COMPETENCY MAPPING

Title ***STCW Table***	***Table A – III / 1*** ***Specifications of minimum standards of competence for officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine room.***

GUIDANCE NOTES	
TERMS	***DESCRIPTION***
Positive **Reward**	***Score will increase in the assessment criterion / may be combined with increased gradual scoring*** ***Bonus points, an integer within the range of 0 to 100. The default value is 0.***
Negative **Penalty**	***Score will decrease in the assessment criterion / may be combined with decreased gradual scoring*** ***Penalty points, an integer within the range of 100 to 0. The default value is 100.***
Triggered Once **Single**	***A trigger is activated once.*** ***A rule is triggered in the scenario only once: the first time the conditions occur.***
Multiple **Cyclical**	***Assessment scoring can be started multiple times.*** ***A rule is triggered every time the conditions occur.***
Delay **Time Dependency**	***The assessment scoring can be delayed in order to give the student some reaction time, for example after a malfunction has been activated.*** ***Time dependency ruling***
Critical Criterion **Weight**	***The assessment must be achieved in order to pass the test.*** ***Multiplier of a trainee's level of competency***

Levels of Simulation

Operational -the task relates to the inputs and outputs and their relationship and has to do with the performance of a function
Functional - the task relates to the functions or activities performed by the system without reference to which of the elements of the system perform those functions
Communication - relates to effective communication between human resources to report, get feedback, or to execute a task
Emergency - task performed in circumstances where there is variation or deviation from an expected scenario or situation

Color Coding:

THEORETICAL EXAMINATION **SIMULATION ASSESSMENT** **LABORATORY ASSESSMENT**

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Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
Function 01: Marine Engineering at the Operational Level							
C1 Maintain a safe engineering watch	C1.1 Thorough knowledge of principles to be observed in keeping an engineering watch, including: .1 duties associated with taking over and accepting a watch .2 routine duties undertaken during a watch .3 maintenance of the machinery space logs and the significance of the readings taken .4 duties associated with handing over a watch C1.2 Safety and emergency procedures; changeover of remote/ automatic	At the end of the assessment the candidate must be able to: .1 perform duties associated with taking over and accepting a watch .2 perform routine duties during a watch .3 maintain machinery space logs and the significance of the readings taken .4 perform duties associated with handing over a watch 1. Implement safety and emergency procedures; change-over of remote/automatic to	**F1C1.1** **Criterion A** The conduct of taking over of the watch conforms with accepted principles and procedures. **F1C1.2** **Criterion B** The frequency and extent of monitoring of engineering equipment and systems conforms to manufacturers' recommendations and accepted principles and procedures, including principles to be observed in keeping an engineering watch. **F1C1.3** **Criterion C** A proper record is maintained of the movements and activities relating to the ship's engineering systems.	**Criterion A1** Take-over an engineering watch: 1. Identify existing power supply and their distribution; 2. determine the availability of ship's fuel, lubricants, and water supply 3. determine the status of main and auxiliary machinery, **Criteria B and C** Perform the Engineering watch: Monitor and record the parameters of the following machinery as per company standard: 1. Fuel oil system 1.1 Pressures __bar 1.2 Temperatures __ deg C 1.3 FO Service Tank Level __% 2. Lubricating oil system 2.1 Pressures __bar 2.2 Temperatures __ deg C 2.3 Cylinder Oil Service Tank Level __% 3. Cooling water system (HT and LT) 3.1. Pressures __bar 3.2 Temperatures __ deg C 3.3 FW Expansion tank Level __% 4. Sea water system 4.1 SW Pump discharge pressure __bar 4.2 SW Inlet temperature to LT Cooler __ deg C 5.Starting Air and Control Air system 5.1 No.1 Starting Air Bottle Pressure __bar 5.2 Control Air Bottle Pressure __bar	Rubric	Operational Functional Communication	Theoretical and Practical (SIMULATOR)

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	to local control of all systems C1.3 Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accidents, with particular reference to oil systems	local control of all systems 2. Apply 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 systems		5.3 Service Air Pressure __bar 6. Electrical Power System 6.1 Load ___KW 6.2 Current __ Amp 6.3 RPM __rpm 6.4 FO Pressures __bar 6.5 FO Temperatures __deg C 6.6 LO Pressures __bar 6.5 LO Temperatures __deg C 6.7 FW Cooling Temp. Inlet __ deg 7. Bilge System 7.1 Bilge alarms 8. Steam generating Plant 8.1 Water level 8.2 Steam pressure 8.3 Steam temperature 8.4 Fuel oil 8.5 Feed water tank 9. Air-conditioning and Refrigeration System 9.1 Refrigerant level 9.2 Lubricating oil level 9.3 Pressure 9.4 Storage temperature 10. Advise the CE for any deviation from the normal values **Criterion A2** Hand-over an engineering watch: 1. relay the standing order of the day; 2. inform the reliever about the status of various machinery involved in watchkeeping; 3. relay the level and condition of various tanks			

