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NVIC 04-17  
February 16, 2017

NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 04-17

Subj: GUIDELINES ON QUALIFICATION FOR NATIONAL AND STCW  
ENDORSEMENTS FOR SERVICE AS ASSISTANT ENGINEER AND  
OFFICER IN CHARGE OF AN ENGINEERING WATCH ON OFFSHORE  
SUPPLY VESSELS

Ref: (a) International Convention on Standards of Training, Certification and Watchkeeping  
for Seafarers, 1978, as amended (STCW), incorporated into regulations at 46 CFR  
11.102

1. PURPOSE. This Navigation and Vessel Inspection Circular (NVIC) provides guidance on qualification for and renewal of national officer and STCW endorsements for service as Assistant Engineer and Officer in Charge of an Engineering Watch (OICEW) on offshore supply vessels (OSVs).
2. ACTION. The Coast Guard will use this NVIC and Title 46 Code of Federal Regulations (CFR) Sections 11.329 and 11.555 to establish whether mariners are qualified to hold national officer and STCW endorsements authorizing service as engineering officers on OSVs. Officers in Charge, Marine Inspection (OCMIs) should bring this NVIC to the attention of the maritime industry within their zones of responsibility.
3. DIRECTIVES AFFECTED. National Maritime Center (NMC) Policy Letter 7-00 is cancelled.
4. BACKGROUND/DISCUSSION.
  - a. The International Maritime Organization (IMO) amended the STCW Convention and STCW Code on June 25, 2010. These amendments entered into force for all ratifying countries, including the United States, on January 1, 2012.

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- b. The Convention is not self-implementing; therefore, the U.S., as a signatory to the STCW Convention, initiated regulatory changes to ensure full implementation of the amendments to the STCW Convention and STCW Code. The U.S. implements these provisions under the Convention and under the authority of the United States Code, Titles 33 and 46. The Coast Guard published a final rule in the Federal Register on December 24, 2013 (78 FR 77796) that implements the STCW Convention and STCW Code, including the 2010 amendments. This rule also made changes to qualification requirements for national endorsements, including those for service on OSVs. This rule became effective on March 24, 2014. The Coast Guard is publishing this NVIC to provide guidance on complying with these regulations and is cancelling previous policy.
  - c. The Coast Guard recognizes the operational requirements of OSVs and that some operations and requirements applicable to other classes of vessels may not apply to OSVs. Using the authority described in 46 CFR 11.201(l); 11.301(f); 11.329(d); and 11.555(e) the Coast Guard has modified some of the requirements for merchant mariner credentials for engineering officers that will be limited to service on OSVs.
  - d. The Coast Guard is extending the period during which mariners may qualify for STCW endorsements as OICEW limited to service on OSVs under previous regulations and policies until January 1, 2018. Mariners may qualify for national endorsements limited to service on OSVs under previous regulations and policies until March 24, 2019. Additional guidance is provided in Enclosure (1).
5. DISCLAIMER. This guidance is not a substitute for applicable legal requirements, nor is it itself a regulation. It is not intended to, nor does it impose legally-binding requirements on any party. It represents the Coast Guard's current thinking on this topic and is issued for guidance purposes to outline methods of best practice for compliance with the applicable law. You can use an alternative approach if the approach satisfies the requirements of the applicable statutes and regulations.
6. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.
- a. The development of this NVIC and the general policies contained within it have been thoroughly reviewed by the originating office, and are categorically excluded (CE) under current USCG CE # 33 from further environmental analysis, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1 (series). Because this NVIC implements, without substantive change, the applicable Commandant Instruction or other federal agency regulations, procedures, manuals, and other guidance documents, Coast Guard categorical exclusion #33 is appropriate.
  - b. This NVIC will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policies in this NVIC must be individually evaluated for

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compliance with the National Environmental Policy Act (NEPA), DHS and Coast Guard NEPA policy, and compliance with all other environmental mandates.

7. DISTRIBUTION. No paper distribution will be made of this NVIC. An electronic version will be located at <http://www.uscg.mil/hq/cg5/nvic>.
8. RECORDS MANAGEMENT CONSIDERATIONS. This NVIC has been thoroughly reviewed during the directives clearance process, and it has been determined there are no further records scheduling requirements, in accordance with the Federal Records Act (44 U.S.C. 3101 et seq.), NARA requirements, and the Information and Life Cycle Management Manual, COMDTINST M5212.12 (series). This policy does not create significant or substantial change to existing records management requirements.
9. FORMS/REPORTS. None.
10. REQUEST FOR CHANGES. All requests for changes and questions regarding implementation of this NVIC should be directed to the Mariner Credentialing Program Policy Division (CG-MMC-2), at (202) 372-2357 or [MMCPolicy@uscg.mil](mailto:MMCPolicy@uscg.mil). To obtain approval for an OSV training and assessment program, contact the NMC at [IAskNMC@uscg.mil](mailto:IAskNMC@uscg.mil) or (888) 427-5662

P. F. THOMAS  
Rear Admiral, U. S. Coast Guard  
Assistant Commandant for Prevention Policy

- Encl: (1) Qualification Requirements for National and STCW Endorsements for Service as Assistant Engineer and Officer in Charge of an Engineering Watch on Offshore Supply Vessels
- (2) Assessment Guidelines for Officer in Charge of an Engineering Watch in a Manned Engine-Room or Designated Duty Engineer in a Periodically Unmanned Engine-Room on Vessels Powered by Main Propulsion Machinery of 750 kW/1,000 HP Propulsion Power or More Limited to Service on Offshore Supply Vessels
  - (3) Record of Assessment for Officer in Charge of an Engineering Watch Limited to Service on Offshore Supply Vessels

**QUALIFICATION REQUIREMENTS FOR NATIONAL AND STCW  
ENDORSEMENTS FOR SERVICE AS ASSISTANT ENGINEER AND OFFICER IN  
CHARGE OF AN ENGINEERING WATCH ON OFFSHORE SUPPLY VESSELS**

1. **GENERAL.** This enclosure provides guidance to qualify for national and STCW endorsements for service as Assistant Engineer and Officer in Charge of an Engineering Watch (OICEW) on offshore supply vessels (OSVs).
2. **NATIONAL ENDORSEMENT.** The national endorsement of Assistant Engineer of Offshore Supply Vessels will be issued without tonnage limitations. This endorsement authorizes service on OSVs of any tonnage, subject to any propulsion power and propulsion mode limitations on their endorsement.
  - a. **Sea service.** As is specified in 46 CFR 11.555, the service required to qualify for a national officer endorsement as Assistant Engineer (OSV) is as follows:
    - 1) The minimum service required to qualify for an endorsement as Assistant Engineer (OSV) of Unlimited Propulsion Power is either:
      - A) Three years of service in the engine room. Eighteen months of this service must have been as a qualified member of the engine department (QMED) or equivalent position; or
      - B) One year of total service as part of an approved or accepted Assistant Engineer (OSV) training program.
    - 2) The minimum service required to qualify an applicant for an endorsement as Assistant Engineer of Offshore Supply Vessels of Less Than 4,000 HP/3,000 kW is 2 years of service in the engine room. One year of this service must have been as a QMED or equivalent position.
    - 3) Assistant Engineer of Offshore Supply Vessels of Less Than 1,000 HP/750 kW is 1 year of service in the engine room. Six months of this service must have been as a QMED or equivalent position.
  - b. **Training.** To qualify for a national officer endorsement as Assistant Engineer (OSV), mariners must provide evidence of successful completion of the following training:
    - 1) First Aid and CPR (46 CFR 11.201(i)). If this training was previously completed for another endorsement it need not be re-taken. Holding an endorsement that required this training will be satisfactory evidence that the training was completed; and
    - 2) Basic and Advanced Firefighting (46 CFR 11.201(h)(2)(v)). This training must have been completed within the past 5 years, or if it was completed more than 5 years before the date of application, the applicant must provide evidence of maintaining the standard of competence as specified in 46 CFR 11.302(b) and 11.303(b).

- c. Propulsion modes. Mariners may qualify for specific propulsion modes under the general requirements applicable to all national engineer officer endorsements specified in 46 CFR 11.502.
- d. Propulsion power limitations. Propulsion power limitations may be applied and removed in accordance with 46 CFR 11.503.

3. STCW ENDORSEMENT.

- a. As is specified in 46 CFR 11.329(d), the Coast Guard may exempt an applicant from meeting any individual knowledge, understanding, and proficiency required in Section A-III/1 of the STCW Code. Under this authority, mariners may qualify for an OICEW endorsement that will be limited to service on OSVs by providing evidence of:
  - 1) Service. Meeting the service requirements in 46 CFR 11.329(a)(1), as follows:
    - A) At least 36 months of seagoing service in the engine department. Experience gained in the deck department may be creditable for up to 3 months of this service; or
    - B) At least 12 months of workshop skill training and seagoing service as part of an approved training program that meets the requirements of Section A-III/1 of the STCW Code;
  - 2) Engine Room Watchkeeping Duties. Having performed, during the required seagoing service, engine room watchkeeping duties, under the supervision of an officer holding the STCW endorsement as chief engineer officer or as a qualified engineer officer, for a period of not less than 6 months. Since many vessels do not have manned engine rooms, experience with engine room maintenance which includes duties under the direct supervision of the Chief Engineer, Second Engineer Officer/First Assistant Engineer, and/or the officer in charge of the watch may be substituted for watch keeping experience;
  - 3) Standard of Competence. Meeting the standard of competence in Section A-III/1 of the STCW Code (incorporated by reference, see 46 CFR 11.102) as applicable to OSVs; and
  - 4) Training. Successful completion of Coast Guard approved or Coast Guard accepted training for:
    - A) Medical First-Aid Provider;
    - B) Basic and Advanced Firefighting. If this training was completed more than 5 years before the date of application, the applicant must provide evidence of maintaining the standard of competence as specified in 46 CFR 11.302(b) and 11.303(b);

- C) Proficiency in Survival Craft and Rescue Boats Other Than Fast Rescue Boats (PSC) or Proficiency in Survival Craft and Rescue Boats Other Than Lifeboats and Fast Rescue Boats (PSC-Limited);
  - D) Engineroom Resource Management (ERM);
  - E) Auxiliary Machinery;
  - F) Motor Plants;
  - G) Electrical Machinery and Basic Electronics; and
  - H) Control Systems.
- b. To remove the limitation to OSVs, mariners must meet all requirements in 46 CFR 11.329 for the OICEW endorsement without a limitation to OSVs. This will require the mariner to complete the tasks in NVIC 17-14 that are not included in or are identified as specific to OSVs in Enclosure (2) of this NVIC.
  - c. To qualify for an STCW endorsement as OICEW, mariners must provide evidence of meeting the standard of competence for Basic Training (46 CFR 11.302) and Advanced Firefighting (46 CFR 11.303). If this training was completed more than 5 years before the date of application, the applicant must provide evidence of maintaining the standard of competence as specified in 46 CFR 11.302(b) and 11.303(b).
4. GRANDFATHERING.
- a. Mariners who hold national endorsements as Engineer (OSV) and STCW endorsements for OICEW limited to OSVs of not more than 500 GRT/3,000 GT based on the statutory limits on OSVs before October 15, 2010, will have the tonnage limitations on their endorsements that are limited to service on OSVs removed on their next credential transaction to authorize service as Assistant Engineer and/or OICEW on any OSV (46 CFR 11.551). Any propulsion power and/or propulsion mode limitations will remain. In addition, the limitation on the STCW endorsement restricting it to service on OSVs will remain, unless the mariner meets all requirements for an OICEW endorsement that is not trade-restricted. Any propulsion power or propulsion mode limitations will also remain on the endorsement(s).
  - b. Mariners who hold national Engineer (OSV) and STCW endorsements for OICEW limited to near coastal domestic voyages will have this route limitation removed on their next credential transaction. The limitation on the STCW endorsement restricting it to service on OSVs will remain, unless the mariner meets all requirements for an OICEW endorsement that is not restricted to service on OSVs.
  - c. Under previous policy, mariners could qualify for national and STCW endorsements as Engineer (OSV) and OICEW limited to OSVs by holding an endorsement for Assistant Engineer (Limited). Mariners may continue to qualify under previous regulations and policy as follows:

- 1) Mariners may qualify for a national officer endorsement as Assistant Engineer (OSV) until March 24, 2019, by holding or qualifying for a national endorsement as Assistant Engineer (Limited) or Designated Duty Engineer of Unlimited Propulsion Power (DDE-Unlimited) based on service and/or training that began before March 24, 2014. It is not necessary to have held an endorsement as Assistant Engineer (Limited) or DDE-Unlimited before March 24, 2014, it is only necessary to have begun the service or training for that endorsement before that date. No further service, examination, or training for Assistant Engineer (OSV) is required.
  - 2) Mariners may qualify for an STCW endorsement as OICEW with a limitation to service on OSVs until December 31, 2017, by holding or qualifying for a national endorsement as Assistant Engineer (Limited) and providing evidence of completion of the following:
    - A) Basic Training. If this training was completed more than 5 years before the date of application, the applicant must provide evidence of maintaining the standard of competence as specified in 46 CFR 11.302(b);
    - B) Advanced Firefighting. If this training was completed more than 5 years before the date of application, the applicant must provide evidence of maintaining the standard of competence as specified in 46 CFR 11.303(b); and
    - C) Approved OSV assessment program for Engineer/OICEW.
  - d. In order to remove a limitation to service on OSVs from an OICEW endorsement, mariners must meet all requirements for OICEW in 46 CFR 11.329 that were not met previously. This will require the mariner to complete the tasks in NVIC 17-14 that are not included in or are identified as being specific to OSVs in Enclosure (2) of this NVIC.
5. RENEWAL OF ENDORSEMENTS.
- a. To renew a national officer endorsement, mariners must meet the applicable requirements in 46 CFR 10.227.
  - b. To renew an STCW endorsement as OICEW mariners must meet the applicable requirements to renew their national endorsements in 46 CFR 10.227 and provide evidence of:
    - 1) Meeting the standard of competence for Leadership and Teamworking Skills. This may be done by successfully completing assessment nos. 16.1.A through 16.4.A in Enclosure (2);
    - 2) Completion of approved or accepted training for ERM;
    - 3) Maintaining the standard of competence in:
      - A) Basic Training as specified in 46 CFR 11.301(b)(2);

- B) Advanced Firefighting as specified in 46 CFR 11.301(c)(2); and
- 4) Seafarers serving as Lifeboatman must also provide evidence of maintaining the standard of competence for Proficiency in Survival Craft (46 CFR 12.613) or Proficiency in Survival Craft-Limited (46 CFR 12.615), as appropriate.



**Assessment Guidelines for Officer in Charge of an Engineering Watch in a Manned Engine-Room or Designated Duty Engineer in a Periodically Unmanned Engine-Room on Vessels Powered by Main Propulsion Machinery of 750 kW/1,000 HP Propulsion Power or More Limited to Service on Offshore Supply Vessels**

**Standard of Competence**

As specified in 46 CFR 11.329(a)(3), every candidate for an endorsement as Officer in Charge of an Engineering Watch in a Manned Engine-Room or Designated Duty Engineer in a Periodically Unmanned Engine-Room on Vessels Powered by Main Propulsion Machinery of 750 kW/1,000 HP, including an endorsement that is limited to service on offshore supply vessels (OSVs), must provide evidence of having achieved the required standard of competence specified in Table A-III/1 of the STCW Code. The table below is adopted from Table A-III/1 of the STCW Code to assist the candidate and assessor in the demonstration of competency.

**Practical Skill Demonstrations**

These assessment guidelines establish the conditions under which the assessment will occur, the performance or behavior the candidate is to accomplish, and the standards against which the performance is measured. In addition, the unique requirements of different equipment manufacturers for operating, maintenance, and repair; the different generations and configurations of systems; and the specific nature of shipboard installations did not permit the development of detailed performance criteria. As a result, many of the criteria in these guidelines call for direct reference to the manufacturers' instructions, recommendations and specifications, or the ship's standard operating procedures, to determine whether the candidate's actions were appropriate, complete, timely, and executed in the proper sequence.

**Qualified Assessors**

A shipboard Qualified Assessor (QA) who witnesses a practical assessment may sign the appropriate blocks and pages in the Record of Assessment in Enclosure (3) or an equivalent record. All assessments must be signed by a qualified assessor approved by the Coast Guard in accordance with 46 CFR 10.405. In order to facilitate the transition to this new requirement, the Coast Guard will accept assessments that have been demonstrated in the presence of, and signed by, an assessor who has not been Coast Guard approved until December 31, 2017, provided that the assessor meets the professional requirements in 46 CFR 10.405(a)(3) to assess competence for the specific endorsement. Assessors must be in possession of the level of endorsement, or other professional credential, which provides proof that he or she has attained a level of experience and qualification equal or superior to the relevant level of knowledge, skills, and abilities to be assessed (46 CFR 10.405(a)(3)). In the interim, the Coast Guard will accept assessments signed by mariners who hold an appropriate national endorsement and have at least 1 year of experience as Chief Engineer and/or Second Engineer Officer/First Assistant Engineer on vessels of the applicable propulsion mode(s) of at least 750 kW/1,000 HP. For assessments signed on a military vessel, the assessor should be authorized to conduct similar assessments for the U.S. Navy or U.S. Coast Guard Personnel Qualification Standard (PQS) for underway officer of the engineering watch (EOOW). After December 31, 2017, QAs must be approved by the National Maritime Center to conduct the assessment (46 CFR 10.405). Qualified military personnel need not be approved QAs and may continue to sign assessments after December 31, 2017.

*Successful completion of these guidelines will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to OSVs. The use of these guidelines is not mandatory and alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.*

Enclosure (2) to NVIC 04-17

**Notes:**

The following notes are used in the “Task No.” column of the assessment table that follows:

- All* The assessment is required for all OICEW endorsements regardless of any limitations for propulsion mode and/or vessel equipment.
- Steam* The assessment is required for an endorsement valid for steam propelled vessels.
- GT* The assessment is required for an endorsement valid for gas turbine propelled vessels.
- Motor* The assessment is required for an endorsement valid for motor propelled vessels.
- Note 1* A candidate who does not perform this task may receive an endorsement that is limited to motor and/or gas-turbine propelled vessels without distilling plants.
- Note 2* A candidate who does not perform this task may receive an endorsement that is limited to motor and/or gas-turbine propelled vessels without waste-heat or auxiliary boilers.
- Note 3* This assessment is the same or equivalent to one for an endorsement that is not trade-restricted, and need not be repeated to remove the limitation to OSVs.
- OSV* The assessment is specific to OSVs, and another assessment of the KUP is needed for an endorsement that is not limited to OSVs. For an endorsement that will be limited to OSVs, the identically numbered assessment from NVIC 17-14 for the endorsement that is not limited to OSVs may be substituted for this assessment.
- Course* The assessment is satisfied by completing the specified approved course.

