

U.S. Department of  
Homeland Security

United States  
Coast Guard



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# Work Item Standards and Specifications (WISS) for Coast Guard Vessel Maintenance and Repair



This publication supersedes SFLC Standard Specifications

## Surface Forces Logistics Center (SFLC) Engineering Services

12/15/2025

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## REFERENCES

### COAST GUARD DRAWINGS

Reserved

### SFLC MANUALS AND TECHNICAL GUIDANCE

- 5 [COAST GUARD VESSEL COATINGS SPECIFICATIONS \(VCS\), version furnished with the solicitation on SAM.gov](#)

### OTHER REFERENCES

- American Society of Mechanical Engineers (ASME) B16.34, 2004, Valves-Flanged, Threaded, and Welding End
- 10 ASTM International (ASTM) F992, 2006, Standard Specification for Valve Label Plates
- International Standard Organization (ISO) 4406, 2018, Hydraulic Fluid Power – Fluids – Method for Coding the Level of Contamination by Solid Particles
- Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) SP-58, 2003 Edition, Pipe Hangers and Supports
- 15 Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) SP-61, 2003 Edition, Pressure Testing Of Steel Valves
- Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) SP-67, 2002 Edition, Butterfly Valves
- 20 Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) SP-72, 1999 Edition, Ball Valves with Flanged or Butt-Welding Ends for General Service
- Manufacturers' Standardization Society of the Valve and Fittings Industry (MSS) SP-80, 2008 Edition, Bronze Gate, Globe, Angle and Check Valves
- ASTM International (ASTM) D1330, 2010, Standard Specification for Rubber Sheet Gaskets
- 25 Society of Automotive Engineers (SAE) Aerospace Material Specification (AMS) G-6032, 2014 Grease, Plug Valve, Gasoline and Oil Resistant, NATO Code Number G-363, Metric
- American National Standards Institute/NSF International (ANSI/NSF) 61, 2015, Drinking Water System Components - Health Effects
- American National Standards Institute/American Water Works Association (ANSI/AWWA) C652, 2011, Disinfection of Water-Storage Facilities
- 30 SAE J1942/1\_202112 Qualified Hoses for Marine Applications
- [NFPA 557 Get full name and date/version](#)

## CHAPTER 000 GENERAL GUIDANCE AND ADMINISTRATION

### 000a Guidance for Understanding Requirements Documents

Category	Definition
Generic Maintenance Actions	<p>These verbs describe types of maintenance work to be performed on designated configuration items and classes, are defined in subchapter 000b below, and are designated using bold font (e.g., <b>Abate, Clean, Inspect, Operate &amp; Inspect, Overhaul, Renew, Repair, Pressure Test</b>, etc.).</p> <p>These will generally appear in work items, but appear herein as well to describe sub-tasks.</p> <p>EXAMPLE</p> <p style="padding-left: 40px;"><b>"Overhaul</b> the PORT Propulsion Shaft Seal."</p>
Generic Service Actions	<p>These verbs describe types of service to be provided, are defined in subchapter 000b below, and are designated using bold font (e.g., <b>Provide, Perform, Comply, Provide</b>, etc.).</p> <p>These will be followed by a description of the service in the work item, or will point to a "Supply, Service, and General Requirements Items Item" herein.</p> <p>EXAMPLE</p> <p style="padding-left: 40px;"><b>"Perform</b> with "</p> <p style="padding-left: 40px;"><b>"Provide</b> TEMPORARY FIRE SAFETY SUPPLIES/SERVICES (000e)"</p>
Generic Administrative Actions	<p>These verbs describe types of administrative functions to be performed, are defined in subchapter 000b below, and are designated using bold font (e.g., <b>Submit, Attend, Notify, Verify</b>, etc.).</p> <p>These will be followed by a description of the administrative function in the work item, or will point to an "Administrative Item" herein.</p> <p>EXAMPLE</p> <p style="padding-left: 40px;"><b>"Submit</b> a CFR."</p>
Supply, Service, Administrative, and General Requirements Items	<p>These are collections of subtasks/standards/specifications that are designated in ALL CAPS. A SWBS designation (at the end of, or near, the task in the work item) points the reader to a WISS SWBS Section.</p> <p style="padding-left: 40px;">ENVIRONMENTAL PROTECTION PLAN (000c) ARRIVAL CONFERENCE (000c) GENERAL REQUIREMENTS FOR SURFACE PREPARATION AND COATINGS APPLICATION (631b)</p> <p>These items are invoked via Tasks in work items or herein.</p> <p>EXAMPLES</p> <p style="padding-left: 40px;"><b>Submit</b> an ENVIRONMENTAL PROTECTION PLAN (000c) <b>Attend</b> the ARRIVAL CONFERENCE (000c) <b>Comply</b> with all GENERAL REQUIREMENTS FOR SURFACE PREPARATION AND COATINGS APPLICATION (631b)</p>

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Category	Definition								
Amendments to Generic Actions	<p>These are tables that describe <b>additional</b> maintenance standards that apply to specific types/classes of configuration item, above those required by the Generic Actions.</p> <p>-----</p> <p>A SWBS designation (at the end of, or near, the task in the work item) points the reader to a WISS SWBS Section (i.e., the 123a designation).</p> <p>EXAMPLE</p> <p style="padding-left: 40px;"><b>"Clean</b> the Grey Water Tank (123a)."</p> <p>The reader finds the designated SWBS Section in WISS. In that section the reader finds the table that matches the configuration item being worked. The name of the type/class of configuration item will appear in the top row of the table with a definition of that type/class.</p> <p><b>123a Tanks and Voids</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #d3d3d3;">"Structural-Tank"-and-"Structural-Void"¶</th> </tr> </thead> <tbody> <tr> <td style="font-size: small;">DEFINITION--"Structural-Tanks"are enclosed spaces/chambers designed to store or contain liquids that are integral to the hull (i.e., share a wall or other structural member with the hull/vessel structure).¶</td> </tr> <tr> <td style="font-size: small;">DEFINITION--"Structural-Voids"are enclosed spaces/chambers that are integral to the hull (i.e., share a wall or other structural member with the hull/vessel structure) but are not designed to store or contain liquids.¶</td> </tr> <tr> <td style="font-size: small;">If the SOW invokes one of the following actions on this type of system/component then amend that task description as follows; any additional amendments that may be described inside the SOW must take precedent.¶</td> </tr> <tr> <td style="font-size: small;"><b>Inspect¶</b></td> </tr> <tr> <td style="font-size: small;"><i>Various additional requirements¶</i></td> </tr> <tr> <td style="font-size: small;"><b>Clean¶</b></td> </tr> <tr> <td style="font-size: small;"><i>Various additional requirements¶</i></td> </tr> </tbody> </table> <p>The <i>Various additional requirements</i> are then appended to the requirements described by the Generic Action.</p>	"Structural-Tank"-and-"Structural-Void"¶	DEFINITION--"Structural-Tanks"are enclosed spaces/chambers designed to store or contain liquids that are integral to the hull (i.e., share a wall or other structural member with the hull/vessel structure).¶	DEFINITION--"Structural-Voids"are enclosed spaces/chambers that are integral to the hull (i.e., share a wall or other structural member with the hull/vessel structure) but are not designed to store or contain liquids.¶	If the SOW invokes one of the following actions on this type of system/component then amend that task description as follows; any additional amendments that may be described inside the SOW must take precedent.¶	<b>Inspect¶</b>	<i>Various additional requirements¶</i>	<b>Clean¶</b>	<i>Various additional requirements¶</i>
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<b>Inspect¶</b>									
<i>Various additional requirements¶</i>									
<b>Clean¶</b>									
<i>Various additional requirements¶</i>									
Tasks	<p>A task is described when an Action (e.g., <b>Clean, Inspect, Overhaul, Renew, Repair</b>, etc.) is coupled with a configuration item (e.g., "the Mast", "the #1 Fire Pump", the "port anchor windlass", etc.), or a Supply, Service, Administrative, and General Requirements Item.</p> <p>EXAMPLES</p> <p style="padding-left: 40px;"><b>"Clean</b> the Grey Water Tank (123a)."</p> <p style="padding-left: 40px;"><b>"Provide</b> TEMPORARY FIRE SAFETY SUPPLIES/SERVICES (000e)"</p> <p style="padding-left: 40px;"><b>"Submit</b> a CFR."</p>								
Optional requirements	<p>Whenever optional requirements are presented in the SOW (e.g. "[ ] Option A, [ ] Option B, [ ] Option C", etc.) all options designated with an "[X]" must be performed or complied with; the other options must not be performed (i.e., the options left blank "[ ]")</p>								
Primary Service Providers	<p>The term CONTRACTOR or Contractor is used throughout the SOW and WISS to denote the entity/organization (e.g., the prime commercial contractor, the Coast Guard Yard, any particular Coast Guard Industrial Facility, etc.) who has been charged with performing the services described in the SOW.</p>								
Tech-Proposal/Tech-Info Request Items	<p><i>Tech-Proposal/Tech-Info Request Items</i> describe pre-award document submissions that will inform technical evaluations impacting contract award decisions.</p>								
Notes	<p>Language designed to assist the reader's comprehension/navigation of the requirements, or to provide suggestions/data (for info only, must be verified/validated by the reader) and examples based on prior contracts, etc., will appear in grey boxes. This language is not contractually binding.</p> <div style="border: 1px solid black; background-color: #d3d3d3; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">This is a sample note.</p> </div>								
Configuration Item Classes	<p><i>Configuration Item Classes</i> describe groups of configuration items that share maintenance standards. They are defined in the various technical chapters below and are designated by capitalizing the first letter of each word and enclosing in</p>								

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Category	Definition
	<p>quotation marks (e.g., "Structural Plate and Shapes", "Tank" or "Void", "Wet Deck", etc.).</p> <p>Each particular configuration item designated in the SOW may belong to one or more <i>Configuration Item Classes</i>.</p> <p>The SOW will direct the reader to the WISS sections that contain the applicable <i>Configuration Item Classes</i>.</p> <p>The SOW may assist or guide the reader in assigning a <i>Configuration Item Class</i> to a particular configuration item using a note, BUT regardless, the reader must still classify all configuration items designated in the SOW using the <i>Configuration Item Class</i> definitions described herein; then identify and conform to all applicable requirements stated herein for each applicable <i>Configuration Item Class</i>.</p>

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### 000b Generic Action Definitions

<b>Generic Maintenance Actions</b>	
<p>Whenever the following action terms appear in the SOW or herein with <b>bold</b> letters the corresponding definitions below apply, otherwise use dictionary definitions and the surrounding context to determine their meaning.</p>	
<b>Action</b>	<b>Definition</b>
<b>No Work or N/A</b>	<p>The corresponding component, assembly, etc. appears in the SOW "for info only"; the corresponding task description requires no work or action.</p> <p>However, collateral work (e.g., cleaning in support of gas-free certifications, removal as an interference, repair of damage, etc.) may still be required on the corresponding component, assembly, etc. if impacted by other task descriptions specified elsewhere in the SOW, or if the component/assembly is damaged by the contractor, etc.</p>
<b>Abate</b>	<p>This is the removal and proper disposal of hazardous material. Typically, this will be used in work items that remove known hazardous materials such as LEAD BASED PAINT (LBP), ASBESTOS CONTAINING MATERIAL (ACM), etc. <b>Comply</b> with all Federal, state, and local regulations that may apply.</p>
<b>Operate &amp; Inspect</b>	<p>This is the assessment the designated equipment/system while operating it through its full range of motion and/or functionality for the purpose of determining all discrepancies that may require repair work.</p> <p>Coast Guard personnel will operate the equipment/system, testing all associated features (e.g., controls, indicators, readouts, displays, panels, etc.) and cycling all associated items (e.g., actuators, shafting, linkages, etc.).</p> <p style="padding-left: 40px;">For deck machinery the equipment should be operated in a safe, no-load condition; an operational test using test weights is not required. However, to supplement the no-load test specified and required above, test weights may be handled by request pending COR approval after the COR determines the system is safe to handle weights. The rated load of the system must not be exceeded. Furnishing and handling test weights for the purpose of troubleshooting must result no additional cost to the Government.</p> <p style="padding-left: 40px;">If applicable, <b>Inspect</b> sheave assemblies, using Coast Guard Drawing FL-1702-11 as a guide.</p> <p>All unusual conditions (e.g., noise, vibration, overheating, binding, misalignment, maladjusted controls, and malfunctioning controls or read-outs found, etc.) must be reported in a CFR.</p> <p>At the conclusion of all operations, <b>Inspect</b> the equipment/system.</p>
<b>Clean</b>	<p>This is the removal of all contaminates (e.g., dust, dirt, grease, foreign material, etc.) from the designated surface, component, item, etc. to the greatest extent practicable.</p> <p>See the <b>Terms and Definitions</b> section below for the definition of "Cleanliness Grade A" (a work item may require that a surface/fluid/etc. meet the "Cleanliness Grade A" description).</p>
<b>Inspect</b>	<p>This is the examination of, either visually or physically by touch, all designated surfaces/parts/components/systems.</p> <p>All instruments/tools used during the inspection that require calibration must possess a valid calibration documentation (e.g., unexpired calibration sticker, etc.).</p> <p>The examination is for the purpose of identifying and reporting <i>all discrepancies</i>. Include a description of those discrepancies in the applicable/associated report submission with recommended repairs.</p> <p>If not part of final testing/inspection, open or remove any inspection plates, cover plates, and other non-load bearing and non-power transmitting components that may be part of the designated surfaces/parts/components/systems, to gain access to hidden surfaces.</p> <p>Do not disassemble or disturb load bearing or power transmitting components to perform the examination unless directed in the SOW or elsewhere herein.</p> <p>Perform the following as they apply to the item being examined:</p> <ul style="list-style-type: none"> <li>• Identify all leaks (e.g. fuel leaks, hydraulic fluid leaks, sea water leaks, air leaks in pneumatic systems, oil leaks, etc.) at mechanical piping joints.</li> <li>• Identify all damage (e.g. impacts, deformation, warping, bending, yielding, excessive corrosion, significant loss of base material, cracks, excessive wear, unusual wear patterns, etc.) that may</li> </ul>

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<b>Generic Maintenance Actions</b>	
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<b>Action</b>	<b>Definition</b>
	<p>affect the strength or the proper, trouble-free, safe operation of load bearing and power transmitting components (e.g. structural members, pressurized piping, pump cases, motor cases, valve bodies, hydraulic cylinder bodies, cylinder tie rods, accumulator and flask bodies, hose assemblies, heat exchanger tubing and shells, shafts, mechanical pins, keys, keyways, splines, set-screws, stakes, gear teeth, cams, cam-followers, couplings, cylinder rods, clevises, and trunnions etc.).</p> <ul style="list-style-type: none"> <li>Identify all damage (e.g. raised metal, nicks, burrs, scratches, scoring, heat checks, galling, pitting, gouges, corrosion, damage, yielding or stretching, excessive wear, and all other unusual discontinuities with surrounding surfaces, etc.) that may affect proper, trouble-free, safe operation (e.g. sealing, flow rates and pressures, etc.) of each surface that is critical to the operation of the part/component/system, or that mates with or runs against a machined or plated surface (e.g. various machined surfaces, cylinder bores, pistons, piston rods, all surfaces that mate with o-rings or seals, valve spools and spool bores, valve seats, and screw threads, bearing/journal surfaces, etc.).</li> </ul> <p>After the examination is complete reinstall all removed parts and return the component/system to normal operating condition pending completion of other tasks being performed in conjunction with the examination.</p>
<b>Service &amp; Inspect</b>	<p>This is performing all practicable preventive maintenance tasks (e.g., inspections, cleaning, lubricating, etc.) on an item without performing significant/intrusive disassembly or other potentially high-risk actions.</p> <p>Remove from the designated component/assembly/system all inspection plates, cover plates, and other non-mechanical load bearing components, as applicable, to gain access to hidden surfaces. Do not disturb mechanical load bearing components or mechanical power transmission components prior to or during the inspection.</p> <p><b>Clean, Inspect</b> all accessible surfaces. Uncoated surfaces must meet Cleanliness Grade A, unless otherwise specified herein, or in the work item, or system specifications.</p> <p><b>Lubricate</b> uncoated surfaces of the component/assembly/system as specified in the system specifications or the work item. When a lubricant is not specified herein, or in the work item, or the system specifications use a lubricant conforming to CID A-A-50433.</p> <p>Prior to reinstalling removed covers, plates, and non-mechanical load bearing components <b>Perform</b> all other work specified or invoked by the work item.</p> <p>Reinstall all removed parts and return the component to normal operating condition.</p>
<b>Lubricate</b>	<p>This is the application of a lubricant (e.g., grease, oil, silicone, etc.) on the designated surface/component to reduce sliding friction or to protect the surface from oxidation/corrosion. When a lubricant is not specified in the task description, system specifications, or herein, use a lubricant conforming to CID A-A-50433.</p>
<b>3D-Scan</b>	<p>This is the digital capture of dimensional data using a laser scanning device.</p>
<b>NDE</b>	<p>This is nondestructive examination, the act of determining the suitability of a material or a component for its intended purpose using techniques not affecting its serviceability.</p> <p><i>NDE</i> is the standard term used by AWS. Nondestructive inspection (NDI), nondestructive testing (NDT), and nondestructive evaluation are interchangeable terms for <i>NDE</i></p>
<b>Overhaul</b>	<p>This is the complete disassembly of an item to identify and perform all necessary repairs/renewals to sub-components that can only be assessed after disassembly; after conditional repairs are performed the item is completely reassembled with all new consumable/wearing components and reinstalled into the system and tested.</p> <p>Completely disassemble the designated component/assembly.</p> <p>Determine which sub-components are "Consumables" (000d), and which are not.</p>

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<b>Generic Maintenance Actions</b>	
<p>Whenever the following action terms appear in the SOW or herein with <b>bold</b> letters the corresponding definitions below apply, otherwise use dictionary definitions and the surrounding context to determine their meaning.</p>	
<b>Action</b>	<b>Definition</b>
	<p><b>Inspect</b> all exposed surfaces of all non-“Consumables” (000d); <b>Submit</b> a CFR detailing all discrepancies and recommended repairs.</p> <p><b>Clean, Inspect</b> all accessible surfaces. Uncoated surfaces must meet Cleanliness Grade A, unless otherwise specified herein, or in the work item, or system specifications.</p> <p><b>Renew</b> each Government-furnished sub-component that was not designated as conditional (**).</p> <p><b>Perform</b> all newly authorized work specified in CR(s) that resulted from the prior inspections (e.g., renewal of conditional GFP, etc.).</p> <p><b>Perform</b> all other work specified or invoked by the task description that can only be performed prior to reassembling the component or assembly.</p> <p><b>Lubricate</b> uncoated surfaces of the component or assembly as specified in the system specifications, the task description, or herein.</p> <p><b>Renew</b> all “Consumables” (000d) at reassembly (e.g., seal, gasket, o-ring, bearing, self-locking fastener, etc.).</p> <p>Reassemble the designated component/assembly and return it to normal operating condition within the system.</p>
<b>Repair</b>	<p>This is correcting an identified discrepancy to a given standard of performance or material condition; corrective maintenance.</p>
<b>Renew</b>	<p>This is the permanent removal and disposal of an item and then the installation, in its place, of a new and unused item which is identical in material, form, fit, and function; the new item must:</p> <ul style="list-style-type: none"> <li>• Have the same shape, size, dimensions, and other physical parameters.</li> <li>• Physically interface/interconnect with the existing equipment/surfaces the same way the original item did, becoming an integral part of that component/system.</li> <li>• Perform the same functions as the original item.</li> </ul> <p>When not using GFP for renewal, <b>Perform</b> all necessary actions (overhead procurement costs) required to identify and procure an acceptable/equivalent replacement item.</p>
<b>Groom</b>	<p>This is the preparation of the designated equipment/system for final testing by performing the following in conjunction with all other associated work specified, and while Coast Guard personnel operates the equipment/system in a no-load condition.</p> <p><b>Operate and Inspect</b> all components in the designated equipment/system. Perform the following as they apply to the particular equipment/system:</p> <p style="padding-left: 40px;">Verify that all reservoirs and gear cases are filled to the level required in the system specifications.</p> <p style="padding-left: 40px;">Verify that all installed system isolation valves (e.g., return line valves, case drain line valves, etc.) are properly aligned prior to energizing and operating equipment.</p> <p style="padding-left: 40px;">Verify that all associated control valves, electrical and mechanical controls, and actuators are operating properly.</p> <p style="padding-left: 40px;">If the designated equipment/system is hydraulic remove air from the hydraulic system. Break mechanical joints at high points while cycling actuators, if required, to bleed air from the hydraulic system. Verify there are no lube oil or hydraulic fluid leaks.</p> <p style="padding-left: 40px;">Adjust, as required, adjustable components (e.g., sensors, controls, readouts, pressure control valves, flow control valves, limit switches, proximity switches, etc.) to achieve proper operation, as specified in the work item or in the system specifications (i.e., dwgs, TPs, manufacturer’s instructions, etc.).</p> <p style="padding-left: 40px;">Identify all lubrication points in the system. <b>Lubricate</b> these points as specified in the work item or in the system specifications.</p>

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### Generic Maintenance Actions

Whenever the following action terms appear in the SOW or herein with **bold** letters the corresponding definitions below apply, otherwise use dictionary definitions and the surrounding context to determine their meaning.

Action	Definition
<p><b>Pressure Test</b></p>	<p>This is a test that proves the strength of a pressure-vessel (e.g., pipe, flask/bottle, accumulator, etc.) or structural boundary by internally pressurizing that pressure-vessel /boundary with a fluid or gas to a measured pressure.</p> <p>Typically, a temporary pressure test rig is used to perform the test that includes a pump/compressor, a certified pressure gage, a relief valve. The relief valve must be set to relieve at a pressure that will prevent damage to the vessel/boundary.</p> <p>A test pressure and relief valve pressure will be specified herein, in the work item, or in the test specifications.</p>
<p><b>Pull Test</b></p>	<p>This is a procedure used to prove the design of, or weld repairs to, the designated item (e.g., pad eyes, tie-downs, bits, chocks, etc.)</p> <p>If not specified in the work item or system specification, the required force for the pull test on the designated item must be determined as specified below:</p> <ul style="list-style-type: none"> <li>• For periodic testing of a deck fitting the force of pull on the fitting must be 1.5 times the deck fitting's rated load.</li> <li>• For testing subsequent to a weld-repair of a deck fitting (i.e., renewal or repair of a fitting) the force of pull on the deck fitting must be 2 times the deck fitting's rated load.</li> </ul> <p>The proper direction to pull against the specified item must be determined; generally, this is the direction in which the deck fitting and surrounding deck or bulkhead displays its greatest resistance to damage and deformation.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>General purpose fittings are typically strongest when pulled perpendicular to the deck or bulkhead where they are attached. Special purpose fittings may be stronger in a direction specific to their intended use that may differ from perpendicular to the deck or bulkhead.</p> </div> <p>Pull the designated item to the force and in the direction determined above and hold for one minute.</p> <p>Release the load and verify no permanent deformation or damage to the designated item or the surrounding structure (e.g., deck, bulkhead, etc.) as applicable.</p>
<p><b>Weight Test</b></p>	<p>This is an operational test using test weights. Procedures may be specified herein, in the work item, or in the system specifications. If no test procedure is specified, <b>Submit</b> a proposed written procedure to the COR; do not proceed with weight testing without COR approval.</p> <p><b>Provide</b> all necessary temporary rigging gear (e.g., temporary wire ropes and pendants, external lifting devices such as a crane, strong-backs, test weights, tag lines, dynamometers, come-alongs, steamboat ratchets, shackles, dunnage, bumpers, etc.).</p> <p>Place dunnage under test weights to protect the vessel's deck and pier, as applicable. Place bumpers or other protective measures between the hull and pier when test procedures involve warping the vessel.</p> <p><b>Provide</b> all necessary rigging services (e.g., riggers, external crane operators, etc.) required to perform the referenced testing procedures invoked by the task description.</p> <p>Conduct a briefing for cognizant shipboard personnel at least 24 hours prior to initiating the test.</p> <p>Allow Coast Guard personnel to inspect and approve all temporary rigging gear prior to use.</p> <p>Determine the vessel's load status and verify that the vessel's stability is adequate and safe for performing the test procedure. Conduct weight testing only when the vessel is waterborne and only after at least one of the following three conditions have been met:</p> <ul style="list-style-type: none"> <li>• The vessel is in a full liquid load condition.</li> <li>• A full liquid load condition has been simulated through the use of equivalent weights that have been arranged shipboard to achieve the same metacentric height (GM) as a full liquid load condition.</li> </ul>

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<b>Generic Maintenance Actions</b>	
<p>Whenever the following action terms appear in the SOW or herein with <b>bold</b> letters the corresponding definitions below apply, otherwise use dictionary definitions and the surrounding context to determine their meaning.</p>	
<b>Action</b>	<b>Definition</b>
	<ul style="list-style-type: none"> <li>• The vessel's DCA or EO or EPO has determined that the vessel's stability meets or exceeds the minimum stability required to safely perform the test procedure.</li> </ul> <p>Avoid conditions that will cause sudden application of test loads.</p> <p>Keep test weights as close to the deck as practicable while performing the test procedure to minimize damage to the vessel if control of the test weight is lost.</p> <p>Do not allow immersion of a deck edge or a list of over 15 degrees while performing the test procedure.</p>
<b>Inspect-Op Test (Initial)</b>	<p>This set of inspections and tests must be performed prior to performing any subsequent maintenance action (e.g., cleaning, disassembly, etc.) that may inadvertently cause new discrepancies; at least one <i>Inspect-Op Test (Initial)</i> task must be performed in each work item.</p> <p>These inspections and tests must be performed with the intent of identifying and reporting <i>all</i> previously undocumented discrepancies.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Before proceeding with maintenance work it is critical that all new, previously unidentified, discrepancies are identified and reported at this step.</p> <p>Otherwise, it will be assumed that all newly discovered discrepancies were caused by the party performing the follow-on maintenance work (i.e., that party will be expected to prove that they did not cause the discrepancy); correction of those discrepancies will be at that party's expense. New discrepancies that can only be discovered post-disassembly are excepted.</p> </div> <p><b>Inspect</b> all designated surfaces/equipment/system/etc. any all others that may be affected by any subsequent maintenance action.</p> <p>If the designated surfaces/equipment/system/etc. contains any subcomponents that can be operated, or if any other undesignated equipment/system/etc. will potentially be affected by any subsequent maintenance actions then <b>Operate and Inspect</b> all those components.</p> <p>Perform all other associated actions (e.g., <b>Weight Test</b>, etc.) that may be specified in the work item.</p> <p><b>Submit</b> a report of findings as described in the SOW.</p>
<b>Inspect-Op Test (Final)</b>	<p>This action must be performed immediately prior to the completion of each work item and after performing all other associated maintenance tasks.</p> <p>This action must be performed on the designated surfaces/equipment/systems/etc., and on all other surfaces/equipment/system/etc. that were affected by work. The intent is to prove that all maintenance and repairs were performed satisfactorily, and to prove that no new discrepancies were introduced during the performance of work. A report must be submitted that documents satisfactory completion of all associated work.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>It will be assumed that all new discrepancies identified at this step were caused by the party performing the associated maintenance work (i.e., that party will be expected to prove that they did not cause the discrepancy). Correction of these new discrepancies must be at the expense of the party who performed those maintenance actions.</p> </div> <p>If the designated surfaces/equipment/system/etc. contain any components that can be operated, or if any other undesignated equipment/system/etc. was potentially affected by work then <b>Operate and Inspect</b> all those components.</p> <p>Perform all other associated actions (e.g., <b>Weight Test</b>, etc.) that may be specified in the work item.</p> <p><b>Inspect</b> all designated surfaces/equipment/system/etc., and all others that may have been affected by work.</p> <p><b>Submit</b> a report of attesting to satisfactory completion of the work item.</p>

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

<b>Generic Service Actions</b>	
Whenever the following action terms appear in the SOW or herein with <b>bold</b> letters the corresponding definitions below apply, otherwise use dictionary definitions and the surrounding context to define them.	
<b>Action</b>	<b>Definition</b>
<b>Provide</b>	This is to furnish a supply item or service item; all associated incidental/overhead activities (general & administrative, procurement, shipping, handling, disposal of associated containers/waste, etc.) must be included.  For sub-contracted services, the provider must oversee/supervise the sub-contractor and be responsible for all their associated and incidental actions/waste/etc.
<b>Perform</b>	Carry out, accomplish, or fulfill the designated service; <b>Comply</b> with the associated requirements.
<b>Comply</b>	Act in accordance with all designated document(s). The document(s) will contain requirements that must be followed while performing tasks specified in the SOW or herein.  These designated document(s) generally describe mandatory procedures for performing maintenance actions, provide configuration specifications, or specify standards and specifications for performing work.
<b>Conform</b>	Act in accordance with all specified or applicable rules, standards, regulations, laws, statutes, etc.  These are generally requirements that are incidental to the maintenance tasks being performed.
<b>Rip-out</b>	This means to remove and properly dispose of the designated item(s) (e.g., part, component, equipment, etc.).
<b>Install</b>	This means to place or fix the designated item (or items, e.g., part, component, equipment, etc.) in its final position in the system. If that item is not designated as GFP in the work item or a CR/mod, then <b>Provide</b> that item.
<b>Remove/Reinstall</b>	This means to take the designated item (or items, e.g., part, component, equipment, all associated sub-components, etc.) away or off from its position occupied in the system. Retain that item for reinstallation later back into the system. Perform any designated tasks on that item and take all necessary precautions to prevent damage to that item in the interim. Then place or fix the designated item in back position within the system again; restore it to its prior configuration with all prior functionality.
<b>Package</b>	This means to completely prepare the designated item (or items, e.g., part or parts, component or components, equipment, all associated sub-components, etc.) for shipment.
<b>Refer</b>	Read or otherwise use the specified document(s) as a source of information, guidance, advice, etc.; consult. The document(s) may contain suggested procedures, best practices, expected configuration descriptions, etc., but it is the obligation of the reader to select the best, most appropriate action/requirement/task/etc. in the context of 1) all available information, 2) the particular circumstances, and 3) the actual requirements specified in the SOW/WISS/Law/Regulation/Statute/etc.

<b>Generic Administrative Actions</b>	
Whenever the following action terms appear in the SOW or herein with <b>bold</b> letters the corresponding definitions below apply, otherwise use dictionary definitions and the surrounding context to define them.	
<b>Action</b>	<b>Definition</b>
<b>Submit</b>	Communicate the information described in the task to the COR/KO in an appropriate document format that can be used as evidence of the communication later (e.g., photo-image, fax, written report, e-mail, letter, etc.).
<b>Attend</b>	This means to be present at the designated event or meeting.

<b>Generic Administrative Actions</b>	
Whenever the following action terms appear in the SOW or herein with <b>bold</b> letters the corresponding definitions below apply, otherwise use dictionary definitions and the surrounding context to define them.	
<b>Action</b>	<b>Definition</b>
<b>Notify</b>	<p>This means to formally/officially advise the COR or KO, as designated in the SOW, of proposed details and scheduling of a designated event, and then only finalize the scheduling of that event after the COR concurs with that proposal.</p> <p><b>Submit</b> the designated information. Wait for confirmation of receipt and concurrence (i.e., do not proceed without an affirmative response from the Coast Guard).</p> <p>Notification must occur at least 24 hours prior to events that require Coast Guard personnel witness or verification. If such an event will occur more than 50 miles from the primary location of contract performance, then provide at least 3 working days notice. Do not proceed without Coast Guard personnel being present.</p>
<b>Verify</b>	Establish the truth, accuracy, or reality of a condition or an action, prior to proceeding to the next step.

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## 000c General Administrative Items

5 **ARRIVAL CONFERENCE** – This is an in-person meeting, phone-conference, or combination of both that is planned and scheduled by the KO/COR and occurs after contract award and prior to the start of contract work. In-person meetings may either convene onboard the vessel or near the vessel at the CONTRACTOR’s conference facilities. A letter containing an agenda for meeting will be sent to the CONTRACTOR.

In addition to other agenda items, the following fire prevention and fire response topics must be discussed/addressed and a:

- 10
- Fire alarm and response procedures
  - Firefighting jurisdictional cognizance
  - Installation or municipal fire and emergency services firefighting capability and procedures
  - CONTRACTOR communication system for fire reporting and control or firefighting efforts
  - Shipboard arrangement including access routes, availability or firefighting systems (installed and temporary), and communication systems
  - Shipboard firefighting organization, systems, drills, and equipment
  - Compatibility of vessel, CONTRACTOR, and/or region/installation or municipal fire and emergency service’s firefighting equipment
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(General Requirements (All Contracts))

20 **CFR** – This is a “condition found report”; they are generally used to document discrepant conditions on vessels, but may be used to submit measurements, certify satisfactory completion of a task such as a test, etc. *CFRs* should be in electronic format whenever possible, and should be submitted within 24 hours after completing the task that requires documentation (e.g., after completing an **Inspect/Op Test (Final)** on a particular system, etc.).

25 ((General Requirements (All Contracts)) | Maintenance Work Item)

30 **CIR** – This is a type of CFR that must be submitted within the first 25% of the contract performance period so that repairs can be authorized and performed in a timely manner that supports contract/project schedule. *CIRs* generally must be submitted immediately after conducting inspections/tests that are intended to reveal discrepancies that must be corrected prior to completing the work item.

((General Requirements (All Contracts)) | Maintenance Work Item)

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

**ENVIRONMENTAL PROTECTION PLAN** – This is a document that outlines how hazardous materials, petroleum products, hazardous substances, hazardous wastes, and other solid wastes will be handled.

5 The intent is to encapsulate all environmental-related documentation in one document (or set of documents), the *ENVIRONMENTAL PROTECTION PLAN*. Submit the first version (version 1) pre-award or at the ARRIVAL CONFERENCE, as directed in the SOW. This document is maintained throughout the contract performance period by the Contractor.

10 Then, as the contract progresses, and previous environmental regulation compliance documents are edited, or as new documentation is generated, append those documents to the *ENVIRONMENTAL PROTECTION PLAN* and resubmit the entire plan as a new/most-accurate version (e.g., version 2, version 3, etc.).

The last version submitted must be a complete record of all environmental regulation compliance actions.

Contact Kyle Klinedinst Kyle.C.Klinedinst@uscg.mil (717) 856-6953 with questions.

15 The *ENVIRONMENTAL PROTECTION PLAN* must be maintained (i.e., edited, and resubmitted whenever one of the required elements below changes during contract execution). The final version of the *ENVIRONMENTAL PROTECTION PLAN* must serve as a record of all related actions taken during the contract performance period.

20 The *ENVIRONMENTAL PROTECTION PLAN* must **Comply** with all requirements within all Federal, state, and local regulations, the plan must address/describe, at a minimum, the following (use these headings in the plan for clarity):

### General

- GENERAL STORAGE SITE PLAN - describe/show where hazardous materials will be properly staged and/or stored
- WASTE COLLECTION AND CONTAINMENT PROCEDURES – describe how waste will be contained and collected following requirements of 49 CFR 178.
- 25 • HAZARDOUS MATERIAL (HM) SPILL AND CLEANUP PLAN - describe tools and materials that will be on hand and readily available to facilitate containment and cleanup.
- HAZARDOUS WASTE (HW) MANAGER – provide training certifications for the Contractor's hazardous waste manager and all personnel conducting hazardous waste activities.
- 30 • HW IDENTIFICATION METHODS – describe methods that will be used to analyze and identify whether or not generated material (blasting debris, paint waste, etc.) are hazardous wastes.
- HW LICENSES AND PERMITS – provide all documents that are required to be obtained or currently held by the Contractor as prescribed by Federal, state, and local regulations, including Contractor's EPA Generator ID#.
- 35 • AIR DISTRICT PERMITS – provide all documents required to be obtained or currently held by the Contractor as prescribed by Federal, state, and local regulations.
- OTHER PERMITS – All permits required by the National Pollutant Discharge Elimination System (33 U.S.C. 1342) to be obtained or currently held by the Contractor as prescribed by Federal, state, and local regulations.

### Contract/Project Specific

- 40 • HM/HW LIST - A list of all anticipated solid waste, trash/debris, hazardous wastes that will be generated and a Federal/state/local regulation cross reference list that will impact proper disposal, and copies of the analysis of all Hazardous Material (HM) or Hazardous Waste (HW) disposal samples taken and results.
  - When performing *HAZARDOUS MATERIAL ABATEMENT* (e.g., LBPs removal, ACMs removal, etc.) include the following, as applicable:
    - 45 ▪ Copies of all HM sample results prior to commencing work.
    - Results of all air monitoring samples to the COR within 24-hours of completing the sampling, or upon receipt of the laboratory test results.
    - All notices to the EPA, as required by 40 CFR 61.145 and other applicable state and local agencies, prior to commencing asbestos removal work.
    - 50 ▪ Documentation that certifies all primary and sub-contractors fulfilling abatement requirements possess all local, state, and federal certification licenses and applicable permits, for fulfilling those abatement requirements.
    - A report containing the LBP sample results.
    - A report containing the "aggressive air sample" results.



## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

- Include a list of names, contact information, and written commitment from all subcontractors and required Tech Reps indicating they are available for work during the proposed time period.
- Include a list of all instruments (i.e. instrument name, valid calibration date, work item(s) where the instrument will be used, etc.) that will be used for inspections and tests.

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(General Requirements (All Contracts))

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**FIRE PREVENTION AND RESPONSE PLAN** – This document must describe how the risk of fire, and the damage caused by fire, will be mitigated. The *FIRE PREVENTION AND RESPONSE PLAN* must contain the following data/representations, and all other relevant information; the plan must be revised/amended, resubmitted, and approved by the COR in advance of any change that will affect the accuracy of the data/representations contained therein.

