

ASSESSMENT CRITERIA
CHIEF ENGINEER—OSV (DOMESTIC) TO NEAR COASTAL AND OCEANS WATERS ROUTE EXTENSION

Attached are proposed assessment criteria for evaluating the competency of individuals who want to extend the authority of a Chief Engineer — OSV (Domestic) license to near coastal and oceans waters. Because these license holders have already met qualification requirements for length of service, passed the full written exam, and demonstrated a number of proficiencies (see Chief Engineer – OSV – Domestic Assessment Criteria), this table is targeted to those knowledge and skill items that are important and relevant to operations outside domestic waters, including:

Fabrication of materials
 Construction and repair
 Maintenance of electrical
 systems
 Refrigeration and air
 conditioning

Troubleshooting
 Safe entry of confined spaces
 Maintenance and repair of main propulsion
 Maintenance and repair of auxiliary systems
 National and international requirements applicable to
 operations outside domestic waters

It is understood that these criteria do not represent the final assessment tools to be used when demonstrating proficiency. Just as a performance standard requiring a "minimum score of 70% on a written exam" implies the development of a valid exam, a standard that requires radiotelephone procedures to be "conducted in accordance with regulations and accepted procedures" implies the use of an assessment form describing those regulations and procedures which can be used by a designated examiner in the conduct of the demonstration.

ASSESSMENT CRITERIA CHIEF ENGINEER—OSV (DOMESTIC) TO NEAR COASTAL AND OCEANS WATERS ROUTE EXTENSION
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Function: Marine Engineering

Competence: Use of appropriate tools for fabrication and repair operations typically performed on ships

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
Characteristics and limitations of materials used in construction and repair of ships and equipment	Knowledge of strength of materials such as yield strength, tensile strength, impact resistance and ductility	Written exam	List the characteristics and limitations of materials used in the construction and repair of ships and shipboard equipment.	70% minimum score on written exam
	Knowledge of the types of material failures experienced under stress and strain conditions, such as fatigue, corrosion, brittle and ductile failures and creep		Describe the types of material failures experienced under stress and strain conditions.	
Characteristics and limitations of processes for fabrication and repair	Knowledge of the basic elements required to weld steel in fabrication and repair	Written exam	List the basic elements required to weld steel in fabrication and repair.	70% minimum score on written exam
	Knowledge of the basic elements required to perform basic machining in fabrication and repair		Describe the basic elements required to perform basic machining in fabrication and repair.	

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Function: Marine Engineering

Competence: Use of appropriate tools for fabrication and repair operations typically performed on ships

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
Properties and parameters considered in the fabrication and repair of systems and components	Knowledge of manufacturer's recommendations, and statutory regulations pertaining to the fabrication and repair of systems and components	On board ship or Laboratory	Describe the significance of manufacturer's recommendations, and statutory regulations pertaining to the fabrication and repair of systems and components.	Correctly describes the significance of manufacturer's recommendations, and statutory regulations pertaining to the fabrication and repair of systems and components.
	Knowledge of materials testing methods	Written exam	List the types of material failures experienced under stress and strain.	70% minimum score on written exam

Competence: Use hand tools and measuring equipment for dismantling, maintenance, repair and reassembly of shipboard plant and equipment

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
Design characteristics and selection of materials in construction of equipment	Knowledge of the common materials used in ship and shipboard equipment construction	Written exam	Describe the basic characteristics of common materials used in the construction of shipboard equipment and systems.	70% minimum score on written exam
Interpretation of machinery drawings and handbooks	Use technical manuals and machinery drawings	On board ship or Laboratory	Participate in the dis-assembly, maintenance, repair and re-assembly of shipboard equipment using machinery drawings and manuals.	Correctly performs all tasks in accordance with supervisor's instructions.

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Function: Marine Engineering

Competence: Use hand tools and measuring equipment for dismantling, maintenance, repair and reassembly of shipboard plant and equipment

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
Design characteristics and selection of materials in construction of equipment	Knowledge of the common materials used in ship and shipboard equipment construction	Written exam	Describe the basic characteristics of common materials used in the construction of shipboard equipment and systems.	70% minimum score on written exam
Interpretation of machinery drawings and handbooks	Use technical manuals and machinery drawings	On board ship or Laboratory	Participate in the dis-assembly, maintenance, repair and re-assembly of shipboard equipment using machinery drawings and manuals.	Correctly performs all tasks in accordance with supervisor's instructions.