Numbering gaps in the sequence of assessments are intentional to allow easy correlation to corresponding assessments for endorsements that are not limited to service on OSVs.

*Successful completion of these guidelines will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to OSVs. The use of these guidelines is not mandatory and alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.*

**Assessment Guidelines for Officer in Charge of an Engineering Watch in a Manned Engine-Room or Designated Duty Engineer in a Periodically Unmanned Engine-Room on Vessels Powered by Main Propulsion Machinery of 750 kW/1,000 HP Propulsion Power or More Limited to Service on Offshore Supply Vessels**

Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.1.A <i>All Note 3</i>	Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch, including:  .1 Duties associated with taking over and accepting a watch	On a vessel of at least 1,000 HP at sea, on a simulator, or in a laboratory,	the candidate conducts an inspection of machinery spaces before taking over the engine room watch.	The candidate:  1. Correctly determines, describes, and reports the status or condition of the main and auxiliary machinery (including fuel, lubricating oil, cooling water, and support systems), control systems, indicating panels, and communication systems;  2. Correctly determines, describes, and reports the status and condition of the steering system and all associated gear;  3. Correctly determines, describes, and reports the condition of the bilges with respect to water level and contamination; and  4. Takes proper action to prevent safety and pollution violations.
1.1.B <i>Motor Note 3</i>	Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch, including:  Routine duties undertaken during a watch	On a motor vessel of at least 1,000 HP at sea, on a simulator, or in a laboratory,	the candidate assumes and keeps the watch in accordance with STCW Code (A-VIII/2 part 3-2), describing each step and makes necessary inspections and site visits required to understand and verify the status of the watch and machinery.	The candidate:  1. Reads and understands all standing orders and special instructions;  2. Identifies work being performed, and identifies and describes personnel involved and potential hazards in the engine room;  3. Conducts a complete round of the plant, inspecting all lubricating-oil levels and adding lube-oil as necessary;  4. Records pertinent system, equipment and machinery pressures and temperatures;  <i>Continued on next page</i>

*Successful completion of these guidelines will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to OSVs. The use of these guidelines is not mandatory and alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.*

Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.1.B <i>Cont'd</i>  <i>Motor Note 3</i>					<p style="text-align: right;"><i>Continued from previous page</i></p> <p>5. Ensures that:</p> <ul style="list-style-type: none"> <li>a. The water level in the freshwater expansion tank for main and auxiliary engine is half-full;</li> <li>b. The level or capacity in the settler and day tanks, main engine lube-oil, auxiliary engine lube-oil, and lube-oil storage tanks and potable and distilled-water tanks are within minimum and maximum limits and notes any transfers in progress;</li> <li>c. Refrigeration machinery operating parameters are monitored and recorded;</li> <li>d. Air conditioning machinery operating parameters are monitored and recorded;</li> <li>e. Potable and non-potable water systems hydro-pneumatic tank water levels are maintained at approximately half-full and the air charge pressures are maintained at recommended levels;</li> <li>f. Ship service air compressor lube-oil levels and compressed air system operating parameters are monitored, recorded, and maintained within the normal range;</li> <li>g. Ship service air compressor lube-oil level is within the normal range, recording the ship service system air compressor air discharge temperature and cooling inlet/outlet temperatures and air flask pressure;</li> </ul> <p style="text-align: right;"><i>Continued on next page</i></p>

*Successful completion of these guidelines will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to OSVs. The use of these guidelines is not mandatory and alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.*

Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.1.B <i>Cont'd</i>  <i>Motor Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ul style="list-style-type: none"> <li>h. The moisture from the ship service system air compressor intercooler, air moisture separating device, and air flasks/receiver is drained;</li> <li>i. The electricity generating plant voltage, current, power, power factor, and frequency are inspected;</li> <li>j. Engine lubricating oil conditioning equipment (including purifiers and filtration equipment) operating parameters are monitored and recorded;</li> <li>k. Waste-oil tank level is monitored and recorded;</li> <li>l. Sea temperature is recorded;</li> <li>m. Bilge-water holding tank soundings are recorded;</li> <li>n. Stern-tube bearing lubrication operating parameters are monitored and recorded;</li> <li>o. Compressed air is made available on deck in support of vessel operational requirements;</li> <li>p. Engine-room and cargo-hold bilge wells have been de-watered the according to level, draft, and heel of the vessel;</li> <li>q. Wash water is made available on deck in support of vessel operational requirements;</li> <li>r. All required entries have been appropriately made in the engine room log book; and</li> </ul> <p>6. Answers maneuvering orders in engine-room control; and</p> <p>7. Takes proper action to prevent safety and pollution violations.</p>

*Successful completion of these guidelines will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to OSVs. The use of these guidelines is not mandatory and alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.*

Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.1.B.1  <i>Note 1 OSV</i>	Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch, including:  Routine duties undertaken during a watch	On a motor vessel of at least 1,000 HP fitted with a de-salinization or distilling plant while keeping a watch at sea, on a simulator, or in a laboratory	the candidate monitors the de-salinization or distilling plant.	The candidate: <ol style="list-style-type: none"> <li>1. Monitors and records all de-salinization or distilling plant pressures, pressure drops, vacuums;</li> <li>2. Monitors the salinity panel and records distillate or permeate salinities as appropriate and determines the destination of distillate or permeate (tank on fill);</li> <li>3. Ensures that all operating parameters are within manufacturer recommendations and immediately investigates the cause in the eventuality of a high salinity alarm; and</li> <li>4. Notifies the watch engineer of any unsafe or unusual conditions.</li> </ol>
1.1.C  <i>Steam Note 3</i>	Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch, including:  .2 Routine duties undertaken during a watch	On a steam vessel of at least 1,000 HP at sea, on a simulator, or in a laboratory,	the candidate assumes and keeps the watch in accordance with STCW Code Section A-VIII/2 part 3-2, describing each step and making all necessary inspections and site visits required to understand and verify the status of the watch and machinery.	The candidate: <ol style="list-style-type: none"> <li>1. Reads and understands all standing orders and special instructions;</li> <li>2. Identifies work being performed, and identifies and describes personnel involved and potential hazards in the engine room;</li> <li>3. Conducts a complete round of the plant, inspecting all lubricating-oil levels and adding lube-oil as necessary;</li> <li>4. Records pertinent system, equipment and machinery pressures and temperatures;</li> </ol> <p style="text-align: center;"><i>Continued on next page</i></p>

*Successful completion of these guidelines will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to OSVs. The use of these guidelines is not mandatory and alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.*

Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.1.C <i>Cont'd</i>  <i>Steam</i> <i>Note 3</i>					5. Inspects and records: <ol style="list-style-type: none"> <li>a. The level in the fuel oil settling tank;</li> <li>b. The level in main engine lube-oil sump, ship's service turbo generator sump, and lube-oil storage tank;</li> <li>c. The main boiler steam pressures and temperatures, forced draft fan pressures, uptake pressure and temperature, fuel-oil and feed pump discharge pressures, de-aerating feed tank pressure and temperature; condensate temperature, bleed steam pressures, etc;</li> <li>d. The available potable, make-up feed, and reserved feedwater tanks;</li> <li>e. Refrigeration compressor suction and discharge pressures and temperatures; and thaw, meat, freeze, vegetable, and dairy box temperatures;</li> <li>f. Air conditioning compressor suction and discharge pressures and temperatures, chill water cooler circulating pump discharge pressure, and outlet and return temperatures;</li> <li>g. That the potable water and sanitary systems hydro-pneumatic tanks water level are at half-full and the air charge is at the recommended pressure with the pump cycled off;</li> <li>h. That the ship service system and control air compressor lube-oil levels are within the normal range on the dipstick, recording the each compressed air system pressure;</li> <li>i. That moisture from compressed air systems moisture separating device and air receivers are drained;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

*Successful completion of these guidelines will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to OSVs. The use of these guidelines is not mandatory and alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.*

Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.1.C <i>Cont'd</i>  <i>Steam</i> <i>Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ul style="list-style-type: none"> <li>j. Generator amps, kVA, and frequency;</li> <li>k. Lube-oil centrifuge oil input pressure and temperature;</li> <li>l. Waste-oil tank level;</li> <li>m. Saltwater evaporator feed, saltwater cooling and air conditioning/refrigeration system saltwater supply pump discharge pressures, if so equipped;</li> <li>n. Sea temperature;</li> <li>o. Bilge-water holding tank has been sounded and recorded;</li> <li>p. Stern-tube supply pump discharge pressure and temperature;</li> <li>q. That the engine-room and cargo-hold bilge wells have been de-watered according to level, draft, and heel of the vessel; and</li> <li>r. That all required entries have been appropriately made in the engine room log book;</li> </ul> <ul style="list-style-type: none"> <li>6. Answers maneuvering orders in engine-room control mode; and</li> <li>7. Takes proper action to prevent safety and pollution violations.</li> </ul>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.1.D <i>GT</i> <i>Note 3</i>	Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch, including:  .2 Routine duties undertaken during a watch	On a gas-turbine vessel of at least 1,000 HP at sea, on a simulator, or in a laboratory,	the candidate assumes and keeps the watch in accordance with STCW Code (A-VIII/2 part 3-2), describing each step and making all necessary inspections and site visits required to understand and verify the status of the watch and machinery.	The candidate: 1. Reads and understands all standing orders and special instructions; 2. Identifies work being performed, and identifies and describes personnel involved and potential hazards in the engine room; 3. Conducts a complete round of the plant, inspecting all equipment, machinery lubricating-oil levels, adding lube-oil as necessary, and recording all pertinent system, equipment and machinery pressures and temperatures, during the watch, including: a. Checking plant’s operational status; b. Checking gas generator RPM; c. Checking gas generator vibration; d. Checking gas generator inlet temperature and pressure; e. Checking power turbine rpm; f. Checking power turbine inlet temperature; g. Checking power turbine vibration; h. Checking power turbine exhaust temperature; i. Checking gas turbine bearings’ temperature and oil flow; j. Checking governor, turbine/reduction gear lube-oil sump levels; k. Checking the physical condition of pipes, tubing, and hoses for wear or leaks; l. Observing gas turbine lube-oil supply and scavenging temperatures;  <i>Continued on next page</i>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.1.D <i>Cont'd</i>  <i>GT</i> <i>Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ul style="list-style-type: none"> <li>m. Observing gas turbine air intake and exhaust temperatures and pressures, including air-intake filter pressure drop, as appropriate;</li> <li>n. Checking start air pressure;</li> <li>o. Reading and recording fuel-oil meter and day-tank levels;</li> <li>p. Observing and recording the sea temperature;</li> <li>q. Sounding and recording the bilge-water holding tank;</li> <li>r. Observing the stern-tube supply pump discharge pressure and temperature;</li> <li>s. Checking for any unusual conditions or noises;</li> <li>t. Notifying the watch engineer of any unusual or unsafe conditions;</li> <li>u. Taking proper action to prevent safety and pollution violations;</li> <li>v. Ensuring that the engine-room and cargo-hold bilge wells have been de-watered according to level, draft, and heel of the vessel;</li> <li>w. Ensuring that all required entries have been appropriately made in the engine room log book; and</li> </ul> <p>4. Answers maneuvering orders in engine-room control mode.</p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.1.E <i>All Note 3</i>	Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch, including:  Maintenance of the machinery space logs and the significance of the readings taken	On a vessel of at least 1,000 HP at sea or on a simulator,	the candidate maintains engine room logs and demonstrates understanding of the significance of the readings.	The candidate:  1. Makes a round of the engine room and notes pressure and temperature readings; 2. Enters this data in respective fields in engine room logs; 3. Notes the acceptable range of all of the readings; and 4. Explains the reasoning behind the range.
1.1.F <i>All Note 3</i>	Maintain a safe engineering watch	Thorough knowledge of Principles to be observed in keeping an engineering watch, including:  Duties associated with handing over a watch	On a vessel of at least 1,000 HP at sea, on a simulator, or in a laboratory,	the candidate hands over a watch.	The candidate provides the following information to the relieving watch officer prior to going off watch:  1. Operational status of the plant; 2. Unusual alarms or conditions occurring during the previous watch; 3. Standing orders; 4. Maintenance performed during the previous watch; 5. On-going repairs affecting plant operations; and 6. Expected evolutions during the watch.

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.2.A  <i>All Note 3</i>	Maintain a safe engineering watch	Safety and emergency procedures; change-over of remote/automatic to local control of all systems	On a vessel of at least 1,000 HP, on a simulator, or in a laboratory or workshop,	the candidate properly and safely changes systems from remote/automatic to local control.	The candidate: <ol style="list-style-type: none"> <li>1. Checks the operational status of all operating machinery;</li> <li>2. Checks pressures, temperatures, fluid levels, and rotational speeds of the equipment being changed;</li> <li>3. Follows the manufacturers recommendations to change control from remote to local;</li> <li>4. Re-checks pressures, temperatures, fluid levels, and rotational speeds of the equipment being changed; and</li> <li>5. Re-checks operational status of all operating machinery.</li> </ol> <p><u>Main Propulsion Throttle Control</u></p> <ol style="list-style-type: none"> <li>1. Changes the main propulsion throttle control from bridge control to engine room control and verifies proper operation of the throttle; and</li> <li>2. Changes the main propulsion throttle control from engine room control to bridge control and verifies proper operation of the throttle.</li> </ol> <p><u>Cooling Water Systems</u></p> <ol style="list-style-type: none"> <li>1. Transfers plant cooling systems from remote/automatic to local manual control ; and</li> <li>2. Maintains correct operating temperatures through manual regulation of the respective cooling water system.</li> </ol> <p><u>Bilge, Ballast, and Firemain System</u></p> <ol style="list-style-type: none"> <li>1. Demonstrates the procedure to transfer bilge, ballast, &amp; Firemain System from remote/automatic to local manual control;</li> <li>2. Operates fire pump locally to verify proper operation;</li> <li>3. Operates bilge pump locally to verify proper operation; and</li> <li>4. Operates ballast pump locally to verify proper operation.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.3.A <i>All Note 3</i>	Maintain a safe engineering watch	Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil system	On a vessel of at least 1,000 HP, on a simulator, or in a laboratory or workshop,	the candidate responds to alarms.	<p>The candidate responds to the following alarms:</p> <ol style="list-style-type: none"> <li>1. Low lube oil pressure, high lube oil temperature, and low lube oil sump level;</li> <li>2. High coolant temperature and low coolant level;</li> <li>3. Low fuel oil pressure, low or high fuel oil temperature, and low fuel oil day or settling tank level;</li> <li>4. General fire and emergency;</li> <li>5. Low steering gear oil level, high steering gear oil temperature, steering gear motor overload, and loss of steering;</li> <li>6. High machinery space and dry cargo hold bilge level, high bilge water holding tank level, and high waste oil holding tank level;</li> <li>7. High fuel oil storage tank level;</li> <li>8. Fixed CO2 system impending release/space evacuation; and</li> <li>9. Fire, smoke, and hazardous gas detection system annunciator panel.</li> </ol> <p>For each alarm, the candidate:</p> <ol style="list-style-type: none"> <li>1. Correctly identifies the alarm;</li> <li>2. Correctly acknowledges the alarm;</li> <li>3. Correctly confirms the alarm condition;</li> <li>4. Ensures that timely action is taken to correct the indicated alarm condition;</li> <li>5. Clears the alarm when corrective actions have been taken; and</li> <li>6. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.3.B <i>All Note 3</i>	Maintain a safe engineering watch	Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil system	On a vessel of at least 1,000 HP, on a simulator, or in a laboratory or workshop,	the candidate describes the immediate actions to be taken in the event of fire.	The candidate's description includes: <ol style="list-style-type: none"> <li>1. Determining that a fire has occurred and identifying the type of fire;</li> <li>2. Activating the fire/general alarm;</li> <li>3. Notifying the bridge of the particulars of the fire;</li> <li>4. Action to contain the fire; and</li> <li>5. Proper action to extinguish the fire.</li> </ol>
1.3.C <i>All Note 3</i>	Maintain a safe engineering watch	Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil system	On a vessel of at least 1,000 HP, on a simulator, or in a laboratory or workshop,	the candidate describes the immediate actions to be taken in the event of an accident.	The candidate's description includes: <ol style="list-style-type: none"> <li>1. Determining that an accident has occurred and identifying the type of accident;</li> <li>2. Activating the general alarm;</li> <li>3. Notifying the bridge of the particulars of the accident;</li> <li>4. Determining the priority of actions;</li> <li>5. Action to administer first aid, if necessary;</li> <li>6. Isolating the affected system, if it is safe to do so;</li> <li>7. Taking remedial action, if it is safe to do so; and</li> <li>8. Remaining on the scene until help arrives.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
1.3.D <i>All Note 3</i>	Maintain a safe engineering watch	Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil system	On a vessel of at least 1,000 HP, on a simulator, or in a laboratory or workshop,	the candidate describes the immediate actions to be taken in the event of an oil system fire or accident.	The candidate's description includes: <ol style="list-style-type: none"> <li>1. Determining that an oil system fire or accident has occurred;</li> <li>2. Isolating the affected system, if it is safe to do so;</li> <li>3. Activating the fire/general alarm;</li> <li>4. Notifying the bridge of the particulars of the fire or accident;</li> <li>5. Action to contain the fire or accident; and</li> <li>6. Action to extinguish the fire and/or remediate the accident.</li> </ol>
2.1 <i>All Note 3</i>	Use English in written and oral form	Adequate knowledge of the English language to enable the officer to use engineering publications and to perform engineering duties	This KUP and competency is demonstrated by successful completion of the written examination for a corresponding national officer endorsement.		