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- the name/contact info (e.g. business phone number, personal phone number, etc.) of each employee designated as a "Fire Prevention Supervisor"
- when the vessel will be berthed or drydocked at a Contractor's facility provide the facility's Fire Safety Plan document described in [29 CFR 1915.502](#) Fire Safety Plan. Also include a description of 1) who will fight a fire and what equipment will be used, 2) the location of where all manual disconnects/breakers for all temporary power sources (e.g., shore-tie, portable generators, etc.) will be located relative to the vessel accesses/gangways/brows.
- a list of the vessel's "Fire Detection/Alarm Systems" (000d) components that must be temporarily disabled or secured in order to complete the contract requirements; and a description/proposal of how the functionality of those components will be temporarily substituted/supplemented (see TEMPORARY FIRE SAFETY SUPPLIES/SERVICES below).
- a list of the vessel's "Fire Fighting/Dewatering System" (000d) components (e.g., firemain pumps, portable fire extinguishers, halon and AFFF systems, etc.) that must be temporarily disabled or secured in order to complete the contract requirements; and a description/proposal of how the functionality of those components will be temporarily substituted/supplemented (see TEMPORARY FIRE SAFETY SUPPLIES/SERVICES below).
- a description of 1) when shipboard "Fixed Fire Fighting Systems" (000d) will be online or offline, 2) how temporary systems will integrate with shipboard systems if this will be necessary, 3) how the temporary systems will be tested, the frequency of tests, 4) how the vessel's temporary functional alarms and communications that are used during shipboard emergencies will be maintained/supplemented,.
- a list of every fitting (e.g., door, hatch, scuttle, etc.) that will be made inoperable (i.e., cannot be easily and rapidly closed or secured to stop air flow during a fire, or cannot be easily fully opened as an escape route in the event of a fire, etc.) during the execution of the contract. Describe how the risks caused by each inoperable fitting will be mitigated (e.g., use of quick-disconnect fittings on hoses/cables to allow rapid fitting closure, use of fire curtains in Fire Zone Boundary openings, fitting will be made clear/operable whenever left unattended or at the end of each shift by removing hoses/cable/etc., etc.)
- A list of every breach that will be made to any "Fire Zone Boundary" (e.g., hull access cuts through a boundary, removal of sea valves or piping that will allow air a new path to flow across a boundary, etc.). Also describe the methods that will be used to temporarily seal or slow down air flow across these breaches when they are left unattended or in the event of a fire.
- A description of escape routes in the event each installed "Fixed Fire Fighting System" (000d) is activated.
- Procedures that have been developed to properly enable/disable systems that, when discharged, are immediately dangerous to life/health (e.g., CO2 total flooding systems, etc.)

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(General Requirements (All Contracts))

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**SEVERE WEATHER PLAN** – This document describes the actions that must be taken to mitigate the risk of damage to a Coast Guard asset in the event of severe weather. This document must contain the following data/representations, and all other appropriate information.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

WEATHER	CONDITION (As determined by the CO of the vessel)	Approx. Arrival Time (hours)	ACTION
GALE STORM/ HURRICANE/ TYPHOON	IV	▶ 74	Review hazardous/destructive weather implementation plan.
	III	▶ 48	Take preliminary precautions.
	II	▶ 24	Take precautions to permit establishing an appropriate state of readiness on short notice.
	I	▶ 12	Take appropriate precautions to minimize damage.
THUNDERSTORM/ TORNADO (Lightning and thunder anticipated)	II	◀ 6	Take precautions to permit establishing an appropriate state of readiness on short notice.
	I	◀ 0*	Take appropriate precautions to minimize damage.

▶ Trend indicates a possible threat of destructive winds within the number of hours shown.

◀ Destructive winds accompanying the phenomenon are reported or expected in the general area within the number of hours shown.

\*IMMINENT

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  - a description of all actions that will be taken at each Weather Conditions Level, with a responsible party assigned to each action
  - the name/contact info (e.g. business phone number, personal phone number, etc.) of the Contractor's employee who will execute *Severe Weather Plan Supervisor* duties, who the vessel's CO will call whenever a weather-related action must be taken.
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  - each step that will be taken to secure or remove all Contractor-furnished items and equipment (e.g. staging, generators, welding machines, cranes, etc.).
  - each step that will be taken to secure and safeguard all Government owned properties (e.g. removed interferences, GFP, MTI items, etc.)
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  - a description of how the vessel will be protected from other floating items (e.g. barges, doughnuts, work floats, other vessels, etc.).
  - a description of how all emergency services will be provided (e.g. security, fire protection, flooding protection, shipboard dewatering and fire main capability, electrical power generation, communications, etc.).
  - a description of how the vessel will be secured to the pier or drydock, including the following:
    - Size, type, and number of lines.
    - A sketch, showing location of all securing devices (e.g. fenders, bumpers, camels, etc.)
    - How tension and slack in lines will be monitored during heavy weather.
    - How all openings will be made watertight.
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  - how floating pier (if installed) will be secured during high winds or high tides.

(General Requirements (All Contracts))

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### 000d Ancillary/Collateral Work

<b>000 Configuration Item Classes</b>	
Particular vessel configuration items designated in the SOW may belong to one or more the classes described below; determine the applicable classes, then conform to the corresponding requirements for those classes as they apply to the tasks designated in the SOW.	
Class	Definition
"Consumables"	Parts or components that are generally made from relatively soft materials that are designed to wear, or tend to wear, significantly faster than surrounding/mating parts. These softer less durable parts are not intended to last the service life of the parent component/assembly. Examples include seals, gaskets, o-rings, bearings, bushings, wear strips, self-locking fasteners with soft parts that deform at installation, etc.
"Disturbed Consumables"	These are "Consumables" that have been removed or have otherwise been made accessible or are otherwise exposed during the process of disassembly or interference removal, while performing a task.
"Interferences"	Any part of a vessel, whether permanently installed or portable, that must be moved, isolated, or disturbed so that the work specified in a work item may be accomplished; these may include machinery, piping, ducts, wiring, insulation, structure, and anything else which interferes with proper/safe accomplishment of a work item.  These also include items that may have been necessarily, or inadvertently, damaged during disassembly (e.g., paint/coatings, insulation material, seals/gaskets/o-rings, etc.).
"Restricted Interferences"	"Interferences" that are vital to the health, well-being, and feeding of the vessel's crew that, if removed, will result in a dangerous or hazardous condition to the vessel or the environment.  All firefighting equipment (e.g., extinguishers, alarms/detectors and associated cables, etc.)
"Fire Zone Boundary"	A fire zone boundary is a permanent, continuous, interior bulkhead or deck that will limit the passage of flame/smoke/air. All closable "Fittings" (100a) that are part of the bulkhead/deck are considered part of the boundary.  <i>A Fire Zone Boundary is breached when</i>  Unless otherwise specified elsewhere in the SOW, treat all watertight bulkheads and decks, and all associated "Fittings" (100a) as <i>Fire Zone Boundaries</i> .
"Fire Detection/Alarm Systems"	These are all vessel installed systems with various sensors (e.g., heat, smoke, etc.) and alarms (e.g., bells, horns, cell phone callers, etc.) designed to alert personnel when an unintentional fire has been detected.
"Fire Fighting/Dewatering Systems"	These are all vessel installed systems/equipment (e.g., piping, hoses, pressure vessels, valves, electrical sensors/controls, etc.) designed to hold and disburse various firefighting agents (e.g., firemain sea water, halon systems, CO2 systems, AFFF systems, etc.) and all vessel installed systems/equipment designed to remove those expended agents from the vessel (e.g., bilge pump systems, P100/P200 pump systems, etc.).
"Fixed Fire Fighting Systems"	These are a special type of vessel installed firefighting system/equipment that are either manually triggered or are triggered by sensors that then operate or release agent in a more rapid/automatic fashion (i.e., halon, CO2 banks, galley fire suppression systems, etc.).

**IDENTIFICATION/REMOVAL/RESTORATION OF INTERFERENCES** – All "Interferences" must be identified (e.g., via first-hand pre-award or post-award vessel inspections, or via prior observations/experiences on the same vessel or a similar class vessel, or via drawings/TPs, or via notes that may be provided in work items, etc.).

When disassembly or "Interference" removal is required to perform specified work, disassemble the system or remove "Interferences" or both only to the extent necessary to perform the work specified.

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

After each "Interference" is removed to facilitate safe contract work it must be 1) stored to prevent all damage (e.g., out of the weather and in a climate-controlled space when appropriate, out of the way of work that may cause damage, etc.), and 2) tagged with removable tags or stenciled with non-permanent paint to identify the vessel and the location where it must be re-installed.

5 All "Interferences" (000d) must be completely and properly restored in their original condition, operational-capability, and aesthetic appearance prior to performing **Inspect/Op Test (Final)** for the work item. The Contractor must restore bonding, grounding or shielding to all equipment or structures which have been disturbed due to any interference work.

(General Requirements (All Contracts))

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**RESTRICTED INTERFERENCE REMOVAL PLAN** – This is a document that, at a minimum, describes 1) the proposed procedures that will be used for removing and restoring the "Restricted Interferences" (000d), 2) the time at which they will be restored, 3) and any proposed alternate arrangements that may be needed to minimize inconvenience to the crew, or to alleviate the hazardous conditions.

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(General Requirements (All Contracts))

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**GFP AND MTI STORAGE/PACKAGING/HANDLING SERVICES** – In the SOW, *Government-furnished Property (GFP)* tables list supply items that the Coast Guard will furnish. *Mandatory Turn-In Items (MTI)* designate the old/existing items that, after being renewed using GFP, must be returned to the Coast Guard *Property Administrator (PA)*; the other items that are not designated as MTI must be disposed of properly.

Store GFP/MTI out of the weather to prevent all damage; use climate-controlled storage when temperature and/or humidity will negatively affect a stored item. Protect all exposed surfaces subject to moisture-damage and/or corrosion (e.g., coat with a thin film of corrosion preventive compound, blank-off, wrap or seal with weather-proof/water-proof barrier material, etc.).

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**Provide** all labor and equipment required to handle all GFP/MTI (e.g., cranes, fork-trucks, rigging rear, etc.).

Package MTI for shipment back to a central Coast Guard facility; packaging must provide reasonable protection from shipping damage. **The quality (e.g. size, strength) and manner (e.g. items per package, protective attributes) of the return packaging provided for the MTI item must be substantially equivalent to the quality of packaging of the GFP-item received.** Existing shipping containers and mounting hardware provided with the corresponding GFP items may be reused unless otherwise specified; remove or permanently cover all old/outdated shipping information and data from reused containers. Complete and enclose in the MTI packaging all necessary documents prior to releasing the MTI to the Coast Guard PA.

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(General Requirements (All Contracts))

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**PIER-SIDE SUPPLIES/SERVICES** – A secure pier or wharf must be provided when a Coast Guard vessel is moored/docked at a "Contractor's Facility" (000d). The pier or wharf must have adequate clearance to safely accommodate the vessel being moored/docked. Water depth must be sufficient at the pier to allow the vessel's lowest underwater appendage to clear the bottom by at least two feet at:

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- Ordinary low water mark on non-tidal rivers.
- At all tide conditions predicted during the availability for tidal rivers and other navigable waterways (Bay, Lake, etc.).

The pier or wharf must be adequately constructed and conditioned to support weight-handling gear such as cranes, forklifts, and delivery vehicles that are necessary for the completion of the work described in the SOW; load limitations must be clearly identified and marked in a conspicuous location.

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A temporary fender system must be provided to prevent the vessel's sides from chafing and colliding with the pier or wharf while moored/docked. Do not moore/dock a different vessel alongside the Coast Guard vessel without written permission from the COR.

(General Requirements (All Contracts))

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**INSTALLATION/REMOVAL OF PROTECTIVE MEASURES** – Reasonable measures must be taken to protect all Coast Guard property from damage and contamination. Installation and subsequent removal of various temporary or consumable items that will provide effective protection is required. Consumable protective items must be properly disposed of. Temporary coverings must not be removed during contamination-producing operations without permission of the COR. Examples of required protective measures include:

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- Installation of various items (e.g., plugs, blanks, wraps, covers, seals, masks, etc.) inside of openings contained in, and over the top of, Coast Guard property (e.g., equipment, components, cables, wire ways,

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

boats, machinery, winches, rigging, weapons systems, electrical/electronic equipment, valves, vents not in use, other openings, etc.), using fire retardant and water repellent materials as appropriate that will prevent damage to, and the entry of contaminants into, the Coast Guard property.

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- When in dry dock, coverings over transducers, zinc anodes, propeller blade seals, rudder bearings, stern tube and strut bearings, spool pieces, spud wells, fin stabilizer seals and bow thrusters, etc. must be performed. Bearings and seals must be wrapped, and soft caulking material must be inserted into the open ends of rudder and shaft stave bearings to prevent entry of foreign materials during surface preparation and painting procedures.

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- Placing drain channels in overboard discharges in use, to direct discharges away from the hull.
- Installation of wooden plugs or coverings for sea chest spool pieces, scuppers and overboard discharges not in use.
- All fine surfaces (e.g. machined surfaces with a finish, etc.) exposed while a component, assembly, or system is disassembled for repair must be protected with temporary coverings that will prevent damage and corrosion.

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- Covering of all glass (port lights, windows, etc.) adjacent to areas interior and exterior where abrasive blasting, burning, or welding is required or accomplished, to prevent scarring and damage.
- Installation of fire retardant industrial filter material on the intake of supply and exhaust ends of ventilation systems that will remain in use during performance of work. Maintain all filter materials, to prevent excessive air restriction and/or damage to ventilation motors.

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- Installation of double curtain baffles at the entrances of each access where airborne contamination could occur during contamination-producing operations. Install a dirt-collecting mat on the deck directly inside each access.

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- Installing adequate protection to all deck covering or deck surfaces in areas affected by contract work and on all main access routes to these areas. Immediately repair or renew any protective coverings which are damaged during the course of work. Acceptable protective deck coverings include heavy cardboard, masonite (fiberboard), flame-retardant polyethylene deck plate with a non-slip diamond pattern from 10 to 40 mil thickness or plywood installed in sufficient quantities to adequately protect deck surfaces.

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- Hydraulic system must be protected from contamination. Maintain the existing hydraulic system cleanliness. Take all necessary precautions to prevent the introduction of contaminants. Whenever disconnecting or removing components from a hydraulic system, immediately and completely seal all openings to the component and the rest of the system. Use either caps for externally threaded connection points, bolt-on blanks, or taped-on discs and covers of durable plastic or sheet-metal no less than 1/16-inch thick. Plastic bags may be used only when arrangement or configuration prevents the use of the other sealing methods specified above. Filling openings with rags or other articles is prohibited.

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(General Requirements (All Contracts))

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**INCIDENTAL CORRECTION OF LABEL, TAG, MARKING DISCREPANCIES** – Discrepant tags/plates/labeling/etc. must be renewed or otherwise brought into compliance. Inspect the designated items for discrepancies when compared to system drawings, TPs, other referenced documents, and other similar tags/plates/etc. found aboard the vessel.

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Valve label plates must comply with ASTM F992.

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The following information must be stenciled onto piping, in conspicuous locations, preferably near control valves. 1) Name of the piping system service, 2) the destination of flow, where feasible, and 3) the direction of flow, indicated by an arrow 3 inches long pointing away from the lettering (for reversible flow, point an arrow away from each end of the lettering). Letter color must be either black or white and must contrast the background surface (i.e. either black on light surfaces or white on dark surfaces). For piping systems that are insulated, labeling must be stenciled onto the insulation material.

Put a para here to describe the types of labels a KTR wouldn't be responsible for, but consult the work item

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(General Requirements (All Contracts))

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**INDUSTRY STANDARD WORKMANSHIP REQUIREMENTS** – At a minimum, quality of workmanship must meet industry standards; higher standards may be specified herein, in the SOW, and in documents incorporated by reference.

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These are examples of industry standard workmanship practices:

- all ragged or burned off edges are ground/filed to a smooth surface.
- surface discrepancies caused by removal or installation of welded items (e.g., fixtures, equipment, plating, piping, fittings, etc.) are cleaned to the root and finished off to accept proper coatings application.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

- holes are blanked off flush with welded plates of like material and thickness when pipes, cables, fittings, etc., are permanently removed.
- new pipes, cables, duct work, installed furniture and equipment, etc., are supported (e.g., using appropriate brackets, hangers, stand-offs, chocks/gussets, etc.) and/or secured to carry the weight of the items, to prevent excessive vibration, and to withstand loads caused by rolling and pitching at sea.
- discrepant tags/stenciling/label-plates/etc. are made correct to match drawings/TPs, prior to FINAL ACCEPTANCE INSPECTIONS/TESTS, when they are in-scope of the contract or are otherwise affected by contract work (e.g., valve label plates must be installed on new valves, painted stenciling on piping/doors/bhds must be restored if removed, etc.).

(General Requirements (All Contracts))

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### 000e Safety, Environmental, and Habitability

**TEMPORARY FIRE SAFETY SUPPLIES/SERVICES** – The following temporary supplies and services must be provided for the duration of a contract to address fire safety risks while maintaining full compliance with [29 CFR Subpart P - Fire Protection in Shipyard Employment](#). Work described in the SOW must be planned and executed to minimize the quantity of *Temporary Fire Safety Supplies/Services* that must be provided. The optimal combination of vessel-installed and temporary measures must be determined and implemented.

All fire safety related requirements must be discussed at the *ARRIVAL CONFERENCE (000c)* and all misunderstandings must be eliminated; plans for obtaining all required information that may be currently missing or unavailable must be made and corrective actions must be taken in a timely manner.

A *FIRE PREVENTION AND RESPONSE PLAN (000c)* must be documented, submitted, maintained, and resubmitted as necessary, for the duration of the contract.

At least one trained, competent "Fire Prevention Supervisor" must be designated each shift to perform the following duties/tasks:

- Immediately after production work commences, at the start of the contract, conduct a tour to familiarize ship's force and the COR with all the egress/access points and anticipated conditions that may occur while industrial work is in progress.
- When the vessel is berthed/drydocked at a CONTRACTOR's facility, and if outside fire response organizations will be used, invite their representatives on a tour of the vessel to inspect layout, access routes to controlled areas, specific operations, occupancies, hazards, etc. If accepted then conduct the tour as early as practicable in the availability.
- Conduct multiple ad hoc inspections during each shift of all vessel areas affected by contract work to identify and immediately correct all avoidable/unnecessary fire hazards. One inspection must occur near the end of each shift and Coast Guard representatives (e.g., COR, ship's force reps, etc.) must be invited and given the option to conduct this inspection jointly. One initial inspection must occur immediately after the start of production work and must be conducted jointly with the COR.
- Be available to address/correct fire safety discrepancies identified ad hoc by the COR.
- Verify that the risks caused by the negative impact of contract work on each "Fire Zone Boundary" have been mitigated to the greatest practicable extent (e.g., proper fire curtains and fume-tight closures have been installed to minimize air flow, unattended hoses/cables/etc. that pass through a "Fire Zone Boundary" have quick-disconnects installed, etc.).

**FIRE BOUNDARIES** - Risks caused by disturbing "Fire Boundaries" (000e) must be mitigated; "Fire Boundaries" should be left intact and functional to the greatest practicable extent at all times. The *FIRE PREVENTION AND RESPONSE PLAN* must be revised/resubmitted to show each new breach to a "Fire Zone Boundary" that will be left unattended outside of normal working hours (e.g., a door/hatch is made un-closable/un-securable due to repair work, an access cut is made into a "Fire Zone Boundary", etc.).

Rigging of hoses, welding leads, and temporary lights must be kept clear of the decks on temporary "trees" or brackets and be arranged to minimize tripping and other safety hazards. Passageways must be kept clear of obstructions.

When a "Fire Zone Boundary" is breached to facilitate contract work, and that breach will be left unattended, industry-standard methods (e.g. installation of fire curtains and fume-tight closures to minimize air flow, installation of quick-disconnect fittings on hoses and cables so that doors/closures are securable within three minutes, etc.) must be used to minimize the impact on fire safety. Gaseous/mist releases (e.g., halon, water mist, HPF, CO<sub>2</sub>, etc.) from "Fixed Fire Fighting Systems" (000e) must be properly contained in spaces/compartments as designed; temporary measures must provide this function. The installation of these temporary measures must be approved by the COR before the breach is left unattended.

**FIRE DETECTION AND ALARM SYSTEMS** - Risks caused by disabling or securing all or part of shipboard "Fire Detection/Alarm Systems" (000e) must be mitigated; equivalent method(s) for temporarily maintaining all lost functionality must be proposed, approved by the KO/COR, and subsequently implemented.

The most economical option(s) available for maintaining equivalent functionality must be selected (i.e. for extended loss of service of the entire system a complete temporary fire detections/alarm system may be the best option, for shorter durations temporary watch standers may be more economical, etc.). All disabled equipment/systems (e.g., pull boxes, etc.) must be clearly marked "Out of Service" with signage.

Fire responders must be notified of fires as soon as practicable. A complete description of how the entire system will function (i.e., how temporary physical systems will detect fires and sound alarms, who will hear the alarms, how false alarms will be filtered, what procedures will be followed for notifying the designated fire response organization, etc.) must be detailed in the *FIRE PREVENTION AND RESPONSE PLAN (000e)*. The

## Work Item Standards and Specifications (WISS)

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descriptions and procedures must detail 24hrs per day, 7 days per week support over the complete duration of the contract.

After the KO/COR have agreed to the proposed methods and procedures, the capability of these systems must be maintained for the duration of the contract to the greatest practicable extent.

5 FIRE FIGHTING AND DEWATERING SYSTEMS - Risks caused by disturbing, disabling or securing "Fire Fighting/Dewatering Systems" (000e) must be mitigated; equivalent method(s) for temporarily maintaining all lost functionality must be proposed, approved by the KO/COR, and subsequently implemented.

10 When temporary firemain/seawater is provided to a vessel for firefighting, the net flow rate must be greater than or equal to what the vessel's fire pumps can achieve, and distribution across the vessel's piping system must be in proportion to flow provided by the vessel's fire pumps. Measures must be taken to prevent freezing (e.g., recirculation circuit, etc.) when conditions warrant. Testing must be performed to confirm proper valve line-up, piping is free of obstructions, etc.

15 When portable extinguishers are relocated, location placards at the original location must direct personnel to the temporary location. The vessel's portable fire extinguishers are not to be used for fire watch. Portable fire extinguishers must be installed so that the maximum travel distance to an extinguisher from any interior point of the vessel on the same level is no more than 50 feet. All relocated firefighting equipment must remain accessible to casualty response personnel.

20 The functionality of a system whose sole purpose is to extinguish fire from a specific hazard (e.g., ammunition, flairs/pyrotechnics, etc.) need not be maintained if the associated hazard has been completely removed from the vessel.

All disabled equipment/systems (e.g., hose racks/reels, sprinkler systems, AFFF/Halon/FM200/etc., etc.), must be clearly marked "Out of Service" with signage. Temporary protective enclosures installed around fire hoses/reels must be painted red.

25 FIXED FIRE FIGHTING SYSTEMS - The risks caused by the potential activation of "Fixed Fire Fighting Systems" (000e) must be mitigated. If a system's sole purpose is to extinguish fire from a specific hazard(s) (e.g., ammunition, flairs/pyrotechnics, etc.) that particular system should be disabled/secured/isolated so that it cannot discharge whenever the hazard has been removed from the vessel; that system's functionality should be completely restored afterward. A description of escape routes in the event a system is activated must be included in the FIRE PREVENTION AND RESPONSE PLAN (000e).

30 "Fixed Fire Fighting Systems" (000e) must be physically isolated before they are disturbed, or maintenance is performed on them.

Manually activated "Fixed Fire Fighting Systems" (000e) must be operated by qualified/authorized personnel only. All personnel must be evacuated from affected spaces prior to manual activation of a "Fixed Fire Fighting System" (000e).

35 Procedures must be developed for properly enabling/disabling systems that, when discharged, are immediately dangerous to life/health (e.g., CO2 total flooding systems, etc.).

40 MINIMIZATION OF FIRE LOAD - Material supporting imminent work must be brought on the cutter and stored where the work is being performed. Material that appreciably contributes to fire load must be removed at the end of each work shift when personnel are not present. Trash, debris, and packaging materials must be promptly removed from the vessel at the end of each work shift and not allowed to accumulate.

NFPA 557, Standard for Determination of Fire Loads for use in Structural Fire Protection Design, may be used for guidance.

(General Requirements (All Contracts))

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**INSTALLATION/REMOVAL OF TEMPORARY VESSEL ACESSES** – This is the temporary installation of at least two vessel accesses (e.g., brows, gangways, etc.) that must conform to all 29 CFR 1915.74 requirements (e.g., must have railings with mid-rails on each side, must have a turn table when appropriate, must have steps when appropriate, must have safety nets installed when appropriate, must be illuminated over the entire length, must be properly trimmed at all times, all installed items must have adequate size/strength/safety, etc.). Vessel accesses must be free of obstructions at all times and must be removed prior to vessel departure.

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(General Requirements (All Contracts))

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## Work Item Standards and Specifications (WISS)

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**TEMPORARY VENTILATION INCIDENTAL TO CONTRACT WORK** – This is maintaining continuous positive ventilation of all spaces/compartments that are affected directly and indirectly by contract work by conforming to 29 CFR 1910.94, 1926.57, or 1926.353, as applicable; ANSI/ASHRAE 62.1, Section 6.1, and ASHRAE Std 26, Paragraph 4.9 may also apply.

When ventilation is shut down due to contract work, ventilation must be provided to manned compartments equivalent to the normal zonal ventilation rating for that space. Additional exhaust ventilation must be provided to spaces contaminated by fumes caused by contract work (welding, preservation, cleaning, adhesive application, etc...). For work areas contaminated with or laden by fumes, the ventilation must be set up in a net exhaust condition so as to create slightly negative pressure in the compartment as compared to adjacent compartments.

**LOCKOUT/TAGS-PLUS SYSTEM AND LOGS REQUIREMENTS** – Full compliance with all regulatory requirements for control of hazardous energy (e.g., 29 CFR 1910.147, 29 CFR 1915.89, etc.) is required, as applicable to the work specified in the SOW and CRs.

The CONTRACTOR must designate an employee as a "Lockout/Tags-Plus Coordinator". Prior to the start of work the "Lockout/Tags-Plus Coordinator" must coordinate with Coast Guard representatives to achieve a program and procedures that are in full regulatory compliance (e.g., who will hold/maintain logs, who will sign tags, etc.), where all duties are accomplished by either the CONTRACTOR or the Coast Guard, pending specific contract circumstances (e.g., vessel docked at home port versus at a "Contractor's Facility" (000d), etc.).

Generally, when the vessel is not at a "Contractor's Facility" (000d), the vessel crew will be responsible hanging tags and maintaining logs.

[eCFR :: 29 CFR Part 1915 Subpart F -- General Working Conditions](#)

(General Requirements (All Contracts))

**VARIOUS SAFETY-RELATED AND HOUSEKEEPING SUPPLIES/SERVICES** – Whenever disassembly, interference removal, or other work incident to repair work introduces a new potential safety hazard, reasonable measures must be taken to mitigate new risks to personnel safety.

Plates or covers must be installed over each deck opening created by contract work, to prevent injury to personnel, and to protect the vessel's interior spaces and equipment against outside contamination. When covering a deck opening left from a removed hatch or scuttle, the cover must be configured to allow normal passage of ship's personnel and equipment.

Temporary lines or rails must be installed in place of all removed lifelines or life rails until they are permanently restored.

Adequate illumination of work spaces must be maintained by providing safe temporary lighting whenever necessary; lighting arrangement must not contribute to slips, trips, falls, electric shock, burns, etc. or restrict safe ingress/egress from spaces. Fully comply with all [29 CFR 1915.82 Lighting](#) requirements.

Comply with all [29 CFR 1915.81 Housekeeping](#) requirements. Aisles and passageways in all work areas must be maintained in good condition at all times. All staging platforms, ramps, stairways, walkways, aisles, and passageways on vessels or dry docks must be kept clear of all tools, materials, and equipment (except those that are in use), and all debris such as welding rod tips, bolts, nuts, and similar material; hoses and electric conductors must be elevated over or placed under the walkway or working surfaces or covered by adequate crossover planks.

Working areas on or immediately surrounding vessels and dry docks, graving docks, or marine railways must be kept reasonably free of debris, and construction material. Ensure that materials and debris do not present a hazard to personnel.

Slippery condition on walkways or working surfaces must be mitigated immediately.

Free access to all exits, fire alarms, and fire-extinguishing equipment must be maintained at all times.

All oils, paint thinners, solvents, waste, rags, or other flammable substances must be kept in fire resistant covered containers when not in use.

Job site contamination must be prevented; protective clothing and plastic shoe covers must be provided to all personnel (employees and Coast Guard Inspectors) who must access the work areas.

Upon completion of all work, remove equipment and material from the work site and restore all existing facilities affected by the work to original conditions.

(General Requirements (All Contracts))

### 045a Care of Ship

Reserved

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### 074a Welding and Allied Processes

#### 074 Configuration Item Classes

Particular vessel configuration items designated in the SOW may belong to one or more the classes described below; determine the applicable classes, then conform to the corresponding requirements for those classes as they apply to the tasks designated in the SOW.

Class	Definition
"Weldment"	This is any item or assembly that is welded together using one or more "Weld Joints" (074a).
"Weld Joint"	This a continuous deposit of weld material used to join two pieces of metal together.
"Brazed Joint"	This a continuous deposit of brazing material (e.g., solder, etc.) used to join two pieces of metal together, typically used pipe joints.

**WELDING AND BRAZING GENERAL REQUIREMENTS** – All welding/brazing must be performed by certified personnel using approved welding/brazing/soldering procedure specifications (WPS/BPS/SPS). All welding/brazing must be in accordance with the applicable WPS/BPS and a commercial welding code or military welding standard. Different regulating codes for different WPSs/BPSs may be used; however, all documentation, welding/brazing, and personnel requirements for each procedure must follow the same code (e.g., the WPS, the Procedure Qualification Records (PQRs) and the welder qualification and testing of the welds must be per the same code/standard, etc.).

A WELDING PLAN (074a) must be submitted when designated in the General Requirements work item.

**WELDING EQUIPMENT REQUIREMENTS** - Take all necessary precautions to prevent personnel injury and coating system damage (e.g., due to improper connection and grounding of tools/equipment, etc.); Electrically isolate or disconnect ungrounded or sensitive equipment as necessary. Welding machine ground connections must be made as close to the work area as practicable, but no further than 10 feet away.

**WELD JOINT REQUIREMENTS** - Joint design and fit-up dimensions must be in accordance with the applicable drawings, work item, welding code or requirements of MIL-STD-22. Welding terms, definitions, and symbols must be interpreted in accordance with AWS A2.4 and AWS A3.0.

Permissible unfairness in steel and welded structures, including hull insert plates, must be in accordance with Section 12.3, Alignment and Fairness, of MIL-STD-1689A. Inappropriate reductions in structural member height and poor fit-up of insert plates that leads to warping of shell plate, bulkheads or framing, as well as waviness and distortions is not allowed. Damage resulting from failure to meet alignment and fairness requirements must be repaired at the welder's expense.

All surfaces must be cleaned to bare metal out to one inch on both sides of the weld joint to remove all foreign materials, unless otherwise directed in the SOW. Scale and metallic oxides must be removed from surfaces on which weld metal is to be deposited.

Low ductility shielded metal arc welding electrodes, including AWS classification E6010, E6011, E6012, E6013, E7014 and E7024, are not approved for joints in any welds, including *critical welds* (see Terms and Definitions (862a)).

Temperature crayons must not be used that contain elements such as lead, sulfur, zinc, cadmium, or mercury.

Gas metal-arc welding (GMAW) utilizing short circuiting arc transfer technique (the consumable electrode is deposited during repeated short circuits) must not be used for welds in ship structure above 0.25-inch material thickness unless the process and application are specifically approved in advance by the Coast Guard.

When inspecting welds using any nondestructive evaluation (NDE) method (e.g., visual inspection (VT), liquid penetrant inspection (PT), magnetic particle inspection (MT), etc.), the weld surface condition must comply with appropriate NDE standard. Inspection must be in the final surface condition. Inspection of repairs to base materials or welds must be to the same requirements as the original base material or weld.

Remove metallic zinc from all joint surfaces on which welds are to be deposited and for a distance which will be at least 1 inch from the edges of the finished welds. The localized heating technique must not be used for removing zinc coatings from HY-80/100/130, STS or similar chemistry, or quenched and tempered low alloy high strength materials.

**Repair or Renew** all disturbed coatings. **Install** a new coating system on new surfaces, as specified in the SOW or CR (631a, 631c). All new and disturbed surfaces must be properly prepared (e.g., a new initial anchor-tooth profile must be created on new surfaces, etc.) and then coated to match existing adjacent surfaces.

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SAFETY – Welding must not be performed, under any circumstances, on any member where water, oil, or other similar liquid is in direct contact with the surface opposite the side to be welded, or when there is less than 3 inches of base material between the weld area and the side in contact with the liquid.

(General Requirements (All Contracts))

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**WELDING PLAN** – A *WELDING PLAN* must include the following, unless otherwise specified in the SOW:

- A description of the welding/brazing standard(s) that will be followed (e.g., AWS, ASME, ASTM, NAVSEA S9074-AR-GIB-010/278, MIL-STD-1689A, NAVSEA 0900-LP-001-7000, and NAVSEA 0900-LP-060-4010, etc.).
- All WPSs/BPSs/SPSs representative of the installation and repair work that may be performed during the execution of the SOW, along with a summary list and current revision dates.
- EVIDENCE OF COMPETANT WELDERS (074a)
- Supporting PQRs when requested.
- All other information/data specified in the SOW

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(General Requirements (This Contract))

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**EVIDENCE OF COMPETANT WELDERS** – This is a list of the qualified welders/brazers who will be performing contract weld and brazed joints. This list must include:

- Personnel certification documentation, including at a minimum the names of the certified individuals and WPSs/BPSs they are certified to perform.
- Continuity documentation proving proper certification maintenance. Certifications must be maintained to the applicable code. Continuity periodicity for personnel certification is dictated by commercial welding codes and military welding standards.

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(General Requirements (This Contract))

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**WELD JOINT SPECIFIC WPSs AND QPRs** – Reserved.

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**WELD JOINT SPECIFIC QUALITY ASSURANCE REPORTS** – Reserved.

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## CHAPTER 100 HULL

### 100a General

<b>100 Configuration Item Classes</b>	
Particular vessel configuration items designated in the SOW may belong to one or more the classes described below; determine the applicable classes, then conform to the corresponding requirements for those classes as they apply to the tasks designated in the SOW.	
Class	Definition
"Primary Hull Structure"	The main strength decks and shell plating and their supporting framing, principal longitudinal bulkheads, vertical keel, deep web girders and stiffeners designed to withstand the ship bending stress. This also includes primary support structure which consists of the collision bulkhead, main transverse and bent bulkheads, and foundations that are integral parts of the primary girder and primary support structure.
"Butt"	A <i>butt</i> is a transverse or vertical plate edge connection in the shell, bulkhead, or deck plating (the plate butt is perpendicular to the plate <i>seam</i> ).
"Seam"	A <i>seam</i> is a fore-and-aft or horizontal plate edge connection in the shell, bulkhead, or deck plating
"Fitting"	Watertight or fume tight closure (e.g., doors, hatches, scuttles, air ports, and dogged manholes, etc.)
"Damage Control Deck"	Reserved
"Transverse Watertight Bulkhead"	These are bulkheads that extend from the keel to a main deck or a "Damage Control Deck" and from side to side. They provide extra transverse stiffening and partition the hull into independent watertight sections. <i>Transverse Watertight Bulkheads</i> are a vessel's fire zone when fire zones are not indicated in Damage Control books or drawings.
"Structural Plate and Shapes"	Any load bearing structural element that is part of the hull (e.g., shell plate and supporting members, transverse and longitudinal, masts, superstructure, decks, gunnels, machinery foundations, etc.).
"Shell Plate and Supporting Structure"	Reserved
"Non-Structural Plate and Shapes"	Reserved
"Non-Structural Tank"	The are enclosed spaces/chambers designed to store or contain liquids that are "stand alone" and are typically fastened or welded to structural foundations but do not share structure with the vessel's hull, and are not designed to add strength/rigidity to the vessel's structure.
"Potable Water Tank"	Reserved
"Chain Locker"	Reserved
"Quick Acting Watertight Door"	Reserved

## 110a Shell and Supporting Structure, Superstructure

<b>"Structural Plate and Shapes" and "Shell Plate and Supporting Structure"</b>
DEFINITION - "Structural Plate and Shapes" are any load bearing structural element that is part of the hull (e.g., shell plate and supporting members, transverse and longitudinal, masts, superstructure, decks, gunnels, machinery foundations, etc.).
<b>Inspect</b>  <b>Perform</b> generic inspections on the designated surfaces/components.  Identify and report all discrepancies related to as failing or failed coatings, pitting, rust, significant deformation of plate, cracks, obvious reductions in shell plate thickness, etc.  Whenever plate thickness wastage due to corrosion/erosion will approach 25%, impacting accurate repair recommendations, <b>Perform</b> UT-SHOT MEASUREMENTS (110a) and PIT MEASUREMENTS (110a) to help justify recommended repairs and increase their accuracy. Include measurement data in report findings.
<b>3-D Scan</b>  This work must be performed by a qualified technician. The KO/COR may request submission of evidence proving successful operation of this type of 3-D laser scanning equipment during one or more prior contracts by at least one of the current on-site technicians. At least one of the current on-site technicians must have prior experience performing all specified scanning tasks.  When performing a 3-D Scan, the vessel's hull (sides, bottom and transom), shaft skegs (and shafting if in place) and the dock floor must be scanned to obtain a 3D point cloud, and a registered, reduced point cloud data set.  The 3D laser scan point cloud accuracy must be within +/- 2 mm local scans and 5mm global scan alignment for the hull and deck surfaces. A point cloud reduction process must be conducted to determine the shell plating deformations including an average of the deck nonskid covering to show the underlying plate deformations by averaging points over a 20 mm grid on the hull. The point cloud of hull appendages must be reduced over a 1mm grid.  The 3D laser scan (3D Point cloud) must be converted to a point cloud format that can be used in Rhino 3D version 5.0. Staging interferences located around the hull of the Cutter must be digitally removed from the data.  The measured 3D point cloud and meshed surfaces must be compared to the hull lines based NURBS surface developed by US Coast Guard SFLC to determine dimensional deviations from the lines based NURBS surface. The dimensional deviations must be rendered in the Rhino 3D in 1mm increments and colors to show the dimensional gradients. The hull must be positioned relative to the 3D hull surface in coordination with the US Coast Guard.  Report - A neatly organized model using layers and color contour images of the surface comparisons must be provided. The 3D point cloud in Rhino 3D 5.0 formatted files must be provided and delivered in electronic format by ftp or mailed CDs to the USCG within 2 weeks after conducting the 3D Laser Scan. The report must include all photographs, illustrations, charts, graphs, tables, calculations, text, analyses, algorithms, conclusions, and recommendation deliverables developed as a part of the tasking. The Coast Guard will review the report, and may provide feedback or conduct discussions with the 3-D scan service provider prior to acceptance. The report must be delivered to Coast Guard with a document cover letter to the address specified in the SOW.