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	C1.4 Knowledge of engine room resources management principles, including: .1 allocation, assignment and prioritization of resources .2 effective communication .3 assertiveness and leadership .4 obtaining and maintaining situational awareness .5 consideration of team experience	At the end of assessment, the candidate should be able to: 1. apply the following engine-room resource management principles: .1 Allocation, assignment, and prioritization of resources .2 Effective communication .3 Assertiveness and leadership, including motivation .4 Obtaining and maintaining situational awareness .5Consideration of team experience	F1C1.4 Criterion D Resources are allocated and assigned as needed in correct priority to perform necessary tasks. F1C1.4 Criterion E Communication is clearly and unambiguously given and received. F1C1.4 Criterion F Questionable decision and/or actions result in appropriate challenge and response. F1C1.4 Criterion G Effective leadership behaviours are identified. F1C1.4 Criterion H Team member(s) share accurate understanding of current and predicted engine-room and associated system state, and of external environment.	Tasks are clustered in the C16.3 - Use of leadership and Teamwork -Performance Standard.	Automatic and Rubric	Operational Functional Communication	Practical (SIMULATOR)

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
C2 Use English in oral and theoretical communication	Adequate knowledge of the English language to enable the officer to use engineering publications and to perform engineering duties	**This KUPs is demonstrated by the successful completion of the theoretical examination**					
C3 Use of internal communications	C3.1 Operation of all internal communication systems onboard	At the end of the assessment the candidate must be able to: 1. Communicate using all internal communication systems on board	**F1C3.1** **Criterion K** Transmission and reception of messages are consistently successful. **F1C3.1** **Criterion L** Communication records are complete, accurate and comply with statutory requirements	Successfully transmits and receives messages consistently. Check that the communication records are complete, accurate and comply with statutory requirements: **Criteria K & L** Transmission of telegraph orders must be acknowledged and executed within 10 seconds Tasks are clustered in the C16- Use of leadership and Teamwork -Performance Standard.	Rubric	Communication	Theoretical and Practical SIMULATOR and LABORATORY

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
C4 Operate main and auxiliary machineries and associated control systems	C4.1 Basic construction and operation principles of machinery systems, including: .1 Marine Diesel Engine	**This KUPs is demonstrated by successful completion of the theoretical examination.**					
	.2 Marine Steam Turbines						
	.3 Marine Gas Turbine						
	.4 Marine boilers						
	.5 Shafting installations including propeller						
	.6 Other auxiliaries, including various pumps, air compressor, purifier, freshwatergenerator, heat exchanger, refrigeration, air-conditioning and ventilation system						
	.7 steering gear						
	.8 automatic control systems						
	.9 fluid flow and characteristics of lubricating oil						
	.10 deck machinery						

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Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
C4 Operate main and auxiliary machineries and associated control systems	C4.2 Safety and emergency procedures for the operation of propulsion plant machinery including control systems C4.3 Preparation, operation, fault detection and necessary measures to prevent damage for the following machinery items and control systems: .1 main engine and associated auxiliaries .2 steam boilers, associated auxiliaries and steam steams .3 auxiliary prime movers and associated systems .4 other auxiliaries including refrigeration, air conditioning and ventilation systems	At the end of the assessment the candidate must be able to: 1. apply safety and emergency procedures for operation of propulsion plant machinery, including control systems 2. prepare, operate, detect fault and necessary measures to prevent damage for the following machinery items and control systems: .1 main engine and associated auxiliaries .2 steam boiler and associated auxiliaries and steam systems .3 auxiliary prime movers and associated systems .4 other auxiliaries, including refrigeration, air-	**F1C4.2** **Criterion N** Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations and avoid pollution of the marine environment. **F1C4.3** **Criterion O** Deviations from the norm are promptly identified. **F1C4.3** **Criterion P** The output of plant and engineering systems consistently meets requirements, including bridge orders relating to changes in speed and direction. **F1C4.3** **Criterion Q** The causes of machinery malfunctions are promptly identified, and actions are designed to ensure the overall safety of the ship and the plant, having regard to the prevailing	Plans and carry out operations in accordance to operating manuals, established rules and procedures to ensure safety of operations and avoid pollution of the marine environment; Promptly identify deviations from norm standards; Check that the output of plant and engineering systems consistently meets requirements, including bridge orders relating to changes in speed and direction; Promptly identify causes of machinery malfunctions, and provide actions designed to ensure the overall safety of the ship and the plant, having regard to the prevailing circumstances and conditions; **Criteria N & O** Test the Main Engine after preparing the following requirements: 1. Fresh Water-Cooling System 2. Starting Air System	Rubrics	Operational Functional Emergency	Theoretical and Practical (SIMULATOR)