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
3.1.A  <i>All Note 3</i>	Use internal communication systems	Operation of all internal communication systems on board	On a vessel of at least 1,000 HP, on a simulator, or in a laboratory,	the candidate tests internal communications, (e.g. sound powered phones and dial telephones, portable radios, engine order telegraphs or remote propulsion control devices, alarm systems, and the ship's whistle) in support of testing propulsion control, maneuvering, and steering.	The candidate: <ol style="list-style-type: none"> <li>1. Within the required time prior to Standby, coordinates with the officer in charge of the navigation watch the time at which the engine order telegraphs or remote propulsion control devices will be tested;</li> <li>2. Uses the engine-room phone to notify the bridge that the engine department is ready to test the engine order telegraphs or remote propulsion control devices;</li> <li>3. Responds to movement of the engine room telegraph, notifies bridge of any discrepancies, and logs them in the engine room log book;</li> <li>4. Responds to notification from the bridge of any failures encountered during testing of the ship's sound signals;</li> <li>5. Asks the bridge to sound the ship's whistle;</li> <li>6. Telephones the senior engineer in the steering-gear room when the bridge makes notification that it is ready to test the steering gear;</li> <li>7. Assists the senior engineer in contacting the navigation bridge when ready to test the steering gear;</li> <li>8. During testing of the steering gear, observes the "run" indicator lights and power failure alarms and makes note that they are functional;</li> <li>9. Receives the report from the bridge that the testing of the ship's internal communications, whistle, engine order telegraph, and steering gear have been completed;</li> <li>10. Makes an entry in the engine room log book noting the time all gear was tested; and</li> <li>11. Prepares the engine-room bell log, if applicable, noting the time that all gear was tested.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.1.A <i>All Note 3</i>	Operate main and auxiliary machinery and associated control systems	Basic construction and operation principles of machinery systems,	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate demonstrates understanding of basic construction and operating principles of engine room and deck equipment.	The candidate reads drawings and instructions and describes the construction and operating mechanisms of all engine room and deck equipment, including control systems.
4.1.B <i>Steam Note 3</i>	Operate main and auxiliary machinery and associated control systems	Basic construction and operation principles of machinery systems,	On a steam vessel of at least 1,000 HP, on a simulator, or in a laboratory,	the candidate prepares and lights off a main propulsion boiler (assuming other boiler is in operation).	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Visually inspects boiler to ensure that boiler firesides and watersides are properly closed up and that all manholes, hand holes, and access plates are properly secured;</li> <li>2. Wipes up any oil accumulations in the furnace or air casing;</li> <li>3. Checks closed bottom and surface blow valves; waterwall and economizer header drain valves; chemical feed and main and auxiliary feed stop check valves; main and auxiliary and soot blower steam stop valves, and the gauge glass drain valve;</li> <li>4. Checks open the steam drum vent valve; superheater drain and vent valves; gauge glass cutoff valves; instrument and gauge root valves; and the feedwater stop valves;</li> <li>5. Vents the economizer and closes the valve when water evident at vent;</li> <li>6. Brings the boiler water level to 1 inch from the bottom of the gauge glass, filling or draining the boiler as necessary and makes sure to verify the ability to feed the boiler;</li> <li>7. Blows down the boiler water level gauge glass to insure accuracy, leaving several inches of water in the glass;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.1.B <i>Cont'd</i>  <i>Steam</i> <i>Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>8. Visually inspects the boiler and checks for water leaks;</li> <li>9. Eases off on all steam stop valves and re-closes them hand tight;</li> <li>10. Inspects and cleans all fuel oil strainers and ensures atomizers are made up with clean tips;</li> <li>11. Ensures that the air register doors operate freely;</li> <li>12. Inserts a burner with small size tip into burner tube;</li> <li>13. Starts forced draft fan, adjusts damper, opens register(s), and purges the furnace;</li> <li>14. Ensures burner fuel oil root valves are closed and opens the recirculating valve;</li> <li>15. When fuel oil reaches proper temperature, reduces purging air volume and uses a torch or electric igniter to light burner;</li> <li>16. Watches the rise in steam drum water level and feeds as necessary;</li> <li>17. Closes superheater drain and drum vent when drum pressure reaches the recommended pressure ;</li> <li>18. Continues slow fire and feeding until drum pressure is nearly line pressure;</li> <li>19. Opens auxiliary steam stop to “float” the boiler online;</li> <li>20. Closes superheater vent; puts feedwater and firing on “auto;”</li> <li>21. Ensures that all operations are in accordance with manufacturer’s recommended procedures; and</li> <li>22. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.1.C <i>Steam Note 3</i>	Operate main and auxiliary machinery and associated control systems	Basic construction and operation principles of machinery systems,	On a steam vessel of at least 1,000 HP, on a simulator, or in a laboratory,	the candidate secures a main propulsion boiler.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Cracks open superheater vent;</li> <li>2. Secures fires, leaving register open slightly to keep dripping oil from burner tip, being careful not to cool furnace too rapidly;</li> <li>3. Closes auxiliary steam stop and main &amp; auxiliary feed stops;</li> <li>4. Closes fuel oil burner root valves;</li> <li>5. Maintains several inches of water in the gauge glass using the chemical feed line as steam pressure and water level drop;</li> <li>6. Opens drum vent when drum pressure reaches recommended pressure;</li> <li>7. Opens superheater drain and closes the drum feed stop when all pressure is off the drum;</li> <li>8. Ensures that all operations are in accordance with manufacturer's recommended procedures; and</li> <li>9. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.2.A  <i>All Note 3</i>	Operate main and auxiliary machinery and associated control systems	Safety and emergency procedures for operation of propulsion plant machinery, including control systems	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate identifies and describes safe working practices and safety equipment and describes actions to be carried out during steering gear failure and exhaust stack fires	The candidate:  <u>Safety</u> <ol style="list-style-type: none"> <li>1. Identifies the types and use of appropriate safety equipment; and</li> <li>2. Describes safe working practices within the engine room and elsewhere on the ship, including:                             <ol style="list-style-type: none"> <li>a. Lockout/tagout procedures;</li> <li>b. Emergency operating procedures for critical equipment; and</li> <li>c. Use of standby crewmembers as backup.</li> </ol> </li> </ol> <u>Emergency</u> <ol style="list-style-type: none"> <li>1. Describes steering gear emergency operations, including failure of:                             <ol style="list-style-type: none"> <li>a. Steering gear control from bridge; and</li> <li>b. Electrical power to all systems; and</li> </ol> </li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.2.A <i>Cont'd</i>  <i>All Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <p>2. Describes how to respond to exhaust stack fires, including:</p> <ol style="list-style-type: none"> <li>a. Securing the boiler, diesel engine, or gas turbine, as appropriate;</li> <li>b. Shutting the fuel and air supply to the boiler, diesel engine, or gas turbine as appropriate;</li> <li>c. Ensuring that the exhaust stack fire location is completely isolated and not allowing any ingress of air;</li> <li>d. Deploying suitable fire extinguishing agent such as carbon dioxide, dry chemical, steam smothering, or water mist as appropriate to fight possible re-flash resulting from hot spots;</li> <li>e. Thoroughly inspects all pertinent appurtenances after waiting the period of time specified by the boiler, diesel engine, or gas turbine manufacturer;</li> <li>f. Making no attempt to immediately open the exhaust stack as it might lead to a severe explosion; and</li> <li>g. Consults boiler, diesel engine, or gas turbine manufacturer instructions as appropriate.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.2.B <i>Steam Note 3</i>	Operate main and auxiliary machinery and associated control systems	Safety and emergency procedures for operation of propulsion plant machinery, including control systems	On a steam vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate describes actions to be carried out in the event of propulsion boiler carry-over.	The candidate's description includes: <ol style="list-style-type: none"> <li>1. Identifying the operating symptoms associated with boiler carryover (fluctuating superheat temperature, excessive turbine vibration, and/or reduction gear rumbling);</li> <li>2. Cracking open the superheater header and main steam line manual drain valves;</li> <li>3. Identifying and correcting the cause of the carry-over:                             <ol style="list-style-type: none"> <li>a. Closing the throttle sufficiently to eliminate the carryover if the carryover is the result of opening the throttle too fast;</li> <li>b. Reducing the boiler load by closing in on the throttle to reduce the firing rate if the carryover is the result of too high a steaming rate;</li> <li>c. Adjusting the feed water regulator to maintain the correct operating water level if the carryover is the result of high water level; and</li> <li>d. Reducing the solid content of the boiler water through continuous and/or surface blow if the carryover is the result of excessively high dissolved solid content of the boiler water; and</li> </ol> </li> <li>4. Closing the manual drain valves once the situation has been rectified.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.2.C <i>Motor Note 3</i>	Operate main and auxiliary machinery and associated control systems	Safety and emergency procedures for operation of propulsion plant machinery, including control systems	On a motor vessel of at least 1,000 HP, on a simulator, or in a laboratory,	the candidate assists in starting a main propulsion diesel engine, describing the actions as they are being performed.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Checks the cooling water and associated equipment:               <ol style="list-style-type: none"> <li>a. Checks all valves to ensure system is lined up for operation;</li> <li>b. Starts motor-driven cooling-water pump, if necessary;</li> <li>c. Ensures systems have adequate pressure and flow;</li> <li>d. Vents cooling-water heat exchangers, using the vent cocks or vent valves on the heat-exchanger shells;</li> <li>e. Re-checks the water level in freshwater expansion tanks for adequacy; and</li> <li>f. Verifies that the above actions are indicated on the control panel;</li> </ol> </li> <li>2. Checks on the lube-oil system;               <ol style="list-style-type: none"> <li>a. Checks that all valves and pumps are lined up for proper operation;</li> <li>b. Ensures that the cooling-water system is on line and operational;</li> <li>c. Checks the sump level for adequate supply;</li> <li>d. Checks all necessary temperatures and pressures for normal operating conditions; and</li> <li>e. Verifies above actions are indicated on control panel;</li> </ol> </li> <li>3. Checks for open indicator cocks and rotates engine on engine-turning gear after obtaining permission from the bridge;</li> <li>4. Checks indicator cocks for water and disengages the jacking gear;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.2.C <i>Cont'd</i>  <i>Motor Note 3</i>					<p style="text-align: right;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>5. Checks on the air system:                             <ol style="list-style-type: none"> <li>a. Ensures that all tanks are charged;</li> <li>b. Checks valves to ensure system is properly lined up;</li> <li>c. Ensures compressors are properly lined up and ready;</li> <li>d. Checks associated systems (reducers and dryers) for proper operation and flow; and</li> <li>e. Verifies above actions are indicated on control panel;</li> </ol> </li> <li>6. Drains start air receivers and start air headers of moisture;</li> <li>7. Takes appropriate action to eliminate moisture;</li> <li>8. Restores valves and indicator cocks to their operating positions;</li> <li>9. Checks all system indicators and alarm systems for proper operation;</li> <li>10. Completes all necessary checks on the fuel-oil system;                             <ol style="list-style-type: none"> <li>a. Lines up and primes the fuel system;</li> <li>b. Checks to ensure that sufficient clean fuel for anticipated engine operation is available;</li> <li>c. Starts fuel-oil purifier systems and fuel-oil transfer system in support of vessel power plant operational requirements;</li> <li>d. Checks heaters, filters, and pumps for acceptable operation;</li> <li>e. Checks all fuel oil heating equipment;</li> <li>f. Checks temperatures and pressure for normal operating conditions; and</li> <li>g. Verifies that actions are indicated on control panels;</li> </ol> </li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.2.C <i>Cont'd</i>  <i>Motor</i> <i>Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>11. Starts engine, following all proper procedures for the type of starting system in use and in accordance with the manufacturer's recommendations, ship's procedures, and standing orders;</li> <li>12. Verifies voice communication, correct time, and Engine Order Telegraph setting with bridge;</li> <li>13. Correctly describes actions as they are being performed; and</li> <li>14. Takes proper action to prevent safety and pollution violations.</li> </ol>
4.3.A  <i>Steam</i> <i>Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for the main engine and associated auxiliaries	On a steam vessel of at least 1,000 HP, on simulator, or in a laboratory,	the candidate assists in starting a main propulsion turbine engine, describing the actions as they are being performed.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Starts the main lube-oil pump;</li> <li>2. Verifies that there is flow through the gravity tank overflow line using the sight-glass;</li> <li>3. Verifies that there is lube-oil flow to all main-engine bearings;</li> <li>4. Engages the jacking gear to the main engine;</li> <li>5. Makes notification of jacking gear status;</li> <li>6. Turns on jacking-gear motor;</li> <li>7. Establishes steam flow to the gland-seal regulator and adjusts it to recommended levels;</li> <li>8. Starts the gland exhaust condenser fan;</li> </ol> <p style="text-align: center;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.A Cont'd  <i>Steam                      Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>9. Verifies that the main circulator high-suction and overboard-discharge valves are open;</li> <li>10. Starts the main circulator pump;</li> <li>11. Opens the main-condenser saltwater header vents until flow is observed;</li> <li>12. Verifies that main condensate pump suction and discharge stop valves are open;</li> <li>13. Verifies that main condensate pump vent line valve is open</li> <li>14. Starts the main condensate pump;</li> <li>15. Opens the inlet/outlet valves to both the first and second stage air-ejector elements;</li> <li>16. Lines up steam to the air-ejector pressure reducing station;</li> <li>17. Opens the steam root valve to the second stage main air-ejector element;</li> <li>18. Observes progressive increase in vacuum;</li> <li>19. Inspects the entire system for proper operation;</li> <li>20. Correctly describes actions as they are being performed; and</li> <li>21. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.B <i>GT</i> <i>Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for the main engine and associated auxiliaries	On a gas turbine vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate assists in starting a main propulsion gas turbine engine, describing the actions as they are being performed.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Ensures that the enclosure is secure;</li> <li>2. Ensures that the starting medium is available and at recommended pressures;</li> <li>3. Ensures that all permissive obligations are met, including: <ol style="list-style-type: none"> <li>a. Reduction gear oil is at pressure;</li> <li>b. Jacking gear is disengaged;</li> <li>c. Clutch is disengaged (if so fitted);</li> <li>d. Gas generator speed is below alarm point;</li> <li>e. Uptake and supply stacks are clear;</li> <li>f. Command throttles are in the IDLE position; and</li> <li>g. Command and Control logic is reset;</li> </ol> </li> <li>4. Initiates starting sequence from command platform;</li> <li>5. Monitors all speeds, temperatures and pressures vital to engine start;</li> <li>6. Ensures start medium and ignition system are secured upon reaching gas generator idle speed; and</li> <li>7. Records start initiation and at idle times.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.C <i>Motor Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for the main engine and associated auxiliaries	On a motor vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and monitors an operating main diesel engine, describing actions as they are being performed.	The candidate: <ol style="list-style-type: none"> <li>1. Checks all main-engine and propulsion machinery bearing and lubrication parameters to detect signs of bearing overheating;</li> <li>2. Checks all temperature and pressure indicating devices and displays for readings within normal operating ranges;</li> <li>3. Checks the oil level in the engine/reduction gear sumps;</li> <li>4. Maintains the proper level in the engine freshwater cooling expansion tanks;</li> <li>5. Checks the lube-oil temperature from the lube-oil cooler, and maintains the oil temperature at proper temperature;</li> <li>6. Checks the pressure of the cooling-water main;</li> <li>7. Properly responds to alarms;</li> <li>8. Is constantly alert for unusual sounds and/or vibrations, and reports them to the OICEW;</li> <li>9. Correctly describes actions as they are performed; and</li> <li>10. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.D <i>Steam Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for the main engine and associated auxiliaries	On a steam vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and monitors an operating main steam turbine engine, describing actions as they are being performed.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Checks all main-engine and reduction-gear bearing thermometers to detect signs of overheating;</li> <li>2. Checks oil sight-flow indicators for proper oil flow</li> <li>3. Checks the clearance indicators for proper rotor position;</li> <li>4. Checks all thermometers, pressure gauges, and vacuum gauges for readings within operating ranges;</li> <li>5. Checks the oil level in the main sump;</li> <li>6. Maintains the proper water level in the de-aerating feed tank;</li> <li>7. Constantly monitors the salinity indicators;</li> <li>8. Checks the lube-oil temperature from the lube-oil cooler, and maintains at proper temperature;</li> <li>9. Checks the pressure of the cooling-water main;</li> <li>10. Properly responds to and logs all speed change orders;</li> <li>11. Is constantly alert for unusual sounds and/or vibrations and reports them to the OICEW;</li> <li>12. Correctly describes actions as they are performed; and</li> <li>13. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.E <i>GT</i> <i>Note 3</i>	Operate main and auxiliary machinery and associated control systems.	Preparation, operation, fault detection and necessary measures to prevent damage for the main engine and associated auxiliaries	On a gas turbine vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and monitors an operating main gas turbine engine, describing actions as they are being performed.	The candidate: <ol style="list-style-type: none"> <li>1. Checks enclosure for fire, lighting, vibration;</li> <li>2. Monitors necessary operational parameters, including:                             <ol style="list-style-type: none"> <li>a. Reduction gear oil supply pressure and bearing temperatures;</li> <li>b. Power turbine and gas generator speeds and vibration levels;</li> <li>c. Compressor inlet and discharge temperatures and pressures;</li> <li>d. Power turbine inlet temperature and pressure;</li> <li>e. Gas turbine bearing lube oil temperatures; and</li> <li>f. Exhaust gas temperature and pressure;</li> </ol> </li> <li>3. Performs performance calculations and compares results with ideal mapping data; and</li> <li>4. Determines necessary changes to operational procedures or status.</li> </ol>
4.3.F <i>Motor</i> <i>Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and measures to prevent damage for main engine and associated auxiliaries	On a motor vessel of at least 1,000 HP or a simulator, or in a laboratory,	the candidate assists in securing a main propulsion diesel engine, describing actions as they are being performed.	The candidate: <ol style="list-style-type: none"> <li>1. At “Finished With Engines,” coordinates with bridge to shift main engine from bridge control to engine-room control;</li> <li>2. Changes over and verifies that change in control has occurred;</li> <li>3. Secures fuel-oil supply and booster pumps, (if fitted) and acknowledges low-pressure alarm;</li> <li>4. Closes air start blocking valve;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.F <i>Cont'd</i>  <i>Motor Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>5. Closes air receiver outlet valves to air start system;</li> <li>6. Opens each cylinder indicating cock;</li> <li>7. Engages engine-turning gear;</li> <li>8. Starts engine-turning gear and cycles through one revolution;</li> <li>9. Secures main lube-oil system supply pumps and acknowledges low-pressure alarm;</li> <li>10. Secures jacket fresh cooling water supply pump and acknowledges low-pressure alarm;</li> <li>11. Secures power to alarm and instrumentation panel;</li> <li>12. Secures cooling medium supply valves to intercooler;</li> <li>13. Opens air box drain valves, scavenging air receiver drains valves, or charge air manifold drain valves, as appropriate;</li> <li>14. Line up main engine cooling water system to keep main engine warm while secured in support of vessel operational requirements; and</li> <li>15. Enters the time that all systems were secured in logbook.</li> </ol>
4.3.G <i>Steam Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for the main engine and associated auxiliaries	On a steam vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate assists in securing a main steam turbine.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Secures the main steam stops at Finished With Engines;</li> <li>2. Alternately uses ahead and astern throttles to bleed off steam trapped in main steam lines;</li> <li>3. Secures bulkhead stops;</li> <li>4. Secures astern guarding valve;</li> <li>5. Verifies that main shaft is no longer rotating;</li> </ol> <p style="text-align: center;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.G <i>Cont'd</i>  <i>Steam</i> <i>Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>6. Engages jacking gear after it is confirmed that the main shaft is no longer rotating;</li> <li>7. Posts a notice that main-engine “Jacking Gear Engaged”;</li> <li>8. Verifies that the lube-oil system continues to operate;</li> <li>9. Verifies that lube-oil flow continues through turbine bearing sight glasses;</li> <li>10. Verifies that lube-oil temperatures at each bearing are below 160°F;</li> <li>11. Verifies that the lube-oil cooler outlet temperature is maintained at recommended levels; and</li> <li>12. Verifies that each main shaft steady-bearing oil ring rotates freely.</li> </ol>
4.3.H  <i>GT</i> <i>Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for the main engine and associated auxiliaries	On a gas turbine vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate assists in securing a main gas turbine.	The candidate performs the following for a normal stop sequence: <ol style="list-style-type: none"> <li>1. Ensures that the throttle at the Command Platform is in the “idle” position;</li> <li>2. Initiates “Normal Shutdown” sequence from the Command Platform;</li> <li>3. After the recommended Cool Down period, ensures that:                             <ol style="list-style-type: none"> <li>a. Main fuel stop valves are closed;</li> <li>b. Clutch (if equipped) is disengaged;</li> <li>c. Jacking gear is engaged upon shaft rotation stop;</li> <li>d. Module cooling system is operative; and</li> <li>e. Gas turbine and enclosure is inspected for damage and/or fire.</li> </ol> </li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.I <i>Note 2</i> <i>Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for the steam boiler and associated auxiliaries and steam systems	On a motor or gas turbine vessel of at least 1,000 HP equipped with an oil-fired auxiliary boiler, or simulator, or in a laboratory,	the candidate monitors the oil-fired or waste-heat auxiliary boiler.	<p>The candidate performs either (A) or (B)</p> <p>(A) OIL FIRED AUXILIARY BOILER</p> <ol style="list-style-type: none"> <li>1. Monitors the steam drum pressure and water level;</li> <li>2. Monitors the feed water pressure;</li> <li>3. Monitors the fuel oil service pump suction and discharge pressures and fuel-oil supply pressure and temperature to the supply header and applicable fuel oil strainer pressure drops;</li> <li>4. Monitors the fuel oil settling/service tank levels and temperatures;</li> <li>5. Strips fuel oil settling tanks of moisture as appropriate;</li> <li>6. Monitors the stack temperature;</li> <li>7. Monitors the atomizing steam pressure as applicable;</li> <li>8. Observes the condition of flame through peephole;</li> <li>9. Visually inspects boiler casing, hand holes, manholes, and piping for leaks;</li> <li>10. Promptly wipes up any oil accumulations presenting a fire hazard</li> <li>11. Notifies the watch engineer of any unusual or unsafe conditions, unusual sounds, or vibrations; and</li> <li>12. Takes proper action to prevent safety and pollution violations.</li> </ol> <p><b>NOTE:</b> Recorded readings from analog gauges should be <math>\pm 5\%</math> of actual, except boiler water level which should be <math>\pm 1''</math> of actual.</p> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.I <i>Cont'd</i>  <i>Note 2</i> <i>Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <p>(B) WASTE HEAT AUXILIARY BOILER</p> <ol style="list-style-type: none"> <li>1. Monitors the steam drum pressure and water level;</li> <li>2. Monitors the feed water pressure;</li> <li>3. Monitors the feed pump suction and discharge pressures;</li> <li>4. Monitors the feed tank level and temperature;</li> <li>5. Monitors the boiler water circulating pump suction and discharge pressures, as applicable;</li> <li>6. Monitors the exhaust gas inlet temperature;</li> <li>7. Monitors the stack temperature;</li> <li>8. Visually inspects boiler casing, hand holes, manholes, and piping for leaks;</li> <li>9. Notifies the watch engineer of any unusual or unsafe conditions, unusual sounds, or vibrations; and</li> <li>10. Takes proper action to prevent safety and pollution violations.</li> </ol> <p><b>NOTE:</b> Recorded readings from analog gauges should be <math>\pm</math> 5% of actual, except boiler water level which should be <math>\pm 1''</math> of actual.</p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.J <i>Steam Note 3</i>	Operate main and auxiliary machinery and associated control systems.	Preparation, operation, fault detection and necessary measures to prevent damage for the steam boiler and associated auxiliaries and steam systems	On a steam vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate tests the boiler water for: <ul style="list-style-type: none"> <li>• P-alkalinity;</li> <li>• Total alkalinity;</li> <li>• Chlorides;</li> <li>• Phosphates;</li> <li>• Dissolved oxygen; and</li> <li>• Total dissolved solids.</li> </ul>	On a daily basis, for no less than a 2-week period, the candidate: <ol style="list-style-type: none"> <li>1. Properly lines up the sample cooler system and obtains required samples of water from each boiler;</li> <li>2. Correctly performs each required test procedure according to the directions provided by the vessel's boiler-water treatment vendor; and</li> <li>3. Records the results.</li> </ol>
4.3.K <i>Steam Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for the steam boiler and associated auxiliaries and steam systems	On a steam vessel of at least 750 kW / 1,000 HP or simulator, or in a laboratory,	the candidate doses and controls boiler water quality by: <ul style="list-style-type: none"> <li>• Continuous blow;</li> <li>• Bottom blow; and</li> <li>• Chemical dosing following recommendation of the boiler-water treatment vendor.</li> </ul>	On a daily basis, for no less than a 2-week period, the candidate: <ol style="list-style-type: none"> <li>1. Identifies which corrective actions associated with the results of chemical testing are applicable;</li> <li>2. Correctly identifies the type and quantity of chemicals to be used to treat the boiler;</li> <li>3. Adds appropriate chemicals to the boiler water while underway; and</li> <li>4. Performs dosing and controls, observing all safety and environmental practices and procedures.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.L <i>Steam Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for the steam boiler and associated auxiliaries and steam systems	On a steam vessel of at least 1,000 HP or simulator, or in a laboratory, under the supervision of the Chief Engineer, and when directed,	the candidate performs a bottom blow of a boiler.	The candidate: <ol style="list-style-type: none"> <li>1. Performs bottom blow when directed, slowing main engine to prevent carry-over or other adverse affects on steaming boiler;</li> <li>2. Secures fires in boiler and opens superheater vent to boiler;</li> <li>3. Secures main-steam stops to boiler to be given bottom blow;</li> <li>4. Using auxiliary feed stop-check, raises level of water in steam drum of boiler to 1 inch from the top of gauge glass;</li> <li>5. Opens bottom blow overboard skin valve;</li> <li>6. Opens water wall bottom blow valve;</li> <li>7. Observes drop in water level, securing bottom blow valve when level is no less than 1 inch from bottom of gauge glass;</li> <li>8. Repeats steps 4 and 5;</li> <li>9. Opens mud drum bottom blow valve and secures when gauge glass water level drops to no less than 1 inch from the bottom;</li> <li>10. Prepares to re-light boiler;</li> <li>11. Starts boiler forced draft fan and pre-purges furnace for 5 minutes;</li> <li>12. Raises water level to 2 inches below normal level;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.L <i>Cont'd</i>  <i>Steam Note 3</i>					<i>Continued from previous page</i>  13. Re-lights burner and adjusts combustion air as necessary; 14. Opens main steam stops to “float” boiler back on line, cracks open superheater and main steam line drains; 15. Begins to return main engine to sea speed when boiler pressures are observed to be equal and slight drop in burner manifold fuel oil pressure is noted; 16. Closes off superheater and main steam drains, and superheater vent; 17. Continues to slowly re-establish engine speed; and 18. Conducts round of engine room to verify that all steam systems and equipment are operating at normal levels.
4.3.M  <i>All Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for auxiliary prime movers and associated systems	On a vessel of at least 1,000 HP or simulator, or in a laboratory or workshop,	the candidate plans for and changes over from the on-line low pressure service air compressor to the stand-by unit, describing actions as they are being performed.	The candidate:  1. Checks the oil reservoirs and, if necessary, fills them to the proper level with the correct grade of oil; 2. Ensures that the power is off, checks the belts for excessive sagging and ensures that they are in the proper position in the pulley wheels, and jacks the compressor over by hand, if applicable; 3. Starts up the air compressor; 4. Places the air compressor in service and properly shuts down the replaced air compressor; 5. Drains and removes all accumulations of moisture or oil from the separators and air receivers; 6. Tests pressure-relief devices; and 7. Takes proper action to prevent safety and pollution violations.