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ASSESSMENT CRITERIA CHIEF ENGINEER—OSV (DOMESTIC) TO NEAR COASTAL AND OCEANS WATERS ROUTE EXTENSION
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Function: Marine Engineering

Competence: Use hand tools, electrical and electronic measuring and test equipment for fault finding, maintenance and repair operations

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
Construction and operational characteristics of shipboard AC and DC electrical systems and equipment	Knowledge of AC/DC rotating machinery	Written exam	Describe the fundamentals of AC/DC rotating machinery.	70% minimum score on written exam
	Knowledge of electrical fundamentals		Describe the fundamentals of transformers, rectifiers, breakers, fuses, electromagnetic relays.	
	Knowledge of electrical schematic diagrams		Describe and interpret electrical schematic diagrams.	

Competence: Use hand tools, electrical and electronic measuring and test equipment for fault finding, maintenance and repair operations

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
Construction and operation of electrical test and measuring equipment	Knowledge of electrical measuring equipment construction	Written exam	Describe construction and operation of electrical test and measuring equipment.	70% minimum score on written exam

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Function: Marine Engineering

Competence: Operate main and auxiliary machinery and associated control systems

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
Preparation of main machinery and preparation of auxiliary machinery for operation	Knowledge of refrigeration and air conditioning system	Written exam	Describe the operation of refrigeration and air conditioning system.	70% minimum score on written exam
Location of common faults in machinery and plant in engine room and action necessary to prevent damage	Knowledge of main engine		Describe possible abnormal conditions of the main engine and make recommendation for corrections.	

Competence: Operate pumping systems and associated controls

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
Pumping Systems - Routine pumping operations	Knowledge for safe entry	Written exam	Describe procedure for safe entry of confined spaces and tanks.	70% minimum score on written exam

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ASSESSMENT CRITERIA CHIEF ENGINEER—OSV (DOMESTIC) TO NEAR COASTAL AND OCEANS WATERS ROUTE EXTENSION
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Function: Marine Engineering

Competence: Operate alternators, generators and control systems

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
<i>Generating plant</i> Appropriate basic electrical knowledge and skills	Knowledge of emergency generator	Written exam	Describe automatic start-up of emergency generators.	70% minimum score on written exam
	Knowledge of emergency electrical system		Describe the emergency electrical system, including circuits served and safety devices.	
	Knowledge of electrical distribution system		Describe arrangement of electrical distribution system from generator to load.	
<i>Generating plant</i> Location of common faults and action to prevent damage	Knowledge of electrical faults	Written exam	Describe possible abnormal conditions in the electrical system, and make proper recommendations for corrections.	70% minimum score on written exam
<i>Control systems</i> Location of common faults and action to prevent damage	Knowledge of troubleshooting electrical faults	Written exam	Describe possible abnormal conditions in electrical control systems, and proper tests to determine location of electrical fault.	70% minimum score on written exam

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ASSESSMENT CRITERIA ENGINEER—OSV (DOMESTIC) TO NEAR COASTAL AND OCEANS WATERS ROUTE EXTENSION
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Function: Marine Engineering

Competence: Maintain marine engineering systems, including control systems

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
Undertake maintenance and repair to plant and equipment	Knowledge of diesel engine maintenance	Written exam	Describe routine maintenance and inspection of diesel engines.	70% minimum on written exam
	Knowledge of electrical equipment maintenance		Describe routine maintenance on electrical equipment.	
	Knowledge of deck machinery maintenance		Describe routine maintenance on deck machinery, winches, windlasses, etc.	

Function: Controlling the operation of the ship and care for persons on board at the operational level

Competence: Apply medical first aid on board ship

<i>Medical aid</i> Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur onboard ship	Know procedures for using medical guides and sources of medical advice by radios	Written exam	List procedures.	70% minimum score on written exam
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Competence: Monitor compliance with legislative requirements

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ASSESSMENT CRITERIA
ENGINEER—OSV (DOMESTIC) TO NEAR COASTAL AND OCEANS WATERS ROUTE EXTENSION

KUP	Performance Objective	Condition of Assessment	Performance Measure	Performance Standard
<p>Basic working knowledge of the relevant IMO conventions concerning safety of life at sea and protection of the marine environment - National requirements affecting the operation and safety of the vessel areas outside domestic waters</p>	<p>Know the following:</p> <ul style="list-style-type: none"> - Relevant IMO conventions concerning safety of life at sea and pollution prevention - National laws and regulations - Certificates required and their period validity - Responsibilities under the load line convention - Responsibilities under SOLAS - Responsibilities under the International Convention of Pollution Prevention - Requirements of the International Health Regulations - International instruments affecting the ship, passengers, crew, and cargo - Methods and aids to prevent pollution - National legislation for implementing international agreements 	<p>Written exam</p>	<p>Describe the application of the relevant conventions, laws, and regulations to OSVs.</p>	<p>70% minimum score on written exam</p>