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
		conditioning and ventilation systems	circumstances and conditions.	3. ME Lube oil system and Fuel oil system 4. Standby generator 5. Main Engine started **Criteria N & O** Promptly identify deviation of the Exhaust Temperature of the engine and should be kept within +/- 50 deg. C of the average temperature. **Criterion P** Monitor the exhaust temperature of the engine as per speed changes **Criterion Q** Detect and rectify the fault of main or aux. machinery during operation.			
C5 Operate fuel, lubrication, ballast, and other pumping systems	C5.1 Operational characteristics of pumps and piping systems, including control systems C5.2 Operation of pumping systems: .1 routine pumping operations .2 operation of bilge, ballast and cargo pumping systems C5.3	At the end of the assessment the candidate must be able to: 1. apply understanding on the operational characteristics of pumps and piping systems, including control systems 2. perform operation of the pumping systems: .1 routine pumping operations .2 operation of bilge, ballast and cargo pumping systems	**F1C5.1** **Criterion R** Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations and avoid pollution of the marine environment. **F1C5.2, C5.3** **Criterion S** Deviations from the norm are promptly identified and appropriate action is taken.	Carry out the planned operations in accordance to operating manuals to avoid marine environment pollution; a. No oil spills b. No pollution c. No comingling or mixing of fuel d. The transfer is in accordance with the approved piping diagram and/or Safety Management System (SMS) e. All oil transfer operation must be recorded in Oil Record Book. Identify and compare deviation from the norm and take actions to rectify faults and restore the system; Carry out the Ballast operation considering the following: a. As per requirement and coordination with Chief Engineer and deck duty officer b. Ballasting and de-ballasting operation in accordance with the Ballast Water Management Regulation.	Rubrics	Operational Functional Emergency	Theoretical and Practical (SIMULATOR)

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	Oily-water separators (or similar equipment) requirements and operations.	3. operates oily-water separators (or similar equipment) requirements and operation		All ballast transfer must be recorded. **Criterion R** Function test and operates Oily-water Separator 15ppm equipment. **Criteria R & S** 1. Carry out transfer to resolve any high-level alarm on fuel leakage tank and overflow fuel tank. 2. Maintain fuel oil service tanks at normal level.			

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Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
Function 02: Electrical, Electronic and Control Engineering at the Operational Level							
C6 Operate electrical, electronic, and control systems	**C6.1** Basic configuration and operation principles of the following electrical, electronic, and control equipment: *.1 electrical equipment* .1. a generator and distribution systems .1.b preparing, starting, paralleling, and changing over generators .1. c electrical motors including starting methodologies	At the end of the assessment the candidate must be able to: 1. apply basic configuration and operation principles of the following electrical, electronic and control equipment: 1.1 electrical equipment .1.a generator and distribution system .1.b preparing, starting, paralleling and changing over generators .1.c electrical motors including starting methodologies	**F2C6.1** **Criterion T** Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operation	Operation is in accordance with operating manuals of the generators and distribution systems and results of risk assessment 1. Perform load sharing between two (2) or three (3) generators. 2. Engage the incoming generator once the following conditions are met: a. Voltage b. Frequency (slightly higher than 60Hz) c. Any of the following should NOT occur: i. Under/Over Voltage alarm/trip ii. High/Low frequency alarm/trip iii. Blackout 3. Connect the generator to the bus bar Breaking the connection between the generators performed based on the following: • kW load (approximately 50% of the total load • Can be done in Auto or Manual • Any of the following should NOT occur: □ High/Low frequency alarm/trip □ Overload/Over current alarm/trip □ Reverse power trip □ Preferential trip Transfer of loads from one generator Interpret the electrical motor control (wye-delta, forward reverse, and direct online starter)	Rubrics	Operational Functional Emergency	Theoretical And Practical (SIMULATOR AND LABORATORY)

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	.1. d high-voltage installations	.1.d high-voltage installations	**Criterion T** Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operation **Criterion U** Electrical, electronic and control systems can be understood and explained with drawings/instructions	Inspection of the high voltage circuit breaker. 1. Use Protective and Recovery gear. • Helmet with face shield • Insulated rubber gloves with leather protector 2. Perform isolation verification test • Maintain safe working distance • Verify the absence of voltage • Discharge the equipment			SIMULATOR / LABORATORY
	.1. e sequential control circuits and associated system devices	.1.e sequential control circuits and associated system devices	Operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operation	1. Perform the sequence of events of at least two motor controllers (wye-delta, forward reverse, and direct online starter) 2. Perform the basic operation of an electro-pneumatic or electro-hydraulic sequence system	Rubric	Operational Functional Emergency	Theoretical and Practical (SIMULATOR)
	C6.2 Electronic equipment .2.a characteristics of basic electronic circuit elements: .2.b flowchart for automatic and control system .2.c functions, characteristics and features of control	2. electronic equipment .2.a characteristics of basic electronic circuit elements: .2.b flowchart for automatic and control system .2. c functions, characteristics and features of control systems for	**F2C6.2, C6.3** **Criterion U** Electrical, electronic and control systems can be understood and explained with drawings/instructions	Use drawings to identify electrical, electronic and control systems; Note: The KUP's are clustered in the task under Competence 4 - Operate main and auxiliary machineries and associated control systems.	Automatic or Rubric	Operational Functional Emergency	Theoretical and Practical (SIMULATOR)