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>4.3.N</p> <p><i>Note 1</i></p> <p><i>Note 3</i></p> <p><i>Task No. 4.3.W may be used as substitute</i></p>	<p>Operate main and auxiliary machinery and associated control systems</p>	<p>Preparation, operation, fault detection and necessary measures to prevent damage for auxiliary prime movers and associated systems</p>	<p>On a motor or gas turbine vessel of at least 1,000 HP or simulator, or in a laboratory,</p>	<p>the candidate plans for and starts the freshwater generator, describing actions as they are being performed.</p>	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Opens the brine pump/eductor overboard skin valve;</li> <li>2. Opens the brine pump eductor saltwater supply valve;</li> <li>3. Opens the vacuum pump/eductor saltwater supply valve;</li> <li>4. Opens the saltwater feed pump discharge and suction valves;</li> <li>5. Starts the saltwater feed pump to supply both the evaporator eductors;</li> <li>6. Closes the vacuum breaker valve atop the evaporator shell;</li> <li>7. Adjusts the brine overboard discharge valve to maintain water level to just cover submerged tube nest in bottom of distiller;</li> <li>8. Delays continuing with operation until 75% of operational vacuum is attained;</li> <li>9. Opens the main heat source valve to distiller heating section;</li> <li>10. Adjusts the main-engine jacket water distiller heating section outlet valve to maintain proper jacket-water temperature differential between inlet and outlet;</li> <li>11. Adjusts the saltwater feed to distiller to maintain proper inlet temperature;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>4.3.N Cont'd</p> <p><i>Note 1</i> <i>Note 3</i></p> <p><i>Task No.</i> 4.3.W may be used as substitute</p>					<p><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>12. Continues to regulate the brine overboard pump discharge to maintain seal and brine level;</li> <li>13. Starts the distillate pump;</li> <li>14. Energizes the salinity indicating panel and verifies that the three-way valve is de-energized and distillate is re-circulated to the evaporator;</li> <li>15. Continues to adjust the saltwater supply valve, controlling saltwater feed temperature, and brine overboard flow rate;</li> <li>16. Monitors the distillate pump salinity level output;</li> <li>17. Verifies the tank to be replenished is lined up;</li> <li>18. Energizes the three-way valve when the distillate salinity level is below alarm level;</li> <li>19. Verifies that the salinity meter reading by comparing to chemical test of a 50 ml sample;</li> <li>20. Records the meter reading once discharge to tank has been established; and</li> <li>21. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.O <i>Note 1</i> <i>Note 3</i> Task No. 4.3.W may be used as substitute	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for auxiliary prime movers and associated systems	On a motor or gas turbine vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and shuts down the freshwater generator, describing actions as they are being performed.	The candidate: <ol style="list-style-type: none"> <li>1. Trips three-way solenoid valve when all tanks have been topped off;</li> <li>2. Closes main heat source valve to and from distiller heating section;</li> <li>3. Allows feed water flow until the distiller has cooled to ambient temperature;</li> <li>4. Secures saltwater feed pump and saltwater supply to both eductors;</li> <li>5. Closes saltwater feed pump discharge and suction valves;</li> <li>6. Opens vacuum breaker valve atop evaporator shell;</li> <li>7. Secures distillate pump motor and close distillate pump discharge valve;</li> <li>8. Logs the time that the unit is secured and the final water meter reading; and</li> <li>9. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.P <i>Steam Note 1 Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for auxiliary prime movers and associated systems	On a steam vessel of at least 1,000 HP equipped with a distilling plant, or simulator, or in a laboratory,	the candidate plans for and starts the freshwater distiller, describing actions as they are being performed.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Opens the brine pump overboard discharge valve;</li> <li>2. Verifies that the brine pump overboard skin valve is open;</li> <li>3. Verifies that the sea suction valve to the distiller saltwater feed pump is open;</li> <li>4. Opens the saltwater feed pump suction and discharge valves;</li> <li>5. Starts the saltwater feed pump to freshwater distilling unit;</li> <li>6. Starts the brine overboard pump;</li> <li>7. Adjusts the brine overboard discharge valve to maintain brine level to just cover the slosh plates in bottom of the flash chambers;</li> <li>8. Opens the steam root valve to the distiller unit steam air ejectors;</li> <li>9. Opens the steam supply valve to the saltwater feed heater (not if the saltwater feed water heater shell vacuum is less than 75% of normal operational vacuum);</li> <li>10. Lines up and opens the L.P. bleed steam to saltwater feed water heater (or applies and regulates de-superheater condensate flow if live steam supply provided to salt water heater);</li> <li>11. Lines up and regulates saltwater feed heater L.P. drain to maintain half of a gauge glass in saltwater feed heater hot well;</li> <li>12. Adjusts the saltwater flow from the saltwater feed heater to maintain proper temperature of feed water to first stage;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.P <i>Cont'd</i>  <i>Steam</i> <i>Note 1</i> <i>Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>13. Observes spray pattern of the feed water and level of water at bottom of the flash chamber;</li> <li>14. Energizes the salinity indicating panel and verifies the three-way dump valve is tripped and will discharge to the bilge;</li> <li>15. Monitors each salinity in the distillate path for indications of abnormal conditions;</li> <li>16. Starts the distillate pump when the static suction line gauge glass is at least half-full;</li> <li>17. Adjusts as necessary the saltwater feed temperature, brine overboard flow rate, and monitors the distillate pump output salinity level;</li> <li>18. Verifies the tank to be replenished is lined up;</li> <li>19. Engages the three-way dump valve when the distillate salinity level is indicated to be at or below alarm level;</li> <li>20. Verifies the salinity meter reading by chemical test comparison of the distillate sample;</li> <li>21. Records the water meter reading once discharge to the tanks has been established; and</li> <li>22. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.Q <i>Steam Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for auxiliary prime movers and associated systems	On a steam vessel of at least 1,000 HP equipped with a distilling plant, or simulator, or in a laboratory,	the candidate plans for and shuts down the freshwater distiller, describing actions as they are being performed.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Trips the three-way dump valve;</li> <li>2. Verifies that the distillate distribution valves to the tanks have been closed;</li> <li>3. Records the water meter reading;</li> <li>4. Closes the steam root valve to the distiller unit steam air ejectors;</li> <li>5. Secures the L.P. bleed steam or live steam and desuperheater condensate flow to the saltwater feed water heater;</li> <li>6. Secures the saltwater feed heater L.P. drain to maintain main or auxiliary condenser vacuum;</li> <li>7. Stops the distillate pump when the static suction line gauge glass is empty;</li> <li>8. Monitors the unit for drop in temperature and decrease in vacuum;</li> <li>9. Secures the saltwater feed pump to the freshwater distilling unit as temperatures and vacuum have decreased and closes the saltwater feed pump suction and discharge valves;</li> <li>10. Stops the brine overboard pump and secures the overboard skin valve when the level in the flash chamber no longer visible; and</li> <li>11. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.R  <i>All Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for auxiliary prime movers and associated systems	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and starts the lube oil or fuel oil purifier, describing actions as they are being performed.	The candidate: <ol style="list-style-type: none"> <li>1. Verifies that brake has been released;</li> <li>2. Checks centrifuge sump oil level and adds oil as necessary;</li> <li>3. Checks discharge valve is open to correct sump or tank;</li> <li>4. Depresses start button to re-start centrifuge motor;</li> <li>5. Verifies that centrifuge is up to proper operating speed;</li> <li>6. Lines up automatic “shoot” panel and adds sealing/priming water until overflow is detected at heavy phase discharge;</li> <li>7. Opens oil supply valve from main sump or tank;</li> <li>8. Lines up steam or power to centrifuge pre-heater, if used;</li> <li>9. Observes cessation of seal/priming water displacement from centrifuge &amp; sets automatic “shoot” panel;</li> <li>10. Monitors increase of oil temperature input to proper temperature; and</li> <li>11. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.S <i>All Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and measures to prevent damage for auxiliary prime movers and associated systems	On a vessel of at least 1,000 HP or in a laboratory,	the candidate plans for and secures a lube oil or fuel oil purifier, describing actions as they are being performed.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. “Shoots” the purifier from the control panel several times to discharge loose sludge;</li> <li>2. Secures steam or power to oil centrifuge pre-heater, if used;</li> <li>3. Closes oil supply to centrifuge;</li> <li>4. Depresses centrifuge motor controller stop button;</li> <li>5. Verifies centrifuge has come to a complete stop and closes clean oil discharge valve; and</li> <li>6. Secures power and valves to the automatic “shoot” panel.</li> </ol>
4.3.T <i>All Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and measures to prevent damage for auxiliaries including refrigeration, air-conditioning and ventilation systems	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate starts an air-conditioning or refrigeration system.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Checks that the crankcase oil level is visible in the sight glass;</li> <li>2. Lines up the condensing water circulating system by opening the condensing water isolation valves and venting the waterboxes to ensure condenser watersides are full;</li> <li>3. For chillers, lines up the chilled water system by opening the chilled water isolation valves and venting the waterboxes to ensure chiller watersides are filled;</li> <li>4. Opens the compressor discharge and main liquid line (king) valves;</li> <li>5. Opens the compressor suction valve approximately one full turn;</li> <li>6. Depresses the start button and starts the compressor in the auto mode;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.T  <i>All Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>7. Slowly opens the compressor suction valve when the compressor starts to help prevent excessive oil foaming until the suction valve is fully open;</li> <li>8. Monitors the suction temperature and listens for any evidence of compressor knocking, throttles down on the suction valve until liquid in the suction line has successfully flashed off, then slowly opens the suction valve until fully open;</li> <li>9. Checks that crankcase oil level is visible in sight glass;</li> <li>10. Lines up the condensing water circulating system by opening the condensing water isolation valves and venting the waterboxes to ensure condenser watersides are full;</li> <li>11. For chillers, lines up the chilled water system by opening the chilled water isolation valves and venting the waterboxes to ensure chiller watersides are filled;</li> <li>12. Opens the compressor discharge and main liquid line (king) valves;</li> <li>13. Opens compressor suction valve one full turn;</li> <li>14. Starts the compressor in auto mode;</li> <li>15. Slowly opens the compressor suction valve when the compressor starts to help prevent excessive oil foaming until the suction valve is fully open; and</li> <li>16. Monitors the suction temperature and listening for compressor knocking, throttles down on the suction valve until liquid in the suction line has successfully flashed off, then slowly opens the suction valve until fully open.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.U <i>All Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for auxiliaries including refrigeration, air-conditioning and ventilation systems	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate monitors an air-conditioning or refrigeration system.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Checks the compressor suction and discharge pressures and temperatures;</li> <li>2. Checks the compressor crankcase oil level;</li> <li>3. Checks the compressor oil pressure and control oil pressure, if applicable;</li> <li>4. Checks the condition of crankcase and compressor noise;</li> <li>5. Checks the receiver level and liquid line sight glass condition;</li> <li>6. Checks the liquid line temperature;</li> <li>7. Checks condition of suction accumulator, if applicable;</li> <li>8. Checks the oil separator oil return sight glass condition, if applicable;</li> <li>9. Checks the condensing cooling water pressure and inlet and outlet temperatures;</li> <li>10. For chillers, checks the chilled water pump suction and discharge pressures and chiller inlet and outlet temperatures, as well as the chilled water expansion tank level;</li> <li>11. Checks the refrigerated space temperatures as applicable;</li> <li>12. Checks supply air, return air, and air conditioned space temperatures as applicable; and</li> <li>13. Checks the compressor drive motor temperature.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.V <i>All Note 3</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for auxiliaries including refrigeration, air-conditioning and ventilation systems	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate secures an air-conditioning or refrigeration system.	The candidate: <ol style="list-style-type: none"> <li>1. Closes the main liquid line (king) stop valve while the compressor is running;</li> <li>2. Allows the compressor to cycle off in automatic by the action of the low pressure cut-out switch;</li> <li>3. Observes the refrigerant receiver level and ensures that the compressor does not restart by the action of the low pressure cut-out switch and that the system is completely pumped down to the receiver;</li> <li>4. Depresses the motor controller stop button with compressor shutdown and not short-cycling;</li> <li>5. Keeps power available to the compressor motor for the to keep the crankcase oil warm via the heater circuit;</li> <li>6. Isolates the compressor by closing the suction and discharge stop valves;</li> <li>7. Isolates the water-cooled condenser by closing the condensing water isolation valves (drains the condenser watersides if required); and</li> <li>8. For chillers, isolates the chiller by closing the chilled water isolation valves.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.W <i>Note 1</i> <i>Note 3</i>  <i>May be used as substitute for tasks 4.3.N and 4.3.O</i>	Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for auxiliaries including refrigeration, air-conditioning and ventilation systems	On a vessel of at least 1,000 HP at sea or at anchor in clean water, on a simulator, or in a laboratory,	the candidate starts and shuts down a reverse osmosis plant.	The candidate starts and shuts down a reverse osmosis plant as follows:  <u>Reverse-osmosis unit start-up procedure</u> <ol style="list-style-type: none"> <li>1. Performs a cursory examination of the plant to ensure that the system is intact, that all components are fully assembled, and that the unit is in a state of operational readiness;</li> <li>2. Ensures that all pre-filter, media filter and cartridge filter drain and vent valves are closed;</li> <li>3. Opens all sea water valves from the sea chest up to the unit, the sea water inlet cock valve, and the feed water pump isolation valves if the unit is so equipped;</li> <li>4. Positions the 3-way feed/rinse/clean/store valve to the normal feed position and lines up the media filter isolation, back-flush, and waste outlet valve for normal operation;</li> <li>5. Positions the 3-way media filter outlet valve to the normal feed position to the cartridge pre-filters;</li> <li>6. Opens the back pressure regulator bypass valve fully and completely backs off on the back pressure regulator valve;</li> <li>7. Positions the 3-way brine discharge/rinse/clean/store valve to the normal overboard position and ensures that all the brine discharge valves to the overboard skin valve are all open;</li> <li>8. Ensures that electrical power is established to the unit by closing the appropriate circuit breaker;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>4.3.W Cont'd</p> <p><i>Note 1</i> <i>Note 3</i></p> <p><i>May be used as substitute for tasks 4.3.N and 4.3.O</i></p>					<p><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>9. Checks the oil level in high pressure pump crankcase, and adds oil as necessary;</li> <li>10. Places feed pump and feed booster pump switches in the automatic mode as appropriate, if so equipped;</li> <li>11. Depresses the unit salinity controller start switch, observes feed pump, booster feed pump, and high pressure pump pressures and feed flow meter, bleeds air from pre-filter, media filter, and cartridge pre-filters as needed, and checks for system leaks;</li> <li>12. Slowly closes the back pressure regulator bypass valve once proper feed has been established, and closes in on back pressure regulator until the manufacturer recommended design pressure is reached for the existing sea water salinity, and observes fresh water product flow meter;</li> <li>13. Lines up fresh water system valves to permit delivery of fresh water to the fresh water storage tank on service and monitors the salinity of the fresh water product;</li> <li>14. Ensures that an acceptable salinity is eventually reached on fresh water product and that the 3-way fresh water product diverting valve switches from the overboard discharge to the fresh water delivery mode; and</li> <li>15. Monitors system, pressures, flows, and salinity to ensure that parameters remain within acceptable limits.</li> </ol> <p><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
4.3.W <i>Cont'd</i>  <i>Note 1</i> <i>Note 3</i>  <i>May be used as substitute for tasks. 4.3.N and 4.3.O</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <p><u>Reverse-osmosis unit procedure for short term shut-down</u></p> <ol style="list-style-type: none"> <li>1. Depresses the unit salinity controller stop switch and ensures that the feed pump, booster feed pump, and high pressure pump all stop rotating and that their respective indicator lights go out;</li> <li>2. Closes all sea water valves from the sea chest up to the unit, the sea water inlet cock valve, and the feed water pump isolation valves if the unit is so equipped;</li> <li>3. Opens any valves in the cleaning tank discharge line to the unit 3-way feed feed/rinse/clean/store valve;</li> <li>4. Positions the 3-way feed/rinse/clean/store valve to the rinse position and lines up the media filter isolation, back-flush, and waste outlet valve for normal operation;</li> <li>5. Ensures that multi-media filter and cartridge pre-filter drain valves are closed;</li> <li>6. Opens the back pressure regulator bypass valve, and backs off on the back pressure regulator valve fully to release the pressure from the unit;</li> <li>7. Ensures that the 3-way brine/clean/store/rinse valve is in the normal brine discharge position;</li> <li>8. Fills the cleaning tank with chlorine free product fresh water;</li> <li>9. Places the booster pump control switch to the "hand" position and observes the feed flow meter;</li> <li>10. Places the booster pump to the "off" position, then "auto" when the feed flow meter indicates no flow (and the cleaning tank is now empty and short-term rinsing is complete); and</li> <li>11. Secures electrical power to the unit by opening the appropriate circuit breaker.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
5.1.A <i>All Note 3</i>	Operate fuel, lubrication, ballast and other pumping systems and associated control systems	Operational characteristics of pumps and piping systems including control systems	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate describes the operating characteristics of pumps and piping systems including control systems.	The candidate reads drawings and instructions and describes the operating characteristics of pumps and piping systems including control systems.
5.2.A <i>All Note 3</i>	Operate fuel, lubrication, ballast and other pumping systems and associated control systems	Routine pumping operations	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and conducts an onboard fuel transfer.	<p>The candidate performs the following actions, and describes them as they are performed:</p> <ol style="list-style-type: none"> <li>1. Applies steam to tank heating coils, if required;</li> <li>2. Monitors contaminated return tank as necessary;</li> <li>3. Lines up the fuel-oil transfer pump and fuel-oil manifold to take a suction on the desired fuel-oil tank as directed;</li> <li>4. Lines up the fuel-oil transfer pump to discharge to the desired tank as directed;</li> <li>5. Determines the fuel-oil tank levels in both tanks;</li> <li>6. Starts the fuel-oil transfer pump;</li> <li>7. Checks the fuel-oil transfer pump suction and discharge pressures to determine that the pump picks up suction;</li> <li>8. Monitors the fuel-oil tank level on the tank being filled;</li> <li>9. Stops the fuel-oil transfer pump when the tank approaches full or the level directed;</li> <li>10. Restores the fuel transfer system piping to normal; and</li> <li>11. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
5.2.B <i>All Note 3</i>	Operate fuel, lubrication, ballast and other pumping systems and associated control systems	Operation of bilge, ballast and cargo pumping systems	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and conducts a ballasting of double-bottom or wing tanks.	The candidate performs the following actions, and describes them as they are performed: <ol style="list-style-type: none"> <li>1. Lines up the ballast pump suction manifold and/or suction piping to take a suction on an appropriate sea chest;</li> <li>2. Lines up the ballast pump discharge manifold and/or piping to direct flow to the ballast tank fill and drain manifold;</li> <li>3. Lines up the ballast tank fill and drain manifold to those ballast tanks as directed;</li> <li>4. Starts the ballast pump;</li> <li>5. Stops the ballast pump when the vessel is brought down to the desired draft marks;</li> <li>6. Restores the ballast system piping to normal; and</li> <li>7. Takes proper action to prevent safety and pollution violations.</li> </ol>
5.2.C <i>All Note 3</i>	Operate fuel, lubrication, ballast and other pumping systems and associated control systems	Operation of bilge, ballast and cargo pumping systems	On a vessel of at least 1,000 HP, on a simulator, or in a laboratory,	the candidate plans for and conducts a de-ballasting of double-bottom or wing tanks.	The candidate performs the following actions, and describes them as they are performed: <ol style="list-style-type: none"> <li>1. Lines up the ballast pump suction manifold and/or suction piping to take a suction on the ballast-tank fill and drain manifold;</li> <li>2. Lines up the ballast-pump discharge manifold to direct flow of sea water overboard;</li> <li>3. Lines up the ballast-tank fill and drain manifold to drain those ballast tanks as directed;</li> <li>4. Starts the ballast pump;</li> <li>5. Stops the ballast pump when tanks are emptied;</li> <li>6. Restores the ballast system piping to normal; and</li> <li>7. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
5.2.D  <i>All Note 3</i>	Operate fuel, lubrication, ballast and other pumping systems and associated control systems	Operation of bilge, ballast and cargo pumping	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and pumps out the engine-room bilge wells.	The candidate performs the following actions, and describes them as they are performed: <ol style="list-style-type: none"> <li>1. Sounds the bilge-water collecting tank to ensure it is capable of accommodating bilge water without overflowing;</li> <li>2. Lines up the bilge system to take a suction from the desired bilge well, and discharges to the bilge-water collecting tank;</li> <li>3. Primes the bilge pump as necessary;</li> <li>4. Starts the bilge pump;</li> <li>5. Monitors the bilge-pump suction and discharge pressure gauges to ensure the bilge pump has picked up suction;</li> <li>6. Monitors the bilge pocket level;</li> <li>7. Stops the bilge pump when the bilge pocket has been pumped dry;</li> <li>8. Restores the bilge system valve line up to normal;</li> <li>9. Properly records information in the Oil Record Book; and</li> <li>10. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
5.2.E <i>All Note 3</i>	Operate fuel, lubrication, ballast and other pumping systems and associated control systems	Operation of bilge, ballast and cargo pumping systems	On a vessel of at least 1,000 HP or a simulator, or in a laboratory,	the candidate plans for and pumps out a cargo hold or the shaft alley bilge wells.	<p>The candidate performs the following actions, and describes them as they are performed:</p> <ol style="list-style-type: none"> <li>1. Sounds the bilge-water collecting tank to ensure it is capable of accommodating bilge water without overflowing;</li> <li>2. Lines up the bilge system to take a suction from the desired bilge well, and discharges to the bilge-water collecting tank;</li> <li>3. Primes the bilge pump, if necessary;</li> <li>4. Starts the bilge pump;</li> <li>5. Monitors the bilge-pump suction and discharge pressure gauges to ensure the bilge pump has picked up suction;</li> <li>6. Monitors the bilge pocket level;</li> <li>7. Stops the bilge pump when the bilge pocket has been pumped dry;</li> <li>8. Restores the bilge system valve line back to normal;</li> <li>9. Properly fills in information in the Oil Record Book; and</li> <li>10. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
5.3.A <i>All Note 3</i>	Operate fuel, lubrication, ballast and other pumping systems and associated control systems.	Oily-water separators (or similar equipment) requirements and operation	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate monitors the oily-water separator system.	The candidate: <ol style="list-style-type: none"> <li>1. Checks the plant's operational status;</li> <li>2. Checks the bilge-water tank level;</li> <li>3. Checks the oily-water-separator chamber pressure or vacuum;</li> <li>4. Checks the filling related pressure/vacuum;</li> <li>5. Checks the overboard-discharge water-pump pressure;</li> <li>6. Monitors the oil-content monitor and ensures that:                             <ol style="list-style-type: none"> <li>a. Equipment is not bypassed, sampling line is open, and flushing water is not being supplied to sensor;</li> <li>b. Automatic valves are not operated in manual mode or disconnected from controlling devices; and</li> <li>c. Temporary hoses are not used during operation and when possible, checks cleanliness of sensors;</li> </ol> </li> <li>7. Checks for any unusual conditions or noises;</li> <li>8. Notifies the watch engineer of any unusual or unsafe conditions; and</li> <li>9. Takes proper action to prevent safety and pollution violations.</li> </ol>
6.1.A <i>All Note 3</i>	Operate electrical, electronic and control systems	Basic operation principles of electrical, electronic and control equipment, Generator and distribution systems	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate describes operating characteristics of the electrical generating and distribution systems.	The candidate reads drawings and instructions and correctly describes the operating characteristics of the electrical generating and distribution systems.