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**PLATE THICKNESS SURVEY** – Reserved

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**UT SHOT MEASUREMENTS** – Reserved

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**PIT MEASUREMENTS** – Reserved

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**HOLE AND PIT WELD REPAIRS** – This is the repair of holes, pits, etc. using clad welding methods in lieu of inserting repair plates.

Holes in plates may be repaired with clad welding, in lieu of insert plates, when the hole-size does not exceed the diameter specified for the corresponding range of plate thicknesses specified in the table below.

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Plate Thickness	Max Hole Dia
$\leq 1/4''$	$5/8''$
$> 1/4''$ through $5/8''$	1"
$> 5/8''$	1.5"

The original hole diameter should be widened to a minimum diameter equal to the plating thickness. The opening must be shaped to 20 degrees minimum included angle before welding.

Holes that are too large to weld repair by this method must be repaired by expanding the hole size for an insert with a minimum diameter of 6 inches.

(Maintenance Work Item)

**SIDESCAN** – This is automated crawler ultrasonic inspection scanning used to make large quantities of plate thickness measurements over large areas; inspection reports are presented in text and graphical/heat-map format.

The KO may request that evidence be submitted proving that, at all times, at least one of the on-site technicians, who are performing or overseeing the scan work, meet all qualifications set forth below:

- have successfully operated the automated plate thickness scanner being used in this contract during at least one similar contract
- are conforming to all ASNT Recommended Practice No. SNT-TC-1A 2006 requirements
- possess ASNT Level III analyst certifications for overseeing the entire scanning process and for evaluating all data obtained during scanning.
- possess ASNT Level III or II analyst certification for operating a hand held meters

When performing this type of scan, all shell plate thickness discrepancies must be identified and reported, while accomplishing and conforming to the following:

All scanning work must be performed in the presence of the COR or a COR Designated Coast Guard Inspector.

An "Echo-To-Echo Transducer" is not authorized for use.

The automated scanning machine must cover all areas of the hull (below the water line and entire freeboard area) up to a maximum of six inches around obstacles. Acceptable obstacles include sea suction, discharges, rudderposts, anodes, stern tubes, drydock blocks and areas blocked by immovable scaffolding or shipyard activity.

The automated scanner must be capable of scanning all convex areas with a radius of 8 inches and greater and concave areas with a radius of 12 inches and greater.

Automated scanning resolution must be set to  $0.5'' \times 0.5''$ .

Hand held scanning must be accomplished in areas not covered by the automated scanning, and in areas where the automated scanner loses data due to sharp dents, surface irregularities, roughness, etc. Follow these guidelines:

- The hand held meter must be calibrated each time it is powered up for use using an ASNT certified calibration block made of mild steel. Demonstrate that the equipment is calibrated prior to and immediately after scanning.
- the hand held meter must be set to a resolution of  $2.0'' \times 2.0''$  or better.
- supplemental hand held readings must be provided on any area of the hull identified as thinner than the criteria for repair defined in paragraph titled "Evaluation criteria" below.
- a resolution set to  $1.0'' \times 1.0''$  or better must be used in areas where the automated scanner loses data

Measure the average paint thickness in order to provide a more accurate metal thickness at all scanned points. The average paint thickness must be clearly defined in the reports.

Evaluation Criteria - Use the following evaluation criteria for all scanned plating (underwater body and freeboard):

- Plates where scan data indicates wastage greater than or equal to 25% nominal plate thickness must be highlighted in "RED" and designated "repair areas".
- Plates where scan data indicates wastage between 10% to 24% of nominal plate thickness must be highlighted in "YELLOW".
- Plates where scan data indicates wastage less than 10% of nominal plate thickness must be highlighted in DARK GREEN.

Label each plate on the hull designated for inspection as per the CG drawings listed in Section 2.

Outline areas measured with the hand held meter on the hull.

## Work Item Standards and Specifications (WISS)

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Outline in WHITE or YELLOW all areas on the hull identified with 25% or greater deterioration.

The colors used to label repair areas must not be used for any other markings on the hull.

Develop an electronic file side scan report comparing the results and the plate drawings (to be submitted with the CIR specified above). The reports must include the following contents (minimum):

- 5
- Findings narrative summary
  - Plate summary – must be in table format with at minimum a column for plate identification, repair identification, location of repair area, size of repair area, and brief description (i.e. exterior pitting, hole, interior corrosion, etc.)
  - A composite mosaic of the scan images overlaid on the appropriate shell plate expansion drawing as listed in paragraph titled "Evaluation criteria" above.
  - A separate page for each plate with a scan image of that plate only. Each page must contain the following:
    - Plate nominal thickness(es).
    - A legend showing plate thickness for green, yellow and red criteria.
    - All repair areas must be outlined in blue in the scan image as they are marked on the hull.
    - All unusual areas on the scan such as rough surface, etc. must be called out and noted in blue.
    - Plate orientation relative to the cutter must be identified.
  - Provide an individual photo for each plate requiring repairs.
  - Raw data files.
- 10
- 15
- 20
- The report must be organized as follows and included in the "Initial inspection/test report submission" described above with two copies of the side scan report on unprotected/editable compact discs (CDs):
- Table of contents
  - Plate summary
  - Complete port side mosaic showing colorized results
  - Port side scan and digital photos of each plate in sequential order
  - Complete starboard side mosaic showing colorized results
  - Starboard side scan and digital photos of each plate in sequential order
  - Transom scan and digital photos
- 25
- 30
- All files must be compatible with USCG standard workstation software (i.e., AutoCAD, MS Office, Adobe PDF, JPEG format).

(Maintenance Work Item)

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## 123a Tanks and Voids

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### "Structural Tank" and "Structural Void"

DEFINITION - "Structural Tanks" are enclosed spaces/chambers designed to store or contain liquids that are integral to the hull (i.e., share a wall or other structural member with the hull/vessel structure).

DEFINITION - "Structural Voids" are enclosed spaces/chambers that are integral to the hull (i.e., share a wall or other structural member with the hull/vessel structure) but are not designed to store or contain liquids.

#### Inspect

Prior to performing any other work on the designated tank, **Inspect-Op Test (Initial)** all equipment directly associated with the tank that may be disturbed or damaged during performance of the specified work (e.g., tank level indicators, etc.).

**Perform** all generic inspections on the designated tank/void surfaces.

All interior surfaces of the tank/void (e.g., bulkheads, floor and overhead plating, structural members, manhole cover surfaces, fasteners, gasket seating surfaces, etc.) must be included in the inspection. All structural discrepancies (e.g. coatings failures, rust, corrosion, bent or deformed plate or stiffeners, etc.) must be identified.

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All discrepancies with all sounding/vent tubes and associated components (e.g. caps, plugs, etc.), striker plates, suction/discharge piping, and all discrepancies with fastener material-type and fastener condition must be identified/reported whenever those items are installed in the system.

The location and depth of all pits that may be in the tank's interior surfaces must be measured/reported.

Identify and inspect all zinc, magnesium, or other cathodic protection anodes that may be installed in the tank; if the anodes are damaged or significantly deteriorated make a recommendation to renew the anode(s) in the inspection report, or otherwise Conform to the tasking in the work item.

A written PLUG LOG (123a) must be developed and maintained whenever one or more plugs are inserted into any pipe leading to or from a tank or void in conjunction with performing the designated for work. A current PLUG LOG (123a) must be submitted or shown whenever requested by the COR/KO. All plugs must be removed upon completion of work and prior to final tank/void closure.

### Clean

Install plugs into all opening that lead to or from tanks/voids being worked that will facilitate the capture of all contaminates while performing cleaning, painting, repairs, etc.

Remove (e.g., rinse, wash, wipe, etc.) all foreign materials (e.g., residual fuel, water, sediment, sludge, rust, biological growth, etc.) from all interior surfaces of the designated tank.

**Renew** all disturbed/exposed soft components (e.g. seals, gaskets, o-rings, etc.).

Do not to damage the existing coating system. Tanks that are coated with oil and not a paint are an exception, it may not be possible to clean the tank coated with oil without removing oil; in those cases, all oil removed must be **Renewed**.

Remove all cleaning media and residues continuously during the washing process. Remove all residual wash media upon completion, and wipe up all residual moisture with clean lint-free cloths.

Dispose of residual tank contents and cleaning fluids in compliance with all applicable Federal, state, and local laws, ordinances, and regulations. Document a complete chain of custody record of the removed tank contents and generated wastes, from the vessel to the point of final destination or delivery. **Submit** the document to the COR upon completion of work.

A written PLUG LOG (123a) must be developed and maintained whenever one or more plugs are inserted into any pipe leading to or from a tank or void in conjunction with performing the designated for work. A current PLUG LOG (123a) must be submitted or shown whenever requested by the COR/KO. All plugs must be removed upon completion of work and prior to final tank/void closure.

**PLUG LOG** – This is a written record of each plug that is temporarily installed into pipe openings that lead to or from tanks/voids being worked; these plugs facilitate the capture of contaminates while performing cleaning, painting, repairs, etc.

5 The log must 1) identify/describe each opening in the tank/void that could be plugged, 2) show when a plug has been temporarily installed into that opening, 3) after removal, show that the plug has been removed from the opening.

10 A list must be kept for each tank/void being entered and worked. All plugs must be removed upon completion of work. The plug log must be available for Coast Guard inspection at all times, in particular when the Coast Guard performs tank/void close-out inspections. A copy of the final plug log, indicating that all temporary plugs have been affirmatively removed from each disturbed tank/void must be submitted with the final inspection/test CFR for the subject work item.

(Maintenance Work Item)

### "Inaccessible Voids"

DEFINITION - *Inaccessible Voids* are enclosed spaces/chambers that do not have an entry (e.g., hatch/scuttle, manhole, etc.) and, typically, can only be inspected internally via vent and plug holes or by cutting temporary accesses into the void's shell.

### Inspect

**Perform** all generic inspections on the designated void surfaces.

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Remove and dispose of all associated threaded void drain plugs. Verify that no liquids drain from the voids, which may indicate a hull leak. Dispose of drained liquids in accordance with all Federal, state, and local laws and regulations. Identify and report all discrepancies; include recommended repairs in the report.

Pending inspection results and only after the subsequent authorization by the KO via CR, **Perform** a VOID AIR TEST (123a) on the designated void(s). Upon completion of those tests, **Submit** a CFR detailing discrepancies and recommended repairs.

Upon completion of all work:

Chase all female threads for each corresponding plug removed.

**Renew** all threaded void drain plugs (using either 316 stainless steel or Monel, as applicable), and coat new plugs prior to installation with a sealing and locking compound conforming to ASTM D5363-AN0123 or a flexible joint compound conforming to MIL-S-45180, Type II.

**VOID AIR TEST** – This is the pressurization of an inaccessible void to confirm tightness of the structural boundary, or to otherwise indicate that a leak is present that must be identified and corrected.

5 SAFETY PRECAUTIONS – When testing a void that can be accessed/entered by personnel, a sign must be placed on each access that clearly states the following phrases in upper case letters: "DANGER, DO NOT ENTER, AIR TESTING IN PROGRESS".

10 Fifteen minutes prior to commencing pressurization for compartment air testing and every quarter hour thereafter until completely depressurized, the COR or a COR designated Coast Guard Inspector will announce on the ship's public address system that compartment air testing is in progress in the designated space and that personnel must stand clear.

PROCEDURES - The following must be installed at the test connection:

- One vent valve.
- Two relief valves arranged in parallel and set at 15 percent above test pressure.
- Two independent pressure gauges, each with a range such that the test pressure is in the middle of the scale.
- An air supply of not more than 25 psig with a supply capability less than the exhaust capability of either relief valve.

20 The void to be tested must be isolated by blanking and/or plugging all openings including lines and vents going to and from the space.

Then a 2.0 psig test pressure (+0.25/-0.0 psig) must be applied. Hold the test pressure in the void for at least 15 minutes to allow the temperature to stabilize. After the 15 minute time has elapsed, hold the pressure for 10-minute additional minutes. No pressure drop allowed during the 10 minute period.

When the allowable test pressure drop is exceeded, leaks must be located and repair recommendations reported. Retest space to the above requirements.

25 After the air test, relieve the pressure and remove all blanks and plugs.

(Maintenance Work Item)

## 167a Watertight Closures (Doors, Hatches, Scuttles)

### "Watertight Closures"

DEFINITION - "Watertight Closures" are doors, hatches, scuttles, etc. that completely seal the adjoining surface from changes in pressure and completely seal the adjoining surface.

#### Operate and Inspect

Prior to performing any other work on the designated closure, **Inspect-Op Test (Initial)** all equipment directly associated with the closure that may be disturbed or damaged during performance of the specified work (e.g., lights switches, etc.).

**Perform** all generic inspections on the designated closure surfaces.

Operate each designated closure through at least one complete dogging cycle and **Inspect** each for all discrepancies that may cause leaks or improper operation (e.g. loose/missing/damaged parts, wear of hinge pins and striker plates; clogged drain lines, binding and/or difficult operation, closure gaskets that are painted/cracked/deteriorated/uneven/deformed more than 1/8", gaskets that are improperly joined/sealed, gaskets that join at a radius/corner, missing or damaged grease fittings, damaged knife edges, etc.).

Apply grease to all intact grease fittings, file smooth any minor nicks or gouges in knife edges. If a nick or gouge in a knife edge has a gap greater than 1/16", the knife edge may require weld buildup prior to filing smooth in order to keep the knife edge fair.

Submit a report describing all discrepancies and recommended repairs.

5

**CHALK TEST** – This test proves that the closure gasket makes adequate contact with the closure knife-edge. The door or hatch being tested must be properly adjusted prior to conducting the chalk test. Chalk the bearing surface or knife edge and close/dog the door or hatch. When the door or hatch is opened, the chalk from the knife edge will have been transferred to the gasket. A successful test is noted by a uniform and continuous chalk mark on the door's or hatch's gasket (100 percent gasket contact). Irregularities or breaks in the chalk mark are cause for test failure.

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(Maintenance Work Item)

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**WATER HOSE TEST** – This test proves that the closure seals properly. Prior to conducting a water hose test, all adjacent equipment must be protected so no damage will occur from any spray or fluid collection. Direct fresh water against the entire boundary being tested. The water hose nozzle must be no less than 1/2" in diameter and the pressure at the nozzle no less than 50 psi. The nozzle must be within 10 feet of the structure being tested. If there is no evidence of water on the opposite side of the structure the test is successful.

(Maintenance Work Item)

## CHAPTER 200 PROPULSION PLANT

### 200a General

#### **200 Configuration Item Classes**

Particular vessel configuration items designated in the SOW may belong to one or more the classes described below; determine the applicable classes, then conform to the corresponding requirements for those classes as they apply to the tasks designated in the SOW.

<b>Class</b>	<b>Definition</b>
"Propulsion Shaft System"	These are the components the components including and aft of the reduction gear flange that mates with the propulsion shaft, the propulsion shaft and associated components (e.g., shaft stock, shaft coupling/flange, associated fasteners, etc.), the bearings that mate with the propulsion shaft (e.g., stern-tube bearings, strut bearings, the associated bearing carriers/housings, etc.), the stern tube structure, strut structure, the propeller, and all associated components (e.g., fasteners, zinc anodes, rope guards, etc.).

### 233a Main Diesel Engines

5 Reserved

## Work Item Standards and Specifications (WISS)

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### 243a Propulsion Shafting

<b>"Shaft Assembly"</b>
DEFINITION – A propulsion shaft assembly is the union of the following generic components, as applicable to the particular vessel: propulsion shaft, propeller and associated sub-components (fasteners, anodes, etc.), all bearings aft of the reduction gear flange (e.g., stern tube bearings, strut bearings, etc.), all vessel structure and associated coatings at that can only be accessed with the propulsion shaft is removed from the vessel (and adjacent coating that make up the same coating system), rope guards, associated fairings, the shaft seal assembly, shaft to reduction gear hubs and fasteners.
<b>Overhaul</b> <b>Perform</b> generic overhaul sub-tasks on the designated shaft assembly components/parts. <b>Perform</b> the following Shaft Inspections and Straightness Check on the designated propulsion shaft. <ul style="list-style-type: none"><li>• All shaft inspections and measurements must be taken in the presence of the COR or the COR's designated Coast Guard inspector.</li><li>• The shaft must be removed from the vessel and mounted on a machine supported on precision roller assemblies at two points, each point must be no more than 24 inches from their respective end of the shaft.</li><li>• The shaft must be slowly spun for at least 2hrs to remove all non-permanent bend/set (elastic hysteresis).</li><li>• All discrepancies must be identified and it must be determined if the shaft is satisfactory for reuse or if shaft renewal is warranted (e.g., significantly bent, journals damaged, etc.) or if repairs can be performed.</li><li>• Findings must be supported by taking complete shaft journal dimensions and propulsion shaft run-out readings via dial indicator survey at the small and large ends of each taper, at the fore and aft ends of each bearing position, at three equally spaced locations between the bearings, and at three equally spaced locations between the intermediate bearing and coupling taper. Each station must be marked at the position of maximum run-out on the periphery of the shaft.</li><li>• All measurement data must be reported on the form at the end of the work item invoking this requirement</li></ul> Unless otherwise specified in the work item, <b>Renew</b> all associated bearings/bushings/staves/fasteners/etc. Unless otherwise specified in the work item, <b>Perform</b> an alignment survey as specified in the work item. Specific shaft seal sub-tasks will be described in the associated work item.

### 245a Propellers

<b>"Propeller"</b>
DEFINITION – a " <i>Propeller</i> " is mechanical part/component for propelling a boat consisting of two or more blades attached to a hub, etc.
<b>Clean</b> <b>Perform</b> generic cleaning on the designated void surfaces. Uncoated bronze/brass/etc. propellers must be cleaned to a bright metal finish prior to inspection.
<b>Inspect</b> <b>Perform</b> all generic inspections on the designated void surfaces. Propellers must be visually inspected in their entirety to identify all discrepancies (e.g., bends, deformation, torn material, and/or missing material, out-of-tolerance discontinuities per ABS Part 7 Appendix Section 10 Table 1, etc.) and any other abnormality that may negatively affect operation.
<b>3D-Scan</b> Scanning of a propeller must be performed or supervised by a technician who has successfully operated the scanning equipment in at least one prior similar contract, and must have prior experience performing all of the scanning subtasks specified herein. First, ISO 484/2 Class I tolerances must be calculated around all original propeller design dimensions. Those original propeller design dimensions must be obtained from a Government-furnished propeller CAD model.

## Work Item Standards and Specifications (WISS)

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### “Propeller”

Next, Class I tolerances must be calculated for each required dimension over 48 equally spaced stations per blade (refer to Sections 7a, 7b, 7c, 7d, 8, 9, 11, 12.2, 12.3, 13 in ISO 484-2). Pitch radii must be measured at 0.3 R, 0.4 R, 0.5 R, 0.6 R, 0.7 R, 0.8 R, 0.9 R, and 0.95 R.

Then, all visible hub and blade surfaces of the propeller must be scanned. Measurements must be accurate to within 0.001”.

After scanning, a table must be generated that shows each design dimension, the corresponding calculated tolerance, and the corresponding measured dimension from the actual propeller. Out of tolerance dimensions must be indicated.

A color-gradient “heat map” of the measured dimensions superimposed over the Government-furnished CAD model design dimension images must be generated. The heat map must highlight where actual propeller dimensions deviate from the design dimensions described by the CAD model.

The table, heat map images, all discrepancies, and all recommended repairs must be described on an inspection report submitted as designated in the work item.

## 256a CIRCULATING AND COOLING SEA WATER SYSTEM

### “Sea Water System Valves”

DEFINITION – A “Sea Water System Valve” is any valve part of a sea water system (e.g., cooling system for main diesel engines and ship’s service diesel engines, auxiliary cooling systems like chill water systems, HVAC compressors, etc.)

DEFINITION – A “Skin Valve” is a type of sea water system isolation valve that generally is the first valve inboard of a sea chest, whose suction side is generally taking water from the sea; these valves are generally worked in dry dock because of the elevated cost of working them while waterborne (coffer dams, divers, etc.)

#### Overhaul

**Perform** generic overhaul sub-tasks on the designated valves.

To establish pricing, assume all designated valves have a bronze housing and flanged connections. Verify actual configuration via ship-check prior to purchasing any materials. If actual configuration differs from the drawing or the work item description, document and submit a report detailing discrepancies.

All residual fluids drained from the piping system must be disposed of in accordance with all Federal, state, and local rules and regulations.

Immediately after removing valves from the system install gaskets and blank flanges over all openings, securing each flange with at least two bolts, 180 degrees apart.

Disassemble each valve to the extent necessary to perform the required work; **Inspect** all disassembled components and parts. **Clean, Inspect** all internal surfaces, the valve body and structure. **Inspect** the surface finish and condition of seats, disks, parting faces, plugs, and sealing surfaces. When necessary, machine, grind, lap and spot-in seat-to-disk to obtain an acceptable leakage rate at or below valve testing standards listed below. Reassemble the valve using new hardware and software (e.g., packing, O-rings, gaskets, seal rings, non-metallic seats, pins, washers, inserts, etc.)

**Inspect** the piping, adjacent foundations, mounting arrangements, exposed bilge surfaces, and associated components and surfaces for all discrepancies (e.g., damage, failed coating systems, corrosion, etc.). Determine the percentage of remaining material for each waster piece that may be installed, if any. Determine, if any, valve label plates are damaged or missing. Report all discrepancies identified.

Shop test the overhauled valves in accordance with the applicable industry standards listed below.

New valves must be commercial-standard type valves, conforming to the applicable industry standard listed below.

New valves must be equivalent (e.g. identical material, etc.) to the existing; substitution of body material or trim set is not authorized. MIL-STD valves installed must be substituted with equivalent commercial standard valves.

VALVE TYPE	INDUSTRY STANDARD
Steel Valves	MSS SP-61
Butterfly Valve	MSS SP-67
Ball Valves, Flanged or Butt-Welded Ends	MSS SP-72
Bronze Gate, Globe, Angle and Check Valves	MSS SP-80
All others	ASME B16.34

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Remove and dispose of all temporary blanks and gaskets. Re-install all overhauled valves; install new valves if that option was selected. **Renew** all disturbed gaskets, seals, and fasteners. Unless otherwise specified, gaskets must conform to ASTM D1330 and fasteners must be nickel-copper.

### "Sea Water System Strainers"

DEFINITION - A "Sea Water System Strainer" is any strainer assembly part of a sea water system (e.g., cooling system for main diesel engines and ship's service diesel engines, auxiliary cooling systems like chill water systems, HVAC compressors, etc.)

#### Overhaul

**Perform** generic overhaul sub-tasks on the designated strainer.

All residual fluids drained from the piping system must be disposed of in accordance with all Federal, state, and local rules and regulations.

Immediately after removing the strainer from the system install gaskets and blank flanges over all openings, securing each flange with at least two bolts, 180 degrees apart.

Disassemble each strainer to the extent necessary to perform the required work; **Inspect** all disassembled components and parts. **Clean, Inspect** all internal surfaces, the strainer body and structure. **Inspect** the surface finish and condition of seats, disks, parting faces, plugs, and sealing surfaces. Reassemble each strainer using new hardware and software (e.g., packing, O-rings, gaskets, seal rings, non-metallic seats, pins, washers, inserts, etc.)

**Inspect** the piping, adjacent foundations, mounting arrangements, exposed bilge surfaces, and associated components and surfaces for all discrepancies (e.g., damage, failed coating systems, corrosion, etc.). Determine if any strainer label plates are damaged or missing. Report all discrepancies identified.

Shop test the overhauled strainers as follows.

For simplex strainers: Pressurize the strainer to 5 psig (9ft head / 2.31 = 3.89 x 135% = 5.26 psig) and hold for 20min. Verify no leaks.

For duplex strainers: Hydrostatically test each overhauled duplex strainer's plug valves, both chambers.

Lubricate the strainer plug valves with plug valve grease conforming to AMS-G-6032. Remove the strainer cover from the unpressurized side to observe leakage rate, blank or close all other openings. Pressurize the sealed side to 5 psig (9ft head / 2.31 = 3.89 x 135% = 5.26 psig) and hold for 20min. Verify the unpressurized side does not completely fill with water. Repeat for the opposite side.

Remove and dispose of all temporary blanks and gaskets. Re-install all overhauled strainers; install new strainers if that option was selected. **Renew** all disturbed gaskets, seals, and fasteners. Gaskets must conform to ASTM D1330 and fasteners must be nickel-copper.

**Repair** PIPE LABELING (256a) if damaged, as necessary.

**PIPE LABELING** – Whenever pipe labeling is damaged in conjunction with repairs/maintenance or when tasked by a work item, or herein, restore or install pipe labeling as described below.

5

Stencil the following onto the pipe surfaces:

- Name of the piping system service.
- Destination, where feasible.
- Direction of flow, indicated by an arrow 3 inches long pointing away from the lettering (for reversible flow, point an arrow away from each end of the lettering).

10

Ensure that all lettering and arrow(s) are black in color, in general, but white for dark-colored piping.

## CHAPTER 300 ELECTRIC PLANT

### 300a General

**THERMOGRAPHIC INSPECTION/REPORT** - This is the thermal photo imaging of an energized electrical component (e.g., ship service switchboard, power panel, load center, motor controller, etc.); any item whose heat signature would indicate failure, imminent failure, preventive maintenance required (e.g. loose connections or poor conductivity), etc.

**SAFETY STANDARDS** - Prior to opening an electrical enclosure, establish an arc flash boundary of at least four (4) feet from the electrical plane of the equipment. Clearly mark and erect a barrier to prevent the access of unauthorized personnel. Establish visible safety boundary at all entrances to the space where work is being performed using red danger tape or signage. Maintain this safety boundary until all thermal inspections are completed and all electrical covers are reinstalled within the space.

**PROCEDURES** - Load/energize the equipment designated for inspection in the SOW to the greatest practicable extent, for at least 30 minutes. Perform a thermal imaging survey of the components in the panels to identify all discrepancies.

For all Ship Service Switchboards, include output leads of all circuit breakers attached to the switchboard, output leads of both SSDG's into main circuit breakers at switchboard, and all terminal strips inside main switchboard. For all load centers, include all power panels throughout the cutter. All output leads from circuit breakers must be surveyed.

Perform detailed thermal imaging scans of all wiring, connections, bus work and all current carrying components that are accessible without breaking the electrical plane of the electrical equipment being surveyed while observing the monitor for hot or cold spots.

When a potential hot or cold spot is found, the temperature difference between the hot or cold spot and surrounding equipment reference temperature must be determined and recorded.

When detecting a hot or cold spot determine the temperature difference between the hot and cold spot in accordance with the IR test equipment OEM procedures manual. For a temperature difference of 70 degrees Celsius and above (Severity Code IV), imminent failure is expected, and must be reported immediately to the ship's EO/EPO and Contracting Officers Representative (COR). Follow all criteria and all reporting actions outlined in table below excluding making repairs.

#### REFERENCE TEMPERATURES & SEVERITY CODE DETERMINATION

TEMPERATURE RISE OR $\Delta T^*$	OPERATIONAL ASSESSMENT	SEVERITY CODE	ACTION
70°C and above	Failure Imminent	IV	Equipment should be secured immediately and ships Engineering Officer notified. Do not operate until repairs are complete.
40°C to less than 70°C	Failure Almost Certain	III	Equipment should be secured if operating conditions permit otherwise monitored until corrective action can be taken.
20°C to less than 40°C	Failure Possible	II	Corrective action should be taken as soon as feasible.
5°C to less than 20°C	Performance Degraded	I	Corrective action should be taken at next scheduled routine maintenance period or as schedule permits.
Less than 5°C	N/A	N/A	No corrective action required; note for future reference.

**\*The temperature rises or  $\Delta T$ 's indicated above are the temperature differentials between the thermal anomaly (i.e., faulty connection or component) and the reference temperature. The reference temperature is normally a similar, normal operating connection, component, or phase.**

**EXCEPTIONS TO EQUIPMENT LOADING.** For equipment that cannot be energized/operated practically or safely due to cutter or project-specific constraints (e.g. bilge/fuel pumps cannot be operated because they will run dry during operations/testing, etc.), in lieu of performing a thermographic inspection, de-energized all affected equipment and conduct a thorough visual inspection of the components inside the affected panel(s). Identify all discrepancies and note all findings and recommended repairs in the "Thermal Inspection Report" below.

**SPECIFICATIONS FOR INFRARED THERMAL IMAGING SYSTEM (IRTIS) EQUIPMENT** - Infrared Thermal Image System (IRTIS) equipment/camera in performance of this survey must meet or exceeds the following performance criteria:

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- Accuracy: +/- 2% or 1.9°C (3.4°F)
- Object temperature range: From at most 40°F to at least +716°F
- Display Type: Color
- Digital Image Type: Color and Grayscale
- Color Palettes: Hot Iron, Rainbow, Grayscale

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TEST EQUIPMENT CALIBRATION AND OPERATIONAL CHECKS - IRTIS equipment must be calibrated and certified per manufacturer. The IRTIS equipment must be adjusted each time equipment is energized. Initially and when the IRTIS test equipment is operated continuously for long periods of time, a grey scale check must be made in accordance with the IRTIS manufacturer's instructions.

10

THERMAL IMAGING CAMERA OPERATOR CERTIFICATION - Operators should be in possession of a current "ANSI/ASNT LEVEL I certification (or higher) meeting SNT-TC-1A: Personnel Qualification and Certification in Nondestructive Testing". Otherwise, be able to describe/report all relevant thermal imaging skills and experience, as directed elsewhere in the solicitation.

15

SCAN IMAGES - Provide, at a minimum, one color and one gray scale IR thermograph image of each faulty component or connection found, showing isothermal level scale on the images. Provide, at a minimum, one digital non-infrared color photographic image of each faulty component or connection found from the same angle and perspective as used for the IR thermograph image, and identify the location of fault with arrow on the images. Save in electronic jpeg format, all thermal images and digital photographs, keeping a record of the images that are being saved. Record all pertinent data associated with each image regarding the piece of equipment, location, specific component or connection and the severity code (I, II, III or IV based on Table 2 criteria above).

20

NOTE: Images and reporting documentation must be assigned a security classification (when applicable) based on security classification of ship's spaces and equipment surveyed within those spaces.

25

THERMAL INSPECTION REPORT - Submit two electronic copies of the thermal image survey report to the COR within five days of completing the thermographic inspection. Include in the report all discrepancies and recommended repairs for all components inspected (i.e. those that could be inspected with the thermal imaging camera, and those that could only be visually inspected). The report must contain one (1) individual full page per fault/condition found including, at a minimum, the following required content:

30

- Date and time of inspection
- Location of equipment (id tag on gear) and name of faulty component within the equipment
- IR thermograph and non-IR digital images
- Ambient air temperature of ship space
- Temperature of faulty component
- Reference component temperature
- Temperature rise ( $\Delta T$ )
- Descriptive technical fault assessment based on temperature rise
- Severity code from Table 2
- Probable cause and recommended action to correction

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## **CHAPTER 400 COMMAND AND SURVEILLANCE**

### **400a General**

Reserved

## CHAPTER 500 AUXILIARY SYSTEMS

### 510a CLIMATE CONTROL

<b>"HVAC System"</b>
DEFINITION - An <i>HVAC System</i> includes all designated duct work, air handlers, louvers, air filters, thermostats, compressors, associated refrigerant and cooling-water piping and heat exchangers, etc
<b>Inspect-Op Test (Initial)</b>  <b>Inspect</b> all system components.  Record an air flow velocity reading at each vent duct outlet while operating the system.  Record all proposed modifications to the system (e.g. new holes or accesses in existing duct, etc.) that will be necessary to perform any other designated action (e.g., cleaning, repairs, renewals, etc.). Do not modify or alter the system without prior Coast Guard authorization.  Include the above data with the report associated with the <b>Inspect-Op Test (Initial)</b> task.
<b>Balance</b>  This is the adjustment of all dampers and flow controls in the HVAC system to achieve the proper air flow through each duct/exchange/supply/return, and to achieve the proper pressure differential between the vessel interior and exterior.. Adjustment guidance/specifications and proper flow rates are described in the system configuration documents (e.g., system drawings, technical publications, etc.) referenced by the SOW, or as described in the SOW.  <b>Groom</b> the system to achieve the required air flow rate through each duct.
<b>Inspect-Op Test (Final)</b>  After all work is complete, operate the system and record an air flow velocity reading at each vent duct outlet for comparison to initial readings. Include this data with the associated CFR. All vent duct and air-handler joints must be leak free.

<b>"HVAC Duct System"</b>
DEFINITION - An <i>HVAC Duct System</i> includes all "HVAC System" components that come in contact with the air being routed/handled around the vessel before that air exits the system. Examples of these components are ventilation ducts, air handlers, fans, air filters, louvers, heating coil and cooling coil surfaces, etc
<b>Clean</b>  Prior to gaining access to system interiors via disassembly, mark the position of all adjustable items (e.g. dampers, louvers, etc.); those items must be put back into their original positions prior to the <b>Inspect/Op Test (Final)</b> (unless rebalancing of dampers i.e., <b>Balance</b> , or other tasks are designated in the SOW).  After gaining access to duct interiors, take a digital "before" photo of each duct's interior surfaces, where openings have been created, showing the original condition of the duct work interiors. <b>Submit</b> these images with the report associated with the <b>Inspect/Op Test (Initial)</b> .  Remove all foreign material (e.g. dust, dirt, grease, lint, cleaning material an fluids, etc.). from all designated ventilation system internal surfaces (e.g. duct work interiors, fan blades, air handler interiors, etc.). Mild detergents (e.g. soapy water, etc.) may be used for dirt/grease removal.  Cycle and lubricate all adjustable items (e.g. dampers, louvers, etc.). Treat surfaces prone to condensation (e.g. cooling coils/fins, condensate tube, drip pans, etc.) with a sanitizing agent (e.g. diluted bleach, etc.). Take all necessary precautions to prevent all incidental damage (e.g. spills, etc.).  Prior to closing the duct work accesses, take a final "after" photo of the same areas as taken above in the "before" images. Submit these images with the report associated with the <b>Inspect/Op Test (Final)</b> .  Dry ice blasting may be used to clean vent duct interiors in lieu of routine mechanical methods (e.g. brushes, cloths, vacuums, etc.) with prior Coast Guard authorization.

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**TEMPORARY HVAC** – *TEMPORARY HVAC* is the temporary installation and subsequent removal of external/portable heating and air-conditioning units to provide climate control to spaces/compartments designated in the SOW. *TEMPORARY HVAC* is typically required when a vessel's HVAC system is disabled/secured for maintenance/repairs. The temperature in the designated spaces/compartments must be maintained between 65 deg F and 75 deg F unless otherwise specified in the SOW.

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### 520a SEA WATER SYSTEMS

Reserved

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### 530a FRESH WATER SYSTEMS

#### "Potable Water Tanks"

DEFINITION - A "Potable Water Tank" is a tank containing fresh water for vessel crew consumption.

#### Inspect

Prior to performing any other work on the designated tank, **Inspect-Op Test (Initial)** all equipment directly associated with the tank that may be disturbed or damaged during performance of the specified work (e.g., tank level indicators, hatches/scuttles, etc.).

**Perform** all generic inspections on the designated tank surfaces. All interior surfaces of the tank/void (e.g., bulkheads, floor and overhead plating, structural members, manhole cover surfaces, fasteners, gasket seating surfaces, etc.) must be included in the inspection. All structural discrepancies (e.g. coatings failures, rust, corrosion, bent or deformation plate or stiffeners, etc.) must be identified.

All discrepancies with all sounding tubes, vent tubes, striker plates, suction/discharge piping, and all discrepancies with fastener material-type and fastener condition must be identified/reported whenever those items are installed in the system.

The location and depth of all pits that may be in the tank's interior surfaces must be measured/reported.

Identify and inspect all zinc, magnesium, or other cathodic protection anodes that may be installed in the tank; if the anodes are damaged or significantly deteriorated make a recommendation to renew the anode(s) in the inspection report.

A written PLUG LOG (123a) must be developed and maintained whenever one or more plugs are inserted into any pipe leading to or from a tank or void in conjunction with performing the designated for work. A current PLUG LOG (123a) must be submitted or shown whenever requested by the COR/KO. All plugs must be removed upon completion of work and prior to final tank/void closure.

**Notify** the COR prior to closing the designated tank(s). Tank closure must be in the presence of Coast Guard personnel. After satisfactory inspection by the Coast Guard, and completion of all authorized repairs, close tank manhole cover(s) with new gasket material conforming to ANSI/NSF 61. Renew all stud cotton grommets (as applicable) upon reinstallation of manhole cover(s).

#### Clean

**Comply** with all GENERAL REQUIREMENTS FOR POTABLE WATER SYSTEMS (530a).

**Perform** all generic cleaning on the designated tank surfaces; remove (e.g., rinse, wash, wipe, etc.) all foreign materials (e.g., water, sediment, sludge, rust, biological growth, etc.) from all interior surfaces of the designated tank.

Do not to damage the existing coating system.

Remove all cleaning media and residues continuously during the washing process. Remove all residual wash media upon completion, and wipe up all residual moisture with clean lint-free cloths.

Dispose of residual tank contents and cleaning fluids in compliance with all applicable Federal, state, and local laws, ordinances, and regulations. Document a complete chain of custody record of the removed tank contents and

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generated wastes, from the vessel to the point of final destination or delivery. **Submit** the document to the COR upon completion of work.

