINE PARTS	CASTINGS	FORCED DRAFT BLOWERS	REDUCTION AND STEAM TURBINE DRIVEN AUXILIARY GEARS
12	ULTRASONIC INSPECTION (UT)	S9074-AR-GIB-010/278, PARAGRAPH 10 T9074-AS-GIB-010/271, ***SECTION*** 6 MIL-STD-2035, ***SECTION*** 8	S9074-AR-GIB-010/278, ***SECTION*** 14	S9074-AR-GIB-010/278, ***SECTION*** 13	S9074-AR-GIB-010/278, ***SECTION*** 16	S9074-AR-GIB-010/278, ***SECTION*** 15
13	LIQUID PENETRANT INSPECTION (PT)	S9074-AR-GIB-010/278, ***SECTION*** 10 T9074-AS-GIB-010/271, ***SECTION*** 5 MIL-STD-2035, ***SECTION*** 7	S9074-AR-GIB-010/278, ***SECTION*** 14 T9074-AS-GIB-010/271, ***SECTION*** 5 MIL-STD-2035, ***SECTION*** 7	S9074-AR-GIB-010/278, ***SECTION*** 13 T9074-AS-GIB-010/271, ***SECTION*** 5 MIL-STD-2035, ***SECTION*** 7	S9074-AR-GIB-010/278, ***SECTION*** 16 T9074-AS-GIB-010/271, ***SECTION*** 5 MIL-STD-2035, ***SECTION*** 7	S9074-AR-GIB-010/278, ***SECTION*** 15 T9074-AS-GIB-010/271, ***SECTION*** 5 MIL-STD-2035, ***SECTION*** 7
14	MAGNETIC PARTICLE INSPECTION (MT)	S9074-AR-GIB-010/278, ***SECTION*** 10 T9074-AS-GIB-010/271, ***SECTION*** 4 MIL-STD-2035, ***SECTION*** 6	S9074-AR-GIB-010/278, ***SECTION*** 14 T9074-AS-GIB-010/271, ***SECTION*** 4 MIL-STD-2035, ***SECTION*** 6	S9074-AR-GIB-010/278, ***SECTION*** 13 T9074-AS-GIB-010/271, ***SECTION*** 4 MIL-STD-2035, PARAGRAPH 6	S9074-AR-GIB-010/278, ***SECTION*** 16 T9074-AS-GIB-010/271, ***SECTION*** 4 MIL-STD-2035, ***SECTION*** 6	S9074-AR-GIB-010/278, ***SECTION*** 15 T9074-AS-GIB-010/271, ***SECTION*** 4 MIL-STD-2035, ***SECTION*** 6

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

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

***PARAGRAPH 3.8 APPLIES**

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

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

***PARAGRAPH 3.8 APPLIES**

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

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

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

LINE	COLUMN	A	B	C	D	E	F
	MATERIAL EVOLUTION	CARBON STEEL (MS), ORDINARY STRENGTH STEEL(OS), AND HIGHER STRENGTH STEEL (HSS)	*** (HY-80/100)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
9	ULTRASONIC INSPECTION (UT)	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
10	LIQUID PENETRANT INSPECTION (PT)	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
11	MAGNETIC PARTICLE INSPECTION (MT)	ABS RULES, PART 2, CHAPTER 4, 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 SHALL RESULT IN NO ADDITIONAL COST TO THE GOVERNMENT.
- THE SHIPBUILDER SHALL UTILIZE THE FABRICATION DOCUMENT SELECTED FOR THE ENTIRE AVAILABILITY AND SHALL NOT SWITCH BACK AND FORTH BETWEEN DOCUMENTS.
- THE SHIPBUILDER SHALL 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 SHALL 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 SHALL SUBMIT EVIDENCE OF SUCH ABS ACCEPTABILITY TO THE SUPERVISOR ALONG WITH DESCRIPTIVE DETAILS AND SUPPORTING DOCUMENTATION FOR THE PROPOSED PROGRAM(S). SUCH DOCUMENTATION SHALL INCLUDE THE WELDING/NDT PROCEDURES AND METHODS OF WELDING/NDT PERSONNEL QUALIFICATION THAT WERE UTILIZED IN FORMER ABS-ACCEPTED WORK. THE SHIPBUILDER SHALL 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.

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

LINE	COLUMN	A	B	C	D	E	F
	MATERIAL EVOLUTION	CARBON STEEL (MS)	(HY-80/100)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
1	WELDER QUALIFICATION	S9074-AQ-GIB-010/248, ***SECTION*** 5					
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, ***SECTION*** 4					
3	ELECTRODE	0900-060-4010, SECTION 10, TABLE 10-1	0900-060-4010, SECTION 10, TABLES 10-2 AND 10-3	0900-060-4010, SECTION 10, TABLE 10-7	0900-060-4010, SECTION 10, TABLE 10-4	0900-060-4010 SECTION 10, TABLES 10-5 AND 10-6	S9074-AR-GIB-010/278, TABLE II
4	JOINT DESIGN	MIL-STD-22 0900-060-4010, SECTION 11					
5	WELDING REQUIREMENTS	0900-060-4010, SECTION 13					
6	WORKMANSHIP REQUIREMENTS	0900-060-4010, SECTIONS 12 AND 14					
7	VISUAL	0900-060-4010, SECTIONS 6, 7, AND 8 T9074-AS-GIB-010/271, ***SECTION*** 8					
8	RADIOGRAPHIC INSPECTION (RT)	0900-060-4010, SECTION 6, TABLE 6-1 AND SECTIONS 7 AND 8 T9074-AS-GIB-010/271, ***SECTION*** 3					
9	ULTRASONIC INSPECTION (UT)	T9074-AS-GIB-010/271, ***SECTION*** 6					
10	LIQUID PENETRANT INSPECTION (PT)	0900-060-4010, SECTIONS 6, 7, AND 8 T9074-AS-GIB-010/271, ***SECTION*** 5					
11	MAGNETIC PARTICLE INSPECTION (MT)	0900-060-4010 SECTION 6 T9074-AS-GIB-010/271, ***SECTION*** 4		NOT APPLICABLE			

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

ATTACHMENT A
(Con't)

COMBATANT SURFACE CRAFT

AMPHIBIOUS WARFARE CRAFT

		TABLE
Landing Craft, Air Cushion	LCAC	4
Landing Craft, Mechanized	LCM	4
Landing Craft, Personnel, Large	LCPL	4
Landing Craft, Utility	LCU	2
Landing Craft, Vehicle, Personnel	LCVP	4
Light Seal Support Craft	LSSC	4
Amphibious Warping Tug	LWT	4
Medium Seal Support Craft	MSSC	4
Swimmer Delivery Vehicle	SDV	4
Side Loading Warping Tug	SLWT	4
Special Warfare Craft, Light	SWCL	4
Special Warfare Craft, Medium	SWCM	4

PATROL CRAFT

Mini-Armored Troop Carrier	ATC	4
Patrol Boat	PB	4
River Patrol Boat	PBR	4
Patrol Craft (fast)	PCF	4
Fast Patrol Craft	PTF	4

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
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

ATTACHMENT A
(Con't)

NON-COMBATANT SURFACE CRAFT

SERVICE CRAFT		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

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.