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
6.1.B <i>All Note 3</i>	Operate electrical, electronic and control systems	Preparing, starting, paralleling and changing over generators	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and conducts a pre-start inspection, and starts a diesel generator engine, describing actions as they are being performed.	<p>The candidate takes the following actions and describes them as they are performed:</p> <ol style="list-style-type: none"> <li>1. Inspects the generator for loose cable connections, that the brush rigging is fitted, and for foreign or loose items that may damage the unit during start-up;</li> <li>2. Inspects the governor terminal shafts and linkages and the generator bearing houses for indications of oil leaks;</li> <li>3. Manually trips the over-speed to prevent fuel rack operation;</li> <li>4. Checks the lube-oil level in the sumps and adds lube oil as necessary;</li> <li>5. Checks the water level in the freshwater expansion tank and adds makeup water as necessary;</li> <li>6. Ensures that the start air receiver is charged, the hydraulic accumulator is charged, or batteries are charged as appropriate, and lines up the starting system in preparation for engine starting;</li> <li>7. Checks the fuel oil level in the day tank and transfers fuel as necessary;</li> <li>8. Lines up the fuel system and primes system, if necessary;</li> <li>9. Resets the trip and determines if the mechanism operates without binding;</li> <li>10. Starts the engine and checks temperatures and pressures; and</li> <li>11. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
6.1.C <i>Steam Note 3</i>	Operate electrical, electronic and control systems	Preparing, starting, paralleling and changing over generators	On a steam vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and conducts a pre-start inspection and starts a steam turbo-generator.	The candidate takes the following actions and describes them as they are performed: <ol style="list-style-type: none"> <li>1. Inspects the alternator for loose cable connections, the brush rigging, and for loose items that may damage unit during start-up;</li> <li>2. Inspects the coupling between turbine/reduction gear and alternator for readiness;</li> <li>3. Inspects the governor unit, reduction gear casing, and bearing housings for indications of lubrication leaks;</li> <li>4. Inspects manual over-speed trip for excessive wear;</li> <li>5. Determines level of lube-oil in sump and adds lube-oil as necessary;</li> <li>6. Manually trips and resets over-speed trip to determine operation without binding;</li> <li>7. Inspects auxiliary circulator pump and its piping for leaks and cracks;</li> <li>8. Verifies that sea suction and discharge valves are open to auxiliary circulator;</li> <li>9. Inspects the auxiliary condensate pump and its piping for leaks and cracks;</li> <li>10. Verifies that the hot well condensate level is visible;</li> <li>11. Verifies that suction, discharge, and vent line valves to auxiliary condensate pump are open;</li> <li>12. Inspects auxiliary circulator and condensate pump motor controllers for readiness;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
6.1.C <i>Cont'd</i>  <i>Steam</i> <i>Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>13. Starts auxiliary circulator;</li> <li>14. Vents-off condenser heads and observes stabilizing of circulated water pressure;</li> <li>15. Starts auxiliary condensate pump;</li> <li>16. Adjusts opening of re-circulating valve to maintain visible level of condensate in hot well;</li> <li>17. Returns to operating level and applies gland seal steam to turbine rotor;</li> <li>18. Admits operating steam to air ejectors, adjusting supply pressure as necessary;</li> <li>19. Determines visible level in hot well, adjusting re-circulating valve as necessary;</li> <li>20. Starts lube-oil supply to unit when vacuum reaches 18-22 inches (obtain assistance if pump is hand-operated);</li> <li>21. Sets the throttle valve;</li> <li>22. Slowly opens throttle valve, gradually increasing turbine rotating speed;</li> <li>23. Allows the unit to rotate without load for even warming;</li> <li>24. Applies lube-oil and alternator cooler water supply as necessary; and</li> <li>25. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
6.1.D <i>All Note 3</i>	Operate electrical, electronic and control systems	Preparing, starting, paralleling and changing over generators	On a vessel of at least 1,000 HP or simulator, or in a laboratory,	the candidate plans for and connects the ship's service generator to the main switchboard, and takes original on-line unit off the board.	The candidate takes the following actions, describing them as they are performed: <ol style="list-style-type: none"> <li>1. Ensures that the plan reflects the proper sequence of actions, is complete, and conforms to the requirements of manufacturer's instructions and the vessel's procedures;</li> <li>2. Inspects and then starts the generator prime mover;</li> <li>3. Verifies that the automatic voltage regulator is at recommended voltage-and manually adjusts as necessary;</li> <li>4. Turns on the synchroscope and observes its direction and speed of rotation;</li> <li>5. Manually adjusts generator speed so that the scope rotation is moving slowly in the "fast" direction;</li> <li>6. Manually closes the in-coming unit's circuit breaker to stop the synchroscope at the 12 o'clock position and turns off the scope;</li> <li>7. Observes available switchboard meters and divides load simultaneously and evenly between on-line and in-coming units;</li> <li>8. Continues to observe available switchboard meters and shifts load between the unit to remain on-line and the off-going unit;</li> <li>9. Continues to manually reduce the off-going unit load until the off-going unit circuit breaker trips, or trips the breaker manually as the kW load of the off-going unit approaches 0; and</li> <li>10. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
6.1.E <i>All Note 3</i>	Operate electrical, electronic and control systems	Basic configuration and operation principles of the following electrical, electronic and control equipment: Electrical motors including starting methodologies High-voltage installations Sequential control circuits and associated system devices	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate demonstrates knowledge of motor controllers, other sequential control systems, and high-voltage properties and precautions.	The candidate:  1. Explains the sequence of events for the starting of at least two motor controllers; one reversing and one non-reversing;  2. Describes the basic operation of an electro-pneumatic or electro-hydraulic sequence system chosen by the assessor; and  3. Lists the inherent dangers of high-voltage systems and describes special safety precautions for operating and troubleshooting such systems.