A written PLUG LOG (123a) must be developed and maintained whenever one or more plugs are inserted into any pipe leading to or from a tank or void in conjunction with performing the designated for work. A current PLUG LOG (123a) must be submitted or shown whenever requested by the COR/KO. All plugs must be removed upon completion of work and prior to final tank/void closure.

**Notify** the COR prior to closing the designated tank(s). Tank closure must be in the presence of Coast Guard personnel. After satisfactory inspection by the Coast Guard, and completion of all authorized repairs, close tank manhole cover(s) with new gasket material conforming to ANSI/NSF 61. Renew all stud cotton grommets (as applicable) upon reinstallation of manhole cover(s).

After all other work involving the potable water system and tank closing have been completed, disinfect and treat the affected potable water tank(s) and associated disturbed piping and components, as necessary, to meet or exceed the requirements of AWWA C652. After tank disinfecting, remove and dispose of all treated water in accordance with all Federal, state and local regulations. Ensure that no one enters the tanks once disinfection is completed.

**Submit** a report providing confirmation that disinfection of tank(s) and associated potable water system disturbed piping and components has been completed and certifying that all sampling and testing is negative for coliform organisms.

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**GENERAL REQUIREMENTS FOR POTABLE WATER SYSTEMS** – Whenever potable water systems are disassembled or whenever the system internals can potentially be exposed to contaminants (e.g., during tank cleaning, piping repairs, valve renewal, etc.) every precaution must be taken to prevent contamination of the system internals (e.g., installation of air-tight blanks on openings, etc.).

If there is reasonable evidence indicating that the internals of a disturbed system have been contaminated, action must be taken to clean and disinfect all contaminated internal surfaces and potable water; this action must be at the expense of the party that caused the contamination. Immediately report all inadvertent contamination to the COR.

To correct all contamination discrepancies identified, and after all other work involving the potable water system has been completed, the affected parts of the potable water system must be disinfected and the affected potable water tank(s) and associated disturbed piping and components must be treated, as necessary, to meet or exceed the requirements of AWWA C652. After disinfecting, remove and dispose of all treated water. Ensure that no one enters all associated tanks once disinfection is complete. Submit a report providing confirmation that disinfection of tank(s) and associated potable water system disturbed piping and components has been completed and certifying that all sampling and testing is negative for coliform organisms.

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### 540a FUEL AND LUBRICANT SYSTEMS

Reserved

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### 550a AIR, GAS, AND MISCELLANEOUS FLUID SYSTEMS

#### "Hydraulic Fluid"

DEFINITION - *Hydraulic Fluid* is the medium by which power is transferred in hydraulic machinery.

#### Renew

Drain and properly dispose of the existing system hydraulic fluids.

**Provide** hydraulic fluids that meet the quantity, type, grade, viscosity, and all other material criteria as specified in the system specifications or in the work item.

**Filter** the new hydraulic fluids through one or more three-micron absolute, non-bypass type filters designed specifically for filtering oils and other lubricants.

**Sample and Test** the new, filtered fluids. **Submit** test results prior to installing into the system.

#### Filter

Use a filtering cart/rig equipped with a three-micron absolute filter, a water separator, and a pressure differential gage across the filter element assembly.

Connect the supply and discharge lines of the filtering cart/rig to the hydraulic system as specified in the system specifications or the task description.

The best connection points will minimize filtering time and will maximize the rate at which previously unfiltered fluid passes through the rig/cart. Select points at opposite ends of the reservoir if possible.

Continuously circulate system hydraulic fluids through the filtering cart/rig for the period specified in the table below based on reservoir size and filter cart/rig pump capacity. The Coast Guard Inspector or COR must be allowed to cycle the system actuators four separate times as described in the notice below during the filtering process.

To dislodge and suspend particulate contamination and to heat the fluid to a maximum, constant, steady state temperature, the Coast Guard inspector will cycle all actuators associated with the hydraulic system for a minimum of 20 minutes at the start of the filtering process. The Coast Guard Inspector will repeat this process a minimum of three additional times, equally spaced through the filtering period.

**Renew** the filter element a minimum of four times equally spaced through the filtering period or every eight hours, whichever is less, and whenever the pressure differential across the filter element exceeds the filter element manufacturer's specifications.

**Sample and test** the system fluids as specified in below, once at the midpoint of the filtering period and once again at the end of the filtering period. **Submit** a CFR after receiving the test results from both samples. If a Change Request has been authorized by the KO based on the test results, continue filtering as specified in the Change Request.

Reservoir Size (gal)	Minimum Filtering Periods Filter Cart/Rig Pump Flow Capacity (GPM)				
	5	10	15	20	25
100	16 hrs	8 hrs	5 hrs	4 hrs	3 hrs
200	32 hrs	16 hrs	11 hrs	8 hrs	6 hrs
300	48 hrs	24 hrs	16 hrs	12 hrs	10 hrs
400	64 hrs	32 hrs	21 hrs	16 hrs	13 hrs
500	80 hrs	40 hrs	27 hrs	20 hrs	16 hrs
600	96 hrs	48 hrs	32 hrs	24 hrs	19 hrs
700	112 hrs	56 hrs	37 hrs	28 hrs	22 hrs
800	128 hrs	64 hrs	43 hrs	32 hrs	26 hrs

#### Sample and Test

The Coast Guard Inspector must be allowed to cycle the system actuators as described in the notice below.

Prior to sampling hydraulic fluid in a system, the Coast Guard inspector will cycle all actuators associated with the subject hydraulic system for a minimum of 20 minutes, and until the system fluid reaches a maximum, constant, steady-state temperature, to dislodge and suspend particulate contamination.

Take at least one fluid sample from the hydraulic system as described in the notice below immediately following system warm-up and actuator cycling. Take other samples from other points in the system as specified in the work

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### "Hydraulic Fluid"

DEFINITION - *Hydraulic Fluid* is the medium by which power is transferred in hydraulic machinery.

item. Submit each sample to an independent laboratory for analysis, in accordance with all fluid sample test requirements specified below.

As a general rule, a volume of oil equivalent to one to two times the volume of oil contained in the sampling line and valve should be displaced before taking the sample. The preferred sampling point is immediately upstream of a return line filter. In the absence of sampling or vent valves, use a pump discharge gage line. Approximately one quart should be drained from gage lines prior to taking a sample. Avoid sampling from a reservoir.

**Submit** a CFR including laboratory contamination report.

Sample containers must be made of glass or plastic. The interior surfaces of sample containers must be cleanliness Grade A. Use one 8-ounce (250-mL) container per sample.

Samples must be tested for water and particulate contamination by a chemical analysis laboratory using optical Automatic Particle Counters (APC). Test reports must describe a level of contamination by solid particles in accordance with ISO 4406 and the level of water contamination in percent by volume or parts per million for each sample taken.

Portable particulate and water content counters are acceptable for intermediate testing provided that calibration certification reports are submitted to the COR. Final contamination test results must be performed and documented by a chemical analysis laboratory as specified above.

Unless otherwise specified in the work item or in the system specifications the maximum acceptable levels of contamination are:

- A particulate count of 20/18/15 in accordance with ISO 4406 (Max 10000 particles per milliliter  $\geq 4 \mu\text{m}$  max 2500 particles per milliliter  $\geq 6\mu\text{m}$ , max 320 particles per milliliter  $\geq 14\mu\text{m}$ ).
- A water content of 500 parts per million (ppm) (0.05% by volume).

The max contamination levels specified above establish a minimum standard when no max contamination level for the system is specified in a work item or the referenced system specifications. More stringent requirements may exist in the work item or in the system specifications and must take precedent.

### "Hydraulic Hose Assemblies"

DEFINITION - *Hydraulic Hose Assemblies* are used to transmit forces by means of oil pressure and consist of flexible hydraulic hoses to which fittings are attached at either end to ensure safe, interlocking connections.

#### Renew

Disconnect, remove, and dispose of each specified hose assembly.

Validate each hose's physical properties (e.g., size, length, material, etc.) against the vessel hose log data.

Fabricate a new hose assembly.

**Pressure-test** (550a) each new hose assembly.

Fabricate and install HYDRAULIC HOSE TAG (550a) onto each new hose assembly.

Flush each new hose assembly to remove all contaminants to achieve cleanliness Grade A prior to installation.

While the Coast Guard Inspector energizes the system and cycles actuators, verify that all disturbed joints are leak free.

**Submit** a hose log data form as specified below for each new hose assembly.

Hose assemblies must conform to SAE J1942-1. All material and mechanical properties of a new hose must be equivalent to the properties of the hose being renewed, which include but are not limited to pressure rating, burst pressure, minimum bend radius, jacket durability, and fluid compatibility. The inner diameter dimension of a new hose must be equal to the inner diameter of the hose being renewed.

New end fittings must be:

- Mild steel crimp type fittings or reusable non-crimp style SST fittings, where the hose assembly will be in the weather or where condensation develops.
- Fabricated from Monel, if the hose assembly fittings being renewed are Monel or other nickel alloys.
- Pressure rated equal to or greater than the new mating hose.

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### "Hydraulic Hose Assemblies"

DEFINITION - *Hydraulic Hose Assemblies* are used to transmit forces by means of oil pressure and consist of flexible hydraulic hoses to which fittings are attached at either end to ensure safe, interlocking connections.

- Compatible with the connection points in the hydraulic system.

After the COR provides the Hose Log Data Form with UNIT FURNISHED DATA for each new hose assembly, the provide the new hose information designated by a \* on the SAMPLE HOSE LOG DATA FORM (550a) below and **Submit** to COR.

#### Pressure-test

Pressurize each new hose assembly to twice its rated working pressure, or twice the design pressure of the hydraulic system, whichever is less. Hold this pressure for 5 minutes. Leakage or permanent deformation is not allowed. Pressure test media must be either water or a hydraulic fluid compatible with the system fluid. If water is used, the hose assembly must be drained after the test and blown dry with clean air.

#### Weatherize

For mild steel crimp type fittings ensure that each fitting is wrapped in a or petroleum wax saturated tape coatings (e.g., Densil (Densyl), etc.). Tape or equivalent, conforming to ANSI/AWWA C217, after installation. Follow manufacturer's instructions to ensure proper installation of the tape.

**HYDRAULIC HOSE TAG** – This is a tag installed on each new hose assembly provided.

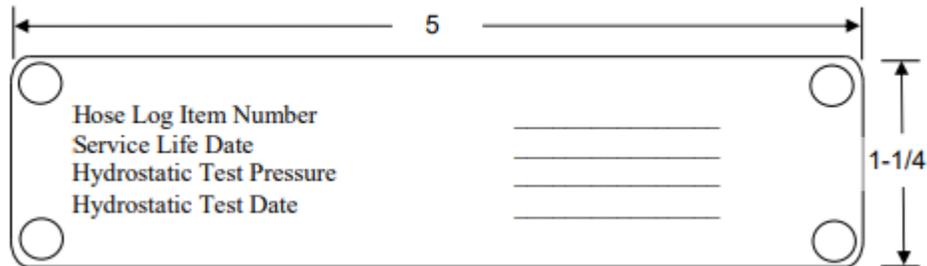
Determine the service life date for each hose assembly.

For hose assemblies exposed to weather or condensation add five years to the date the new hose assembly was pressure tested if the hose is not specifically designed for these conditions.

For all other hose assemblies add eight years to the date the hose assembly was pressure tested.

Permanently stamp, engrave, or etch the following on a metal hose tag as shown below.

- Hose Log Item Number: This is the new serial number on the Hose Log Data Form provided by the vessel.
- Hydrostatic Test Pressure. This is the test pressure in pounds per square inch (psi).
- Date. This is the date of the test in the format (DD/MM/YY).
- Service Life Date. This is the date for hose renewal in the format xQyy (where xQ is the quarter and yy is the year, e.g., 12 December 2008 must be recorded 4Q08).



Attach each tag to the hose assembly near an end fitting using self-clinching nylon straps or metal wire that will not damage the hose.

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**SAMPLE HOSE LOG DATA FORM** – This is a sample of a blank hose log data form containing all required fields. The cells marked with "\*" must be furnished by the installer to the Coast Guard.

Data Description	UNIT FURNISHED DATA	VENDOR FURNISHED DATA
Hose Serial Number		
System Designation		
Associated Assembly		
Item (Hose/Flex Couple/Exp Joint)		
Designation (Std/Non-Std/CBM)		
Compartment Number		
Ship Maintenance Div (Prop/Aux/Elec)		
MPC Number		
MPC Inspection Period (Months)		
Part Number (if applicable)		
NSN (if applicable)		
Construction (Syn Rubber/Teflon/Metal/Plastic)		
Replacement Periodicity (Months)		
ESWBS Code		
Drawing Ref # (if applicable)		
Tech Pub Ref # (if applicable)		
Remarks		
Special Notes		
Source of Supply (Vendor name)		*
Hose Brand		*
Hose Model #		*
Design Pressure (PSI, minimum)		*
Hose Diameter (inches)		*
Hose Assembly Length (inches)		*
Inlet Fitting Description		*
Inlet Fitting Part #		*
Outlet Fitting Description		*
Outlet Fitting Part #		*
Fabrication Date		*
Hydrostatic Test Date		*
Installation Date		
Inspection Date		
Cost Account (30/45)		

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<b>“Hydraulic Pipe” “Hydraulic Tube”</b>
<p>DEFINITION - <i>Hydraulic Pipe</i> is power transmission piping that transports high pressure fluid, generally sized in IPS units (internal diameter size, and wall thickness schedule).</p> <p>DEFINITION - <i>Hydraulic Tube</i> is power transmission piping that transports high pressure fluid, generally sized in outer diameter size and wall thickness.</p>
<p><b>Renew or Modify</b></p> <p><b>Conform</b> to PIPING ARRANGEMENT SPECIFICATIONS (550a).</p> <p><b>Clean</b> all new and disturbed piping and tube interiors</p> <p><b>Pressure Test</b> the new or modified piping or tubing.</p>
<p><b>Pressure Test</b></p> <p>System pumps and relief valves must not be used to perform hydrostatic testing.</p> <p>Provision must be made to relieve pressure trapped downstream of the installed system. At least one manually actuated valve must be provided for overpressure protection during all hydrostatic tests. At least one relief valve must also be provided as automatic overpressure protection.</p> <p><b>Perform</b> a hydrostatic test at 135% of the system operating pressure, but not less than 50 psi, for at least 30 minutes using system fluid, with no allowable leakage or permanent deformation of pressure-containing parts.</p> <p>After the system is restored <b>Perform</b> an operational tightness test by operating the system at normal system pressures and temperatures; no leaks or permanent deformation allowed.</p>

**PIPING ARRANGEMENT SPECIFICATIONS** – When arrangement drawings and details are not specified, or when configurations cannot be maintained when renewing or modifying existing arrangements, all material and mechanical properties of new or modified component arrangements must:

- 5      • Meet the properties of the components being renewed or modified, which include but are not limited to base material, pressure rating, and burst pressure. Inner diameter dimensions that affect flow must be maintained.
- 10     • Minimize the number of new piping joints through the maximum application of pipe bends, with a minimum radius of 5 outside diameters of the new pipe or tube. Use of flanged, threaded union, or similar takedown joints must be minimized.
- Locate takedown joints away from bends or offsets where they are least affected by thermal expansion or other external loadings.
- Mechanically attached fittings (e.g., LOCRING or equivalent, etc.) are authorized for 2-1/2 inch inside diameter and smaller pipe and tube.
- Install rigid pipe hangers in accordance with MSS SP-58 in accordance with the table below.

Nominal Pipe or Tube Size (inches)	Maximum Spacing (feet)
1-1/4 and below	7
1-1/2	9
2	10
2-1/2	11
3	12
3-1/2	13
4	14

<b>“Hydraulic Valves and Manifolds”</b>
<p>DEFINITION - <i>Hydraulic Valves and Manifolds</i> are components/assemblies used to manipulate hydraulic flow/pressure.</p>
<p><b>Renew</b></p> <p>Remove and dispose of the entire assembly, including all attached electrical actuators and sensors as applicable.</p> <p>When not provided as Government-furnished property, <b>Provide</b> and <b>Install</b> a new assembly or component. If a pressure control valve is part of the assembly, bench set the relief pressure as specified below or set during system grooming.</p> <p><b>Renew</b> all associated mounting fasteners.</p>

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## Work Item Standards and Specifications (WISS)

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### "Hydraulic Valves and Manifolds"

DEFINITION - *Hydraulic Valves and Manifolds* are components/assemblies used to manipulate hydraulic flow/pressure.

#### Overhaul

**Inspect** and test all solenoid assemblies and sensors that may be associated with the valve or manifold as described below; if discrepancies exist describe them and propose repairs in a CFR.

TESTING SOLENOID ASSEMBLIES - Apply the rated voltage across the valve's electrical actuators to operationally cycle the valve. Verify there is no insulation degradation.

TESTING ELECTRICAL SENSORS - Actuate and read resistance across sensors, verifying they are in accordance with the system specifications. Verify there is no insulation degradation.

Disassemble all solenoid assemblies, sensor assemblies, encoders assemblies, and all other electrical components associated with the valve or manifold, as applicable, and clean all surfaces including electrical contact points to cleanliness Grade A.

After reassembly, bench set and label pressure control valves (e.g., system relief valves, counterbalance valves, brake valves, pump compensators, any other pressure regulating or reducing valve, etc.) as specified below.

Using a system compatible fluid vent the appropriate ports and adjust the valve in accordance with the system specifications or as specified in the task description, using a calibrated gage. Permanently stamp, engrave, or etch the information below on a new metal tag and attach it to the valve:

- Vessel name and hull number.
- Valve identification number.
- Valve lifting pressure or set pressure.
- Date valve was tested and set.
- Name of repair facility.

If overhauled in place, set and tag pressure control valves in place as described above except using system pump and fluid to apply pressure to the valve.

### "Hydraulic Gages"

DEFINITION - *Hydraulic Gages* are sensor used to measure hydraulic pressure.

#### Renew

Remove and dispose of the designated gage.; **Provide** a new gage in accordance with the system specifications.

**Calibrate** each new gage.

**Install** the new gage in accordance with the system specifications.

#### Calibrate

MASTER GAGE - This is the contractor's gage, whose calibration certification must be traceable to an accuracy four times greater than the instrument to be calibrated. Master gages used must have current certificates attesting the date, accuracy, and environmental or other conditions under which the furnished results were obtained.

##### CALIBRATION SPECIFICATIONS FOR GAGES BEING CALIBRATED

DIAL TYPE PRESSURE GAGE - Accuracy of pressure gages with dial diameters 3.5 inches and larger must be within 1 percent accuracy, pressure gages with dial diameters between 3.5 inches and 2 inches must be within 3 percent accuracy, and dial diameters 2 inches and less must be within 5% accuracy.

DIAL TYPE THERMOMETERS - Accuracy of all direct indicating, bi-metallic, or remote gas filled bulb thermometers must be within 2% accuracy.

ALL OTHER TYPES OF GAGES - Accuracy of all other types of gages must be as specified in the work item or the system specifications.

Remove the designated gage from the system if not already removed.

Calibrate each gage against a MASTER GAGE.

Attach a calibration certification sticker to each gage as specified below.

CALIBRATION CERTIFICATION STICKER. Clearly label the following data on a calibration certification sticker and affix it to each gage:

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### "Hydraulic Gages"

DEFINITION - *Hydraulic Gages* are sensor used to measure hydraulic pressure.

- Date calibrated.
- Due date (add 12 months to date calibrated).
- Calibration laboratory.
- Initials or code of person performing calibration.

**Submit** a CFR listing each gage calibrated, with nomenclature, location, manufacturer, model, serial number, date of calibration, calibration laboratory, identification of person who performed calibration, and a traceability statement.

If a gage fails calibration obtain authorization to renew or repair it.

Install/re-install each gage in accordance with the system specifications.

### "Hydraulic Gas-charged Accumulators"

DEFINITION - *Hydraulic Gas-charged Accumulators* are pressure vessels used to store hydraulic fluid and absorb fluctuations in hydraulic pressure/flow.

#### **Renew or Overhaul or Service and Inspect**

After performing all other specified work, charge the accumulator with an inert gas in accordance with the system specifications.

### "Hydraulic Heat-Exchangers/Fluid-Coolers"

DEFINITION - *Hydraulic Heat-Exchangers/Fluid-Coolers* are used to exchange heat from hydraulic fluid to another medium.

#### **Overhaul**

Do not use cleaning equipment or media that will damage the heat exchanger or cooler.

**Pressure test** heat exchanger or cooler as specified below.

While reassembling heat-exchangers/coolers **Renew** the following components, as applicable, in accordance with the equipment manufacturer's recommendations:

- Fasteners (must be stainless steel).
- Threaded fittings.
- O-rings, gaskets, and seals.
- Hoses between cooler and piping systems, and associated hose clamps.
- Thermostats.

#### **Pressure Test**

Determine the design operating pressure of the tube side and shell side of the heat exchanger.

Apply test pressure to the exterior tube walls equaling 125 percent of the working design operating pressure of the tubes and hold for a minimum of 15 minutes. Visually inspect tubes for leaks.

Apply test pressure to the interior tube walls equaling 125 percent of the working design operating pressure of the tubes and hold for a minimum of 15 minutes. Visually inspect tubes for leaks.

While maintaining the test pressure on the interior of the tubes, apply a test pressure of 125 percent of the shell's working design operating pressure for a minimum of 15 minutes.

Visually inspect shell for leaks.

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**Fluid Contamination Code Conversion.**– The following table is provided for historical information only; NAS 1638 is no longer active and must not be referenced.

ISO 4406 CODE	NEAREST NAS 1638 CLASS
-/23/20	-
-/22/19	-
-/21/18	12
-/20/17	11
-/19/16	10
-/18/15	9
-/17/14	8
-/16/13	7
-/15/12	6
-/14/11	5
-/13/10	4
-/12/9	3
-/11/8	2
-/10/7	1
-/9/6	0
-/8/5	00
-/7/4	-

### “Hydraulic System”

DEFINITION - *Hydraulic System* is the collection all associated hydraulic components (e.g., pumps, actuators, valves, manifolds, pipe and tubing, hoses, associated controls and sensors,

#### Flush or High Turbulent Flush

**Submit** a FLUSHING PLAN (550a). Do not proceed without COR approval of the plan.

Flush each circuit using Contractor furnished components (e.g., flushing rig, hoses, adaptors, etc.). Clean each designated component.

Provide a flushing rig/components and fittings necessary to connect to the piping to be flushed. Provide calibrated flow measuring devices, gages and test equipment.

Provide at least one flow measuring device for each flushing circuit where the circuit has multiple branches with concurrent flow. The flow in the primary or most critical branch must be monitored. If multiple circuits are flushed concurrently, each circuit must have flow measuring device. Flow meter calibrations must be provided to the COR prior to flushing.

Pressure gages, differential pressure, or duplex pressure gage must be provided at all output and return ends of installed piping of each flushing circuit, including the ends of all branches to validate the actual pressure drop during flushing. Pressure gages, differential pressure, or duplex pressure gage must be across flushing rig filters or strainers to determine differential pressure.

ASTM D4174 must be used for flushing guidance, except as follows:

- For central hydraulic systems, or extensive piping networks, temperature and flushing flow rate must be maintained until the desired minimum fluid contamination level has been reached and remained stable (or decreasing) for at least 10 minutes.
- Contamination level must be checked at least once every 10 minutes using calibrated
- particle counting test equipment. The circuit must be flushed for a minimum of 1 hour.
- For simple hydraulic circuits serving one function, and a relatively low total fluid piping volume, temperature and flow rate must be maintained until the desired fluid minimum contamination level has been reached and remained stable (or decreasing) for at least 10 minutes. Contamination level must be checked at least once every 5 minutes using calibrated particle counting test equipment. The circuit must be flushed for a minimum of 20 minutes.
- All flushing fluid which has gone through the piping to be flushed must pass through return filters prior to going into the flushing reservoir. Contamination samples must be taken at a joint just prior to this return filter.
- Contamination levels must be identified by ISO 4406 cleanliness code, based on averaged particle counts at 3 different particle sizes (4, 6 and 14 micron). Unless otherwise directed, the target minimum contaminant

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Hydraulic System"

DEFINITION - *Hydraulic System* is the collection all associated hydraulic components (e.g., pumps, actuators, valves, manifolds, pipe and tubing, hoses, associated controls and sensors,

code level for an operating system must be to Code 19/17/14. Systems and equipment must be flushed to a lower contamination level of 18/16/13 or better in order to permit the operating hydraulic system to generate some contaminants. Note that contamination codes must not be determined or reported in other formats and then converted by estimation into ISO 4406 code.

- The condition of flushing unit filters and strainers must be continuously observed. Whenever a noticeable increase in the pressure drop across filters or strainers is observed, the filter media must be changed immediately.

Components which are not part of the flushing loop circuits must be cleaned. They must be disassembled, inspected, cleaned, repaired, and reassembled with fresh seals. Particular attention must be paid to last chance filters, internal strainers, internal orifices, pilot piping, and valve spools which may have trapped contamination from the distribution systems; these areas must be cleaned by hand. Particular attention must be paid to first components upstream and downstream of the ends of the flushing circuits. After cleaning, the component must be sealed from re-contamination by cap, plug, plate or appropriate sealing method; rags and duct-taped light-weight plastic are not acceptable.

- If significant damage is found as part of the inspection and cleaning process, a CFR must document the damage and request direction for further cleaning, repair or replacement.
- The status of components cleaned in place must be tracked.
- The status of components being removed and shop cleaned must be tracked.
- The status of components being removed and sent to an outside facility must be tracked.
- The cleaning seals of components being returned for installation must be reviewed, and appropriate action taken if seal has been voided.
- Determination of ISO 4406 contamination codes and recording of same is not required.

Hoses may be flushed, similar to the flushing circuits but with a small flushing pump, or may be cleaned by alternate appropriate methods. Such methods include cleaning with a compressed air pig system.

- The status of hoses being flushed must be tracked.
- Hoses must be inspected for condition.
- Where hoses are cleaned by flushing, at least 40 times the fluid volume of the hose must be pumped through the hose at high velocity (25 fps). • Where hoses are cleaned with a compressed air pig system, and a significant amount of contaminate is removed, a second pig may be required.
- Where hoses are not properly installed (too short, too tight radius, with chaffing, etc.) consideration must be made to replacement in lieu of cleaning, and installation issues corrected. Poor installation practices must not be repeated. Submit a CFR. Replacement must be at the direction of the Contracting Officer's Representative.
- Where hoses have achieved at least ½ of their service life, consideration must be made to replacement in lieu of cleaning. Service life of each hose must be checked using the Unit's Hose Log database or hose tracking system. Submit a CFR. Replacement must be at the direction of the Contracting Officer's Representative.
- Where replacement hoses are provided, all of the hose construction data must be provided in hard copy. See paragraph C2.2
- Hoses must be capped or plugged to prevent re-contamination, and must be tagged with the assigned Hose Log database tag id number.
- Determination of ISO 4406 contamination codes and recording of same is not required.

Tubing sections may be flushed, similar to the flushing circuits but with a small flushing pump, or may be replaced.

- The status of tubing sections must be tracked.
- Particular attention must be paid to the cleanliness of tubing in case drainage systems, which see little flow and may have accumulated significant silt.
- During flushing, at least 40 times the fluid volume of the tube must be pumped through the tubing at high speed (25 fps).
- After forming or bending, tubing must be flushed or may be cleaned by alternate appropriate methods. Cleaned tubing must be capped or plugged to prevent re-contamination.
- During reinstallation, tubing must be installed with new seals or ferrules. Installation processes must ensure that tubing sections are fully seated.
- Determination of ISO 4406 contamination codes and recording of same is not required.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Hydraulic System"

DEFINITION - *Hydraulic System* is the collection all associated hydraulic components (e.g., pumps, actuators, valves, manifolds, pipe and tubing, hoses, associated controls and sensors,

When a **High Turbulent Flush** is required in a work item, ensure the minimum flow rates provided in the table below are maintained for each piping leg within a flushing.

Pipe Size inside diameter (Inch)	Gal/Min
To 0.5	18
0.5 to 0.75	34
0.75 to 1.0	56
1.0 to 1.25	100
1.25 to 1.5	138
1.5 to 2.0	230
2.0 to 2.5	330
2.5 to 3.0	420

1. The table above is based on the interior diameter of the piping, and not on the nominal pipe size. Flow rates represent minimum flow needed to achieve a turbulent flow condition and maximize benefits of flushing effort. Flow rates are based on a flow velocity of 25 ft/second – used for removing scale from the walls of carbon steel pipes.
2. If there is a conflict between the pressure and flow rate requirements of this specification, the minimum flow rates must be governing, unless the design pressure of the piping is exceeded.
3. The use of by-pass (flow control) valves is not allowed downstream of the flow meters.
4. Where a section of piping is fabricated with a larger diameter pipe and is welded to smaller diameter pipe, use the smaller pipe minimum flow rate for flushing..

When **Flush** is required in a work item, ensure the minimum flow rates provided in the table below are maintained for each piping leg within a flushing.

Nom Sch 40 Pipe Size (inches)	Pipe or Tube ID (inches)	Min Flow Rate (GPM)	
		150°F cSt ~ 22.6	180°F cSt ~ 14.2
Up to 1/8	0.269 or less	8	5
>1/8 thru 1/4	0.270 - 0.364	10	7
>1/4 thru 3/8	0.365 - 0.493	14	9
>3/8 thru 1/2	0.494 - 0.622	18	11
>1/2 thru 3/4	0.623 - 0.824	24	15
>3/4 thru 1	0.825 - 1.049	30	19
>1 thru 1-1/4	1.050 - 1.380	39	25
>1-1/4 thru 1-1/2	1.381 - 1.610	46	29
>1-1/2 thru 2	1.611 - 2.067	59	38
>2 thru 2-1/2	2.068 - 2.469	71	45
>2-1/2 thru 3	2.470 - 3.068	88	56

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Hydraulic System"

DEFINITION - *Hydraulic System* is the collection all associated hydraulic components (e.g., pumps, actuators, valves, manifolds, pipe and tubing, hoses, associated controls and sensors,

1. The table above lists minimum flushing fluid flow rates for various inner diameters of pipe or tube at required temperature range to achieve turbulent flow; it does not mandate a specific flow rate for each pipe size; rather it provides a reference for the flow rate deemed adequate to achieve the desired end result of a standard flush.
2. The table above is based on the interior diameter of the piping, and not on the nominal pipe size. Flow rates represent flow needed to achieve a minimum turbulent flow condition. Flow rates are based on a flow velocity of 12 ft/second – with the express purpose of removing loose contaminants from the walls of pipes.
3. If there is a conflict between the pressure and flow rate requirements of this specification, the minimum flow rates must be governing, unless the design pressure of the piping is exceeded.
4. The use of by-pass (flow control) valves is not allowed downstream of the flow meters.
5. Where a section of piping is fabricated with a larger diameter pipe and is welded to smaller diameter pipe, use the smaller pipe minimum flow rate for flushing.

**FLUSHING PLAN** –This is a written description of the proposed flushing process.

Describe and list all piping runs, tubing runs, hose assemblies, etc. in the system that cannot be disassembled and cleaned. Grouping those components together, to the greatest extent practicable, identify a series of flushing circuits and describe how each will be connected to a flushing rig; some piping may be part of multiple flushing circuits. Identify the end points of each circuit, and where jumper hoses will be installed around cleanable components within the circuit.

List fluid flow rate in gallons per minute (GPM) for each flushing circuit to meet minimum flow rate specified below. Estimate the pressure drops which will occur in each circuit. Describe the proposed flushing rig pump capability, and verify that it can support the intended actions. Turbulent flow must be established and maintained in all piping sections, unless approved by the KO.

Describe and list each component in the system (pumps, valves, motors, cylinders, hoses, tubing, etc.) which will be disassembled and cleaned. Describe how each component will be cleaned (e.g. cleaned in place, removed for bench cleaning, sent to a subcontractor for cleaning, cleaned with a (hose) pig, flushed as an independent item, etc.) When listing components, group components serving dedicated sections of the hydraulic circuit together. The list must be in a format which can be used as a check-off sheet.

Describe methods that will be used to ensure cleanliness of components and circuits.

## 560a SHIP CONTROL SYSTEMS

Reserved

## 573a CARGO HANDLING SYSTEMS

### "Vital Fastener Assemblies"

DEFINITION - *Vital Fastener Assemblies* is a fastener assembly that is either a mechanical load bearing component or a mechanical power transmission component in a deck machinery system (e.g., fasteners connective a crane assembly to its pedestal foundation).

#### Renew

**Verify** that the existing fastener installed complies with the system specifications; **Submit** discrepancies.

**Install** new vital fastener assemblies that are identical in type of head, nominal size, threads per inch, thread class, length of thread, overall length, material grade, material class, and all other dimensional and mechanical properties to those assemblies being renewed.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Vital Fastener Assemblies"

DEFINITION - *Vital Fastener Assemblies* is a fastener assembly that is either a mechanical load bearing component or a mechanical power transmission component in a deck machinery system (e.g., fasteners connective a crane assembly to its pedestal foundation).

Threaded surfaces of all new or disturbed fasteners installed in systems exposed to the weather must be coated with a commercial anti-seize compound prior to reinstallation. The compound must not contain lead or copper.

Torque all new and disturbed vital fastener assemblies in accordance with the system specifications or as specified in the work item.

CERTIFIED FASTENERS – When the work item requires *CERTIFIED FASTENERS* submit certification to the COR stating:

- Two of the fasteners from each heat of steel have been tested to meet or exceed minimum strength and maximum hardness for the grade of fastener being renewed.
- A minimum average Charpy impact energy value of 30 ft-lbs (40.6 Joules) at zero degrees Fahrenheit obtained from three tests with no single test value less than 22 ft-lbs (29.8 Joules) was obtained from each fastener tested

### "Wire Rope Assemblies"

DEFINITION - *Wire Rope Assemblies* is a combination of wire rope (used in deck machinery or as stays) and end fittings, terminals, and lanyards that are attached to wire rope to form a complete unit.

#### Renew

**Install** only one-hundred percent strength efficiency end fittings onto the wire rope in accordance with system specifications. End fittings must be compatible with all existing lifting appliances. Install either poured spelter, poured resin, permanently swaged, or fiege type end fitting onto the wire rope as specified in the work item or system specifications. When end fitting type is not specified, use poured spelter type end fittings.

**Pull Test** the new wire rope assembly to the tension specified in the work item. If no tension is specified in the work item use the weight specified in WIRE ROPE ASSEMBLY PULL TEST TENSIONS (573a) that corresponds to the rope type and nominal diameter.

Prior to putting the wire rope in service on the vessel, **Submit** documentation certifying that the wire rope assembly was successfully pull tested to the specified tension.

**Lubricate** the new wire rope assembly as described below.

The following post installation inspections must be performed on all crane and davit wire rope assemblies.

- Verify the wire rope assembly is properly attached to the hoist or winch drum in accordance with the system specifications.
- Verify the winch drum is not overfilled with rope. While the Coast Guard inspector operates the machinery and lowers the hook to the position where during normal operations the maximum amount of wire rope is unwrapped from the drum, verify the minimum number of wraps specified in the system specifications are on the drum.

**The above inspection verifies that a wire rope assembly installed is of sufficient length. Typically, winch and hoist system specifications require a minimum of 2-1/2 to 5 wraps, or dead-turns, of wire rope on the drum when the wire rope is fully paid-out.**

#### Lubricate

Wire rope assemblies must be pressure-lubricated with lead-free grease specifically designed for use on wire ropes installed in salt water marine environments. The grease must be compatible with pressure lubrication equipment. Environmentally friendly lubricants are preferred.

**WIRE ROPE ASSEMBLY PULL TEST TENSIONS** – Unless otherwise specified in the work item or system specifications wire rope pull test tensions must be as follows:

**DYFORM-18, 6X19 AND 6X36 IWRC RRL**

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

Wire Rope Nominal Diameter (inches)	Pull Test Tension in Pounds (40% of the acceptable breaking strength)		
	Improved Plow Steel (IPS) (uncoated)	Extra Improved Plow Steel (EIPS or XIPS) (uncoated)	Extra Extra Improved Plow Steel (EEIPS or XXIPS) (uncoated)
1/2	8,960 (+448 -0)	10,400 (+520 -0)	11,680 (+584 -0)
9/16	11,280 (+564 -0)	13,120 (+656 -0)	14,800 (+740 -0)
5/8	14,000 (+700 -0)	16,080 (+804 -0)	18,160 (+908 -0)
3/4	20,000 (+1000 -0)	22,960 (+1148 -0)	25,920 (+1296 -0)
7/8	26,960 (+1348 -0)	31,040 (+1558 -0)	35,040 (+1752 -0)
1	35,040 (+1752 -0)	40,320 (+2016 -0)	45,520 (+2,276 -0)
1-1/8	41,040 (+2,052 -0)	50,720 (+2536 -0)	57,200 (+2,860 -0)

**“Brakes and Clutches”**

DEFINITION - A clutch is a transmission and control component that provides for energy transfer from the driver to the driven shaft. A brake is a transmission and control component that stops a moving load, regulates movement, or holds a load at rest by transforming kinetic energy into heat.

**Service**

**Renew** the friction discs that are part of the designated brake or clutch.

Prior to placing back in service, verify that air has been removed from pistons, cylinders, and hoses or tubes leading to all hydraulically operated brakes and clutches.

**Overhaul**

**Renew** the friction discs that are part of the designated brake or clutch.

Prior to placing back in service, verify that air has been removed from pistons, cylinders, and hoses or tubes leading to all hydraulically operated brakes and clutches.

**“Open Gearing and Gear Reducers”**

DEFINITION - *Open Gearing* are open or semi-enclosed gear drives, also known as heavy-duty gear drives or ring and girth gears, used for power transmission. *Gear Reducers* are an enclosed system of gears in an arrangement such that input speed can be lowered to a slower output speed but have the same or more output torque.

**Service**

**Renew** gear case oil for gear reducers.

**Conform** to ACCEPTABLE CONTAMINATION LEVELS FOR GEAR LUBE OIL (573a)

When a lubricant is not specified in the work item or system specifications, the lubricant must **Conform** to MIL-PRF-18458.

**Overhaul**

**Renew** gear case oil for gear reducers.

**Conform** to ACCEPTABLE CONTAMINATION LEVELS FOR GEAR LUBE OIL (573a)

When a lubricant is not specified in the work item or system specifications, the lubricant must **Conform** to MIL-PRF-18458

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**ACCEPTABLE CONTAMINATION LEVELS FOR GEAR LUBE OIL** – Unless otherwise specified in the work item or in system specifications maximum acceptable levels of contamination must be:

- A particulate count of -/19/16 in accordance with ISO 4406 (max 5000 particles per milliliter ≥ 6µm, max 640 particles per milliliter ≥ 14µm).
- A water content of 0.1% by volume.

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Mechanical Chain Stopper Assemblies"

DEFINITION - *Mechanical Chain Stopper Assemblies* are mechanisms used to hold/release buoy chains that are not externally powered or driven.

#### Inspect-Op Test (Initial)

**Inspect** the designated equipment while Ship's Force performs the designated test.

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**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

#### NO LOAD OPERATIONAL TEST

- Release and reset the chain stopper a minimum of 3 cycles.
  - Verify that the reset spring does not bottom out (fully compress) when the stopper is fully extended.
  - Verify that the spring fully resets the stopper.

#### Inspect-Op Test (Final)

Temporarily **Provide** the test weights designated in the work item; those items will be turned back over to the Contractor upon completion of testing.

**Inspect** the designated equipment while Ship's Force performs the designated test.

**Renew** TEST LABEL PLATES (573a).

-----

**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

Perform the NO LOAD OPERATIONAL TEST described above.

#### OPERATIONAL TEST

- Suspend the specified operational load test weight in the work item from the stopper and hold for a minimum of 10 minutes using an external lifting device and an appropriately sized chain.
- Release the operational load test weight using the chain stopper's release mechanism.
- Verify that the stopper has no permanent deformation or damage.

#### STATIC LOAD TEST

If weld repairs have been performed on the designated chain stopper, then test as follows:

- Suspend the specified static load test weight from the stopper and hold for a minimum of 10 minutes using an external lifting device and an appropriately sized chain.
- Remove the test weight.
- Verify that the stopper has no permanent deformation or damage.
- Return the chain stopper to its normal operating condition.

### "Hydraulic Chain Stoppers"

DEFINITION - *Hydraulic Chain Stoppers* are mechanisms used to hold/release buoy chains that are externally powered or driven by hydraulic systems.

#### Inspect-Op Test (Initial)

**Inspect** the designated equipment while Ship's Force performs the designated test.

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**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

#### NO LOAD OPERATIONAL TEST

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Hydraulic Chain Stoppers"

DEFINITION - *Hydraulic Chain Stoppers* are mechanisms used to hold/release buoy chains that are externally powered or driven by hydraulic systems.

- Extend and retract all actuators a minimum of three cycles, verify proper operation and no unusual vibration, noise or binding.

#### Inspect-Op Test (Final)

Temporarily **Provide** the test weights designated in the work item; those items will be turned back over to the Contractor upon completion of testing.

**Inspect** the designated equipment while Ship's Force performs the designated test.

**Renew** TEST LABEL PLATES (573a).

**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

Perform the NO LOAD OPERATIONAL TEST described above.

#### OPERATIONAL TEST

- Suspend the specified operational load test weight in the work item from a chain that attaches to the buoy chain winch and passes through the chain stopper assembly.
- Demonstrate normal operational use of the stopper using the operational load test weight and the buoy chain winch to raise and lower the test load a minimum of three cycles, verify that the rising sheave freely turns when the loaded chain is pulled through the sheave groove. Set the chain in the stopper, slack the chain between the buoy chain winch and the stopper, re-tension the chain between the winch and the stopper, and lift the chain from the stopper with the rising sheave.
- Retrieve the operational load test weight using the buoy chain winch. Verify that the chain loaded with the test weight is properly released from the stopper with no unusual noise, vibration, or binding.
- Remove the test weight and verify that the stopper has no permanent deformation or damage.
- Return the chain stopper to its normal operating condition.

#### STATIC LOAD TEST

If weld repairs have been performed on the designated chain stopper, then test as follows:

- Suspend the specified static load test weight from the stopper and hold for a minimum of 10 minutes using an external lifting device and an appropriately sized chain.
- Remove the test weight.
- Verify that the stopper has no permanent deformation or damage.
- Return the chain stopper to its normal operating condition.

### "Winches"

DEFINITION - *Winches* are hauling or lifting devices consisting of a rope, cable, or chain winding around a horizontal rotating drum, turned by a crank or by motor or other power source

#### Inspect-Op Test (Initial)

**Inspect** the designated equipment while Ship's Force performs the designated test.

**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

#### FUNCTIONAL NO LOAD OPERATIONAL TEST

Operate the winch in both directions a minimum of 2 minutes, verify that:

- All controls and sensors are operating properly.
- No unusual vibration or noise is emitted from the winch and there is no binding or misalignment.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Winches"

DEFINITION – *Winches* are hauling or lifting devices consisting of a rope, cable, or chain winding around a horizontal rotating drum, turned by a crank or by motor or other power source

- Proper setting and release of the winch brake.
- If the winch has a "level wind are assembly" fully extend and retract level wind arm hydraulic cylinder in a no-load condition. Verify proper operation of all controls. Verify no unusual vibration, noise, or binding.
- Ensure sufficient tension is kept on wire ropes to prevent improper wrapping on hoist drum.

### Inspect-Op Test (Final)

Temporarily **Provide** the test weights and any other equipment (e.g., strongbacks, external cranes, etc. for winches not equipped with boom/sheave assemblies (i.e., cross deck winches, mooring winches, etc.)) that may be needed, as designated in the work item; those items will be turned back over to the Contractor upon completion of testing.

**Inspect** the designated equipment while Ship's Force performs the designated test.

**Renew** TEST LABEL PLATES (573a).

**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

Perform the FUNCTIONAL NO LOAD OPERATIONAL TEST described above.

#### STATIC LOAD TEST

Using an external lifting device, suspend the specified static load test weight from the winch structure and hold for a minimum of 10 minutes. Remove the test weight. Verify no permanent deformation or damage to any components.

#### STATIC LOAD TEST FOR LEVEL WIND ARE ASSEMBLIES

While performing static load test, verify that the level wind arm hydraulic cylinder does not drift. Verify no permanent deformation or damage to any components.

#### WINCH BRAKE / MODIFIED STATIC LOAD TEST

Using an external lifting device, suspend the specified static load test weight for each hoist from the applicable wire rope assembly and hold for a minimum of 10 minutes. Verify the winch brake holds without slipping.

Remove the test weight. Verify no permanent deformation or damage to any components.

#### DYNAMIC OVERLOAD TEST

DO NOT adjust relief valve and pressure compensator settings to accomplish this test.

Raise and lower each specified dynamic load a minimum of three complete cycles and through as wide a range as practicable; stopping the winch at least twice in each direction every cycle. Verify the following as applicable:

- The winch lifts the dynamic load.
- The winch brake stops and holds the dynamic load without slipping.
- No permanent deformation, damage to, or overheating of any components.
- Proper operation of all controls and sensors.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment.
- Verify no leakage from hydraulic components.

#### RATED LOAD TEST

Raise and lower the specified rated load a minimum range of 5 feet a minimum of 10 complete cycles, starting and stopping the winch at least twice in each direction, verify the following:

- The winch lifts the rated load at rated speed.
- The brake stops and holds the rated load without slipping.
- No permanent deformation or damage to any components.
- Proper operation of all controls and sensors.
- No unusual vibration, noise, or binding.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Booms and Cranes"

DEFINITION - *Booms and Cranes* a large/tall machines used for moving heavy objects by suspending them from a projecting arm or beam.

#### Inspect-Op Test (Initial)

**Inspect** the designated equipment while Ship's Force performs the designated test.

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**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

#### FUNCTIONAL NO LOAD TEST

During no-load operations ensure sufficient tension is kept on wire ropes to prevent improper wrapping on hoist drum.

Operate each actuator associated with the boom or crane in both directions a minimum of 2 minutes by topping the boom, rotating the boom, and operating each associated winch, verify that:

- All controls, sensors and alarms are operating properly.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment.
- Proper setting and release of each brake.

#### Inspect-Op Test (Final)

Temporarily **Provide** the test weights and any other equipment that may be needed, as designated in the work item; those items will be turned back over to the Contractor upon completion of testing.

**Inspect** the designated equipment while Ship's Force performs the designated test.

**Renew** TEST LABEL PLATES (573a).

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**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

Perform the FUNCTIONAL NO LOAD TEST described above.

#### STATIC LOAD TEST

Using an external lifting device, suspend the specified static load test weight from the winch structure and hold for a minimum of 10 minutes. Remove the test weight. Verify no permanent deformation or damage to any components.

#### STATIC LOAD TEST

Using an external lifting device, suspend the specified static load test weight from the boom or crane structure and hold for a minimum of 10 minutes.

Remove the test weight. Verify no permanent deformation or damage to any components.

#### WINCH/BRAKE MODIFIED STATIC LOAD TEST

Using an external lifting device, suspend the specified static load test weight in the work item for each hoist from the applicable wire rope assembly and hold for a minimum of 10 minutes.

Verify that each hoist brake holds without slipping.

Remove the test weight. Verify no permanent deformation or damage to any components.

#### DYNAMIC OVERLOAD TEST

DO NOT adjust relief valve and pressure compensator settings to accomplish this test.

Raise and lower each specified dynamic load from the applicable hoist a minimum of three complete cycles and through as wide a range as practicable; rotate each dynamic load through as wide a range as practicable a minimum of three complete cycles; top each dynamic load through as wide a range as practicable (or as otherwise specified), a minimum of three complete cycles starting and stopping each actuator at least twice in each direction every cycle. Verify the following, as applicable:

- Each actuator lifts or rotates the dynamic load.
- Each brake stops and holds the dynamic load without slipping.
- No permanent deformation, damage to, or overheating of any components.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### **"Booms and Cranes"**

DEFINITION - *Booms and Cranes* a large/tall machines used for moving heavy objects by suspending them from a projecting arm or beam.

- Proper operation of all controls and sensors.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment.
- Verify no leakage from hydraulic components.

#### RATED LOAD TEST

Raise and lower each specified rated test load from the applicable hoist a minimum of 10 complete cycles and through as wide a range as practicable; rotate each rated load through as wide a range as practicable a minimum of 10 complete cycles; and top each rated load (or as otherwise specified) a minimum of 10 complete cycles, starting and stopping each actuator at least twice in each direction every cycle. Verify the following as applicable:

- Each actuator lifts or rotates the rated load at rated speed.
- Each brake stops and holds the rated load without slipping.
- No permanent deformation, damage to, or overheating of any components.
- Proper operation of all controls and sensors.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment
- Verify no leakage from hydraulic components

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Anchor Windlass" and "Capstans"

DEFINITION - *Anchor Windlass* is a machine used to let-out and heave-up a ship's anchor and chain.

DEFINITION - *Capstans* are revolving machinery with cylinders moving on a vertical axis or horizontal used for winding a rope or cable, generally powered by a motor.

#### Inspect-Op Test (Initial) and Inspect-Op Test (Final)

**Inspect** the designated equipment while Ship's Force performs the designated test.

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**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

#### WILDCAT OPERATIONAL TEST

With the vessel waterborne, raise and lower each anchor individually from the hawse pipe to the channel floor a total of three complete cycles, stopping each anchor in the middle of travel at least once each cycle; operate each pawl and pelican hook; and cycle each mechanical band brake twice as applicable, verify:

- no unusual vibration or noise is emitted from any component (e.g., winch, actuator, each shaft assembly, each pin assembly, etc.) and there is no binding or misalignment.
- wildcat lifts the rated load at rated speed.
- load is held and controlled by each hydraulic disc brake and each operates satisfactorily.
- load is held and controlled by each mechanical band brake and each operates satisfactorily.
- no leakage from hydraulic components.

#### CAPSTAN OPERATIONAL TEST

With the vessel waterborne and while the Coast Guard Inspector warps the vessel forward a minimum of 30 feet, then aft a minimum of 30 feet three complete cycles, verify:

- the capstan will warp the vessel.
- proper operation of all controls and sensors.
- the brake sets and releases properly.
- no permanent deformation, damage to, or overheating of any components.

### "Single Point Davits"

DEFINITION - *Single Point Davits* is a small crane used to raise and lower a small boat.

#### Inspect-Op Test (Initial)

**Inspect** the designated equipment while Ship's Force performs the designated test.

-----

**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

#### NO LOAD OPERATIONAL TEST

During no-load operations ensure sufficient tension is kept on wire ropes to prevent improper wrapping on hoist drum.

Operate each actuator associated with the davit in both directions a minimum of two minutes by topping the boom (if applicable), rotating the boom, and operating the hoist, verify:

- All controls and sensors are operating properly.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment.
- Proper setting and release of each brake.

#### Inspect-Op Test (Final)

Temporarily **Provide** the test weights and any other equipment that may be needed, as designated in the work item; those items will be turned back over to the Contractor upon completion of testing.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Single Point Davits"

DEFINITION - *Single Point Davits* is a small crane used to raise and lower a small boat.

**Inspect** the designated equipment while Ship's Force performs the designated test.

**Renew** TEST LABEL PLATES (573a).

-----  
**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

Perform the NO LOAD OPERATIONAL TEST described above.

#### STATIC LOAD TEST

Using an external lifting device, suspend the specified static load test weight from the davit wire rope assembly and hold for a minimum of 10 minutes.

- Verify that the davit hoist brake holds without slipping.
- Remove the test weight from the davit wire rope assembly.
- Verify no permanent deformation or damage to any components.
- Verify no leakage from hydraulic components.

#### WINCH BRAKE / MODIFIED STATIC LOAD TEST

Using an external lifting device, suspend the specified static load test weight from the davit wire rope assembly and hold for a minimum of 10 minutes.

- Verify that the davit hoist brake holds without slipping.
- Remove the test weight from the davit wire rope assembly.
- Verify no permanent deformation or damage to any components.
- Verify no leakage from hydraulic components.

#### DYNAMIC OVERLOAD TEST

Raise, lower, and rotate the specified dynamic load a minimum of three complete cycles and through as wide a range as practicable, and if applicable, top the dynamic load through as wide a range as practicable a minimum of 3 complete cycles starting and stopping each actuator at least twice in each direction every cycle, verify the following if applicable:

- Each actuator lifts or rotates the dynamic load.
- Each brake stops and holds the dynamic load without slipping.
- No permanent deformation, damage to, or overheating of any components.
- Proper operation of all controls and sensors.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment.
- Verify no leakage from hydraulic components.

#### RATED LOAD TEST

Raise, lower, rotate, and if applicable top the specified rated load a minimum of 10 complete cycles and through as wide a range as practicable, starting and stopping each actuator at least twice in each direction every cycle, verify the following as applicable:

- Each actuator lifts or rotates the rated load at rated speed.
- Each brake stops and holds the rated load without slipping.
- No permanent deformation, damage to, or overheating of any components.
- Proper operation of all controls and sensors.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment.
- Verify no leakage from hydraulic components.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Dual Point Davits"

DEFINITION - *Dual Point Davits* are a hoisting mechanisms used to raise and lower a small boat, typically consisting of two booms and wire ropes.

#### Inspect-Op Test (Initial)

**Inspect** the designated equipment while Ship's Force performs the designated test.

A Coast Guard small boat must not be used as a test weight during davit testing.

-----  
**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

#### NO LOAD OPERATIONAL TEST

During no-load operations ensure sufficient tension is kept on wire ropes to prevent improper wrapping on hoist drum.

Operate each actuator associated with the davit in both directions a minimum of 2 minutes by extending and retracting the davit arms and operating the hoist(s), verify:

- All controls and sensors are operating properly.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment.
- Proper setting and release of each brake.

#### Inspect-Op Test (Final)

Temporarily **Provide** the test weights and any other equipment that may be needed, as designated in the work item; those items will be turned back over to the Contractor upon completion of testing.

**Inspect** the designated equipment while Ship's Force performs the designated test.

**Renew** TEST LABEL PLATES (573a).

-----  
**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

Perform the NO LOAD OPERATIONAL TEST described above.

#### STATIC LOAD TEST

Using an external lifting device, suspend the specified static load test weights from each wire rope assembly and hold for a minimum of 10 minutes.

- Verify that the hoist brake holds without slipping.
- Remove the test weight.
- Verify no permanent deformation or damage to any components.
- Verify no leakage from hydraulic components.

#### WINCH BRAKE / MODIFIED STATIC LOAD TEST

Using an external lifting device, suspend the specified static load test weight from each wire rope assembly and hold for a minimum of 10 minutes.

- Verify that the hoist brake holds without slipping.
- Remove the test weight.
- Verify no permanent deformation or damage to any components.
- Verify no leakage from hydraulic components.

#### DYNAMIC LOAD TEST

Raise, lower, extend and retract the specified dynamic load test weights a minimum of 3 complete cycles and through as wide a range as practicable starting and stopping each actuator at least twice in each direction every cycle, verify the following, as applicable:

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Dual Point Davits"

DEFINITION - *Dual Point Davits* are a hoisting mechanisms used to raise and lower a small boat, typically consisting of two booms and wire ropes.

- Each actuator lifts or rotates the dynamic load test weights.
- Each brake stops and holds the dynamic load test weights without slipping.
- No permanent deformation, damage to, or overheating of any components.
- Proper operation of all controls and sensors.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment.
- Verify no leakage from hydraulic components.

#### RATED LOAD TEST

Raise, lower, extend, and retract the specified rated load test weights a minimum of 10 complete cycles and through as wide a range as practicable, starting and stopping each actuator at least twice in each direction every cycle, verify the following, as applicable:

- Each actuator lifts or rotates the rated load test weights at rated speed.
- Each brake stops and holds the rated load without slipping.
- No permanent deformation, damage to, or overheating of any components.
- Proper operation of all controls and sensors.
- No unusual vibration or noise is emitted from any component (e.g., winch, actuator, shaft assembly, pin assembly, etc.) and there is no binding or misalignment.
- Verify no leakage from hydraulic components.

**TEST LABEL PLATES** – These are 3 inch by 5 inch label plates made from 1/16 thick minimum anodized-hydrated aluminum sheet, using printed black lettering for the titles, similar to those shown below. Stamp, engrave, etch, or print the test information onto the label plate: system name, contractor name, date of test, and the weight values specified in the work item. These plates must be affixed in plain view onto the equipment that was tested using an adhesive.

#### Operational Test

**System**

**Contractor**

**Date**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

#### Operational and Weight Test

**System**

**Contractor**

**Date**

Rated Load Test Weight

Dynamic Load Test Weight

Static Load Test Weight

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

<b>Operational and Weight Test</b>	
<b>System</b>	_____
<b>Contractor</b>	_____
<b>Date</b>	_____
Aux Rated Load Test Weight	_____
Aux Dynamic Load Test Weight	_____
Aux Static Load Test Weight	_____
Main Rated Load Test Weight	_____
Main Dynamic Load Test Weight	_____
Main Static Load Test Weight	_____

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Small Boats"

DEFINITION - *Small Boats* are small, open vessels carried by a cutter, generally used in law enforcement operations to board other vessels.

#### Inspect-Op Test (Initial) and Inspect-Op Test (Final)

Temporarily **Provide** the test weights and any other equipment that may be needed, as designated in the work item; those items will be turned back over to the Contractor upon completion of testing.

**Inspect** the designated equipment while Ship's Force performs the designated test.

-----

**If no Maintenance Procedure Card is designated, or no other procedure is specified in the work item, Ship's Force will perform the following procedure.**

#### SMALL BOAT LIFTING EYE AND SLING TEST

Test small boat lifting eyes and slings by performing the following:

Collect unit specific data associated with full outfit of the small boat: weight of personnel, weight of fuel, and weight of cargo.

Weigh the small boat to determine its actual weight.

Perform calculations to determine the required test weight.

Record the test weight value in pounds and all other data and calculations described above. Note any test weight value exceeds 150% of the rated load of the associated davit.

#### **CAUTION**

**If the CG Inspector or COR determines that the hull weight of the boat exceeds 115% of the new boat weight specified in the system specifications or the work item, or if the maximum launch weight exceeds the working load limit of the davit, then all further testing of the boat lifting eyes and slings will be suspended until CG Inspector or COR contacts the cognizant Product Line subject matter expert for instructions..**

After the COR has approved the test weight value and all other submitted calculations, multiple individual test weights must be furnished whose combined weight must equal the approved test weight value plus 0% minus 5%.

The number of individual test weights must be equal to or greater than the number of lifting points on the small boat. The test weights must be fabricated from water bags, or similar soft material or must be placed on pads to prevent damage to the small boat.

Determine the optimum arrangement for the test weights on the waterborne small boat and place the test weights accordingly.

Arrange the test weights so that the tension caused by the added weight is distributed evenly on each strap of the lifting sling and as close to each lifting eye as practicable in conjunction with maximizing overall stability of the boat.

Suspend the small boat from the lifting slings used during normal operations. Using an external lifting device, hoist and suspend the small boat just above the surface of the water and hold for a minimum of 10 minutes.

Lower the small boat back into the water and verify no permanent deformation or damage to the small boat or the lifting sling. Remove the weights from the small boat and return it to normal operating condition.

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## 580a MECHANICAL HANDLING SYSTEMS

Reserved

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### 593a SEWAGE AND GREY WATER SYSTEMS

#### "Grey Water Piping Interiors"

DEFINITION - *Grey Water Piping Interiors* are the interiors of all drain piping in a grey water system, used to move grey water to a holding tank.

#### Clean

Depending on the condition of the system at the contract start date, chemical cleaning may not adequately remove all obstructions, scale, and build-up present. More intrusive cleaning methods, such as pressure washing, flexible auger cleaning, or other mechanical means of cleaning, may be required to remove all obstructions, scale, etc. These more intrusive methods are in scope if necessary to achieve the specified cleanliness. The use of one or more them, in the appropriate quantities, to achieve minimum cleaning requirements may be required pending conditions of the system.

**Submit** a CLEANING PLAN (593a) to the COR and obtain COR approval for the plan prior to initiating work. **Perform** the tasks described in the COR approved plan, and as described below.

Do not drain any fluids (e.g. sewage, grey water, fresh water, etc.) into any space, bilge, or exterior location. Do not use vessel-installed pumps to offload system contents.

CHEMICAL CLEANING - When chemically cleaning piping and component interiors use a commercially available biodegradable descaler (e.g., SEW CLEAN, etc.) safe for use on the base material. Fill the systems with descaler and hold for period to clean achieve adequate cleaning. Flush-out and properly dispose all residuals, waste, and cleaners.

Before filling a system with descaler all openings below the fill point must be blanked off or plugged.

MECHANICAL CLEANING - When CHEMICAL CLEANING (above) will not adequately achieve required cleanliness mechanically cleaning of pipes and component is necessary. Various mechanical means (e.g., disassembly, auger cleaning, high-pressure water-jet cleaning, etc.) must be used to achieve required cleanliness (i.e., free of all foreign materials, loose scale, sediment, sludge, etc.).

After cleaning, inspect the piping and component interiors at the locations specified in the "Cleaning Plan", using a borescope as necessary, in the presence of the COR; verify that all solid deposits, visible to the unmagnified eye, have been removed.

#### "Grey Water Tank Interior"

DEFINITION - *Grey Water Tank Interior* is the interior surfaces of a grey water tank, used to hold grey water.

#### Clean

**Submit** a CLEANING PLAN (593a) to the COR and obtain COR approval for the plan prior to initiating work. **Perform** the tasks described in the COR approved plan, and as described below.

Remove as necessary, **Clean, Inspect**, and re-install all tank interior components (e.g. TLIs, limit switches, eductors, etc.) prior to closing the tank.

Commercially available biodegradable descalers that are safe for use on all tank materials must be used when chemically cleaning tanks.

Do not drain any fluids (e.g. sewage, grey water, fresh water, etc.) into any space, bilge, or exterior location. Do not use vessel-installed pumps to offload system contents.

**Conform** to all inspection and cleaning requirements for "Structural Tanks" (123a) as they apply to the designated tank (e.g., PLUG LOG development/maintenance/submission, proper waste disposal and submission of "chain of custody" documents, proper tank closing procedures, etc.). If a coating system is present, and coating system discrepancies exist, **Submit** a report detailing the discrepancies and recommended repairs, include an estimated square footage of failed coating in the report.

All foreign material on the interior surfaces of the tank must be remove and properly disposed of.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

<b>"Sewage Piping Interiors"</b>
DEFINITION - <i>Sewage Piping Interiors</i> are the interiors of all piping in a sewage system, used to move sewage to a holding tank.
<b>Clean</b> <b>Conform</b> to all inspection and cleaning requirements for <b>Clean</b> "Grey Water Piping Interiors" above.

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<b>"Sewage Tank Interiors"</b>
DEFINITION - <i>Sewage Tank Interiors</i> are the interior surfaces of a sewage tank, used to sewage.
<b>Clean</b> <b>Conform</b> to all inspection and cleaning requirements for <b>Clean</b> "Grey Water Tank Interior" above.

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**CLEANING PLAN** – This is a document that describes the following data items as they apply to the cleaning tasks specified in the SOW

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- A list of all components (e.g., flanges, valves, pumps, TLIs, etc.) that will be disturbed or removed to gain access to the interior of the system(s), or to facilitate cleaning.
- A list of all chemicals and cleaners that will be used including the associated product and safety data sheets; these item must be safe for use on all affected materials
- A brief description of the procedures that will be used to clean the system
- A brief description of where and how all waste material will be captured and disposed of.

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## CHAPTER 600 OUTFIT AND FURNISHINGS

### 600a GENERAL

#### 600 Configuration Item Classes

Particular vessel configuration items designated in the SOW may belong to one or more the classes described below; determine the applicable classes, then conform to the corresponding requirements for those classes as they apply to the tasks designated in the SOW.

Class	Definition
"Critical-Coated Surfaces"	<p>This is a surface that may warrant COATINGS QUALITY ASSURANCE CHECKPOINTS (631b) i.e. elevated quality assurance, during coatings preparation/application because failed coatings 1) may affect safety, or 2) may not be easily detected, or 3) may require significant outlay of funds/resources/time to re-work, or 4) may result in lost operational days.</p> <p>The following generic surfaces and components are examples of <i>Critical-Coated Surfaces</i> and may be designated as such in the SOW: "Freeboard", "Superstructure", "Weather Deck", "Mast", "Stack", "Underwater body", "Buoy Deck", "Flight Deck", "Rudder", "Strut", "Stabilizing Fin", "Stern Door", "Wet Notch" or "RHIB Notch", "Tanks", "Voids", "Bilges", "Chain Lockers", "Sea Bays", "Forepeak", "Ventilation Plenum/Trunk", "Shaft Alley", "AFF Station", "Deck Machinery".</p> <p>The SOW may designate other surfaces, not listed here, as <i>Critical-Coated Surfaces</i> or may un-designate them.</p>

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### 631a Coating System Tasks

#### "Coating System" - Task Description Amendments

DEFINITION - An *Coating System* is the combination of all layers of paint applied to a surface that provide protection against damage/corrosion, enhance appearance aesthetically, provides labeling/designations, etc.

#### Clean

Reserved

#### Install

This is the installation of a new coating system on a designated component/surface that is uncoated.

Unless otherwise specified in the SOW:

- **Comply** with all GENERAL REQUIREMENTS FOR SURFACE PREPARATION AND COATINGS APPLICATION (631b).
- EQUIPMENT TESTING - When abrasive blasting will be used, and when tasked to do so from within the SOW, **Perform** ABRASIVE BLAST EQUIPMENT TESTING (631b) in the presence of the COR; test results must be approved by the COR prior to abrasive blasting Coast Guard assets.
- ELEVATED QA DOCUMENTATION - When specified in the SOW, **Perform** COATINGS QUALITY ASSURANCE CHECKPOINTS (631b) during surface preparation and coatings application. The SOW will specify who must serve as Coatings Inspector (CI). After the completion of coating application work, **Submit** COATINGS QA FORMS (631b) with the CFR associated with **Inspect-Op Test (Final)** task.
- The following subtasks (surface inspections, surface preparation, etc.) must be performed in conjunction:
  - INSPECTIONS - As part of the work item's **Inspect-Op Test (Initial)** task or other in-process inspections, **Submit** at least one report that either describes all surface/component discrepancies (e.g., excessive corrosion requiring weld repair, out-of-tolerance anchor tooth profiles, pitting and other surface defects, etc.) and recommended repairs, or otherwise indicates that no discrepancies are present. Perform as many ad hoc inspections/tests as required to fully assess existing conditions (e.g., existing/preliminary profile readings, in-process profile readings, etc.). Applying coatings over surface defects is **PROHIBITED** without prior Coast Guard approval.
  - **Perform** SURFACE PREPARATION (631b) on the designated surface/component. :
    - DEFAULT SUBSTRATE CLEANLINESS - Unless otherwise specified in the SOW or the coating manufacturer's instructions, the surface/component must be cleaned and prepared to meet the definition of *NEAR-WHITE METAL BLAST CLEANED SURFACE* as specified in SSPC SP-10 for steel surfaces.
    - SUBSTRATE PROFILE - the anchor tooth profile of the surface/component must be within the tolerance specified by the primer coat manufacturer. Out of tolerance surface profiles must be reported and subsequently corrected unless otherwise accepted in writing as satisfactory by the COR. Take every reasonable precaution required to prevent unnecessary increases to anchor tooth profile of the surface/component; if the surface is currently in tolerance DO NOT increase the depth of profile during surface preparation without prior written authorization from the COR.
- **Perform** COATINGS SYSTEM APPLICATION (631b) on the designated surface/component.

#### Repair

This is the removal of damaged coatings from the designated component/surface and the subsequent application of new coatings in place of all damaged/missing coatings. All discrepancies that may affect the proper adhesion of new coatings must be either corrected or accepted as satisfactory by the COR.

Due to the nature of coating discrepancies (e.g., damaged coatings may be hidden from view, existing conditions may degrade with time, etc.), the complete scope of required repairs may not be specified in the SOW. Often components/surfaces must first be cleaned to facilitate complete inspections and accurate assessments. Then a report must be developed that completely describes all coating discrepancies and proposed repairs; include this report in the CFR that is tied to work item's **Inspect-Op Test (Initial)** task. Final repair scope in addition to any repairs already specified in the SOW will be authorized/funded by CR.

The SOW may specify that COATINGS QUALITY ASSURANCE CHECKPOINTS (631b) be performed in conjunction with repairs, will designate a Coatings Inspector (CI), and may require the submission of COATINGS QA FORMS (631b)

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Coating System" - Task Description Amendments

DEFINITION - An *Coating System* is the combination of all layers of paint applied to a surface that provide protection against damage/corrosion, enhance appearance aesthetically, provides labeling/designations, etc.

Unless otherwise specified in the SOW:

- **Comply** with all GENERAL REQUIREMENTS FOR SURFACE PREPARATION AND COATINGS APPLICATION (631b).
- EQUIPMENT TESTING - When abrasive blasting will be used, and when tasked to do so from within the SOW, **Perform** ABRASIVE BLAST EQUIPMENT TESTING (631b) in the presence of the COR; test results must be approved by the COR prior to abrasive blasting Coast Guard assets.
- ELEVATED QA DOCUMENTATION- When specified in the SOW, **Perform** COATINGS QUALITY ASSURANCE CHECKPOINTS (631b) during surface preparation and coatings application. The SOW will specify who must serve as Coatings Inspector (CI). After the completion of coating application work, **Submit** COATINGS QA FORMS (631b) with the CFR associated with **Inspect-Op Test (Final)** task.
- **Perform** SURFACE PREPARATION (631b) on the designated surface/component. The following inspections and preparation subtasks must be performed in conjunction:
  - **INSPECTIONS** - As part of the work item's **Inspect-Op Test (Initial)** task or other in-process inspections, **Submit** at least one report that either describes all surface/component discrepancies (e.g., excessive corrosion requiring weld repair, out-of-tolerance anchor tooth profiles, pitting and other surface defects, etc.) and recommended repairs, or otherwise indicates that no discrepancies are present. Perform as many ad hoc inspections/tests as required to fully assess existing conditions (e.g., existing/preliminary profile readings, in-process profile readings, etc.). **Applying coatings over surface defects (e.g., pits caused by corrosion, excessively corroded areas, etc.) is PROHIBITED without prior Coast Guard approval.**
    - **DEFAULT SUBSTRATE CLEANLINESS** - Intact coatings must be cleaned/roughened/abraded to the level specified by the coating manufacturer to facilitate proper coating adhesion. Unless otherwise specified in the SOW or the coating manufacturer's instructions, when coating damage requires cleaning down to the bare substrate, the substrate must be cleaned to BARE METAL POWER TOOL CLEANING LEVELS (LEVEL 3) as specified in SSPC SP-11. Substrate anchor tooth profiles must be within the primer coat manufacturer's specified tolerance. Out of tolerance surface profiles must be reported and either corrected or otherwise accepted in writing as satisfactory by the COR.
- **Perform** COATING SYSTEM APPLICATION (631b) on the designated surface/component.

### Overcoat

Typically, a work item may specify that the **Overcoat** action be performed over a coating system that has just receive a **Repair** action to restore a uniform appearance across the entire surface.

This is the application of a top-coat over the existing coatings on the designated component/surface to provide a uniform color and a fresh, discrepant-free finish. All discrepancies that may affect the proper adhesion of new coatings must be corrected or accepted as satisfactory by the COR.

Surface condition requirements (e.g., cleanliness, roughness/profile, dryness, etc.) of the coated areas receiving the new top-coat must meet the coating manufacturer's requirements; **Clean** the existing coatings as necessary to meet those requirements. Do not apply new coatings over discrepant existing coatings.

Unless otherwise specified in the SOW, find corresponding component/surface in CG COATINGS SPECIFICATIONS (631c) and use coating specified as top-coat of the default coating system.

**Comply** with all GENERAL REQUIREMENTS FOR SURFACE PREPARATION AND COATINGS APPLICATION (631b).

## "Coating System" - Task Description Amendments

DEFINITION - An *Coating System* is the combination of all layers of paint applied to a surface that provide protection against damage/corrosion, enhance appearance aesthetically, provides labeling/designations, etc.

### Renew

This is the complete removal of the existing coating system and the installation of a completely new coating system on the designated component/surface.

Unless otherwise specified in the SOW:

- **Comply** with all GENERAL REQUIREMENTS FOR SURFACE PREPARATION AND COATINGS APPLICATION (631b).
- EQUIPMENT TESTING - When abrasive blasting will be used, and when tasked to do so from within the SOW, **Perform** ABRASIVE BLAST EQUIPMENT TESTING (631b) in the presence of the COR; test results must be approved by the COR prior to abrasive blasting Coast Guard assets.
- ELEVATED QA DOCUMENTATION - When specified in the SOW, **Perform** COATINGS QUALITY ASSURANCE CHECKPOINTS (631b) during surface preparation and coatings application. The SOW will specify who must serve as Coatings Inspector (CI). After the completion of coating application work, **Submit** COATINGS QA FORMS (631b) with the CFR associated with **Inspect-Op Test (Final)** task.
- The following subtasks (surface inspections, surface preparation, etc.) must be performed in conjunction:
  - INSPECTIONS - As part of the work item's **Inspect-Op Test (Initial)** task or other in-process inspections, **Submit** at least one report that either describes all surface/component discrepancies (e.g., excessive corrosion requiring weld repair, out-of-tolerance anchor tooth profiles, pitting and other surface defects, etc.) and recommended repairs, or otherwise indicates that no discrepancies are present. Perform as many ad hoc inspections/tests as required to fully assess existing conditions (e.g., existing/preliminary profile readings, in-process profile readings, etc.). Applying coatings over surface defects is **PROHIBITED** without prior Coast Guard approval.
  - **Perform** SURFACE PREPARATION (631b) on the designated surface/component. :
    - DEFAULT SUBSTRATE CLEANLINESS - Unless otherwise specified in the SOW or the coating manufacturer's instructions, the surface/component must be cleaned and prepared to meet the definition of *NEAR-WHITE METAL BLAST CLEANED SURFACE* as specified in SSPC SP-10 for steel surfaces.
    - SUBSTRATE PROFILE - the anchor tooth profile of the surface/component must be within the tolerance specified by the primer coat manufacturer. Out of tolerance surface profiles must be reported and subsequently corrected unless otherwise accepted in writing as satisfactory by the COR. Take every reasonable precaution required to prevent unnecessary increases to anchor tooth profile of the surface/component; if the surface is currently in tolerance DO NOT increase the depth of profile during surface preparation without prior written authorization from the COR.
- **Perform** COATINGS SYSTEM APPLICATION (631b) on the designated surface/component.

## 631b Coating System Application Requirements

Coast Guard Yard's existing forms (preservation plan, QA sheets, etc.) meet all requirements and may be substituted for plans and forms described herein when the Contract is executed at the Coast Guard Yard.

**PRESERVATION PLAN** – This document must describe, at a minimum, the following information, broken down by work item. Specifics are provided in the FORMS spreadsheet that is included with the solicitation documents; the spreadsheet may be used for the *PRESERVATION PLAN* or an equivalent document (generated by Contractor) that contains all the fields shown in the FORMS spreadsheet. COR approval of the document must be obtained prior to surface preparation and coatings application:

- Preparation methods that will be used, with the associated allowable anchor tooth profile ranges for the specified surfaces and primer coatings that will be used
- Description of the coatings that will be applied – listed by manufacturer and product name/identification numbers
  - Target wet and dry film thickness values

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

- Authorized reducers/solvents – including maximum percent by volume for reducers/solvents
- Colors by SAE AMS-STD-595 color number
- Application method for each coat
- Application pressure and nozzle size requirements listed on the manufacturer's product data sheet(s)
- 5 ○ Minimum recoat windows for applying subsequent coats, maximum recoat windows to apply subsequent coats adjusted for anticipated temperatures
- All special instructions or environmental limits for storage and application listed by the coating manufacturer; describe the conditions the coatings will be stored in.
- Intended final cure times prior to immersion or full duty rating (as applicable).
- 10 • A description of temporary structures and equipment (e.g., enclosures, HVAC systems, etc.) that will be used to correct anticipated environmental condition discrepancies that may impact coatings application.