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
6.2.A  <i>All Note 3</i>	Operate electrical, electronic and control systems	Basic configuration and operation principles of the following electrical, electronic and control equipment:  Characteristics of basic electronic circuit elements  Flowchart for automatic and control systems  Functions, characteristics and features of control systems for machinery items, including main propulsion plant operation control and steam boiler automatic controls	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate demonstrates knowledge of basic electronic elements and diagrams.	The candidate:  1. Identifies and explains the characteristics and uses of: <ol style="list-style-type: none"> <li>a. Resistors;</li> <li>b. Potentiometer;</li> <li>c. Capacitors;</li> <li>d. Transistors;</li> <li>e. Thyristors;</li> <li>f. Inductors;</li> <li>g. Semi-conductors;</li> <li>h. Diodes;</li> <li>i. Integrated circuits;</li> <li>j. Light dependent resistors (LDRs)/thermistors;</li> <li>k. Parallel circuits;</li> <li>l. Series circuits;</li> <li>m. Ohm's law;</li> <li>n. Frequency modulation; and</li> <li>o. Amplitude modulation;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>6.2.A Cont'd</p> <p>All Note 3</p>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>2. Identifies the following in a drawing of an electronics circuit:               <ol style="list-style-type: none"> <li>a. Ammeter;</li> <li>b. Amplifier;</li> <li>c. “And” and “Or” gates and inverters;</li> <li>d. Antenna;</li> <li>e. Battery;</li> <li>f. Capacitor;</li> <li>g. Circuit breaker;</li> <li>h. Diode;</li> <li>i. LED;</li> <li>j. Schottky diode;</li> <li>k. Hull ground;</li> <li>l. Integrated circuit;</li> <li>m. Rectifier;</li> <li>n. Relay;</li> <li>o. Rheostat;</li> <li>p. Transformer;</li> <li>q. Voltmeter; and</li> <li>r. Wattmeter; and</li> </ol> </li> <li>3. Identifies the use of an electronic circuit based upon a drawing provided by the assessor.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>6.3.A</p> <p><i>All Note 3</i></p>	<p>Operate electrical, electronic and control systems</p>	<p>Basic configuration and operation principles of the following electrical, electronic and control equipment:</p> <p>Various automatic control methodologies and characteristics</p> <p>Proportional-Integral-Derivative (PID) control characteristics and associated system devices for process control</p>	<p>On a vessel of at least 1,000 HP, or in a laboratory or workshop,</p>	<p>the candidate describes the fundamentals of automation and control system technology.</p>	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Identifies and describes the function of the components in a motor controller, a combustion control system, or a feedback control circuit;</li> <li>2. Explains the terms:               <ol style="list-style-type: none"> <li>a. <i>Zero</i>;</li> <li>b. <i>Live zero</i>;</li> <li>c. <i>Gain</i> and;</li> <li>d. <i>Span</i>; and</li> </ol> </li> <li>3. Identifies the uses and associated problems of the following controls:               <ol style="list-style-type: none"> <li>a. On/off;</li> <li>b. Proportional;</li> <li>c. Integral;</li> <li>d. Derivative;</li> <li>e. Split range; and</li> <li>f. Cascade.</li> </ol> </li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
7.1.A <i>All Note 3</i>	Maintenance and repair of electrical and electronic equipment	Safety requirements for working on shipboard electrical systems Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems Detection of electric malfunction, location of faults and measures to prevent damage Construction and operation of electrical testing and measuring equipment Function and performance tests of equipment: interpretation of electrical and simple electronic diagrams	On a vessel of at least 1,000 HP, or in a laboratory or workshop, using a Megger,	the candidate plans for the lock and tag out an electric motor and measures and records the dielectric strength of the insulation of the motor through connections in the controller, describing actions as they are being performed.	The candidate performs the following actions and correctly describes them as they are being performed:  <ol style="list-style-type: none"> <li>1. Correctly plans for and lays out the job, in proper sequence, and incorporates all safety considerations;</li> <li>2. De-energizes the motor circuit;</li> <li>3. Employs available mechanical means (e.g., fuse removal, circuit breaker box lock, etc.) to prevent unintentional energizing of the circuit;</li> <li>4. Employs a sturdy tag device stating which circuit is de-energized, reason, date and time, and the person's name who will be working on the motor;</li> <li>5. Confirms that the system is de-energized and uses the Megger correctly in accordance with manufacturer's instructions;</li> <li>6. Corrects the reported resistance value for temperature and it is within +/- 5% of the assessor's solution; and</li> <li>7. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>7.2.A <i>All Note 3</i></p>	<p>Maintenance and repair of electrical and electronic equipment</p>	<p>Safety requirements for working on shipboard electrical systems Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems Detection of electric malfunction, location of faults and measures to prevent damage Construction and operation of electrical testing and measuring equipment Function and performance tests of equipment: interpretation of electrical and simple electronic diagrams</p>	<p>On a vessel of at least 1,000 HP, or in a laboratory or workshop,</p>	<p>the candidate troubleshoots a malfunctioning motor controller.</p>	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Obtains the necessary schematics and wiring diagrams;</li> <li>2. Verifies that circuit breakers and switches supplying power to the motor and associated control equipment are closed as appropriate;</li> <li>3. Uses a voltmeter to check for power available at the service entrance of the controller and verifies that all supply voltages are within accepted parameters;</li> <li>4. Tests power and control fuses using on-line testing techniques with a voltmeter to verify the results, and tests the fuses off-line with an ohmmeter;</li> <li>5. If fuses are blown, visually checks for obvious signs of electrical shorts and grounds;</li> <li>6. Visually checks the interior of the controller enclosure for signs of overheating, burning of contacts, weak contactor springs, corroded magnetic contactor armature faces, discoloration of terminals and conductors, broken conductors, loose fuses, and loose terminal connections; also smells for burned insulation;</li> <li>7. Restores power and attempts to restart the motor while observing the motor controller to determine what relays and contactors are pulling in;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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<p>7.2.A Cont'd</p> <p>All Note 3</p>					<p style="text-align: center;"><i>Continued from previous page</i></p> <p>8. If the motor contactor is pulling in:</p> <ul style="list-style-type: none"> <li>a. Listens for buzzing or chattering noises;</li> <li>b. Uses a voltmeter to check for voltage drops and imbalances; and</li> <li>c. Uses a clamp-on ammeter to check for current draws and imbalances in the power circuit lines and verifies the normal current by checking the motor nameplate data;</li> </ul> <p>9. If the motor contactor is not pulling in:</p> <ul style="list-style-type: none"> <li>a. Determines what motor controller load energization actions (such as relays, timers, contactors, indicator lights, etc.) do take place; and</li> <li>b. Uses the control schematic to determine the specific operating contacts that are necessary for energizing specific operating contactor and relay coils for normal motor startup;</li> </ul> <p style="text-align: center;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>7.2.A Cont'd</p> <p>All Note 3</p>					<p style="text-align: center;"><i>Continued from previous page</i></p> <p>10. Checks to see if normal voltage is applied to the operating coil after closing operating contacts:</p> <ul style="list-style-type: none"> <li>a. If the normal voltage is being applied to the operating coil, tests the coil resistance with an ohmmeter, ensuring first that power is secured to the controller and coil is properly isolated;</li> <li>b. If no voltage at all is being applied to the operating coil, determines the location of the open in the control circuit;</li> <li>c. If an unacceptably low voltage is being applied to the operating coil, determines the location of the partial open in the control circuit;</li> </ul> <p>11. Verifies the on-line results for low or no voltage by testing operating contacts for continuity using off-line testing techniques with an ohmmeter; and</p> <p>12. Ensures that power is secured to the controller and operating contacts are properly isolated before testing.</p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>7.2.B <i>All Note 3</i></p>	<p>Maintenance and repair of electrical and electronic equipment</p>	<p>Safety requirements for shipboard electrical systems Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment Detection of electric malfunction, location of faults and measures to prevent damage Construction and operation of electrical testing and measuring equipment Function and performance tests of equipment interpretation of electrical and simple electronic diagrams</p>	<p>On a vessel of at least 1,000 HP, or in a laboratory or workshop,</p>	<p>the candidate repairs a malfunctioning motor controller.</p>	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Replaces blown fuses as needed with replacement fuses that are of the correct type and properly rated, and fuse holders should tightly grip the fuses;</li> <li>2. Refurbishes contacts as necessary using techniques that are in accordance with instruction manuals;</li> <li>3. Replaces controller parts as needed using only the manufacturer’s recommended spares;</li> <li>4. When replacing controller components, leads should be marked and connection scheme sketches drawn to insure correct wiring;</li> <li>5. Properly tightens lugs and terminals;</li> <li>6. Cleans motor controllers in accordance with the manufacturer’s instructions, avoiding the use of compressed air;</li> <li>7. Lubricates controller linkages and pivots in accordance with the manufacturer’s instructions; and</li> <li>8. Thoroughly tests controller function prior to placing equipment back into normal service and ensures that all system voltages and current draws are within manufacturer specifications.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
7.3.A  <i>All Note 3</i>	Maintenance and repair of electrical and electronic equipment	Detection of electric malfunction, location of faults and measures to prevent damage	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate plans and carries out a logical procedure to detect the location of ground(s) indicated on the main switchboard.	The candidate: <ol style="list-style-type: none"> <li>1. Correctly plans and lays out the job, in proper sequence, and incorporates all safety considerations;</li> <li>2. Ensures that the logic path followed will progressively eliminate or reduce possible grounding sources by:                             <ol style="list-style-type: none"> <li>a. Isolating the circuit breaker panel by sequentially opening each circuit feeder;</li> <li>b. Isolating each circuit by opening each breaker in the panel until the circuit is found; and</li> <li>c. Isolating each outlet/piece of equipment, if necessary;</li> </ol> </li> <li>3. Correctly identifies grounding source(s);</li> <li>4. Correctly describes the actions as they are performed; and</li> <li>5. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
7.4.A <i>All Note 3</i>	Maintenance and repair of electrical and electronic equipment	Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment Detection of electric malfunction, location of faults and measures to prevent damage Construction and operation of electrical testing and measuring equipment	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate disassembles and reassembles an electric motor.	The candidate: <ol style="list-style-type: none"> <li>1. Disassembles an AC or DC electric motor;</li> <li>2. Thoroughly cleans internal components;</li> <li>3. Makes continuity and ground tests of stator/rotor coils;</li> <li>4. Turns/grinds commutator and undercut mica if necessary in a DC motor;</li> <li>5. Checks, replaces, and fits brushes if applicable;</li> <li>6. Fits new bearings if necessary;</li> <li>7. Reassembles the motor;</li> <li>8. Sets brush tension if applicable;</li> <li>9. Tests run if possible; and</li> <li>10. Takes proper action to prevent safety and pollution violations.</li> </ol>
7.5.A <i>All Note 3</i>	Maintenance and repair of electrical and electronic equipment	Function and performance tests of the following equipment: <ol style="list-style-type: none"> <li>.1 Monitoring systems</li> <li>.2 Automatic control devices</li> <li>.3 Protective devices</li> </ol>	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	The candidate responds to and clears at least two alarms from the engine control monitoring system.	The candidate: <ol style="list-style-type: none"> <li>1. Fills bilge well to test high bilge water alarm and pumps out well to clear alarm;</li> <li>2. Uses smoke test gear to test two fire alarm sensors and clears out smoke and reset alarm.</li> <li>3. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>7.5.B</p> <p><i>All Note 3</i></p>	<p>Maintenance and repair of electrical and electronic equipment</p>	<p>Function and performance tests of automatic control devices</p>	<p>On a vessel of at least 1,000 HP,</p>	<p>The candidate performs a steering gear test.</p>	<p>The candidate performs either A or B:</p> <p>A. <u>Rudder-equipped vessel</u></p> <ol style="list-style-type: none"> <li>1. Using first one, then the other steering gear pump, alternately operates steering gear from maximum port to maximum starboard rudder from the ships wheel, non-follow up switches and local manual control devices;</li> <li>2. On a running generator, not connected to the bus, shuts off valve to low LO shut down sensor;</li> <li>3. With one steering gear motor running, interrupts power via circuit breaker on main switchboard to test if other unit starts automatically; and</li> <li>4. Takes proper action to prevent safety and pollution violations.</li> </ol> <p>B. <u>Z-Drive equipped vessel</u></p> <p>Using each available steering pump, rotate the Z Drive unit in a 360-degree rotation from the ships wheel/joystick, non-follow up switches and local manual control devices within a period specified by the manufacturer.</p>
<p>7.5.C</p> <p><i>All Note 3</i></p>	<p>Maintenance and repair of electrical and electronic equipment</p>	<p>Function and performance tests of the following equipment and their configuration: Protective devices</p>	<p>On a vessel of at least 1,000 HP, or in a laboratory or workshop,</p>	<p>The candidate tests a low lube oil (LO) shutdown protective device.</p>	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. On a running generator, not connected to the bus, shuts off valve to low LO shut down sensor;</li> <li>2. Drains LO from line between valve and sensor;</li> <li>3. Ensures that engine shuts down;</li> <li>4. Closes drain valve; open sensor valve; and</li> <li>5. Restarts engine to confirm proper operation; and</li> <li>6. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
8.1.A <i>All Note 3</i>	Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	Materials used in construction and repair of ships and equipment Fabrication and repair Fabrication and repair of systems and components Safe working practices Safety measures to ensure a safe working environment and for using hand tools, machine tools and measuring instruments Use of hand tools, machine tools and measuring instruments	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate uses hand and machine tools to fabricate two items specified by the assessor.	The candidate plans and fabricates to the satisfaction of, and with tolerances specified by, the assessor:  1. At least one of the following: a. Plumb bob; b. Bolt with hex head (either SAE or metric); c. Threaded pipe nipples and “bell” reducer; d. Parallel clamp; or e. A similar item that may be required on board as specified by the assessor; and  2. At least one of the following: a. Screw jack; b. Coupling, pipe thread-to-flare tubing – any size; c. Pump shaft; d. Valve stem; or e. A similar item that may be required on board as specified by the assessor.