Include with the submission of the *PRESERVATION PLAN* all source SDS sheets, COC sheets, Product Data Sheets, F-718s, and all other applicable coating manufacturer's instructions that correspond to each coating product that will be used on the vessel.

15 ("General and Administrative Requirements" Work Item, Maintenance Work Item)

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**GENERAL REQUIREMENTS FOR COATINGS APPLICATION** – The following requirements apply to all coating application tasks:

20 **Comply** with all SSPC-PA 1 requirements, and all coatings manufacturer requirements for proper application of their coatings (e.g., prerequisite environmental conditions like ambient humidity/temperature/substrate surface temperature/etc., personnel safety protective measures, etc.). SOW/WISS language takes precedent when in conflict with manufacturer's instructions. The following guidelines apply when coatings manufacturer's guidance is silent:

- 25 • Coating materials must be maintained at a temperature range of 65°F to 85°F.
- Work surface and surrounding temperature must be between 50°F and 90°F for water-thinned coatings, and 35°F and 95°F for other coatings.
- Coatings should not be applied if, during the cure period, the temperature is expected to fall below the minimum cure temperature.
- 30 • Relative humidity must be less than or equal to 50 percent for confined spaces (e.g., forepeak compartments, tanks, and voids); and not more than 85 percent for all other open areas. Some coatings systems (e.g., Bilge Epoxy Coating Systems, etc.) have no dew point restrictions, consequently they may be applied at a relative humidity between 10 and 100 percent.
- Coatings must only be applied only when surfaces are completely dry, and surface temperature is at least 5°F above the dew point.

35 All surface discrepancies that will impact proper coatings application and adhesion (e.g., excessive corrosion/damage, inadequate/excessive anchor tooth profile, etc.) must be identified and corrected prior to applying new coatings.

All necessary precautions must be taken to prevent contamination of, or damage to, prepared surfaces and adjacent surfaces.

40 Disposable/consumable materials and temporary equipment (e.g., disposable boot covers, disposable coveralls, and disposable gloves) must be provided to Coast Guard personnel upon request prior to Coast Guard conducting inspections to prevent substrate contamination.

45 Coating colors must conform to the descriptions provided in the SOW (either directly described therein, or in a vessel class coatings schedule drawing that has been incorporated by reference from the work item), otherwise coatings colors must conform to descriptions provided herein. For repairs/renewals, if no color is specified, maintain the existing color scheme of the existing pre-repaired/renewed coatings.

50 When coatings must be applied under discrepant ambient environmental conditions, those conditions must be corrected prior to coatings application; **Provide** temporary enclosures (e.g., tents, scaffolding w/shrink-wrap, etc.) and temporary HVAC systems (e.g., portable AC units, heaters, blowers, dehumidifiers, etc.), as necessary, to correct all environmental condition discrepancies.

**All runs, drips and sags in all applied coatings must be avoided or corrected.**

All coating-related materials must be delivered to the job site in original and unopened containers. The following information/documentation must be made available upon request by the COR, or when specified herein or in the SOW:

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- Product manufacturer's name.
- Product's name or number.
- Batch number.
- Date of manufacture.
- Shelf life.
- Product data sheets or ASTM F718 sheet.
- Safety Data Sheet (SDS).
- Certificate of Compliance (COC).

(631a| Maintenance Work Item)

**ABRASIVE BLAST EQUIPMENT TESTING** – Prior to abrasive blasting new and existing Coast Guard surfaces the following tests must be performed to prove that the blast equipment will deliver the proper anchor tooth profile while not damaging Coast Guard assets. This testing is not required for ultra-high-pressure water-jetting equipment.

**Perform** tests and inspections on the associated compressed air equipment IAW ASTM D4285 prior to the start of blasting operations, and 1) whenever a pause in blasting operations results in a significant temperature change of the compressed air and drier systems, and 2) whenever equipment malfunctions or performs improperly, and 3) whenever requested by the COR.

For each type of substrate that will be abrasive blasted (e.g., steel, aluminum, etc.), **Perform** an abrasive blast test on a separate, corresponding disposable coupon.

Each coupon must 1) be flat, greater than or equal to 1/8-inch thick and no less than 1-foot by 1-foot in area, with no welded attachments, and 2) be made from the same material as the surface that will be blasted, and 3) meet Rust Grade "A" condition or better per SSPC-VIS 1 visual standard cards, have all original mill scale intact, and have no anchor profile except surface irregularities from the manufacturing process, and 3) be rigidly affixed to a stable object to prevent movement during blasting. The reverse side of a coupon may be used for subsequent tests provided the surface property requirements described above are met.

Each abrasive blast test must simulate the exact same conditions (e.g., substrate material, equipment, equipment settings and adjustments, procedures, blast media material/size, nozzle size and type, delivery rate and pressure, etc.) that will be experienced later while abrasive blasting the Coast Guard asset. Blast media must not strike the vessel during the test; do not affix the coupon to the vessel.

Abrasive blast testing must be witnessed by the COR; notify the COR at least 24 hours prior to starting the test. After blasting the coupon to the specified standard perform an ANCHOR PROFILE TEST of that surface in accordance with ASTM D4417, method B or C. Document and report the following test results:

- Area of the vessel for which the verified setup is applicable.
- The abrasive media use.
- The nozzle size and type.
- The delivery rate and pressure.
- The test coupon starting properties (material type and surface conditions).
- The resulting ANCHOR PROFILE TEST readings.

Abrasive blast testing must be repeated whenever:

- blast equipment/material/settings/adjustments/procedures/etc. have changed (e.g., if media will be changed from MIL-A-22262 to CID A-A-59316 or vice versa, etc.)
- blast-prepared surfaces on a Coast Guard asset fail an ANCHOR PROFILE TEST.
- the source of supply for the blast media changes, and prior to using that new blast media on a Coast Guard asset
- directed by the COR

(631a "Coatings" ATD | Maintenance Work Item)

**SURFACE PREPARATION – Comply** with the following when performing *SURFACE PREPARATION*:

Preparation standards for metal surfaces are described below, preparation standards for non-metal surfaces (e.g., wood, etc.) are described in CG COATINGS SPECIFICATIONS (631c).

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Total dry film thickness of existing coatings may exceed the specified thickness of new coatings.

5 All substrate surface discrepancies (e.g., excessive corrosion requiring weld repair, excessive anchor tooth profile, etc.) must be identified (e.g., by visual inspection, or using surface profile measurements, or using a combination of these and other methods, etc.) and reported while preparing the surface. Preparation activities are not complete, and coatings must not be applied, until all discrepancies have been either corrected or accepted as satisfactory by the COR.

When tasked to "**Renew**" or "**Install**" a coating system:

10 *SURFACE PREPARATION* is 1) the removal of foreign material and all existing coatings from a designated surface or component to the specified cleaning level, and 2) the verification of, or otherwise the establishment of, a proper anchor tooth profile on all exposed substrate of a designated surface or component.

Unless otherwise specified in the SOW or the coating manufacturer's instructions, the surface/component must be cleaned to meet the definition of NEAR-WHITE METAL BLAST CLEANED SURFACE as specified in SSPC SP-10 when renewing a coating system.

When tasked to "**Repair**" a coating system:

15 *SURFACE PREPARATION* is 1) the removal of foreign material and damaged coatings from a designated surface or component, and 2) the verification of, or otherwise the establishment of, a proper anchor tooth profile on all exposed substrate of a designated surface or component, 3) the cleaning/roughing of satisfactorily intact coatings to accept the application of new coatings.

20 Coatings are considered intact/adherent if they cannot be removed by lifting with a dull putty knife; feather intact coatings into the prepared areas, to create a smooth transition. Roughen all intact/adherent coatings to provide an adequate surface profile. An additional 3 inches of adjacent surrounding intact coatings must be feathered into the repaired coatings.

25 Unless otherwise specified in the SOW or the coating manufacturer's instructions, surfaces with coating damage that extends down to the bare metal substrate must be cleaned to BARE METAL POWER TOOL CLEANING LEVELS (LEVEL 3) as specified in SSPC SP-11.

All exposed weld splatter must be mechanically removed from the surface (via scraper, chipping hammer, etc.).

All items (e.g., framing, stiffeners, brackets, mounting plates/frames, pad eyes, ducting, piping, equipment support, etc.) attached to the designated component/surface, that were previously coated with the same coating system, must be included in the coating repair/renewal.

30 Then the surface must be fully prepared to one or more of the appropriate AAMP/SSPC standards (e.g., SSPC SP10, SSPC SP 11, etc.), or as prescribed in the coating manufacturer's instructions, as appropriate. The SOW may specify a particular cleanliness/preparation standard that must be used. The preparation standards that will be followed must be documented in the PRESERVATION PLAN (631b).

(631a "Coatings" ATD | Maintenance Work Item)

35 **COATING SYSTEM APPLICATION** – A coating system will be specified in the SOW/work item or in a paint schedule (e.g., vessel class 631 dwg, etc.) referenced from the SOW/work item.

40 Apply that coating system in accordance with the coating system's manufacturer's instruction unless otherwise specified in the SOW, herein, or in VCS (i.e., **Comply** with surface cleanliness, surface profile, environmental condition, drying/curing times, WFT, DFT, etc. requirements.). All of these parameters must be specified on the PRESERVATION PLAN (631b), and that plan must be approved by the COR before application can begin.

When specified in the SOW, perform COATINGS QUALITY ASSURANCE CHECKPOINTS (631b) and record actual measurements and certify that proper application was performed on the COATINGS QA FORMS (631b).

(631a "Coatings" ATD | Maintenance Work Item)

45 **STRIPE COAT** – For all coatings systems that require a *STRIPE COAT* (see the separate document titled **Specifications and Qualified Products List for Coast Guard Coatings**), after the primer coat has dried and inspections have been completed, **Perform** the following:

- 50 • identify all coated areas where film thickness may be below the required thickness (e.g., edges, weld seams, welds of attachments and appendages, cutouts, corners, butts, foot/handholds, inaccessible areas such as the back side of piping, underside of I-beams, non-flat surfaces such as mounting hardware, etc.).

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- brush **or spray** a coat of paint onto these areas to bring the primer coat film thickness into specification in accordance with the manufacturer's product data sheet(s). All edges, as well as at least a one inch border outside each edge and weld joint, must receive a coat.

Each stripe coat must be of the specified paint system and must be a different color from both the paint over which it is being applied and the next coat in the system (if a product only comes in 2 colors, the stripe coat must contrast with the color of the previous coat). Full coat inspection must be conducted prior to stripe coat application.

Excluding aluminum substrates, stripe coats are not required when applying coatings to non-ferrous metals or corrosion resistant steels.

(631a "Coatings" ATD | Maintenance Work Item)

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**COATINGS QUALITY ASSURANCE CHECKPOINTS** – The following subtasks must be performed and all requirements must be adhered to prior to, and in conjunction with, performing surface preparation and coatings application:

- **Verify** proper calibration of all instruments.
- **Verify** all aspects of surface preparation are satisfactory:
  - Cleanliness of compressed air.
  - Adequacy of solvent cleaning.
  - Proper handling of blast media.
  - Actual surface preparation procedure.
- **Verify** environmental conditions are in the specified range immediately prior to and throughout coatings-application
- **Inspect** and obtain approval of the final substrate surface condition immediately prior to the application of the primer coat.
- **Verify** and supervise/approve coating system preparation and application procedures (e.g., mixing and thinning, stripe coating application, spray techniques, and film thickness measurements and recordings, etc.).
- **Verify** that applied coats have sufficiently cured for overcoating or for system service.
- **Perform** completion (e.g. measurement taking, signing, etc.) of the designated **COATINGS QA FORMS** (631b), provided with the solicitation documents.
- **Submit** all completed QA inspection forms, upon completion of work.

(Maintenance Work Item)

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**COATINGS QA FORMS** – These are the forms in the spreadsheet document titled QA FORMS.xlsm, provided with the SOW and VCS that applies to this contract will be included within the solicitation package on SAM.GOV. Within the spreadsheet are the following worksheets that must be completed as specified in the SOW.

- PRESERVATION PLAN
- QA1 (PREPARATION DATA)
- QA2 (APPLICATION DATA)
- QA3 (FINAL DFT DATA)

(Maintenance Work Item)

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### 631c Coatings Specifications

**CG COATINGS SPECIFICATIONS** – The copy of the document titled "*Coast Guard Vessel Coatings Specifications (VCS)*" that applies to this contract will be included within the solicitation package on SAM.GOV.

A more current version of "*Coast Guard Vessel Coatings Specifications (VCS)*" may exist at [Standard Specifications \(uscg.mil\)](http://Standard Specifications (uscg.mil)) if a revision occurred subsequent to the posting of this contract's solicitation. If a modification to this contract, incorporating a newer version, is warranted then submit a CFR that states the rationale; a CR/mod may be approved by the KO, pending evaluation of the request.

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The PRESERVATION PLANS (631b) should **Comply** with "*Coast Guard Vessel Coatings Specifications (VCS)*"; it contains the following sections. Exceptions can be authorized through the Coast Guard approval of the PRESERVATION PLANS (631b), but Contractors are urged to use coatings specified in the COATINGS SPECIFICATIONS AND PRE-APPROVED PRODUCTS section of "*Coast Guard Vessel Coatings Specifications (VCS)*" whenever practicable.

5

Section		Description
1	REFERENCES AND TERMS/DEFINITIONS	Points the reader to various supporting documents. Defines various terms.
2	AUTHORIZED COATING SYSTEMS	Describes all coating systems (i.e., specifications for # of coats of paint, the specification/description for each coat, etc.) that are authorized for use on Coast Guard vessels.
3	COATINGS SPECIFICATIONS AND PRE-APPROVED PRODUCTS	This is the list of specifications for all coatings (i.e., the sub-components of each authorized coating system) that are authorized for use on Coast Guard vessels; each corresponding qualified coating product is also listed.
4	SPECIFICATIONS FOR LIMITED USE SYSTEMS AND COATINGS	Describes coatings and coating system that are temporarily pre-approved for limited use (e.g., are undergoing trial or prototype applications, or have been accepted via temporary waiver due to logistics problems, etc.)
5	COATING SPECIFICATIONS FOR VESSEL SURFACES.	Specifies which coating systems are authorized for use on the various types of surfaces.
6	REQUIREMENTS FOR DEVELOPING PAINT SCHEDULE DRAWINGS	Describes requirements for creating a paint schedule drawing (for either a new or existing vessel class) that properly references/invokes CG COATINGS SPECIFICATIONS, so that all coating configuration requirements for a vessel class are explicitly specified, while preserving regulated competition requirements.
7	PROCEDURES FOR OBTAINING PRE-AUTHORIZATION	Describes procedures for qualifying a coating to a specification or coating system that is already contained in the CG COATINGS SPECIFICATIONS.  Also describes how to get a new coating system not already specified in CG COATINGS SPECIFICATIONS, that may contain one or more new coatings, into the CG COATINGS SPECIFICATIONS.
8	COATING APPLICATION STANDARDS FOR NEW VESSEL ACQUISITIONS	Describes standards for applying coatings to newly acquired vessels.

(631a "Coatings" ATD | Maintenance Work Item)

### 634a Interior Deck Covering Systems

10 Reserved

(631a "Coatings" ATD | Maintenance Work Item)

## **CHAPTER 700 ARMAMENT**

### **700a General**

Reserved

## CHAPTER 800 INTEGRATION/ENGINEERING

### 862a Pre-Availability Planning

5 **ESTIMATING AND QUOTING** – The following establishes classifications of different types of contract supply and service costs.

#### LABOR

DIRECT PRODUCTION LABOR (DPL) (TYPE 1) -welders, machinists/mechanics, shipfitters, pipefitters, riggers, helpers, etc. i.e. the personnel that are performing maintenance work on coast guard assets, on the vessel on in a shop.

10 INDIRECT LABOR (IL) (TYPE 2) - All personnel who are not directly performing maintenance work on coast guard assets; all non-DPL labor (e.g., office, legal, mgmt., supervision of DPL, ship superintendents, personnel performing QA/QC functions, etc.), all utility hook-ups, testing on those items/services, and disconnects.

#### MATERIALS

15 DIRECT MATERIALS/ITEMS (DMI) (TYPE 1)

- 1) DIRECT MATERIAL - All material that the Coast Guard takes permanent possession of, or is installed on and leaves with the vessel at the end of the contract (e.g. hull plate, valves, paint, fasteners, etc.),
- 2) RENTALS FOR COAST GUARD USE - All rented items provided to, and used directly by, the Coast Guard during the contract (e.g. temporary watch-stander duty-section berthing i.e. campers/trailers, printers, fax machines, etc.).
- 20 3) DPL RENTALS - All rented items used solely for the purpose of executing the subject Coast Guard contract, that will not be used for servicing any other vessel (e.g. rented cranes, rented generators, rented compressors, rented manlifts, rented fork trucks, etc. and the fuel used to power them).

25 RENTALS FOR COAST GUARD USE and DPL RENTALS must not be fixed assets owned by the contractor and must not be used for purposes outside the subject Coast Guard contract (i.e. shared across other vessels in a contractor's shipyard). The COR must be able to confirm that the items are not being used to accomplish work outside of the contract; rental agreements/receipts that align to the contract performance period may be required to prove .

- 30 4) DPL CONSUMABLES - All items consumed during the performance of DPL (welding rods, gloves, masks, rags, cleaners, etc.) on a contracted maintenance task.

INDIRECT ITEMS (IIS) (TYPE 2)

- 35 1) PROPERTY, PLANT, AND EQUIPMENT - All other items that the Coast Guard does not take permanent possession of, or are in support of IL, or should reasonably be fixed assets of a responsible vessel repair contractor (e.g. contractor office equipment/supplies, tools, welding/fire blankets, repair machinery e.g. shipyard cranes, compressors, welding gear, etc.) or will be used in the maintenance o those fixed assets.

- 2) UTILITIES - all shipyard utilities (e.g., power, water, etc.) used for contracted work, all shipyard power/steam/potable-water/ cooling-water/etc. supplied to the Coast Guard in conjunction with the contract.

40 SUBCONTRACTED SERVICES – These are costs associated with contractors to provide supplemental DPL (e.g., independent coatings inspectors, gas free engineering services, etc.) (TYPE 1).

**It is impossible to know any prime contractor's subcontracting plan PRE-SOLICITATION; each quoting prime contractor may have a different subcontracting plan.**

**The following services will likely be assumed to be subcontracted, otherwise it will be assumed that the prime contractor performs the services directly.**

- Gas Free Engineering Services
- Independent Coatings Inspectors

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### - OEM Technical Representatives when explicitly required by a work item.

**Terms and Definitions** – These are various terms that may be used throughout the contract.

#### DECK MACHINERY AND HYDRAULICS RELATED

- 5 **Assembly:** A group of two or more interrelated components integral to a system that serve a distinct function. Typically, renewal of components within assemblies can be economically justified where renewal of entire assemblies as one unit cannot be economically justified.
- 10 **Cleanliness Grade A:** An uncoated surface is cleanliness Grade A when all visible or touchable areas of an accessible surface are free of grease, oil, flux, scale, dirt, loose particles or loose corrosion products, and all other contamination foreign to the base material of the surface. Light superficial rust on a carbon steel surface, caused by short time exposure to the atmosphere, is permitted. Potable water residues are permitted.
- Component:** A group of one or more interrelated parts that are integral to a system that serves a distinct function. A part is a special case of a component. Components can generally be renewed as a unit.
- 15 **Contractor's Facility:** This is any property (e.g., shipyard, manufacturing or repair facility, berth or slip, etc.) that is owned by the prime contractor or the prime contractor's subcontractor; any non-Government owned facility where a Coast Guard asset or component may be temporarily located for maintenance and repairs.
- 20 **Deck machinery system:** A deck machinery system contains the union of all associated mechanical load bearing components, all mechanical power transmission component associated with a prime mover, and each component integral to the operation both of those sets of components and assemblies, up to and including their machinery foundations. If the prime mover is an electric motor then all components prime mover side of the connection point to ship's service power are part of the system.
- 25 **Dynamic load test:** A weight test used to verify that all mechanical power transmission components in a system are properly assembled, properly installed, properly adjusted, and are capable of producing enough force (i.e., pressure, torque, etc.) to hoist or haul the dynamic load. The weight specified for this test is typically just beneath the weight that the system is capable of hoisting or hauling when all mechanical power transmission components are properly assembled, properly installed, and properly adjusted. Systems installed on vessels and barges are designed to hoist or haul loads greater than their published rating in order to compensate for the increased line tensions experienced while operating in a sea state (dynamic loading).
- 30 **Fine surfaces:** The term fine surfaces denotes the union of each of the following definitions:
- Each uncoated surface of a component whose finish is critical to the operation of the component.
  - Each uncoated surface of a component that mates with or runs against a machined surface, a plated surface, or software.
  - Plated surfaces.
- Haul:** To pull a mechanical load in the horizontal plane.
- 35 **Hoist:** To raise a mechanical load in the vertical plane.
- Mechanical load:** The term mechanical load denotes each of the following definitions:
- A weight or mass not integral to a hoisting machine but suspended from a hoisting machine.
  - A weight or mass not integral to a hauling machine but being hauled by a hauling machine.
- 40 **Mechanical load bearing components:** Each component in a machine that is subjected to stress while supporting or moving a mechanical load.
- Machinery foundation:** Structural members welded to or integral to the ship's structure designed to provide an interface for fastening one or more parts of the machine to the ship.
- Mechanical power transmission component:** Each part in a machine, including those parts integral to the prime mover that is subjected to stress generated by a prime mover.
- 45 **Nondestructive examination (NDE):** The act of determining the suitability of some material or component for its intended purpose using techniques that do not affect its serviceability.
- Part:** A component that can be disassembled no further.
- 50 **Pin assembly:** The union of all components attached to (e.g., by key, spline, stake, press fit, etc.) and mate with or run against a pin including all sleeves, bushings, and rolling contact bearings that support the pin. For example, when tasked to Disassemble and Inspect a Sheave Pin Assembly, all components that mate with the pin (e.g., a sheave, at least one rolling contact bearing assembly or bushing) must be disassembled.
- Prime mover:** The initial source of mechanical energy integral to a deck machinery system in the form of either an internal combustion engine or an electric motor driven directly by current from the ship's service generator.

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5 **Rated load test:** A weight test used to verify that all mechanical power transmission components in a system are properly assembled, properly installed, properly adjusted, and are capable of operating through a complete duty cycle without developing unusual or substandard performance characteristics (e.g., noise, binding, overheating, slow operation, etc.). The weight specified for this test is typically the published Working Load Limit (WLL) of the system.

**Self-locking fastener:** A fastener assembly with a design feature (e.g., a soft insert, pre-deformed threads, etc.) for the purpose of adding friction to the threaded connection.

10 **Shaft assembly:** The union of all components attached to (e.g., by key, spline, stake, press fit, etc.) and mate with or run against a shaft including all sleeves, bushings, and rolling contact bearings that support the shaft. For example, when tasked to Disassemble and Inspect a Winch Drum Shaft Assembly, all components attached to the shaft (e.g., winch drum, at least two rolling contact bearing assemblies, a gear on gearbox end of the shaft, and all associated keys, seal, backing rings, etc.) must be disassembled. The associated gear box would be disassembled only to the extent required to access the specified shaft assembly.

15 **Software:** The term software includes seals, gaskets, o-rings, backing rings for o-rings, lip seals, v-ring packing, flax packing, and mechanical packing seals as part of a component union.

20 **Brake/Modified static load test:** A weight test used to verify that a winch brake, a brake valve, or a counterbalance valve is properly assembled, properly installed, properly adjusted, and is capable of stopping and holding the dynamic load. The weight specified for this test is typically just beneath the weight that will cause a properly assembled, properly adjusted, and properly installed winch brake, brake valve, or counterbalance valve to slip/relieve. The test also verifies, to a lesser extent, the integrity of all other mechanical load bearing components in the system.

25 **System specifications:** All requirements, configuration data, and process descriptions applicable to the work specified that are contained within system drawings, system technical publications, or other documents referenced by a work item or referenced by the standard. Where specifications provided by the system manufacturer disagree with specifications provided by a manufacturer of a component within that system, the specifications provided by the system manufacturer must take precedent, unless otherwise specified.

30 **Task description:** When the work item contains a table similar to the table shown in paragraph 4.1 (Work item interpretation), a task description is a unit of work described by six separate associated cells across one row of a table in a work item that references this standard. Otherwise, it is a sentence or paragraph in a work item that contains a Task Type.

**Task type:** One or more words, typically verbs, that denotes a general description of work that can be performed on a component or assembly. Examples of standard task types are listed in paragraphs 4.1 (Work item interpretation) and 4.2 (Standard task types).

35 **Wearing components:** The term wearing components denotes the union of the following sets of components:

- Software.
- Rolling contact bearings excluding turntable or turret bearings.
- Bushings used in a machine to constrain rotating shafts or mechanical load bearing pins.
- Springs.
- Friction discs in disc brakes and liners in band brakes.

40 **Wear pads and wear strips:** defined as relatively soft parts that slide against one or more relatively hard parts within a machine, the soft part being designed to wear at a much faster rate than the hard part.

### WELDING RELATED

45 **American Welding Society (AWS):** Information concerning certification of welding inspectors, welders, and accredited test facilities for AWS welder certification is available on the World Wide Web internet at <http://www.aws.org>.

**Approved (approval):** Approval refers to when the American Welding Society (AWS), American Bureau of Shipping (ABS), United States Coast Guard or authorized representatives have accepted the item under consideration.

50 **Applicable data sheets:** Refers to welding process data sheets or welding procedure specifications approved by ABS, Mechanical Contractors Association of America National Certified Pipe Welding Bureau (NCPWB) established welding regulatory code or their authorized representative.

**Authorized representative:** Authorized representative is any representative specifically authorized to approve equipment, material, or procedures for the referenced regulatory agency.

55 **Brazer:** A person who performs manual or semiautomatic brazing. In this specification, any reference to a brazer is also applicable to a brazing operator.

**Critical welds:** Critical welds include welds on primary structure (including hull plate, tank tops, structural decks and bulkheads, transverse frames), watertight closures on the bulkhead deck and below, load bearing

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members, life-saving equipment, weight handling equipment, tank and void boundaries, pressurized vessels (including piping, tubing and fittings), machinery that transmit thrust or torque, foundations, propulsion shafting, propellers, water jets, special purpose (including flight deck, buoy deck), special materials (including high yield, monel), and ordnance.

- 5 **Certified:** The term "certified" indicates that there is written proof of qualification.
- Continuity:** Documentation for each welder that their certification has been properly maintained in accordance with the appropriate welding code or military standard.
- Corrugated plate:** Plate with a repetitive pattern utilizing bends in the plate as stiffeners, usually used in structural bulkheads.
- 10 **Flat plate:** A flat plate is considered as any plate that does not require pre-forming before installation.
- Government inspector:** Government inspector is a Government official who is charged with the responsibility for assuring that the materials, processes, fabrication techniques, inspections, tests, and testing personnel meet specification and contractual requirements. In this regard, they must be the COR or delegated representative.
- 15 **Nondestructive Examination (NDE):** The act of determining the suitability of a material or a component for its intended purpose using techniques not affecting its serviceability. NDE is the standard term used by AWS. Nondestructive inspection (NDI), nondestructive testing (NDT), and nondestructive evaluation are interchangeable terms for NDE.
- Procedure qualification:** The demonstration that the use of prescribed joining processes, materials, and techniques will result in a joint exhibiting specified soundness and mechanical properties, and evaluated either by destructive or nondestructive tests or both.
- 20 **Procedure qualification record (PQR):** A document providing the required process variables for a specific application to assure repeatability by properly trained welders, brazers, or solderers.
- Qualified:** The term "qualified" means that the item under consideration has been approved as required by the applicable regulatory agency or authorized representative.
- 25 **Qualifier:** The qualifier is an individual or test facility designated by the applicable welding regulatory agency or contractor as responsible for conducting, supervising and accepting welder qualification testing. The qualifier must be certified by the regulatory agency as a Certified Weld Inspector (CWI) or at a minimum be a competent individual meeting all the education and experience requirements of a CWI as defined by AWS QC1.
- Shaped plate:** A shaped plate is a plate that requires mechanical or other manipulation to pre-form the shape prior to the installation procedure.
- 30 **Shell plate:** A shell plate is a plate forming the outer skin of the hull.
- Sheet metal:** A sheet metal is any material identified by the Manufacturers' Standard Gage for Sheet Steel, at a weight of 41.82 pounds per square foot per inch of thickness (e.g., 5.23 pounds per square foot per 1/8 inch of thickness) whose thicknesses are below 1/4 inch.
- 35 **Solderer:** A person who performs manual or semiautomatic soldering. In this specification, any reference to a solderer is also applicable to a soldering operator.
- Welder:** A person who performs manual or semiautomatic welding. In this specification, any reference to a welder is also applicable to a welding operator.
- 40 **Welding operator:** A person who operates adaptive control, automatic, mechanized, or robotic welding (also brazing and soldering) equipment.
- Welding Procedure Specification (WPS):** A document providing the required welding variables for a specific application to assure repeatability by properly trained welders and welding operators. Brazing procedure specifications (BPS) and soldering procedure specifications (SPS) are similarly defined.

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

**PROCUREMENT EVENTS/MILESTONES** – The following establishes classifications of different types of contract milestones.

PRE-SOLICITATION
POST-SOLICITATION
PRE-AWARD
POST-AWARD
CONTRACT START
ARRIVAL CONFERENCE
CONTRACT END

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### 863a Vessel Dry Docking Requirements

#### 800 Configuration Item Classes

Particular vessel configuration items designated in the SOW may belong to one or more the classes described below; determine the applicable classes, then conform to the corresponding requirements for those classes as they apply to the tasks designated in the SOW.

Class	Definition
"DD Facility"	<p>This is a system of machinery, structure, and other components used to dry dock a vessel. <i>DD Facility</i> types include graving docks, floating dry docks, marine railways, vertical lifts (e.g., Syncrolift® shiplift, etc.), travel lift cranes, etc.</p> <p>For the purposes of this standard a "<i>Docking Cradle</i>" and a "<i>Lifting Cradle</i>" are also considered <i>DD Facilities</i>, though they would be used in conjunction with other <i>DD Facilities</i> to dry dock vessels like vertical lifts and travel lift cranes.</p>
"Docking Cradle"	<p>A "<i>Docking Cradle</i>" will be designated as such on, and must be constructed in accordance with, a Coast Guard drawing unless otherwise authorized by the Coast Guard.</p> <p>"<i>Docking Cradles</i>" use the dock floor for support and have less supporting structure than "<i>Lifting Cradles</i>". "<i>Docking Cradles</i>" cannot be used to lift vessels.</p> <p>If there is no structural component to the a cradle (longitudinal or transverse beams), and if the cradle is only comprised of steel blocks which are fully supported by the dock floor, then these blocks should be treated as typical docking blocks and do not require a cradle certification.</p>
"Lifting Cradle"	<p>A "<i>Lifting Cradle</i>" is similar to a docking cradle but is constructed with additional pad eyes added to the structure to enable the cradle to be lifted with a crane or travel lift. A "<i>Lifting Cradle</i>" will be designated as such on, and must be constructed in accordance with, a Coast Guard drawing unless otherwise authorized by the Coast Guard. A cradles designated as a lifting cradle may be used for either docking or lifting a vessel.</p>
"Block/Cradle FDN Area"	<p>Areas or surfaces in a shipyard that are not directly part of a "DD Facility", but are used to support blocks or cradles that dry docked vessels will rest upon.</p> <p>Often a travel lift will carry a vessel to a <i>Block/Cradle FDN Area</i> in a separate part of a yard where blocks have been assembled, or a cradle has been placed, to hold that vessel during the dry dock period.</p>
"Underwater Body Hull Surfaces"	<p>All exterior vessel surfaces below the waterline, from the upper edge of the boot top down.</p> <p>Examples of items that have these surfaces include hull plate, propellers, sea chest strainer plates, sea chest interiors, fairwaters, rope guards, rudders, shaft struts, z-drives, bow thruster tunnels, and zinc anodes, etc.</p>

(631a "Coatings" ATD | Maintenance Work Item)

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

### "Underwater Body Hull Surfaces" - Amendments to Task Descriptions

Whenever the SOW specifies that one of the following tasks must be performed on a "Shaft Assembly" amend the task description as described below; amendments made by the SOW take precedent.

#### Clean

Perform this action prior to hull growth hardening; cleaning must commence no later than four hours after the vessel has been dry dock.

All marine growth and oxidized coatings must be removed from all "Underwater Body Hull Surfaces" by water-jetting to a WJ-4 visual surface condition, in accordance with SSPC-SP WJ-4/NACE WJ-4. Cleaning must be supplemented with stiff bristle brushes and scrapers as necessary, to remove all visible marine growth, loose rust, loose mill scale, and loose coatings. Do not use chemical additives in the freshwater wash or scrapers on bearing surfaces or transducer faces. Take extreme care to avoid damaging or removing existing intact underwater body coating.

(631a "Coatings" ATD | Maintenance Work Item)

**If DRY DOCK CERTIFICATION DOCUMENTATION is not currently on file with the Coast Guard it must be submitted pre-award (for commercial contracts) as described in the solicitation. DOCKMASTER CERTIFICATION must also be submitted.**

**DRY DOCKING PRE-AWARD SUBMISSIONS** –Submit the following documents with the original offer/quote:

- Dry dock facility certifications applicable to the vessel class being dry docked if certification is not currently on file with Coast Guard.
- PRE-AWARD DOCKING CALCULATIONS (863b). If necessary, **Submit** an alternate blocking arrangement with the pre-award calculations which consists of any changes from the Coast Guard docking plan provided in the work package.
- DOCKMASTER CERTIFICATION (863b)

For additional information necessary to perform dry dock calculations **Submit** a request to the KO. The KO will provide the results of the review prior to contract award.

**DRY DOCKING SERVICES** – *DRY DOCKING SERVICES* must be performed in a certified "DD Facility" that has been approved by the Coast Guard, and under the supervision of a qualified Dockmaster, and under the support of qualified/experienced docking personnel.

The COR will provide the vessel's estimated arrival loading conditions no later than 7 days before the docking day.

Minimal vessel trim must be obtained prior to docking; the COR and vessel's CO/OIC must be consulted to achieve optimal vessel trim. Irregular hull designs (e.g., vessel's keel is not designed to be parallel to the design baseline, etc.) must be accounted for when determining optimal vessel trim. When it is necessary or desirable to dock a vessel with appreciable trim, both the point load on the knuckle block and the maximum unit stress at the after end of the knuckle block must remain within permissible limits of the timber (see *BLOCKING (CALCS)* Timber Stress above). Vessel list angle must be eliminated to the greatest practicable extent prior to docking the vessel (i.e., the list angle must be 0 degrees). The COR and vessel's CO/OIC will provide vessel list information (e.g., actual list angle, probable causes of discrepancies, etc.) in a timely manner if the Dockmaster cannot examine the vessel before docking.

When docking blocks are used they must be fabricated/arranged as shown on the Coast Guard docking plan drawing referenced in the SOW; when Coast Guard drawings omit details docking blocks must conform to *DOCKING BLOCK SPECIFICATIONS*.

All structural/load-bearing fasteners used in cradle construction must be renewed prior to every use/reuse; non-structural fasteners (e.g., guide post mounting fasteners, etc) may be re-used.

The SOW will specify the blocking position that must be used; *VESSEL FLEETING SERVICES* for facilitating 100% access to all hull exterior surfaces are not required unless explicitly requested in the SOW.

The vessel must be dry docked no later than 72 hours after the vessel has arrived at the "DD Facility", or no later than 120 hours when the SOW specifies a pre-docking shaft alignment check.

*DOCKING CALCULATIONS (863c)* must be submitted no later than 3 business days before docking; an *Alternate Blocking Arrangement* must be included if appropriate.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

A *PRE-DOCKING CONFERENCE* must be scheduled and attended no later than 24 hours before dry docking the vessel.

5 The vessel must be safely dry docked during daylight hours in one continuous evolution; special written requests to dry-docking outside of normal daylight hours will only be approved if fully justified and proven safe (e.g., proof of adequate lighting provided, safety procedures described, etc.). The dry dock must be free of all debris and blasting material prior to docking. The Dockmaster assumes all responsibility for the vessel's condition/safety, and relieves the CO/OIC of those duties, when the first extremity of the vessel crosses the sill or plane of the dry dock, on the side of the dry dock that faces the navigable channel.

10 The Dockmaster must approve, in advance, all actions that may change vessel stability (e.g., shifting of weights, fuel, fresh water or ballast, etc.) prior to starting the docking evolution and thereafter until the undocking evolution is complete. The Dockmaster must monitor for safety, and provide direction to as necessary via radio, to all personnel (e.g., Coast Guard, civilian, etc.) onboard the vessel during the docking evolution. The quantity of onboard personnel during the docking evolution must be minimized to only those attending to required stations; their movement must be limited as the vessel is positioned over and landed with full contact on blocks/cradle.

15 All resources and items required to safely dry dock the vessel (e.g., tugs and/or pusher boats, line handlers, radio communications, etc.) must be provided. Winches and other shipboard deck machinery must not be used to control or winch the vessel into position; appropriate attachment points on the vessel may be used to secure and control the vessel during the docking/undocking evolutions.

20 If the docking day must be postponed for reasons of weather (e.g., excessive winds, freezing temperatures, heavy rains, etc.) the date must be tentatively moved to the next forecasted good weather day. The reason for the delay and the anticipated rescheduled date for the event must be communicated to the COR.

Floating dry docks must be operated with the following limitations (see *DOCKING CALCULATIONS* for pumping plan and calculation requirements):

- 25 • Trim between the blocks and keel must not exceed 1 foot per 100 feet of length during the landing of the vessel. Once the vessel is fully landed, a maximum ship/dock trim of 4 feet per 100 feet of length must not be exceeded at any time. The dock may be trimmed to match the vessel's trim but must not exceed the aforementioned limits.
- A minimum of 12 inches must be maintained between the dry dock and the harbor bottom at all times.
- 30 • The final lifted pontoon deck freeboard must be no less than 12 inches.

Qualified divers must be used to monitor block clearances during the positioning of the vessel over the blocks. Divers are required for the following instances:

- When the distance between the hull and the blocks is expected to be nine inches or less.
- When hauling bilge blocks and to verify the success of hauling operations.
- 35 • When cradles are used for docking.
- When alternate blocking plans are used and a diver is determined to be necessary by the Coast Guard.

40 Divers are not required if the Coast Guard determines that conditions during the dive, such as diver visibility and/or safety, will render the dive inspection impractical or not beneficial to the Coast Guard. If divers will not be used in conditions that would typically require them; an alternate means of verifying block placement and contact must be discussed in the docking calculations.

Blocks must be inspected immediately after the vessel has been docked to examine all blocks for total contact.

Blocks must be shimmed as necessary to provide total block contact with the vessel's hull. Supplemental blocking or shoring must be installed, as necessary, for the bow and/or stern overhanging structure as specified in docking plan.

45 The vessel must be refloated and corrective action must be taken if any tendency to strain or damage the vessel is observed, or if the vessel is more than 6 inches off the center of the keel blocks; COR approval must be obtained prior to attempting to dock the vessel again after refloating.

50 All vessel blocking plan arrangement discrepancies must be identified and reported (e.g. interferences to the hull openings or appendages such as skeg plug location identified on the docking plan as 6 inches forward of the end of skeg, after docking it's found to be 18 inches forward and a block cap has landed on it, etc.). Red line markup of the Coast Guard drawing docking plan must be submitted detailing all discrepancies. COR approval must be obtained prior to deviating from blocking plans.

## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

All "Underwater Body Hull Surfaces" must be cleaned and visually inspected for discrepancies.  
INSTALLATION/REMOVAL OF PROTECTIVE MEASURES must be performed.

Weight and moment changes to the vessel caused by relocating or removal of liquid loads and/or dead loads (dunnage) must be tracked and reported.

5 The vessel must be safely undocked during daylight hours in one continuous evolution; special written requests to undock outside of normal daylight hours will only be approved if fully justified and proven safe (e.g., proof of adequate lighting provided, safety procedures described, etc.). The dry dock must be free of all debris and blasting material prior to undocking. The CO/OIC of the vessel assumes all responsibility for the vessel's condition/safety, and relieves the Dockmaster of those duties, after the last extremity of the vessel crosses and leaves the sill or plane of the dry dock, on the side of the dry dock that faces the navigable channel.

The vessel crew and the COR must be notified of the schedule for undocking, including undocking conference date and time, a minimum of four business days in advance of the undocking evolution.

Personnel must be provided and stationed for watertight integrity checks as the vessel undocks. Special attention must be paid to the sea chests that were overhauled during the availability.

15 All applicable precautions and actions specified above for dry docking must also be taken/performed for undocking (e.g., vessel stability changes must be considered, personnel onboard the vessel must be monitored and minimized, weather delay procedures must be adhered to, etc.)

(631a "Coatings" ATD | Maintenance Work Item)

20 **DOCKING BLOCK SPECIFICATIONS** – Unless otherwise specified, docking blocks and their arrangement must comply with the following:

- A benchmark for centerline and baseline must be established. The dock floor must not be considered a baseline unless it can be proven flat, without slope, peaks or depressions
- The dimensional tolerances for the vessel's docking plan must be the following:
  - The height of the vessel's blocks are within ¼".
  - The distances in the longitudinal direction are within 1".
  - The distances of the half breadths (transverse) for side/bilge blocks are within ½".
- Soft caps must be made of Douglas Fir or Pine. Keel block soft caps must measure 2 inches minimum to 6 inches maximum in thickness. Side block soft caps must measure 2 inches minimum to 6 inches maximum in thickness at their shortest (inboard) corner. Side blocks have no maximum thickness limitation at their longest (outboard) corners. Keel block soft caps must not be thicker than the shortest corner of the side blocks. Reused soft caps must be free from any permanent deformations, i.e. crushing, cracking or other material defects.
- The line of normal force for all blocking must pass through the middle one-third of the block base as shown in Side/Bilge Block Construction below.
- Docking blocks must be made of homogeneous materials. Keel blocks must be fabricated of the same materials. Side/bilge blocks must all be fabricated of uniform structure and materials. The side/bilge blocks must not be of stiffer construction material than the keel blocks. Block material below the soft cap must be constructed of one of the following materials: concrete, hard wood or steel.
- Blocks must be secured to prevent wood from floating out of position during the docking/undocking evolution
- Bilge blocks higher than six feet, as measured from the bottom of the block to the highest point of the soft cap, must be stiffened both front and back sides from top to bottom to prevent buckling and tied together in pairs by means of cribbing or bracing. If the side blocks are hauled into position during the docking evolution while tied together, then they must be hauled simultaneously. When stiffening high bilge blocks or bracing two blocks together, the minimum acceptable bracing material must be four (2"x6") wooden planks in a normal-to-hull pattern or a cross-braced pattern and lag bolted in place, shown in Figure 2 (Stiffened or Braced Bilge Blocks). Keel blocks higher than six feet must be cribbed together in the both forward and after one third of the keel block line. The cribbing must be a minimum of 12-inch thick when used with timber blocks.
- Blocks must not obstruct or cover hull openings or fittings. Horizontal and vertical clearance must be provided so that appendages (e.g., rudders, shafts, fin stabilizers, transducers, sonar domes, and retractable bow thrusters, etc.) may be removed and replaced. This clearance must be considered whether or not removals are specified in the SOW.
- Blocks constructed for vessel dockings/haul outs, must be placed on a permanent solid foundation such as concrete, concrete aggregate, dock floors, or cradle fixtures. Cradle fixtures used for vessel haul outs must be

# Work Item Standards and Specifications (WISS)

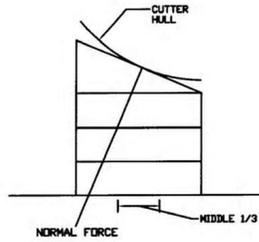
for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

placed on a permanent solid foundation. No block or cradle must rest on loose soil, gravel, sand or other non-permanent foundation. (See DRY DOCK CERTIFICATION DOCUMENTATION "Block/Cradle FDN Area").

## CAUTION!

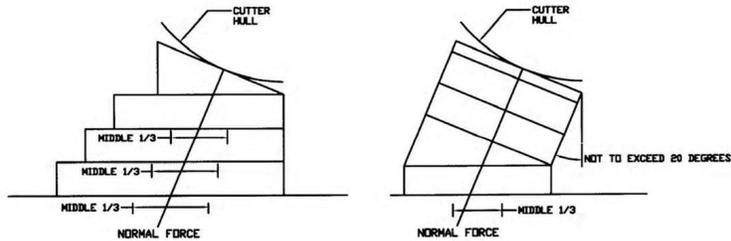
**In cases where cradle fixtures are combined with additional blocks, both must be placed on a permanent solid foundation of uniform composition.**

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### NOT AUTHORIZED

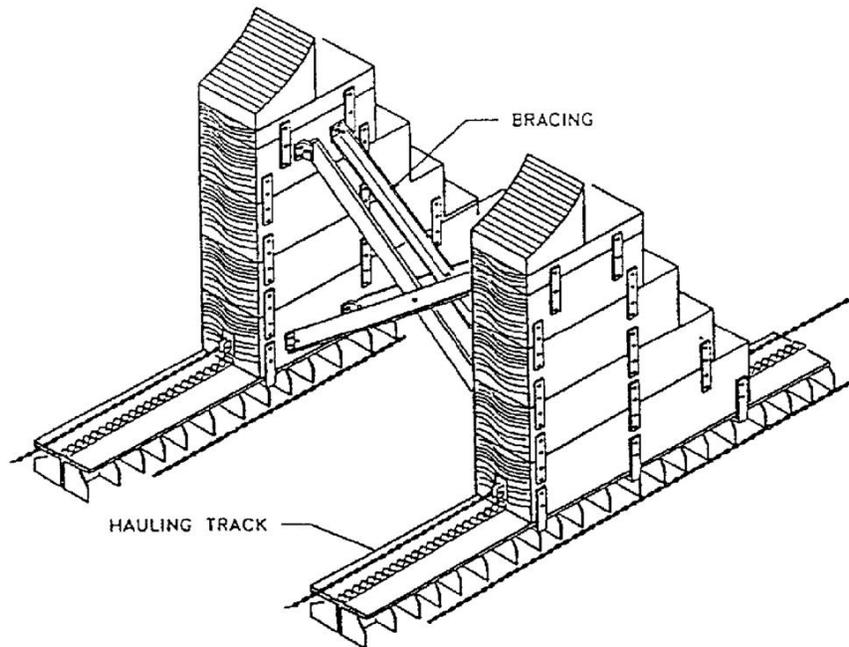
NORMAL FORCE PASSES OUTSIDE MIDDLE 1/3



### AUTHORIZED OPTIONS

NORMAL FORCE PASSES WITHIN MIDDLE 1/3

## Side/bilge block Construction



## Stiffened & Braced Side/bilge blocks

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## Work Item Standards and Specifications (WISS)

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

**PRE-DOCKING CONFERENCE** – This meeting must occur at least 24 hours prior to docking. All of the following must be discussed/performed/provided before concluding this meeting.

5 A block/cradle inspection must be conducted. Instruments used to set block heights and verify block position must not be disturbed until the COR completes the inspection. A benchmark for centerline and baseline must be established. The dock floor must not be considered a baseline unless it can be proven flat, without slope, peaks or depressions. If a lifting cradle is used, that cradle must be inspected on its final foundation. The cradle foundation must not affect the final block height due to any induced twisting or bending from an unlevelled or uneven grade.

10 *DRY DOCKING PROCEDURE DOCUMENTATION* must be provided that describes all stations to be manned and functions to be performed (e.g., line handling, reference point sights over the build, draft readings, watertight integrity checks, casualty and damage control plans of action, etc.).

All information required to complete the PRE-DOCKING CONFERENCE CHECKLIST and the PRE-DOCKING DOCK INSPECTION CHECKLIST shown below must be provided (see DD CHECKLISTS).

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15 **DRY DOCKING PROCEDURE DOCUMENTATION** – At the Pre-Docking Conference, provide to the COR a written dry-docking procedure, which must include the following:

- A short statement of operating procedure, safety requirements, and yard security plans.
- The flooding and pumping plan for a floating dry dock (guidance for preparation of a pumping plan is provided in PUMPING PLAN (CALCS) (863d)).
- Specific list and trim conditions of the vessel during docking.
- Any special precautions or actions required because of characteristics of the docking facility, the vessel, or a combination, e.g. tidal constraints, grade of dock railway.

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25 **UNDOCKING CONFERENCE** – This meeting must occur at least 24 hours prior to undocking and is similar to the *DOCKING CONFERENCE* above; all undocking methods/procedures must be explained to the COR and require COR approval.

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30 **SATISFACTORY UNDOCKING CONDITIONS REPORT** – This is a written report attesting that the following conditions have been met; the COR will verify prior to undocking:

- All transducers are uncovered.
- All zincs are uncovered and free of paint.
- Shaft rope guard and fairwaters are in place.
- All hull opening blanks and plugs are removed.
- All sea chest strainers are bolted in place and lock-wired or otherwise permanently secured, as in the condition before being disturbed.
- All sea valves and waster pieces are properly installed and seated in the closed position.
- All underwater body work has been completed and hull accesses are closed.
- DRY DOCK is free of all debris and blasting material.

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45 **DOCUMENTATION OF DRY DOCKING SIGNIFICANT EVENTS** – This is a report that documents the following information and must be submitted to the COR no later than 48 hours after undocking the vessel.

- The precise time that the vessel's first extremity crossed the dry dock boundary upon docking.
- The precise time that the vessel's last extremity crossed the dry dock boundary upon undocking.
- The forward and aft draft readings just before docking and immediately after undocking.

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- Removal of the temporary closures when the threat to watertight integrity no longer exists.

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**TEMPORARY INSTALLATION AND REMOVAL OF HULL GROUNDING STRAPS** – These are grounding straps that must be temporarily installed to electrically ground the vessel to earth (e.g. using cables to the shore power service grounding bus ashore, etc.) providing personnel shock protection and a safe discharge path for potential lightning strikes. These grounding straps must not be connected to waterborne vessels. These grounding straps are not the return current cables used with electric arc welders. See (074a) for electric arc welding cable requirements.

10

When the vessel is in a floating dry dock both hulls must be electrically bonded together to prevent a potential from developing between them.

15

Grounding cable lugs must be tightly secured to the grounding plates; the lug contact area must be cleaned thoroughly to bare metal, resistance of the connection must not exceed 125 microhms. Total cross sectional area of all ground cables must exceed one million circular mils (1000 kcmil) for each 1000 amperes of shore power capacity per 100 feet of run. Two or more cables connected in parallel may be used to meet cross sectional area requirements. Grounding cables smaller in diameter than 85 MCM (No. 1 AWG) are not permitted. All grounding cables must have completely insulated copper conductors with an insulation resistance value of no less than 0.1 megohm.

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**VESSEL FLEETING SERVICES** – Whenever specified in the SOW, the vessel must be fleeted to another position on the blocks. Pre-docking, docking day, pre-undocking and undocking day events specified herein must be adhered to while conducting the fleeting evolution. This entails floating/undocking the vessel, changing caps on side/bilge blocks to fit hull in next sequential position, and then docking the vessel. In this case cofferdams may be required for any hull opening that is mid-repair at the time of fleeting. Special consideration must be made for the watertight integrity checks during the undocking. Calculations for planned fleeting evolutions (undocking and re-docking) must be submitted along with the initial docking calculations, prior to docking the vessel. If the fleeting evolution is not determined to be required until after docking is complete, the calculations must be submitted at least three (3) business days before fleeting. The calculations must be completed using an estimated loading condition for the vessel at time of fleeting and include the block details for the second blocking position. Should the vessel be fleeted missing any ship's equipment (e.g., small boats, deck machinery or main space machinery, shafts, propellers, etc.) the calculations for fleeting must be revised to suit the existing load conditions at the time of fleeting.

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**DD CHECKLISTS –**

## Work Item Standards and Specifications (WISS)

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<b>PRE-DOCKING CONFERENCE CHECKLIST</b>		
<b>ITEM</b>	<b>SAT</b>	<b>UNSAT</b>
<b>DOCUMENTATION TO BE PROVIDED</b>		
Current Dock Certification		
Operating practices, safety requirements, and yard security plans.		
Docking Calculations		
Blocking Arrangement (If different from docking plan)		
Docking Procedure		
<b>FACILITY SAFETY EQUIPMENT</b>		
Fire alarm locations		
Emergency power		
Emergency ballast/dewatering pumps		
<b>REVIEW</b>		
The flooding and pumping plan for the dry dock. (allowable trim and deflection)		
Specific list, trim and drafts of the vessel during docking. (Grounding, when blocks are hauled) Critical Draft - _____		
GM of ship dock system all phases(Floating DD only - Not less than 5' except on docks of greater than 10,000 LT capacity)		
Block Loading - Trapezoidal, Knuckle		
Any special precautions or actions characteristic to the docking facility, the docked vessel, or a combination.		
High/low water, currents, weather		
Communications plan		
Tug plan		
Cutter entry plan (Line handlers, fenders)		
Cutter clearance above keel blocks, side blocks and other potential obstructions		
Docking position		
Procedure for positioning cutter in dock		
When to secure ship's power		
Use of divers		
Arrange time for block inspection		
Time & Date of Dry Docking _____		
<b>CUTTER CONDITION</b>		
Verify cutter load condition (tanks, drafts, displacement)		
All equipment retracted		
Verify Temporary Services/hookups		
Drafts: FWD_____, MID_____, AFT_____		
Propeller and Rudder Clearances		

## Work Item Standards and Specifications (WISS)

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<b>PRE-DOCKING DOCK INSPECTION CHECKLIST</b>		
ITEM	SAT	UNSAT
<b>FOUNDATION BLOCK - TIMBER</b>		
Check timber for excessive crushing, warping, cracking, rot and degraded material		
Note amount of wear from spiking and dogging		
Evaluate the condition of the interfacing between blocks in the stack		
Note condition of the fasteners in the blocks		
Note arrangements for preventing tripping and floating of blocks		
<b>FOUNDATION BLOCK - CONCRETE</b>		
Structural damage due to over loads		
Corrosion of steel reinforcement		
Concrete for cracking, spalling and exposed rebar		
<b>FOUNDATION BLOCK – STEEL</b>		
Evaluate the loss of steel due to corrosion		
Look for cracks in welds		
Deformed structure		
<b>BLOCKS – GENERAL</b>		
Soft Caps min thickness 2 & no crush		
Spacing & location as per blocking arrangement (+/- 1/2 transversely +/- 1 longitudinally, +/- 1/4 height)		
<b>KEEL BLOCKS</b>		
Sight keel block line for alignment and fit		
Keel block height meets requirement		
Keel Profile applied to keel block offsets		
<b>SIDE/BILGE BLOCKS</b>		
Sight side/bilge block line for alignment and fit		
Side/bilge blocks are required dimensions		
Side/bilge block construction. (Normal force passes through middle 1/3 of all blocks, no gaps, cribbing if over 6')		
<b>MISCELLANEOUS</b>		
Crane clearance		
Check overhead interferences and clearances		
Depth of water (Tide dependent)		
Condition of the working floor for debris, unevenness etc.		
Note mooring system, possibility of streaming		
Note draft/trim devices in use		
Condition of fendering		
Condition of Lifting Straps		

## Work Item Standards and Specifications (WISS)

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<b>DURING &amp; POST DOCKING INSPECTION CHECKLIST</b>		
ITEM	SAT	UNSAT
<b>DURING DOCKING EVOLUTION</b>		
Time & date bow crosses sill. _____, _____		
Cutter came in smoothly. Could it have hit any underwater obstacles?		
Position of the cutter is correct.		
Correct draft of dock when cutter grounds		
Correct drafts of dock & cutter when cutter is landed		
Check for cutter list and alignment		
Correct draft of cutter when side/bilge blocks are hauled		
All side/bilge blocks were hauled fully		
Draft of cutter when setting down on pre-set side/bilge blocks		
Keel Centered on keel blocks (misalignment <6")		
Diver verification of blocks (if required)		
Trim and docking plan being followed		
Damage to blocks (describe below)		
<b>POST DOCKING EVOLUTION</b>		
Proper Contact area (Wedges may be required) If inadequate area refloat (Less than 80%)		
Drafts of dock		
(FWD_____, MID_____, AFT_____)		
Does dock have a hog or sag?		
Are any blocks hitting appendages?		
Any appendages not shown on docking plan or in wrong location?		
Excessive crush of blocks?		
Location: _____		
Verify correct position of cutter on blocks		
Ensure side haul blocks are locked in position		
Damage to cutter (describe below)		

## Work Item Standards and Specifications (WISS)

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<b>PRE-UNDOCKING CONFERENCE CHECKLIST</b>		
<b>ITEM</b>	<b>SAT</b>	<b>UNSAT</b>
<b>DOCUMENTATION TO BE PROVIDED</b>		
Recorded Weight Shifts during availability		
Undocking Calculations		
Undocking Procedure		
<b>UNDOCKING REPORT</b>		
Transducers uncovered		
Zincs uncovered and free of paint		
Shaft rope guard & fairwaters in place		
Hull opening blanks & plugs removed		
Sea chest strainers are bolted in place and lockwired		
Sea valves & waster pieces are properly installed and are in the closed position		
All underwater body work has been completed		
Dock is free of all debris and blasting material		
<b>REVIEW</b>		
The flooding and pumping plan for the dry dock. (allowable trim and deflection)		
Specific list, trim and drafts of the vessel during undocking. (when side blocks are hauled)		
GM of ship dock system all phases(Floating DD only - Not less than 5' except on docks of greater than 10,000 LT capacity)		
High/low water, currents, weather		
Communications plan		
Tug plan		
Temporary services disconnection		
Cutter exit plan (Line handlers, fenders)		
Cutter clearance above keel blocks, side blocks and other potential obstructions		
Pier Location & Temporary services hookup		
Where personnel will be stationed (All hull openings that were worked on)		
Procedure if immediate re-docking is required		
Is ballast required for undocking?		
Time & Date of Undocking _____, _____		
<b>CUTTER CONDITION</b>		
Verify cutter load condition (tanks, drafts, displacement) Perform Tank sounding within 12 hours of undocking.		

**Work Item Standards and Specifications (WISS)**

for Coast Guard Vessel Maintenance and Repair, Surface Forces Logistics Center (SFLC) 5/7/2025

<b>UNDOCKING INSPECTION CHECKLIST</b>		
<b>ITEM</b>	<b>SAT</b>	<b>UNSAT</b>
<b>DURING UNDOCKING EVOLUTION</b>		
All equipment retracted		
Verify Temporary Services/disconnection		
Personnel at hull openings		
Stopped at correct draft for hauling side blocks		
Hauled ALL side blocks FULLY		
Detection of any leaks		
Cutter exited smoothly. Could it have hit any underwater obstacles?		
Time & date bow crosses sill _____, _____		
Drafts: FWD _____, MID _____, AFT _____		
Damage: (describe below)		

(631a "Coatings" ATD | Maintenance Work Item)



## 863b Dry Docking Calculation Requirements

**DOCKMASTER CERTIFICATION** – Dockmaster qualifications must be approved by the Coast Guard prior to dry docking a Coast Guard vessel. This document/resume must provide evidence that the subject “DD Facility” will be supervised and operated by a Dockmaster who possess at least 1 of the following minimum qualifications:

- Has been qualified and has served as a Dockmaster at the same type of “DD Facility” during at least 10 docking/undocking evolutions, of which one has been accomplished within the previous 6 months.
- Has served under a Dockmaster, in an apprentice or assistant role during at least 20 docking/undocking evolutions, of which 10 have been performed at the same type of “DD Facility”, with one docking/undocking evolution conducted within the previous 6 months.
- Has served under a Dockmaster in an apprentice or assistant role during at least 10 docking/undocking evolutions and has served as a Dockmaster at the same type of “DD Facility” for which the individual is qualified during at least 5 docking/undocking evolutions, of which one has been accomplished within the previous 6 months.

(631a “Coatings” ATD | Maintenance Work Item)

**PRE-AWARD DOCKING CALCULATIONS** – This set of calculations must be submitted pre-award and must be based on the vessel’s hydrostatic values described in the SOW (e.g., dry docking work item, Principal Characteristics, etc.); the displacement and Center of Gravity data listed there are conservative estimates based on a vessel classes’ Full Load values, and must not be considered a prediction of the actual vessel load condition at arrival.

The set of required calculation items depends the type of “DD Facility” that will be used to dry dock the vessel; the table below defines the set by mapping each particular “DD Facility” type to the type of calculation item required. Each calculation item is described in Section **863d Calculation Specifications**. All calculations must be prepared by a Naval Architect, or a certified Dockmaster (see DOCKMASTER CERTIFICATION above), or under the supervision of a Professional Engineer. “DD Facility” types not listed do not require *PRE-AWARD DOCKING CALCULATIONS*.

“DD Facility” Type	Required Calculation Items
1 Floating	BLOCKING (CALCS) SYSTEM STABILITY AT PHASE 3 (CALCS) SYSTEM STABILITY AT PHASE 4 (CALCS) SYSTEM STABILITY AT PHASE 5 (CALCS) PUMPING PLAN (CALCS)
2 Graving	BLOCKING (CALCS)
3 Marine Railway	BLOCKING (CALCS)
4 Vertical Lift	BLOCKING (CALCS)
5 Crane/Travel Lift	BLOCKING (CALCS)

*PRE-AWARD DOCKING CALCULATIONS* that were submitted/approved for a prior vessel of the same class may be resubmitted except when the vessel characteristics are significantly different from previously docked vessel and/or the certified capacity of the dry dock has changed.

The following additional items/information must be included in the *PRE-AWARD DOCKING CALCULATIONS* submission, if applicable.

- The “DD Facility” must be rated at greater than or equal to 125% of the weight of the subject vessel (see DRY DOCK CERTIFICATION DOCUMENTATION above). Therefore, if the pre-docking weight of the subject vessel can potentially exceed 80% of the “DD Facility” rating, then, in conjunction with developing docking calculations, liquid and dead loading instructions must be developed and submitted, with resultant VCG, TCG, LCG and GM values; this will demonstrate that the “DD Facility” can safely dry dock the subject vessel. These instructions require Coast Guard review and approval prior to award.

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- All other unique requirements for vessel loading or blocking to suit the "DD Facility" must be provided for review and approval. If circumstances dictate that an alternate blocking plan must be used, the specific details of that plan, including the vertical block offsets and positioning, must be provided for every block that does not fall in a location defined by the vessel's docking plan drawing.

5

(631a "Coatings" ATD | Maintenance Work Item)

**DOCKING CALCULATIONS** – The set of required calculation items depends the type of "DD Facility" that will be used to dry dock the vessel; the table below defines the set by mapping each particular "DD Facility" type to the type of calculation item required. Each calculation item is described in Section **863d Calculation Specifications**. All calculations must be prepared by a Naval Architect, or a certified Dockmaster (see DOCKMASTER CERTIFICATION above), or under the supervision of a Professional Engineer.

10

"DD Facility" Type	Required Calculation Items
1 Floating	BLOCKING (CALCS) STABILITY FOR VESSEL AFLOAT (CALCS) DRAFT AT LANDING (CALCS) STABILITY AT LANDING (CALCS) DRAFT AT INSTABILITY (CALCS) VESSEL'S DRAFT WHEN SIDE BLOCKS ARE HAULED (CALCS) SYSTEM STABILITY AT PHASE 3 (CALCS) SYSTEM STABILITY AT PHASE 4 (CALCS) SYSTEM STABILITY AT PHASE 5 (CALCS) PUMPING PLAN (CALCS)
2 Graving	BLOCKING (CALCS) STABILITY FOR VESSEL AFLOAT (CALCS) DRAFT AT LANDING (CALCS) STABILITY AT LANDING (CALCS) DRAFT AT INSTABILITY (CALCS) VESSEL'S DRAFT WHEN SIDE BLOCKS ARE HAULED (CALCS)
3 Marine Railway	BLOCKING (CALCS) STABILITY FOR VESSEL AFLOAT (CALCS) DRAFT AT LANDING (CALCS) STABILITY AT LANDING (CALCS) DRAFT AT INSTABILITY (CALCS) VESSEL'S DRAFT WHEN SIDE BLOCKS ARE HAULED (CALCS) STABILIZING MOMENT (CALCS)
4 Vertical Lift	BLOCKING (CALCS) STABILITY FOR VESSEL AFLOAT (CALCS) DRAFT AT LANDING (CALCS) STABILITY AT LANDING (CALCS) DRAFT AT INSTABILITY (CALCS) VESSEL'S DRAFT WHEN SIDE BLOCKS ARE HAULED (CALCS) STABILIZING MOMENT (CALCS) CABLE, SLING OR STRAP TENSION (CALCS)
5 Crane/Travel Lift	BLOCKING (CALCS) STABILITY FOR VESSEL AFLOAT (CALCS) CABLE, SLING OR STRAP TENSION (CALCS)

## Work Item Standards and Specifications (WISS)

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5 These calculations must reflect the expected condition of the vessel when it enters the dry dock. Work performed dock side that will affect vessel stability prior to dry-docking must be accounted for in the docking calculations; examples include antennae removal, contractor equipment on-loads, tank emptying, and/or anchor removal, which may be performed by the Contractor and/or the vessel's crew between the time of arrival and before dry-docking.

Data for calculations (e.g., docking plan information/drawings, hydrostatic information, etc.) will be provided by the Coast Guard, vessel Principal Characteristics are listed in the SOW; additional information will be provided upon request.

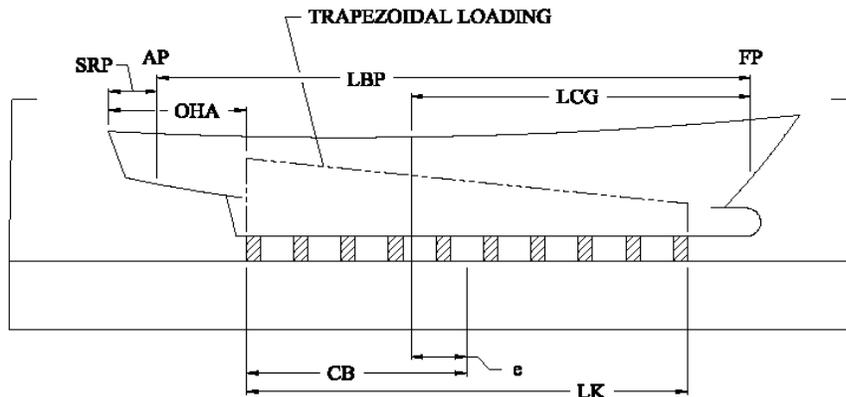
(631a "Coatings" ATD | Maintenance Work Item)

10 UNDOCKING CALCULATIONS – See *DOCKING CALCULATIONS* above. This set of calculations is similar *DOCKING CALCULATIONS* except it must account for all changes to the vessel during the dry dock period that may affect stability during undocking.

(631a "Coatings" ATD | Maintenance Work Item)

### 863c Calculation Specifications

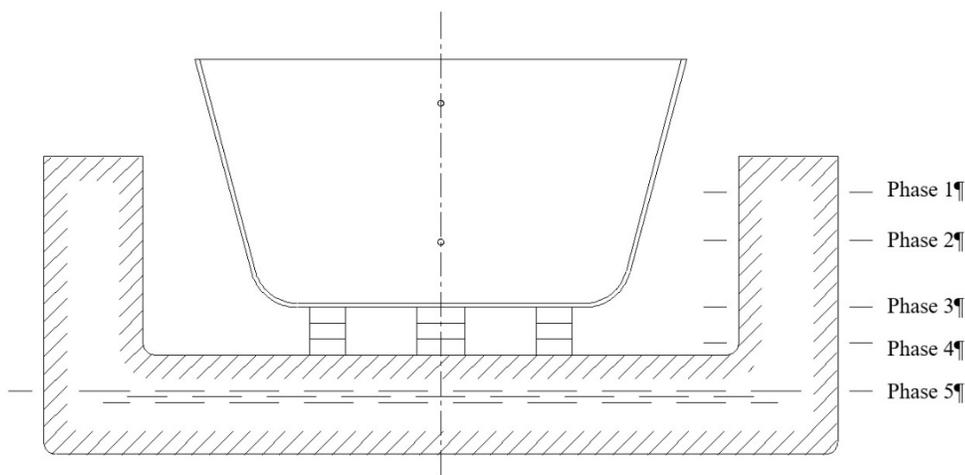
**FIGURE 1  
VESSEL KEY DIMENSIONS**



- LBP** = Length Between Perpendiculars of ship
- SRP** = Distance from after perpendicular (AP) to the point from which distance to the keel blocks is referenced.
- LCG** = distance from forward perpendicular (FP) to ship's longitudinal center of gravity
- OHA** = length of overhang from SRP to first keel block
- LK** = Length of Keel Block
- Cb** =  $Lk/2$  = Distance from the end of the keel blocking to the center of blocking.
- e** =  $CB - (LBP - SRP - LCG - OHA)$  = Eccentricity (Distance from ship's LCG to the center of blocking).

**Note: e may be negative if LCG is FWD of center of blocking; this is acceptable and shifts the maximum trapezoidal load to the bow end of the block line.**

**FIGURE 2**  
**PHASES IN THE DOCKING EVOLUTION FOR STABILITY CALCULATIONS**



Phase 1 – Fully ballasted down condition. In this phase the ship is floating independently and the dry dock is in the submerged condition before the ship bears on the blocks.

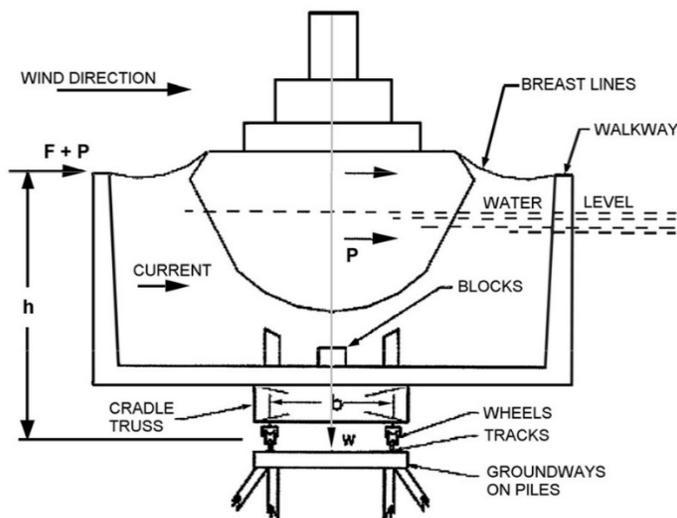
Phase 2 – Partial liftoff. This phase begins as the ship starts bearing on the blocks and part of the ships weight is supported by the floating dock.

Phase 3 – Ship keel at water level. This phase begins when the ship’s keel is about to leave the water plane.

Phase 4 – Top of pontoon at water level. This phase is when the water level between the wing walls is just above the top of the pontoon.

Phase 5 – Normal operating condition. Top of the pontoon is above the water level. Liquid Ballast is at a minimum.

**FIGURE 3**  
**FORCES ON CRADLE DURING DOCKING ON MARINE RAILWAY/SYNCROLIFT**



- h - Height of breast lines above top of tracks
- b - Width of track
- W - Weight of cradle
- F - Wind load
- P - Current load
- F + P - Total load, assumed to be acting at the breast line

**FIGURE 4 - SAMPLE TABLE FOR WATER TO BE REMOVED FROM TANK FOR LIFTING A VESSEL**

		①	②	③	④	⑤	⑥			
Tank	Bulkhead  (Note 1)	Distance from 1 <sup>st</sup> Keel Block to Load Point  (Note 2)	Slope of Load Curve	① * ②	Load / (L <sub>A</sub> - ③)	Distance between load points in ④	Average load per tank: (L <sub>A</sub> +L <sub>F</sub> ) / 2  (Note 3)	Weight per tank: ⑤ * ⑥	Specific volume of water  (Note 4)	Gallons of water to be removed
8	First Keel									
7	8,7									
6	7,6									
5	6,5									
4	5,4									
3	4,3									
2	3,2									
1	2,1									
	Last keel									

Note 1: For shorter keel block lengths, the block may not extend across all tanks. In these cases the first keel block and last keel block are referenced over the tanks on which they are located.

Note 2: Load Points are the First Keel Block; Tank Bulkheads; and Last Keel Block.

Note 3: L<sub>A</sub> = Aft load point over tank; and L<sub>F</sub> = Forward load point over tank.

Note 4: Fresh Water = 269.3 gal/ton; Salt water = 261.8 gal/ton.

**BLOCKING (CALCS)** – The table below lists the types of blocking calculations and the associated requirements. They must be submitted whenever *BLOCKING (CALCS)* are required as applicable to the “DD Facility” type.

Only trapezoidal loading per foot calculations and knuckle loading calculations are required when a “Docking Cradle” or “Lifting Cradle” that was built per Coast Guard Drawings is used to dock a vessel.

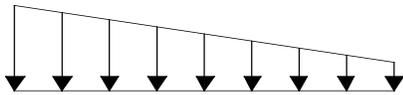
An *Alternate Blocking Arrangement* must be submitted for approval to the COR when the vessel's docking plan does not match the dry dock structural limitations or when the keel/bilge blocks will interfere with scheduled work. Final block positions must be adequately supported from both dock and ship structures. Calculation requirements must be met using the alternate blocking arrangement. The alternate blocking plan must show sufficient detail to build and place the blocks, similar to the standard blocking arrangement. Plans must include the following details:

- block dimensions (length, width, and vertical height offsets to each corner and intermediate point)
- block locations and/or spacing from a known and measurable baseline (for example: vessel centerline and stern reference point)
- block materials and construction details
- location of hull penetrations, appendages or other obstructions that must be avoided when blocking
- special notes for block construction including required bracing or wedging.

If underwater hull work will cause timber stresses in excess of the values specified below additional keel and/or side blocks must be proposed, accepted, and added prior to performing that work; adding blocks require an *Alternate Blocking Arrangement*.

### Trapezoidal (L Tons / ft)

Trapezoidal loading along the keel line. This is distributed load bearing along the keel line and into the structure of the dry dock floor. Typically it is trapezoidal in nature due to the trim on the vessel. Generally the longitudinal center of gravity (LCG) of the vessel is aft of amidships, therefore the majority of load is applied aft. This trapezoidal loading is compared against the docking facility's maximum rated loading (LT/ft) from the facility certification package.



$$\text{Trapezoidal Load (LT/ft)} = \left( \frac{\Delta}{L_k} \right) \pm \left( \frac{6\Delta e}{L_k^2} \right)$$

where:

$\Delta$  = (LT) Vessel Displacement (From Curves of Form)

$L_k$  - (ft) Length of supported keel (calculated)

$e$  = eccentricity = distance from center of  $L_k$  to the vessel LCG (calculated)

**See Figure 1 above.**

### Trapezoidal (L Tons / ft) when using a cradle

For vessels utilizing a cradle, the distributed load bearing along the keel line and into the structure of the dry dock floor has two parts-the loading per foot experienced by the cradle for a given vessel's loading condition, and the weight of the cradle. The loading on the cradle is typically distributed along bilge blocks. In some cases, as with the 110 WPB, additional blocks are constructed after the vessel docks in the cradle. For the trapezoidal loading calculation for vessels using a cradle, the length of the supported keel must be considered the length along the vessel that is supported by the cradle.

$$\text{Trapezoidal Load (LT/ft) with Cradle} = \left( \left( \frac{\Delta}{L_k} \right) \pm \left( \frac{6\Delta e}{L_k^2} \right) \right) + \left( \frac{W_c}{L_c} \right)$$

where:

$\Delta$  = (LT) Vessel Displacement (From Curves of Form)

$L_k$  - (ft) Length of supported keel (calculated)

$e$  = eccentricity = distance from center of  $L_k$  to the vessel LCG (calculated)

$W_c$  = (LT) Weight of Cradle

$L_c$  = (ft) Length of Cradle

### Knuckle load (L Tons).

When docking a vessel that has trim or design drag (typically down by the stern), there is a knuckle load applied on the first keel block and an equal knuckle reaction ( $R_{kn}$ ) created on the vessel as the keel touches at landing. This load is applied as a pivot point that rotates about the block at the point of touch down as the cutter lands on the blocks. This first block, which may be called the knuckle block (KB), will be at the extreme end of the keel line. Its location either Forward or Aft, depends on the trim of the vessel entering the dock. This load is typically seen on keel blocks, however, if no keel blocks are present then the knuckle load will be bearing on the first pair of side blocks. The knuckle load bearing on the keel block and subsequently through to the dock floor. This knuckle load increases as the buoyancy forces are taken off the vessel hull and as the vessel lands completely along the keel line. The knuckle load (LT) should be converted into a pressure based on the area of the contacting blocks to ensure the blocks are not compromised by this additional load, by comparing the knuckle pressure to the block timber stress limits.

$$\text{Knuckle Load Reaction, } R_{kn} \text{ (LT)} = \frac{MTI'' * trim * 12}{k * X_{kn}}$$

where:

MT1" = (ft-LT) Moment to Trim 1" (from Curves of Form or Hydrostatics)

trim = (ft) Trim between vessel keel and keel blocks (should include trim of dock and vessel drag)

k = overhang constant = 0.94 for large overhang or 0.97 for short overhang

$X_{kn}$  = (ft) Calculated distance from outer edge of the first block to make contact with the vessel, the knuckle block (KB) to the vessel LCF (Value of LCF from Curves of Form or Hydrostatics).