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
8.1.B  <i>All Note 3</i>	Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	Materials used in construction and repair of ships and equipment  Fabrication and repair  Fabrication and repair of systems and components  Safe working practices  Safety measures to ensure a safe working environment and for using hand tools, machine tools and measuring instruments  Use of hand tools, machine tools and measuring instruments	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate performs several electric arc welding processes.	For each fillet and groove weld listed below, the candidate: <ol style="list-style-type: none"> <li>1. Prepares required pieces of metal prior to welding;</li> <li>2. Selects the proper machine settings and electrode for the size and material to be joined; and</li> <li>3. Performs a post-weld examination and/or test.</li> </ol> <p><u>Fillet welds of:</u></p> <ol style="list-style-type: none"> <li>1. Flat plates;</li> <li>2. Vertical plates (at right angles); and</li> <li>3. Horizontal [flat] pipe (end-to-end).</li> </ol> <p><u>Groove welds of:</u></p> <ol style="list-style-type: none"> <li>1. Flat plates;</li> <li>2. Vertical plates (at right angles); and</li> <li>3. Horizontal [flat] pipe (end-to-end).</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
8.1.C <i>All Note 3</i>	Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	<p>Materials used in construction and repair of ships and equipment</p> <p>Fabrication and repair</p> <p>Fabrication and repair of systems and components</p> <p>Safe working practices</p> <p>Safety measures to ensure a safe working environment and for using hand tools, machine tools and measuring instruments</p> <p>Use of hand tools, machine tools and measuring instruments</p>	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate uses oxy-acetylene equipment to fabricate a flange.	<p>The candidate fabricates a flange to the satisfaction of, and with tolerances specified by, the assessor:</p> <ol style="list-style-type: none"> <li>1. Prepares required piece of metal prior to burning;</li> <li>2. Selects the proper gas pressure settings and cutting tip; and</li> <li>3. Performs a post-cut examination.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
8.2.A  <i>All Note 3</i>	Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	Methods for carrying out safe emergency and temporary repairs	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate demonstrates the ability to understand the urgency of a problem and carries out safe emergency and temporary repairs.	The candidate: <ol style="list-style-type: none"> <li>1. Isolates the item to be repaired;</li> <li>2. Wears suitable protective equipment;</li> <li>3. Selects the proper tools and materials for repair;</li> <li>4. Uses lockout/tagout principles to keep shipmates informed of his or her activity;</li> <li>5. Does not exacerbate the problem;</li> <li>6. Takes proper action to prevent safety and pollution violations; and</li> <li>7. Performs either "A" or "B":                             <ol style="list-style-type: none"> <li>A. <u>Fabricates and installs a "jubilee" pipe patch:</u> <ol style="list-style-type: none"> <li>1. Isolates the line to be repaired;                                     <ol style="list-style-type: none"> <li>a. Relieves the line of residual pressure;</li> <li>b. Confirms that the pressure has been relieved; and</li> <li>c. Drains the line;</li> </ol> </li> <li>2. Rolls a piece of sheet metal into a cylinder;</li> <li>3. Bends a tab on each edge to form a flange;</li> <li>4. Drills three to five holes through both flanges for securing bolts;</li> <li>5. Puts a piece of rubber or gasket material over the hole that is large enough to cover and overlap the damage at least 2 inches on all sides;</li> <li>6. Slips the jubilee pipe patch over the rubber or gasket material;</li> <li>7. Inserts the bolts into the holes and secures them in place; and</li> <li>8. Slowly applies pressure and check for leaks.</li> </ol> </li> </ol> </li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>8.2.A Cont'd</p> <p>All Note 3</p>					<p style="text-align: center;"><i>Continued from previous page</i></p> <p>B. <u>Fabricates and installs a “soft” patch:</u></p> <ol style="list-style-type: none"> <li>1. Isolates the line to be repaired;               <ol style="list-style-type: none"> <li>a. Relieves the line of residual pressure;</li> <li>b. Confirms that the pressure has been relieved; and</li> <li>c. Drains the unit;</li> </ol> </li> <li>2. Reduces the area of the hole by driving in softwood plugs and wedges as necessary;</li> <li>3. Once the plugs and wedges are in place, trims them off flush with the outside surface of the pipe;</li> <li>4. Covers the damaged area with a piece of rubber that will completely cover and extend about 2 inches past the damaged area on all sides;</li> <li>5. Uses two tightly wound layers of marline or wire to hold the rubber in place; and</li> <li>6. Slowly applies pressure and checks for leaks.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
8.2.B <i>All Note 3</i>	Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	Use of various types of sealants and packings	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate replaces a mechanical seal or repacks a packing gland stuffing box on a centrifugal pump.	The candidate: <ol style="list-style-type: none"> <li>1. Isolates the component to be worked on;</li> <li>2. Uses lockout/tagout procedures;</li> <li>3. Selects the correct type of sealant or packing;</li> <li>4. Prepares sealant/packing to proper size;</li> <li>5. Cleans/prepares surfaces to receive new seal or packing;</li> <li>6. In case of mechanical seals, follows manufacturer's instructions;</li> <li>7. Uses proper tension while tightening bolts;</li> <li>8. Opens isolation valves slowly to check for leaks;</li> <li>9. Fully tests new packing before putting unit back in service and</li> <li>10. Takes proper action to prevent safety and pollution violations.</li> </ol>
8.2.C <i>All Note 3</i>	Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	Use of various types of sealants and packings	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate repacks a valve.	The candidate: <ol style="list-style-type: none"> <li>1. Isolates the component to be worked on;</li> <li>2. Uses lockout/tagout procedures;</li> <li>3. Selects the correct type of sealant or packing;</li> <li>4. Prepares sealant/packing to proper size;</li> <li>5. Cleans/prepares surfaces to receive new seal or packing;</li> <li>6. In case of mechanical seals, follows manufacturer's instructions;</li> <li>7. Uses proper tension while tightening bolts;</li> <li>8. Opens isolation valves slowly to check for leaks;</li> <li>9. Fully tests new packing before putting unit back in service and</li> <li>10. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
8.2.D <i>All Note 3</i>	Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	Use of various types of sealants and packings	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate replaces a flange gasket.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Isolates the component to be worked on;</li> <li>2. Uses lockout/tagout procedures;</li> <li>3. Selects the correct type of sealant or packing;</li> <li>4. Prepares sealant/packing to proper size;</li> <li>5. Cleans/prepares surfaces to receive new seal or packing;</li> <li>6. In case of mechanical seals, follows manufacturer's instructions;</li> <li>7. Uses proper tension while tightening bolts;</li> <li>8. Opens isolation valves slowly to check for leaks;</li> <li>9. Fully tests new packing before putting unit back in service and</li> <li>10. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
9.1.A  <i>All Note 3</i>	Maintenance and repair of shipboard machinery and equipment	Safety measures for repair and maintenance, including the safe isolation of shipboard machinery and equipment  Basic mechanical knowledge and skills  Maintenance and repair, such as dismantling, adjustment and reassembling of machinery and equipment  Use of specialized tools and measuring instruments  Materials in construction of equipment  Machinery drawings and handbooks  Piping, hydraulic and pneumatic diagrams	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate overhauls a centrifugal pump.	The candidate: <ol style="list-style-type: none"> <li>1. Isolates the item to be repaired;</li> <li>2. Selects the proper tools and materials for repair;</li> <li>3. Ensures hoist or other lifting device necessary to support pump body is of correct specification and hooked up properly;</li> <li>4. Uses lockout/tagout procedures to isolate motor from panel;</li> <li>5. Marks alignment markings on the two halves of the coupling flanges and then removes the coupling bolts;</li> <li>6. Shuts suction and discharge valves;</li> <li>7. Cracks open flanges to drain water out;</li> <li>8. Removes the pump cover, jacking up if necessary;</li> <li>9. Lifts out the pump shaft and impeller;</li> <li>10. Dismantles the impeller, liner and removes the wearing rings;</li> <li>11. Removes the gland packing or seal;</li> <li>12. Inspects the pump shaft and casing for erosion, pitting and wear;</li> <li>13. Rectifies defects with brass putty or other method if required;</li> <li>14. Replaces excessively worn parts;</li> <li>15. Checks wear ring clearance, general practice being to replace with new rings;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
9.1.A <i>Cont'd</i>  <i>All Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <p>16. Checks shaft trueness, removes sleeve from shaft, replaces sleeve with 'O' ring (if fitted);</p> <p>17. Checks key, key slots, nuts and threads for good order;</p> <p>18. Assembles all pump parts and tests for free rotation;</p> <p>19. Aligns and tightens coupling;</p> <p>20. Conducts a test run of the pump; and</p> <p>21. Takes proper action to prevent safety and pollution violations.</p>
9.1.B  <i>All Note 3</i>	Maintenance and repair of shipboard machinery and equipment	<p>Appropriate basic mechanical knowledge and skills</p> <p>Maintenance and repair, such as dismantling, adjustment and reassembling of machinery and equipment</p> <p>The use of appropriate specialized tools and measuring instruments</p>	On a vessel of at least 1,000 HP, or in a laboratory or workshop,	the candidate takes up on a leaking packing gland stuffing box while it is in operation.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Correctly plans the job, using the proper sequence of actions to examine an operating rotary pump (without a mechanical seal) to tighten a leaking packing stuffing box and to determine if further examination of the pump is required;</li> <li>2. Visually inspects to determine if leakage of pumped fluid is dripping at an acceptable rate;</li> <li>3. Determines (for saltwater cooling service) if leakage is cool to the touch;</li> <li>4. Uses a set of dividers to determine if packing is evenly distant from casing;</li> <li>5. Tightens packing gland by turning both packing gland nuts by a ¼-turn to maintain a parallel position of the gland with the casing;</li> </ol> <p style="text-align: center;"><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>9.1.B <i>Cont'd</i></p> <p><i>All Note 3</i></p>					<p><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>6. Looks for a reduction in leakage and ascertains by touch if the leakage has become warmer;</li> <li>7. Continues tightening of the packing gland until the leakage is reduced to a continuous dribble and/or the leakage has begun to warm; and</li> <li>8. Notifies the senior engineer if leakage flow is not stemmed and/or the leakage has warmed excessively.</li> </ol> <p><b>NOTE:</b> This task may be performed on any type of pump designated by the assessor</p>
<p>9.1.C</p> <p><i>All OSV</i></p>	<p>Maintenance and repair of shipboard machinery and equipment</p>	<p>Appropriate basic mechanical knowledge and skills</p> <p>Maintenance and repair, such as dismantling, adjustment and reassembling of machinery and equipment</p> <p>The use of appropriate specialized tools and measuring instruments</p>	<p>On a vessel of at least 1,000 HP, or in a laboratory or workshop,</p>	<p>the candidate performs valve and diaphragm maintenance on a air-operated diaphragm pump.</p>	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Correctly plans the job, using the proper sequence of actions to examine an air operated double diaphragm pump in operation to determine whether or not the pump has acceptable volumetric efficiency;</li> <li>2. Isolates the item to be repaired;</li> <li>3. Uses lockout/tagout procedures;</li> <li>4. Selects the proper tools and materials for the repair;</li> <li>5. Removes the suction and discharge manifolds to permit access to the suction and discharge non-return valves (ball or flapper);</li> <li>6. Removes and cleans the suction and discharge non-return valves and their seats. Inspects the valve assemblies for wear and deterioration;</li> <li>7. Removes the suction and discharge chambers to permit access to the diaphragms, diaphragm plates, and center rod;</li> </ol> <p><i>Continued on next page</i></p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
9.1.C <i>Cont'd</i>  <i>All OSV</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>8. Disassembles, removes, and cleans the diaphragms, diaphragm plates, and center rod. Inspects the diaphragms for deterioration;</li> <li>9. Reassembles pump in reverse order from assembly, replacing any worn or damaged valves, valve seats, and diaphragms;</li> <li>10. Clears lockout/tagout and prepares the pump for a test run; and</li> <li>11. Takes proper action to prevent safety and pollution violations.</li> </ol>
10.1.A  <i>All Note 3</i>	Ensure compliance with pollution prevention requirements.	<p>Prevention of pollution of the marine environment</p> <p>Knowledge of precautions to prevent pollution of the marine environment</p> <p>Anti-pollution procedures and all associated equipment</p> <p>Importance of proactive measures to protect the marine environment</p>	On a vessel of at least 1,000 HP; or in a laboratory or workshop,	the candidate puts into service and then secures the sewage waste-treatment plant.	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Describes the vessel's environmental compliance plan and how it relates to the sewage waste-treatment plant;</li> <li>2. Ensures that the plan reflects proper sequences of actions are complete, and that it conforms to the directions and requirements of both the manufacturer's instructions and ship's procedures;</li> <li>3. Successfully puts into service and secures the sewage waste-treatment according to plan;</li> <li>4. Correctly describes the actions as they are being performed; and</li> <li>5. Takes proper action to prevent safety and pollution violations.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
<p>10.1.B</p> <p><i>All Note 3</i></p>	<p>Ensure compliance with pollution prevention requirements.</p>	<p>Prevention of pollution of the marine environment</p> <p>Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Anti-pollution procedures and all associated equipment</p> <p>Importance of proactive measures to protect the marine environment</p>	<p>On a vessel of at least 1,000 HP, or in a laboratory or workshop,</p>	<p>the candidate puts into service and then secures the oily-water separator/oil content monitor system.</p>	<p>The candidate:</p> <ol style="list-style-type: none"> <li>1. Describes the vessel’s environmental compliance plan and how it relates to oily-water separator/oil content monitor system;</li> <li>2. Ensures that the plan reflects proper sequences of actions are complete, and conforms to the directions and requirements of both the manufacturer’s instructions and ship’s procedures;</li> <li>3. Successfully puts into service and secures the oily-water separator/oil content monitor system according to plan;</li> <li>4. Correctly describes the actions as they are being performed; and</li> <li>5. Takes proper action to prevent safety and pollution violations.</li> </ol>
<p>11.1.A</p> <p><i>All Note 3</i></p>	<p>Maintain seaworthiness of the ship</p> <p><i>Ship stability &amp; construction</i></p>	<p>Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment</p>	<p>Onboard a vessel or in a laboratory, and given stability, trim and stress tables, and diagrams,</p>	<p>the candidate determines stability data for vessel.</p>	<p>The candidate determines stability data for vessel and describes whether the stability conditions comply with the IMO intact stability criteria under all conditions of vessel loading.</p>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
11.2.A <i>All Note 3</i>	Maintain seaworthiness of the ship	Understanding of the fundamentals of watertight integrity	Onboard a vessel or in a laboratory,	the candidate describes the actions to ensure and maintain the watertight integrity of the vessel	The candidate's description includes: 1. Stability conditions in compliance with the IMO intact stability criteria under all conditions of loading; and 2. Watertight integrity of the vessel in accordance with accepted practice .
11.3.A <i>All Note 3</i>	Maintain seaworthiness of the ship	Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy	Onboard ship or in a laboratory,	the candidate describes actions to be taken for a partial loss of intact buoyancy.	The candidate describes actions that maintain the watertight integrity of the ship and are in accordance with accepted practice.
11.4.A <i>All Note 3</i>	Maintain seaworthiness of the ship	General knowledge of the principal structural members of a ship and the proper names for the various parts	Onboard ship or in a laboratory,	the candidate describes principal structure members of a ship and the proper names for the various parts.	The candidate correctly identifies and describes the ship's structural members.

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
12.1 <i>All Note 3 Course</i>	Prevent, control and fight fires on board	Fire prevention and fire-fighting appliances  Ability to organize fire drills  Knowledge of classes and chemistry of fire  Knowledge of fire-fighting systems  Action to be taken in the event of fire, including fires involving oil systems			These KUPs are demonstrated by successfully completing approved or accepted training in <i>Basic and Advanced Fire Fighting</i> .
13.1 <i>All Note 3 Course</i>	Operate life-saving appliances	<i>Life-saving</i> Ability to organize abandon ship drills and knowledge of operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment...			This competence and KUP is demonstrated by successfully completing approved or accepted training for either <i>Proficiency in Survival Craft and Rescue Boats, other than Fast Rescue Boats</i> or <i>Proficiency in Survival Craft and Rescue Boats, other than Lifeboats and Fast Rescue Boats</i> or by holding an endorsement for either PSC or PSC-Limited.

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
14.1 <i>All Note 3 Course</i>	Apply medical first aid on board ship	Medical aid Practical application of medical guides and advice by radio, including ability to take effective action in the case of accidents or illnesses that are likely to occur	This KUP is demonstrated by successfully completing an approved or accepted <i>Medical First Aid Provider</i> or <i>Medical Care Provider</i> course.		
15.1.A <i>All Note 3</i>	Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO conventions concerning safety of life at sea and protection of the marine environment	On a vessel or in a laboratory, when asked to describe relevant IMO conventions concerning safety of life at sea and protection of the marine environment,	the candidate describes legislative requirements relating to safety of life at sea, security and protection of the environment.	The candidate correctly describes appropriate legislative requirements.

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
16.1.A <i>All Note 3</i>	Application of leadership and teamworking skills	Working knowledge of shipboard personnel management and training	Aboard a vessel, or in a laboratory, when asked to describe the duties of personnel aboard OSVs,	the candidate describes the basic duties and responsibilities of OSV personnel.	<p>The candidate describes the duties and responsibilities of:</p> <ol style="list-style-type: none"> <li>1. Master;</li> <li>2. Deck department including:               <ol style="list-style-type: none"> <li>a. Chief Mate;</li> <li>b. Second Mate;</li> <li>c. Third Mate;</li> <li>d. Able Seamen; and</li> <li>e. Entry Level Deck</li> </ol> </li> <li>3. Engine department including:               <ol style="list-style-type: none"> <li>a. Chief Engineer;</li> <li>b. First Assistant Engineer;</li> <li>c. Second Assistant Engineer;</li> <li>d. Third Assistant Engineer;</li> <li>e. QMEDs; and</li> <li>f. Entry Level Engine;</li> </ol> </li> <li>4. Steward's department ; and</li> <li>5. Industrial personnel.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
16.2.A <i>All Note 3</i>	Application of leadership and team working skills	A knowledge of related international maritime conventions and recommendations, and national legislation	On a vessel or in a laboratory, when asked to describe international conventions and national regulations,	the candidate describes the basic international maritime conventions and national regulations.	<p>The candidate correctly describes the basic international conventions and national regulations location of information concerning these programs aboard ship related to:</p> <ol style="list-style-type: none"> <li>1. International Convention for the Safety of Life at Sea (SOLAS);</li> <li>2. International Ship and Port Facility Security Code (ISPS);</li> <li>3. International Safety Management Code (ISM);</li> <li>4. International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended (STCW);</li> <li>5. MARPOL 73/78 and its Annexes;</li> <li>6. Oil Pollution Act of 1990 (OPA 90);</li> <li>7. United States laws and regulations on inspection and manning of vessels;</li> <li>8. United States laws and regulations on shipment and discharge of seamen;</li> <li>9. U. S. Coast Guard chemical testing requirements (46 CFR Part 16);</li> <li>10. Department of Transportation Hazardous Materials training requirements; and</li> <li>11. Onboard contracts, including labor contracts.</li> </ol>

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
16.3.A  <i>All Note 3</i>	Application of leadership and team working skills	Ability to apply task and workload management, and effective resource management	On a vessel or in a workshop,	the candidate plans for and assists in taking on and discharging fuel oil.	The candidate: <ol style="list-style-type: none"> <li>1. Meets with the Chief Engineer to plan and schedule the order of events in anticipation of the shore-side bunker hose connection or bunker barge arrival;</li> <li>2. Follows anti-pollution procedures (e.g., plug scuppers, provide vent drip buckets and absorbent medium, etc.);</li> <li>3. Transfers oil internally (under supervision) if required;</li> <li>4. Sounds tanks that are planned to receive bunkers and records levels that are planned to receive bunkers;</li> <li>5. Helps identify and train subordinate personnel who will be assigned to help sound filling tanks and/or communicate with pumping personnel;</li> <li>6. Supervises/assists in the connection of the bunker hose to the vessel taking particular note of type and condition of flange gasket(s);</li> <li>7. Reads and discusses the Declaration of Inspection;</li> <li>8. Checks hose connections for tightness and proper valve line-up;</li> <li>9. Tests methods of communication with barge/shore side, deck and engine room, and sounding personnel;</li> <li>10. Notifies both the mate and engineer on watch before commencing operations;</li> <li>11. Starts process slowly; checking for leaks in hoses and connections;</li> </ol> <p style="text-align: right;"><i>Continued on next page</i></p>

*Successful completion of these guidelines will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to OSVs. The use of these guidelines is not mandatory and alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.*

Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
16.3.A <i>Cont'd</i>  <i>All</i> <i>Note 3</i>					<p style="text-align: center;"><i>Continued from previous page</i></p> <ol style="list-style-type: none"> <li>12. Takes required samples directly from barge tanks or sample valve on hose/flange;</li> <li>13. Tests sample of incoming oil with respect to specific gravity, viscosity, sediment, water content, etc., if such testing equipment is on board;</li> <li>14. Assists in monitoring progress, flow rates, sounding of tanks, topping off, and changing over tanks according to plan;</li> <li>15. Periodically checks bilges for oil content if oil is flowing through piping in the engine room (filling double-bottom tanks);</li> <li>16. Slows bunkering rate as last tank is being filled and secures operations as level approaches predetermined value;</li> <li>17. Assists in securing from the evolution; and</li> <li>18. Assists in making proper entries into Engine Log and Oil Record Books.</li> </ol>

*Successful completion of these guidelines will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to OSVs. The use of these guidelines is not mandatory and alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.*

Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
16.4.A  <i>All Note 3</i>	Application of leadership and team working skills	Knowledge and ability to apply decision-making techniques:  .1 Situation and risk assessment .2 Identify and consider generated options .3 Selecting course of action .4 Evaluation of outcome effectiveness	On board a vessel or in a laboratory, during a fire or emergency simulation,	the candidate supervises a fire or emergency team.	The candidate:  1. Briefs the team on the situation, the approach to remedying the simulated emergency, and the procedures to be executed; 2. Delegates tasks to each of the assigned crewmembers, briefing them about any special procedures or events that may concern them; 3. Checks the assigned crewmembers to ensure that they are using personal protective equipment (PPE) correctly and appropriately; 4. Checks the assigned crewmembers to ensure that they have made available any equipment that will be needed to accomplish the assigned tasks, both team and individual; 5. Executes the generated plan to handle the emergency simulation; and 6. Participates in the post-simulation critique and presents the positive results of the simulation, the negative findings of the simulation, and makes recommendations to improve procedures, equipment availability, and personnel training.

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Task No.	STCW Competence	Knowledge, Understanding and Proficiency	Performance Condition	Performance Behavior	Performance Standard
17.1 <i>All Note 3 Course</i>	Contribute to the safety of personnel and ship	Knowledge of personal survival techniques Knowledge of fire prevention and ability to fight and extinguish fires Knowledge of elementary first aid Knowledge of personal safety and social responsibilities	These KUPs are demonstrated by successful completion of approved or accepted <i>Basic Training</i> or presents evidence of maintaining the standards of competence in <i>Basic Training</i> .		

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# Record of Assessment

for

Officer in Charge of an Engineering Watch  
Limited to Service on Offshore Supply Vessels

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*Candidate's Name*

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*Candidate's Signature*

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*Candidate's Mariner Reference No.*

Enclosure (3) to NVIC 04-17

**NOTE TO QUALIFIED ASSESSOR(S):** In performing your function as a qualified assessor (QA), you may use your initials to indicate you have personally witnessed the demonstration of skill or ability by the person being assessed. The Assessment Guidelines in Enclosure (2) will provide satisfactory evidence of meeting the standard of competence specified in Section A-III/1 of the STCW Code as applicable to Offshore Supply Vessels (OSVs). The use of these Assessment Guidelines is not mandatory and an alternative means of having achieved the standards of competence in the STCW Code will be considered. In accordance with 46 CFR 11.301(a)(1)(i), alternative Assessment Guidelines must be approved by the National Maritime Center before use.

STCW Competence	Knowledge; Understanding, and Proficiency	Task No.	Task Description	Assessor's Initials	Date
Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch, including: Duties associated with taking over and accepting a watch	1.1.A <i>All</i> <i>Note 3</i>	Inspect machinery space; take over watch		
		1.1.B <i>Motor</i> <i>Note 3</i>	Keep watch (Motor)		
		1.1.B.1 <i>Note 1</i> <i>OSV</i>	De-salinization or distilling plant		

**Notes:**

- All* The assessment is required for all OICEW endorsements regardless of any limitations for propulsion mode and/or vessel equipment.
- Steam* The assessment is required for an endorsement valid for steam propelled vessels.
- GT* The assessment is required for an endorsement valid for gas turbine propelled vessels.
- Motor* The assessment is required for an endorsement valid for motor propelled vessels
- Note 1* A candidate who does not perform this task may receive an endorsement that is limited to motor and/or gas-turbine propelled vessels without distilling plants.
- Note 2* A candidate who does not perform this task may receive an endorsement that is limited to motor and/or gas-turbine propelled vessels without waste-heat or auxiliary boilers.
- Note 3* This assessment is the same or equivalent to one for an endorsement that is not trade-restricted, and need not be repeated to remove the limitation to OSVs.
- OSV* The assessment is specific to OSVs, and another assessment of the KUP is needed for an endorsement that is not limited to OSVs. The identically numbered assessment from NVIC 17-14 for the endorsement that is not limited to OSVs may be substituted for this assessment.

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Candidate's Name

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Candidate's Mariner Reference No.

STCW Competence	Knowledge; Understanding, and Proficiency	Task No.	Task Description	Assessor's Initials	Date
Maintain a safe engineering watch	Thorough knowledge of principles to be observed in keeping an engineering watch, including: Duties associated with taking over and accepting a watch	1.1.C <i>Steam</i> <i>Note 3</i>	Keep watch (Steam)		
		1.1.D <i>GT</i> <i>Note 3</i>	Keep watch (Gas Turbine)		
		1.1.E <i>All</i> <i>Note 3</i>	Maintain log book		
		1.1.F <i>All</i> <i>Note 3</i>	Hand over watch		
	Safety and emergency procedures; change-over of remote/automatic to local control of all systems	1.2.A <i>All</i> <i>Note 3</i>	Change-over procedures from remote/automatic to local control systems (OSV)		
	Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil system	1.3.A <i>All</i> <i>Note 3</i>	Respond to alarms		
		1.3.B <i>All</i> <i>Note 3</i>	Take immediate action in the event of fire		
		1.3.C <i>All</i> <i>Note 3</i>	Take immediate action in the event of accident		
		1.3.D <i>All</i> <i>Note 3</i>	Take immediate action in the event of oil system fire or accident		
	Use internal communication systems	Operation of all internal communication systems on board	3.1.A <i>All</i> <i>Note 3</i>	Test internal communications	

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Candidate's Name

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Candidate's Mariner Reference No.



Enclosure (3) to NVIC 04-17

STCW Competence	Knowledge; Understanding, and Proficiency	Task No.	Task Description	Assessor's Initials	Date
Operate main and auxiliary machinery and associated control systems	Basic construction and operation principles of machinery systems	4.1.A <i>All</i> <i>Note 3</i>	Basic construction and operating principles of engine room and deck equipment		
		4.1.B <i>Steam</i> <i>Note 3</i>	Light off a main propulsion boiler		
		4.1.C <i>Steam</i> <i>Note 3</i>	Secure a main propulsion boiler		
	Safety and emergency procedures for operation of propulsion plant machinery, including control systems	4.2.A <i>All</i> <i>Note 3</i>	Safe working practices		
		4.2.B <i>Steam</i> <i>Note 3</i>	Action in event of a propulsion boiler carry-over		
		4.2.C <i>Motor</i> <i>Note 3</i>	Starting main propulsion diesel engine		
	Preparation, operation, fault detection and necessary measures to prevent damage for machinery and control systems	4.3.A <i>Steam</i> <i>Note 3</i>	Assist in preparing main steam turbine for operation		
		4.3.B <i>GT</i> <i>Note 3</i>	Starting main propulsion gas turbine		
		4.3.C <i>Motor</i> <i>Note 3</i>	Monitor main diesel engine operation (OSV)		
		4.3.D <i>Steam</i> <i>Note 3</i>	Monitor main steam turbine operation		
		4.3.E <i>GT</i> <i>Note 3</i>	Monitor main gas turbine operation		
		4.3.F <i>Motor</i> <i>Note 3</i>	Secure main propulsion diesel engine		

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Candidate's Mariner Reference No.

STCW Competence	Knowledge; Understanding, and Proficiency	Task No.	Task Description	Assessor's Initials	Date
Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for machinery and control systems	4.3.G <i>Steam</i> <i>Note 3</i>	Secure main steam turbine		
		4.3.H <i>GT</i> <i>Note 3</i>	Secure main gas turbine		
		4.3.I <i>Notes 2,3</i>	Auxiliary boiler		
		4.3.J <i>Steam</i> <i>Note 3</i>	Test boiler water		
		4.3.K <i>Steam</i> <i>Note 3</i>	Control boiler water quality		
		4.3.L <i>Steam</i> <i>Note 3</i>	Bottom blow boiler		
		4.3.M <i>All</i> <i>Note 3</i>	Secure on line low pressure air compressor and start up and place on line standby unit		
		4.3.N <i>Notes 1,3</i>	Start fresh water generator <i>No. 4.3.W may be used as a substitute</i>		
		4.3.O <i>Notes 1,3</i>	Start fresh water generator <i>No. 4.3.W may be used as a substitute</i>		
		4.3.P <i>Steam</i> <i>Notes 1,3</i>	Start fresh water distiller		
		4.3.Q <i>Steam</i> <i>Note 3</i>	Shut down fresh water distiller		
		4.3.R <i>All</i> <i>Note 3</i>	Start lube or fuel oil purifier		
		4.3.S <i>All</i> <i>Note 3</i>	Secure fuel oil or lube oil purifier		

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Candidate's Name

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Enclosure (3) to NVIC 04-17

STCW Competence	Knowledge; Understanding, and Proficiency	Task No.	Task Description	Assessor's Initials	Date
Operate main and auxiliary machinery and associated control systems	Preparation, operation, fault detection and necessary measures to prevent damage for machinery and control systems	4.3.T <i>All</i> <i>Note 3</i>	Start an A/C or refrigeration system		
		4.3.U <i>All</i> <i>Note 3</i>	Monitor an A/C or refrigeration system		
		4.3.V <i>All</i> <i>Note 3</i>	Secure an A/C or refrigeration system		
		4.3.W <i>Notes 1,3</i>	Monitor a reverse osmosis plant <i>May be used as a substitute for tasks 4.3.N &amp; O</i>		
Operate fuel, lubrication, ballast and other pumping systems and associated control systems	Operational characteristics of pumps and piping systems including control systems	5.1.A <i>All</i> <i>Note 3</i>	Pumps and piping systems		
	Operation of pumping systems	5.2.A <i>All</i> <i>Note 3</i>	Onboard fuel transfer		
		5.2.B <i>All</i> <i>Note 3</i>	Ballasting of a double-bottom or wing tank		
		5.2.C <i>All</i> <i>Note 3</i>	Plan for and conduct a de-ballasting of a double-bottom or wing tank		
		5.2.D <i>All</i> <i>Note 3</i>	Pump out engine room bilge wells		
		5.2.E <i>All</i> <i>Note 3</i>	Pump out a cargo-hold or shaft alley bilge wells		
Oily-water separators (or similar equipment) requirements and operation	5.3.A <i>All</i> <i>Note 3</i>	Monitor the oily-water separator system			

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Candidate's Name

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Candidate's Mariner Reference No.

STCW Competence	Knowledge; Understanding, and Proficiency	Task No.	Task Description	Assessor's Initials	Date	
Operate electrical, electronic and control systems	Basic configuration and operation principles of the following electrical, electronic and control equipment	6.1.A <i>All</i> <i>Note 3</i>	Operating characteristics of electrical generating and distribution systems			
		6.1.B <i>All</i> <i>Note 3</i>	Conduct pre-start inspection and start a diesel generator			
		6.1.C <i>Steam</i> <i>Note 3</i>	Conduct pre-start inspection and start a steam turbo-generator			
		6.1.D <i>All</i> <i>Note 3</i>	Connect ship service generator to main switchboard and remove one from the line			
		6.1.E <i>All</i> <i>Note 3</i>	Motor controllers, other sequential control system, and high voltage circuits			
	Characteristics of basic electronic circuit elements Flowchart for automatic and control systems Functions, characteristics and features of control systems for machinery items	6.2.A <i>All</i> <i>Note 3</i>	Basic electronic elements and diagrams			
		Various automatic control methodologies and characteristics Proportional-Integral-Derivative (PID) control characteristics and associated system devices for process control	6.3.A <i>All</i> <i>Note 3</i>	Fundamentals of automation and control system technology		

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Candidate's Name

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Candidate's Mariner Reference No.

Enclosure (3) to NVIC 04-17

STCW Competence	Knowledge; Understanding, and Proficiency	Task No.	Task Description	Assessor's Initials	Date
Maintenance and repair of electrical and electronic equipment	Safety requirements for working on shipboard electrical systems	7.1.A <i>All</i> <i>Note 3</i>	Use test equipment		
	Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment	7.2.A <i>All</i> <i>Note 3</i>	Troubleshoot a malfunctioning motor controller		
	Detection of electric malfunction, location of faults and measures to prevent damage	7.2.B <i>All</i> <i>Note 3</i>	Repair a malfunctioning motor controller		
	Construction and operation of electrical testing and measuring equipment	7.3.A <i>All</i> <i>Note 3</i>	Detect location of grounds		
	Function and performance tests of equipment and their configuration: interpretation of electrical and simple electronic diagrams	7.4.A <i>All</i> <i>Note 3</i>	Disassemble and reassemble an electric motor		
	Function and performance tests of the following equipment: Monitoring systems; Automatic control devices; Protective devices	7.5.A <i>All</i> <i>Note 3</i>	Respond to engine control monitoring system alarms		
		7.5.B <i>All</i> <i>Note 3</i>	Steering gear test		
		7.5.C <i>All</i> <i>Note 3</i>	Test low lube oil (LO) shutdown protective device		
Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	Materials used in construction and repair of ships and equipment	8.1.A <i>All</i> <i>Note 3</i>	Hand and machine tool projects		
	Fabrication and repair of systems and components Safe working practices Safety measures to ensure a safe working environment and for using hand tools, machine tools and measuring instruments	8.1.B <i>All</i> <i>Note 3</i>	Welding projects		
	Use of hand tools, machine tools and measuring instruments	8.1.C <i>All</i> <i>Note 3</i>	Oxy-acetylene cutting project		

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STCW Competence	Knowledge; Understanding, and Proficiency	Task No.	Task Description	Assessor's Initials	Date
Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board	Methods for carrying out safe emergency and temporary repairs	8.2.A <i>All</i> <i>Note 3</i>	Emergency/temporary repairs		
		8.2.B <i>All</i> <i>Note 3</i>	Replace or repack a packing gland stuffing box		
		8.2.C <i>All</i> <i>Note 3</i>	Repack a valve		
		8.2.D <i>All</i> <i>Note 3</i>	Replace a flange gasket		
Maintenance and repair of shipboard machinery and equipment	Safety measures for repair and maintenance, including the safe isolation of shipboard machinery and equipment Basic mechanical knowledge and skills Maintenance and repair, such as dismantling, adjustment and reassembling of machinery and equipment Use of specialized tools and measuring instruments Materials in construction of equipment Machinery drawings and handbooks Piping, hydraulic and pneumatic diagrams	9.1.A <i>All</i> <i>Note 3</i>	Overhaul a centrifugal pump		
		9.1.B <i>All</i> <i>Note 3</i>	Tighten an excessively leaking packing gland stuffing box while in operation		
		9.1.C <i>All</i> <i>OSV</i>	Air-operated diaphragm pump maintenance		
Ensure compliance with pollution prevention requirements	Prevention of pollution of the marine environment Knowledge of the precautions to be taken to prevent pollution of the marine environment Anti-pollution procedures and all associated equipment Importance of proactive measures to protect the marine environment	10.1.A <i>All</i> <i>Note 3</i>	Put into service and then secure the sewage waste-treatment plant		
		10.1.B <i>All</i> <i>Note 3</i>	Put into service and then secure the oily-water separator/oil content monitor system		

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Candidate's Name

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Enclosure (3) to NVIC 04-17

STCW Competence	Knowledge; Understanding, and Proficiency	Task No.	Task Description	Assessor's Initials	Date
Maintain seaworthiness of the ship	Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment	11.1.A <i>All</i> <i>Note 3</i>	Determine stability data for vessel		
	Understanding of the fundamentals of watertight integrity	11.2.A <i>All</i> <i>Note 3</i>	Watertight integrity		
	Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy	11.3.A <i>All</i> <i>Note 3</i>	Partial loss of intact buoyancy		
	General knowledge of the principal structural members of a ship and the proper names for the various parts	11.4.A <i>All</i> <i>Note 3</i>	Principal structure members of a ship and the proper names for various parts		
Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO conventions concerning safety of life at sea and protection of the marine environment	15.1.A <i>All</i> <i>Note 3</i>	SOLAS, MARPOL and STCW Conventions.		
Application of leadership and teamworking skills	Working knowledge of shipboard personnel management and training	16.1.A <i>All</i> <i>Note 3</i>	Basic duties and responsibilities of vessel personnel		
	A knowledge of related international maritime conventions and recommendations, and national legislation	16.2.A <i>All</i> <i>Note 3</i>	International maritime conventions and national regulations		
	Ability to apply task and workload management, and effective resource management	16.3.A <i>All</i> <i>Note 3</i>	Taking on fuel oil		
	Knowledge and ability to apply decision-making techniques	16.4.A <i>All</i> <i>Note 3</i>	Supervise a fire or emergency team		

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Candidate's Name

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**ASSESSOR AND VESSEL INFORMATION**

Qualified Assessors (QAs) witnessing the successful demonstrations noted in this record should provide the information below relative to their service with the candidate. Prospective QAs should have a minimum of one year as Chief Engineer or Second Engineer Officer/First Assistant Engineer on vessels of the applicable propulsion mode(s) of at least 1,000 HP (750 kW). For assessments performed on a military vessel, the assessor should be authorized to conduct similar assessments for the U.S. Navy or U.S. Coast Guard Personnel Qualification Standard (PQS) for underway officer of the engineering watch (EOOW). After December 31, 2017, QAs must be approved by the National Maritime Center (46 CFR 10.107). Qualified military personnel need not be approved as QAs and may continue to sign assessments after December 31, 2017.

Vessel Name	Propulsion Mode	Propulsion Power	Assessor Name	Assessor Signature	Sample Assessor Initials	Assessor's Mariner Ref. No.	Assessor's Shipboard Position
M/V Handy Boy	Motor	7,654 HP	Ignatius J. Reilly	<i>Ignatius J. Reilly</i>	<i>IGR</i>	0112358	Chief Engineer

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Candidate's Name

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Candidate's Mariner Reference No.