Knuckle Load Pressure (psi) =  $R_{kn} / A_{KB}$

Where:

$A_{KB}$  = (in<sup>2</sup>) Area of knuckle block, the first block(s) to make contact with the hull

### Side Blocks

The number of side blocks required to meet seismic and hurricane overturning moments with dead loads included at 15% of total load.

$M_S = (\Delta / g) * a * KG * 2240$

where:

$M_S$  = (ft-LT) Seismic Moment

$\Delta$  = (LT) Vessel Displacement (from Curves of Form)

g = Acceleration of gravity = 32.2 ft/sec<sup>2</sup>

a = 0.2 \* g

KG = (ft) Vessel's afloat vertical center of gravity (from stability book, incline test, DC Book)

$M_H = A_{Sail} * Sail_{Ht} * (0.004) * V^2$

where:

$M_H$  = (ft-LT) Hurricane Moment

$A_{Sail}$  = (ft<sup>2</sup>) Sail are of vessel exposed to wind forces (calculated)

$Sail_{Ht}$  = (ft) Height of the Center of the Sail Area (calculated)

V = (knots) Velocity of wind Force (typically use 110 knots)

If  $M_H > M_S$ , use  $M_H$ ; If  $M_S > M_H$ , use  $M_S$ .

$N_2 = M_{H/S} / (A_S * S_P * L_2)$

Where:

$N_2$  = Number of side blocks required to resist seismic or hurricane forces

$A_S$  = (in<sup>2</sup>) effective contact area for one side block (calculated)

$S_P$  = (psi) Strength proportional limit of cap timber (typically 800 psi)

$L_2$  = (ft) Average half breadth of side blocks (from Docking Plan or Block Arrangement)

$N_1 = [(N_2 * A_S) + (DL * 2240 / S_P)] / A_S$

Where:

$N_1$  = Number of side blocks on one side

DL = (LT) Dead Load on one set of side blocks =  $\Delta * 0.075$

$N_s = N_1 * 2 =$  Total Number of side blocks required to support the entire ship's dead load plus seismic or hurricane overturning forces

**Bearing area**

Total bearing area (side blocks + keel blocks) on hull and total distributed load throughout blocking build (psi). This bearing area must consider the effective contact area of each block (e.g. if a 24 inch by 24 inch keel block is being used under a vessel with a 6 inch wide keel; the effective area is only 6 inches x 24 inches, not the entire upper surface of the block).

Bearing Area (in<sup>2</sup>) =  $(N_k * A_k) + (N_s * A_s)$

where:

$N_k$  = Total number of Keel Blocks (from docking plan)

$A_k$  = (in<sup>2</sup>) Effective contact area for one keel block (from docking plan)

$N_s$  = Total number of side blocks (calculated above, or actual number from docking plan)

$A_s$  = (in<sup>2</sup>) Effective contact area for one side block (from docking plan)

Distributed Load =  $2240 * \Delta /$  Bearing Area

where:

$\Delta$  = (LT) Vessel Displacement (from Curves of Form)

Bearing Area = (in<sup>2</sup>) Total bearing Area (calculated)

**Timber stress**

Provide the safe allowable block timber stresses. The permissible compressive stress, listed below, must be used when considering side and keel block bearing loads applied to the blocking. The proportional limit loads are to be used when calculating the block stress due to overturning moments.

WOOD PROPERTIES			
Block Material	Permissible Compressive Stress Perpendicular to the grain (psi)	Permissible Compressive Stress Parallel to the grain (psi)	Proportional limit Perpendicular to the grain (psi)
SOFTWOOD			
Douglas Fir	400	1400	800
Yellow Pine	300	900	700
HARDWOOD			
Red & White Oak	600	1300	1300

**STABILITY FOR VESSEL AFLOAT (CALCS)** – Stability calculations for the vessel and vessel/dock combined system, as applicable, must include the KG, KM, and GM (stability index), in addition to drafts (estimated drafts for pre-arrival, actual arrival drafts for docking, and predicted drafts for undocking) and corresponding displacement values.

**DRAFT AT LANDING (CALCS)** – The draft at landing, for a vessel with trim (typically down by the stern), must be calculated to ensure the bow has fully landed prior to slacking mooring lines and hauling side blocks. As the force exerted by the keel block at the knuckle point takes on the weight (displacement) of the vessel and the buoyancy forces are reduced, the waterline along the length of the vessel's hull will recede as if it has fully landed, this is prior to the bow actually landing. This reaction can create a "false landing" effect and if acted upon, by slacking the handling lines and/or hauling side blocks too early, can cause the blocks to be positioned incorrectly on the hull.

$D_i = D_m - [R_{kn} / (12 * TPI)]$

Where:

$D_i$  = (ft) Draft at Landing

$D_m$  = (ft) Mean draft of vessel at docking

$R_{kn}$  = (LT) Knuckle Reaction (calculated)

$TPI$  = (LT/in)Tons per inch immersion (from Curves of Form or Hydrostatics)

To ensure safety, draft at landing must be calculated to ensure it is no less than one (1) foot above the calculated draft at instability. In cases where this requirement may not be met, whether due to damage to the hull, emergency docking, etc., precautions for line handling and hauling blocks must be put into the docking procedure to ensure that the vessel's stability is maintained during the evolution. The precautions must be discussed at the predocking conference and approved by the KO.

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**STABILITY AT LANDING (CALCS)** – Stability at landing must be calculated to ensure the vessel maintains adequate stability during the docking evolution. At landing the effect of the force from the keel blocks on the vessel is essentially the same as reducing the weight of the vessel at the keel level. This effectively reduces the vessel’s GM (stability index) during the landing.

$$GM_{corr} = KM - [(\Delta * KG) / (\Delta - R_{kn})]$$

Where:

$GM_{corr}$  = (ft) Corrected transverse metacentric height (stability index) at landing

KM = (ft) Vessel’s afloat metacentric height above the keel at mean draft (from Curves of Form)

$\Delta$  = (LT) Vessel Displacement (from Curves of Form)

KG = (ft) Vessel’s afloat vertical center of gravity (from Stability book, incline test, or DC Book)

$R_{kn}$  = (LT) Knuckle Reaction (calculated)

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**DRAFT AT INSTABILITY (CALCS)** – The draft at instability for the vessel must be included in the calculations. After the vessel’s keel has landed, the waterline on the hull continues to recede. As the weight of the vessel continues to increase on the keel blocks and buoyancy forces reduce, the effective GM (stability index) continues to decrease. At the draft at instability the vessel’s virtual GM is equal to zero (0) feet. The vessel may take on an appreciable angle of list at this draft.

To calculate the draft at instability, hydrostatic data from several drafts both greater and less than the mean draft must be required. Start with the mean draft of the vessel afloat, then use a draft of one foot above through 2 ft below the mean draft, e.g.  $D_m = 5$  ft, use data points for drafts at 6 ft, 5 ft, 4 ft, and 3 ft. Using the Curves of Form collect data points for LCF, MT1, Displacement, and KM.

Next determine  $X_{kn}$ , the distance from edge of Knuckle Block (KB) to the LCF, for each of the drafts (**See Figure 2 above**).

Then determine  $R_{kn}$ , the knuckle reaction, as calculated above, for each of the drafts.

Next determine the moment of residual buoyancy for each of the drafts using the equation below;

$$M_{RB} = (D - R_{kn}) * KM$$

Where:

$M_{RB}$  = (ft-LT) Moment of residual buoyancy at each draft

$\Delta$  = (LT) Vessel Displacement (from Curves of Form)

$R_{kn}$  = (LT) Knuckle Reaction (calculated)

KM = (ft) Metacentric height at each draft (from Curves of Form)

Now, plot the  $M_{RB}$  (x - axis) versus Draft (y - axis) and a linear best fit line through all data points.

Then determine  $M_{GZ}$ , the vessel’s afloat righting moment, a single point, using the equation below;

$$M_{GZ} = \Delta * KG$$

Where:

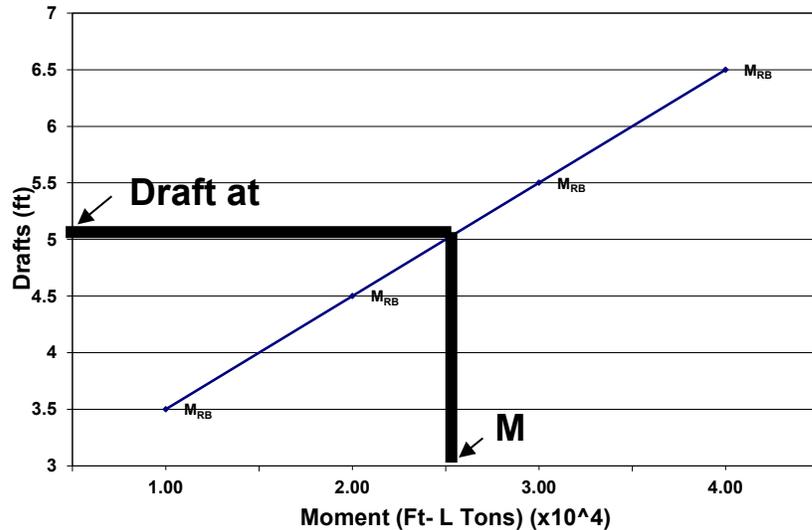
$M_{GZ}$  = (ft-LT) Righting Moment

$\Delta$  = (LT) Vessel’s afloat Displacement at time of docking (from Curves of Form)

KG = (ft) Vessel’s afloat vertical center of gravity (from Stability book, Incline test, or DC Book)

Now, plot the point for the resultant  $M_{GZ}$ , using the  $M_{RB}$  scale on the x - axis. Then draw a line over to the corresponding draft on the y - axis for the draft at instability. Below is an example of the graph.

## Moment vs. Draft (EXAMPLE)



To ensure safety, draft at landing must be calculated to ensure it is no less than one (1) foot above the calculated draft at instability. In cases where this requirement may not be met, whether due to damage to the hull, emergency docking, etc., precautions for line handling and hauling blocks must be put into the docking procedure to ensure that the vessel's stability is maintained during the evolution. The precautions must be discussed at the predocking conference and approved by the KO.

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**VESSEL'S DRAFT WHEN SIDE BLOCKS ARE HAULED (CALCS)** - When using hauled side blocks hauling must occur after the keel is fully landed and while the vessel's GM is a minimum of one (1) foot. The vessel's draft at the time of hauling blocks must be at least 6 inches above the calculated draft at instability, so that there is full contact between all block caps and the hull well in advance of the draft at instability.

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**SYSTEM STABILITY AT PHASE 3 (CALCS)** - See PUMPING PLAN (CALCS) below.

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**SYSTEM STABILITY AT PHASE 4 (CALCS)** - See PUMPING PLAN (CALCS) below.

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**SYSTEM STABILITY AT PHASE 5 (CALCS)** - See PUMPING PLAN (CALCS) below.

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**PUMPING PLAN (CALCS)** - a pumping plan must be created and submitted as a prerequisite for docking a Coast Guard vessel in a floating dock. The pumping plan must be developed for, at minimum, all five stages shown in Figure 2 above.

Calculations must demonstrate that the ship-dock system complies with the minimum GM requirements for the Ship/Dock system through all portions of the planned lift:

- Less than 10,000 LT Minimum GM of 5.0 feet
- 10,000 to 15,000 LT minimum GM of 4.8 feet.
- 15,000 to 20,000 LT minimum GM of 4.5 feet.
- 20,000 to 25,000 LT minimum GM of 4.3 feet.
- 25,000 to 30,000 LT minimum GM of 4.1 feet.
- 30,000 to 35,000 LT minimum GM of 3.9 feet.
- 35,000 to 40,000 LT minimum GM of 3.7 feet.
- 40,000 to 45,000 LT minimum GM of 3.4 feet
- Greater than 50,000 LT minimum GM of 3.28 feet.

The plan must detail the dry dock tank levels for each phase of required stability calculations. Each tank is dewatered in proportion to the load distributed above the tank. Pressing up or emptying dock ballast tanks non-proportionally to obtain adequate GM, by minimizing free surface effect, is not acceptable.

The plan must satisfy the following objectives (**see Figures 1, 2, and 3 above**):

- The dock must have the required lifting capacity to lift the vessel in its desired longitudinal position with respect to the dock, taking into account the residual silt and water in the tank.
- During the docking evolution, neither the vessel by itself nor the vessel dock combination must become unstable.
- Structural integrity of the dock must be maintained during the dry-docking evolution.
- Longitudinal bending moment and the deflection must remain within the acceptable range.
- In case of multi-section docks, the connections must not be overstressed.
- Bulkheads forming the tank boundaries must not be overstressed because of excessive differential loading.
- Blocking must not be overloaded, with special consideration at the knuckle block load.

The plan must define:

- The tank water levels after completion of dry-docking.
- Water levels in the tanks at intermediate drafts of the dry dock at which vessel stability status must be checked.
- Observation to be made in the vessel at intermediate drafts.
- Deflection gauge readings and draft boards to be checked at the intermediate drafts.
- Tank water levels and dock drafts must represent with the values that will be observed at the time of docking; for example: tank sounding depths instead of % full or water volumes.

These steps must be followed in preparation of a pumping plan:

- Examination of vessel data, including its docking drawing, curves of form and inclining experiment or stability report.
- Examination of the vessel survey provided by the COR or vessel CO/OIC, including information on variable loads, vessel's drafts, and abnormalities (such as heavy lifts, trim, or hull damage).
- Calculation of the vessel's displacement and LCG at the time of docking, using arrival draft readings. Calculation of required changes to the variable loads onboard the vessel to correct for list, trim, and excessive free surface effects. Calculations must include stability considerations described above.
- Dock survey, to determine effects of accumulated silt in tanks on available lifting capacity.
- Examination of the required blocking arrangement, to determine the longitudinal location of the vessel with respect to the dock and its center of gravity above the pontoon deck and structural supports.

If strength and stability requirements are not violated, the amount of water that must be removed from each tank may be calculated in advance. Be aware that a calculated pumping plan is for guidance only. The Dockmaster must monitor the dock deflection and drafts during the evolution to ensure that the limits are not exceeded and account for the critical phases of operation. For large or sectional dry docks or when docking a vessel with extremely high loading at one end, bending moments between tanks or dock sections must be considered in preparing the pumping plan.

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**STABILIZING MOMENT (CALCS)** - For marine railways, building ways and vertical lifts, additional calculations must be submitted for both overturning and stabilizing moments. It must be shown that the stabilizing moment is at least 25% greater than the overturning moment, including wind and current forces.

When the vessel is moored to a movable cradle (In-water overturning); the stabilizing moment due to the cradle must exceed the overturning force of the vessel prior to mooring (See the illustration below). Calculation must include both the wind and current forces. If the vessel is lifted by a cradle; but the vessel is moored to a fixed pier or other structure; this calculation is not required.

Overtuning Moment on Cradle (In - Water)

$$M_o = [h * (F + P)] / 2240$$

where:

$M_o$  = (ft - L Tons) Overtuning Moment

$h$  = (ft) Height of breast lines above the top of the track

$F$  = (lbs) Force of the wind =  $0.004 * V^2 * A$

where:

$V$  = (knots) Velocity of the wind forecast for docking

$A$  = (ft<sup>2</sup>) Sail area of the vessel

$P$  = (lbs) Force of the current =  $2.835 * V^2 * A$

where:

$V$  = (knots) Velocity of the current forecast for docking

$A$  = (ft<sup>2</sup>) Underwater area of the vessel being pushed by current

Stabalizing Moment of cradle (In - Water)

$$M_{stab} = \left( \frac{(W / 2240) * b}{2} \right)$$

where:

$M_{stab}$  = (ft - L Tons) Stabalizing Moment

$W$  = (lbs) Weight of the cradle

$b$  = (ft) Width of the track

$$M_{stab} > 1.25 * M_o$$

Once the vessel is lifted and if the vessel is blocked on a moveable cradle (Out-of-water overturning), the stabilizing moment due to the cradle must exceed the overturning force of the wind.

Overtuning Moment on Cradle (Out - of - Water)

$$M_o = [h * (F + P)] / 2240$$

where:

$$M_o = A_{Sail} * h_{Sail} * (0.004) * V^2$$

where:

$M_o$  = (ft - lbs) Wind Overtuning moment

$A_{Sail}$  = (sqft) Sail area of the vessel and Blocking exposed to the wind forces (calculated)

$h_{Sail}$  = (ft) Height of the center of the sail area above ground level (calculated)

$V$  = (knot) Velocity of the wind force (typically use 110 knots)

Stabalizing Moment of cradle (Out - of - Water)

$$M_{stab} = \left( \frac{(W / 2240) * b}{2} \right)$$

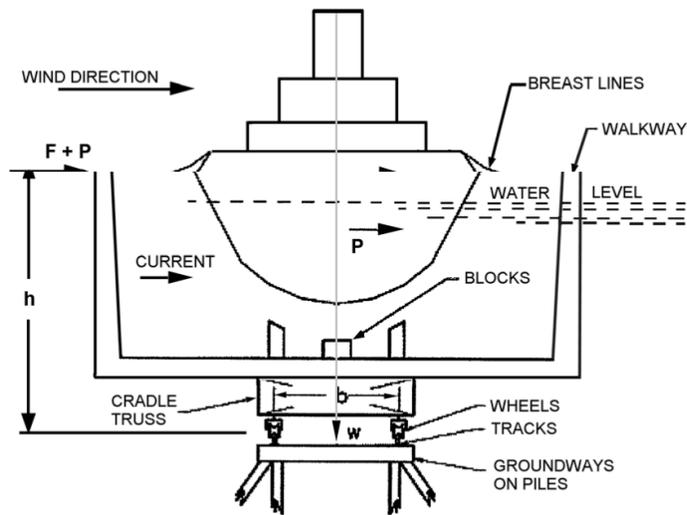
where:

$M_{stab}$  = (ft - L Tons) Stabalizing Moment

$W$  = (lbs) Weight of the cradle and lifted vessel

$b$  = (ft) Width of the cradle tracks/wheels

$$M_{stab} > 1.25 * M_o$$



- h** - Height of breast lines above top of tracks
- b** - Width of track
- W** - Weight of cradle
- F** - Wind load
- P** - Current load
- F + P** - Total load, assumed to be acting at the breast line

**CABLE, SLING OR STRAP TENSION (CALCS)** - For vertical lifts and cranes that do not have load monitoring devices, the Contractor must calculate the load on each strap or lifting cable. All strap loads must be within 20% of each other. The weight distribution of the vessel must be considered for the lift. The lifting slings/straps must be placed symmetrically about the vessel's LCG. When lifting the vessel and buoyancy forces are off the hull, the weight of the vessel must be as equally distributed as practicable between the forward and aft slings/straps.

## 863a Temporary Services

**SHORE-TIE ELECTRICAL POWER TEST PROCEDURE** - This is a test procedure that must be performed prior to plugging in shore-tie cabling to the cutter's receptacle(s), perform the following:

- Using a 500 VDC insulation resistance tester, measure and log the insulation resistance readings on each cable between each pair of phase conductors and between each phase and ground. The insulation resistance of each cable must be no less than 500 kilohms.
- Prior to performing energized testing establish an electrical safety area at the cutter-end of each shore tie cable. Provide appropriate protection from falling and sprayed liquids during the tests.
- Open or remove the protective cover and place each shore tie cable plug on dry insulated matting.
- Energize each cable from the shore power source and verify that all three line-to-line voltages, when measured at the vessel's switchboard, are between 97% and 105% of the nominal value given in Table III, except that one of the no load readings may be as much as 107% of nominal.
- Momentarily energize a test lamp between any two phases of one shore power cable to verify operability for the tests below. The test lamp must consist of one or more series connected incandescent bulbs with an optional step down transformer. The voltage and power ratings of all components must be suitable for visually detecting the presence of shore power voltage without false indications from capacitive coupling.
- For cutters without an on-board shore power isolation transformer, connect the test lamp between any shore power cable phase and a known low resistance earth ground. The test lamp must not glow. If the test lamp glows, then shore power cannot be connected to the cutter until the ground is cleared and the test is performed satisfactorily.
- When more than one shore power cable is to be connected to the cutter, verify that the test lamp does not illuminate when connected between the phase A pin of one shore power cable plug and the phase A pin on each of the other plugs when tested one at a time. Perform this check with either the phase B or phase C pins. If the lamp illuminates at anytime during this test, then correct the phasing at the source end of the affected cable(s) and perform the test of this paragraph in its entirety.
- Momentarily energize the test lamp between any two phases of a shore power cable to verify that it was operable during the tests above.

- De-energize each shore power cable and disestablish the electrical safety area.
- Verify that each in-hull shore power circuit breaker is open. Plug in each shore power cable to the cutter, ensuring that all locking devices are properly latched. Energize the shore tie and verify correct phase rotation using the installed switchboard metering. If phase rotation is incorrect, de-energize shore power, reverse the same two phases on each shore power cable, and repeat all testing steps described above.
- After transferring all shipboard electrical loads to shore power, verify the following parameters using installed metering:
  - o All three steady state line to line voltage pairs meet all Shore-tie Electrical Power Standards and Specifications.
  - o Phase currents are balanced as expected from prior operating history and are within the ampacity of the shore power cabling.
  - o If the shore power source is not derived from an electric utility, steady state line frequency must be between 58.2 and 61.8 Hz. The frequency of electric utility furnished power need not be verified.

(General Requirements (All Contracts))

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**TEMPORARY INSTALLATION AND REMOVAL OF HULL GROUNDING STRAPS** – These are grounding straps that must be temporarily installed to electrically ground the vessel to earth (e.g. using cables to the shore power service grounding bus ashore, etc.) providing personnel shock protection and a safe discharge path for potential lightning strikes. These grounding straps must not be connected to waterborne vessels. These grounding straps are not the return current cables used with electric arc welders.

When the vessel is in a floating dry dock both hulls must be electrically bonded together to prevent a potential from developing between them.

Grounding cable lugs must be tightly secured to the grounding plates; the lug contact area must be cleaned thoroughly to bare metal, resistance of the connection must not exceed 125 microhms. Total cross sectional area of all ground cables must exceed one million circular mils (1000 kcmil) for each 1000 amperes of shore power capacity per 100 feet of run. Two or more cables connected in parallel may be used to meet cross sectional area requirements. Grounding cables smaller in diameter than 85 MCM (No. 1 AWG) are not permitted. All grounding cables must have completely insulated copper conductors with an insulation resistance value of no less than 0.1 megohm.

(General Requirements (All Contracts))

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**TEMPORARY VESSEL HABITABILITY SERVICES** – These are all of the temporary services that are provided when shipboard system are taken down to perform maintenance such as:

- Ship service power (ship service diesel generators, emergency generators, etc.)
- Firemain water
- Main engine cooling water (MSW)
- Auxiliary cooling water (ASW), for HVAC, etc.

Whenever these systems must be taken down for maintenance, equivalent services must be provided as designated in the SOW (what the vessel crew will need pending various circumstances e.g., who/when/where will be living and/or working onboard, etc.)

Based on the needs for these systems/services specified in the work item, describe in the TEMPORARY SERVICES PLAN (863a) how these services will be provided.

These services should be provided in the most economical manor available.

(General Requirements (All Contracts))

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**TEMPORARY SERVICES PLAN** – This is a description of how temporary services (e.g., ship service power, firemain water, etc.) will be provided after critical systems have been taken-down/disabled/de-energized for maintenance.

The SOW will describe the temporary services that will or may be needed during the performance period.

The plan must include a complete description of how the services will be provided (e.g., a description of the shore-tie connection cable/jack, a description of adequate power/flow/pressure rating, a description of connection compatibility with existing shipboard connection points, etc.).

This plan must be approved by the COR before connecting services.

(General Requirements (This Contract))

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**TEMPORARY EXTERNAL SANITARY FACILITIES AND JANITORIAL SERVICES** – Each temporary sanitary facility must be within a five minute walk of the vessel. Each temporary sanitary facility must have a keyed lock on the outside and be lockable from the inside via a sliding latch or similar mechanism. Male and female facilities must be separate.

Each shower stall must be equipped with privacy screens and must provide fresh hot and cold water.. Each sink must provide fresh hot and cold water. A GFI Electrical convenience receptacle compliant with NFPA 70 and National Electric Code (NEC) must be located in close proximity of each sink. Each toilet must have a door and privacy dividers. Each locker must be "lockable" via a hasp or similar mechanism.

Each temporary sanitary facility must be equipped with filtered ventilation and must have locally installed adjustable temperature controls for heating and air conditioning that will maintain the facility's interior temperature between 65 and 78 deg F.

Each temporary sanitary facility must be cleaned at least once a day to include at a minimum: trash removal, restocking of consumables (e.g. toilet paper, soap, light bulbs, etc.), cleaning of all toilets/sinks/showers/floor, all necessary maintenance and repairs (e.g., unclogging toilets/drains, piping repairs, etc.).

Each portable toilet must be located as close as practicable to the vessel not to exceed 100 yards and must be similarly cleaned/restocked/maintained as described above.

(General Requirements (This Contract))

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**OFFICE SPACE WITH JANITORIAL SERVICES** - When an office space is provided for Coast Guard personnel use, it must:

- Comply with International Code Council (ICC)/International Building Code (IBC) and ICC/International Fire Code (IFC) requirements.
- Be located within the primary service provider's facility and no more than ¼ mile from the vessel.
- Have overhead lighting and electrical convenience receptacles sufficient for performing office and administrative work and for powering electronic and electrical equipment. Quantity and placement of the receptacle outlets shall be in accordance with NFPA 70.
- Have heating, filtered ventilation, and air conditioning that will maintain temperatures in the 65-to-75-degree Fahrenheit range, max 50% relative humidity.
- Have locks on all doors that enter the office space. Provide at least two door keys to the Coast Guard.
- Contain at least one 10ft X 10ft minimum private office, inside the larger office space, with a separate locking door.
- Include janitorial services provided on a nightly basis, Monday - Friday, to empty trash and clean floors.
- Be furnished with uninterrupted Broadband Internet Service (i.e. minimum data transfer speeds of 25 Mbps download and 3 Mbps upload) for the duration of the contract performance period, via a multi-port Ethernet switch feeding all required internet lines (e.g., to each office computer furnished, to each required vessel internet line, etc.). The Ethernet connection must use Cat-5 Network cable with RJ-45 connectors/plugs. Upload and download speeds will be measured Ethernet switch. IT support for all equipment/services must be provided.
- Contain the following office items in the quantities specified in the SOW:
  - Desk. Each is accompanied with an ergonomic high back, wheeled, adjustable, straight back chair. Each must be furnished with office supplies (e.g. paper, pens, pencils, highlighters, corrective fluid or tape, binders, tape and dispensers, etc.)
  - Computer/monitor. The computer must have a 24" min flat screen monitor and must be connected to Broadband Internet Service.
  - Lateral filing cabinet. Each has a minimum of 4 drawers, and furnished manila file folders, hanging file folders, and printable file labels.
  - Copier/Printer/FAX/Scanner and supplies. Each is a network-enabled, "All in One" Color Copy Machine, Printer, facsimile (FAX), and Scanner (Snapscan Model S1500 or equivalent) machine, capable of multiple sheet feed, duplexing (double sided copies), sorting, collating, and stapling. Compatible with plain paper letter, legal, and ledger size (11x17). All associated consumable items (e.g. paper, toner cartridges, etc.) must be replenished daily for the duration of the contract performance period.
  - Color laser printer. Each capable of printing letter and legal size. In addition, all associated consumable items (e.g., paper, toner, etc.) must be replenished daily for the duration of the contract performance period.
  - Shredder. Each is a high capacity, cross-cut, compliant with government confidentiality regulations in the general open office area.
  - Dry erase board. Each must be 4ft x 6ft, dry erase markers, to fit above mentioned file cabinet(s), , hole punches, staplers, 3-month view planning wall calendars, etc.
  - Office Telephone. Each with an independent extension number and 24-hour unlimited direct dial local service. Lines may be routed through the Contractor's switchboard.

- Include a kitchenette inside the office space containing following items in the quantities specified in the SOW:
  - Refrigerator. Minimum 3.5 cu ft.
  - Microwave oven. Minimum 0.8 cu ft capacity
  - water cooler with bottled water
  - Coffee mess. Including coffee maker, coffee, sugar, creamer, and hot and cold 10 oz cups. All associated consumable items must be replenished daily.
- Include restroom facilities for project personnel use, within 2 minutes walking distance of the office space. Provide daily janitorial/cleaning services and consumable item (e.g., toilet paper, hand soap, paper towels, etc.) replenishment services for all restrooms. The restroom facilities must be separated to provide Male/Female/Multi-gender toilets in the minimum quantities specified in the SOW, and each restroom must contain at least one sink (with hand soap, paper towels, and waste paper basket), a mirror, a chair/bench, and a means to facilitate privacy for changing (e.g., lockable door, or stalls, or privacy screen, etc.).
- Include shipboard temporary communications in the quantities specified in the SOW:
  - Shipboard Telephone Line. Each with an independent extension number and 24 hour unlimited direct dial local service. Unless otherwise specified, each line must connect to the telecom and computer communications receptacle (e.g., RusselStoll SKW 12-Pin, etc.).
  - Shipboard Internet Line. Unless otherwise specified, Broadband Internet Service must connect to the vessel's telecom and computer communications receptacle (e.g., RusselStoll SKW 12-Pin, etc.).

(Temporary Services Work Item)

**TEMPORARY EXTERNAL DUTY SECTION BERTHING** - When duty section berthing is provided for Coast Guard personnel use, it must:

- Have separate male and female berthing spaces in the quantities specified in the work item.
- Be an enclosed, permanent, or semi-permanent berthing facility, located as close as practicable to the vessel and any toilet and shower facilities provided, but no further than a three-minute walk to either.
- Meet or exceed the building and fire requirements specified in ICC/IBC and ICC/IFC.
- Include a twin-size bed, for each occupant, equipped with an individual locker that can be padlocked. Bunk beds are acceptable, with an individual locker that can be padlocked for each bed.
- Have overhead lighting and electrical power provided, with a minimum of one 20-ampere, 120 volt, grounding-type receptacle outlet, in accordance with NFPA 70.
- Be equipped with filtered HVAC, to maintain temperatures in the 65 to 75 degree Fahrenheit range; include local climate control for the occupant(s).
- Have a lock installed in each berthing area entrance; provide at least two keys for each lock to the Coast Guard.
- Have an installed, audible and visual alarm in the berthing facility that can be actuated from the vessel's quarterdeck in the event of a shipboard emergency.
- Include janitorial services provided on a daily basis; cleaning, trash removal, etc.

## 863b Temporary Access Openings

### Configuration Item Classes

Particular vessel configuration items designated in the SOW may belong to one or more the classes described below; determine the applicable classes, then conform to the corresponding requirements for those classes as they apply to the tasks designated in the SOW.

Class	Definition
"Access Cut"	<i>Access Cuts</i> (sometimes referred to as access plates) are those sections of plating removed and later reinstalled for access and installation or removal of equipment. Access plates do not involve cutting of hull frames.
"Closure Plate"	Similar to large <i>Access Cuts</i> wherein at least one transverse frame is cut.

**PROPOSAL FOR TEMPORARY HULL ACCESS CUTS** – This is a complete description of one or more proposed temporary "Access Cuts" (863c). They must be designed to minimize impact on hull strength to the greatest

practicable extent (e.g. avoid long cuts along strake boundaries, avoid cuts through major transverse framing, avoid cuts in the flat keel, etc.). Proposals must include one legible sketch/drawing of each proposed access. Each sketch/drawing must incorporate the following:

- A full description of the structural members that will be removed/reinstalled (e.g. structure type i.e. shell/deck/bulkhead/etc., material thicknesses, material type/grade, etc.) and plans for removal/reinstallation of any interferences.
- Plan/section/elevation sketch views showing the shape of the access opening, any temporary structural reinforcement that will be installed to prevent distortion of ship's structure, and all relevant dimensions (e.g. distance to existing deck, ship's baseline, frames, centerline, longitudinals, deck-edges, adjacent penetrations, bulkheads, existing weld joints within 12 inches of the proposed cut, etc.).
- Welding details and procedures for removal and reinstallation of access "Closure Plates" (863c) (e.g. weld sequence, weld joint designs, materials used, and descriptions of any permanent or temporary weld backing straps or ceramic backing materials, etc.). "Closure Plate" (863c) weld joints must be full penetration and 100% efficient. Other welds joints in "Primary Hull Structure" (100a) and watertight boundaries must be full penetration and must not have permanent backing straps.
- Descriptions of any cutback of existing welds forming the boundary of the access cut and the welding sequence for (re)installation of the "Closure Plate" (863c).
- Descriptions of all nondestructive inspections and structural boundary tests that will be performed to prove satisfactory restoration.

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## 863a Towing

Reserved

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## 864a Assist Ship's Force

Reserved

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## 864b Gas Freeing Spaces

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**SAFE ENTRY AND HOT WORK CERTIFICATION SERVICES** – These services include precautions for safe entry into confined/enclosed spaces and safe hot work, and the maintenance of safe conditions and warning signs. [29 CFR 1915 Subpart B - Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment](#)

Before entering a tank, void, and any other confined or enclosed space; and before performing manual cleaning and other cold work, the space must be tested and certified *SAFE FOR WORKERS* in accordance with 29 CFR 1915.11-13.

Before performing hot work in a confined or enclosed space, compartment below deck, and on a vessel component, the the space or component must be certified *SAFE FOR HOT WORK* in accordance with 29 CFR 1915.14 and 1915.51-54. [29 CFR 1915 Subpart D Welding, Cutting and Heating](#)

Safe conditions must be maintained in accordance with 29 CFR 1915.15; testing must be performed, as often as necessary, and all necessary measures (e.g., opening, cleaning, ventilating, etc.) must be taken to maintain the safe conditions for the duration of the work being performed. Marine Chemist Certificates, Shipyard Competent Person Log of Inspections, and suitable warning signs and labels must be posted in view of all affected employees, in accordance with 29 CFR 1915.16.

Gas Free Certificates indicating the current status of all affected compartments must be posted on the Quarterdeck and at each open access to the affected compartments.

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## 865a Firewatch Services

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**FIRE WATCH SUPPLIES/SERVICES** – These are supplies/services that include providing trained fire watch personnel and all associated gear (e.g. fire extinguishers, PPE, etc.); all must conform to NFPA 312, Chapter 2. These personnel must be provided for all hot work and whenever required by law or regulation. All gear must be fully maintained and functioning. All fire extinguishers must be fully maintained, free of defects, and fully charged/re-charged after use. The SOW will designate what part, if any, of the supplies/services the Coast Guard will provide.

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## 868a Sea Trials

**DOCK AND SEA TRIALS** – These are tests and inspections that must be conducted while the vessel is underway.

Schedule adequate time to perform *Dock and Sea Trial* inspections and tests in the PLANNING DOCUMENT (000c). Perform the inspections and tests required to get underway and that are most appropriately performed while underway during that time. Provide a pier facility or allow the vessel to move to a Coast Guard pier to support dock trials. Do not conduct tests that require the vessel to be waterborne unless the vessel is waterborne. See the “General Requirements (This Contract)” work item for additional requirements pertaining to the particular contract.

**SEA TRIAL AGENDA** – Ensure the agenda:

- Consists of chronological list of administrative events, inspection events and test events. Events must be arranged to permit expeditious conduct with minimum interference between concurrent events. Mutually compatible events may be scheduled simultaneously.
- Identifies installation of any test equipment or component modification that could impact the normal operation of equipment or systems during performance of the trials.
- Identifies any operating instructions or special test procedures that could impact the normal operations of equipment or systems.
- Includes the full name, title, security clearance, home address, home telephone number and name of next of kin of each Contractor-personnel scheduled to ride the ship during performance of the trials.

Examples of dock trials include conducting cold (pre-light off) and hot checks, cycling machinery (rudders, BPU, turning gear, fin stabilizers), and conducting any post-docking shaft alignment verification checks. This time may also be used to on-load fuel, if needed for operations.

The conditions of the trials will be determined largely by the character of the work that has been performed in each case, and as designated by the COR. A full power trial should be run at this time unless the COR elects to defer this run until all new machinery parts are run-in or the training status of the crew permits full power operation without undue hazard.

This examination may be conducted by the Engineer Officer of the ship, in which case he will report the results of the examination to the COR, fully describing any defects or improper conditions found.

Representatives of manufacturers who have furnished ship components may be invited to witness trials subject to approval of the CO or OINC of the ship.