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	systems for machinery items including main propulsion plant operation control and steam boiler automatic controls C6.3 control system .3. a various automatic control methodologies and characteristics .3. b Proportional-Integral-Derivative (PID) control characteristics and associated system devices for process control *	machinery items, including main propulsion plant operation control and steam boiler automatic control 3. control system .3.a Various automatic control methodologies and characteristics					
C7 Maintenance and repair of electrical and electronic equipment	C7.1 Safety requirements for working on shipboard electrical systems, including the safe isolation of electrical equipment required before personnel are permitted to work on such equipment	At the end of the assessment, the candidate must be able to: 1. apply safety requirements for working on shipboard electrical systems, including the safe isolation of electrical equipment required before	**F2C7.1** **Criterion V** Safety measure for working are appropriate. **F2C7.4, C7.6** **Criterion W** Selection and use of hand tools, measuring instruments, and testing equipment are appropriate and	Apply appropriate safety measures while working: **Criterion V** 1. Wear personal protective equipment: 2. Stop or disconnect the power supply of the equipment: 3. Isolate the equipment to avoid accidental starting (Lock-out/ Tag-out). **Criterion W** 1. Select appropriate hand tools and measuring instruments	Rubric	Operational Functional	Practical LABORATORY

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	C7.2 Maintenance and repair of electrical system equipment, switchboards, electric motors, generator, and DC electrical systems and equipment C7.3 Detection of electric malfunction, location of faults, and measures to prevent damage C7.4 Construction and operation of electrical testing and measuring equipment C.7.5 Function and performance tests of the following equipment and their configuration	personnel are permitted to work on such equipment 2. maintain and repair electrical system equipment, switchboards, electric motors, generators, and DC electrical systems and equipment 3. detect electrical malfunction, locate faults and provide measures to prevent damage. 4. carry out function and performance tests of the following equipment and their configuration: a. monitoring systems b. automatic control devices c. protective devices 5. apply construction and operation principles of electrical testing and measuring equipment	interpretation of results is accurate. **F2C7.2, C7.3** **Criterion X** Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice. **F2C7.5** **Criterion Y** Reassembling and performance testing is in accordance with manuals and good practice.	2. Function test hand tools and measuring instruments Dismantle, inspect, repair and reassemble equipment in accordance to manuals and good practice: **Criterion X** 1. Test the Equipment 2. Locate the fault 3. Dismantle the affected equipment 4. Rectify the fault Reassemble and perform test in accordance to manuals and good practice: **Criterion Y** 1. Reassemble and prepare the equipment prior to test run 2. Switch-on the power supply of the equipment 3. Test run of the equipment 4. After test run, restore the equipment to normal service condition.			

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	.1 monitoring system .2 automatic control devices .3 protective devices C7.6 The interpretation of electrical and simple electronic diagrams	6. Interpret electrical and simple electronic diagrams					

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Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
Function 03: Maintenance and Repair at the Operational Level							
C8 Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board.	C8.1 Characteristics and limitations of materials used in construction and repair of ships and equipment C8.2 Characteristics and limitations of processes used for fabrication and repair C8.3 Properties and parameters considered in the fabrication and repair of systems and components C8.4 Methods for carrying out safe emergency/temporary repairs C8.5 Safety measures to be taken to ensure a safe working environment and for using hand tools, machine tools and	At the end of the assessment the candidate must be able to: - Apply the characteristics and limitations of materials in construction and repair of ships and equipment - Apply characteristics and limitations in for fabrication and repair - Apply the properties and parameters in the fabrication and repair of systems and components - carry out safe emergency / temporary repairs - apply safety measures to ensure a safe working	**F3C8.3 and C8.5** **Criterion Z** Identification of important parameters for fabrication of typical ship – related components are appropriate. **F3C8.6** **Criterion AA** Selection of materials is appropriate. **F3C8.1, C8.2, C8.4 & F3C8.5** **Criterion AB** Fabrication is to designated tolerances. **F3 C8.6 & F3C8.7** **Criterion AC** Use of equipment and hand tools, machine tools and measuring instrument is appropriate and safe.	Identify appropriate and important parameters for fabrication of typical ship – related components; **Criteria Z & AA** 1. Prepare tools and equipment to be use 2. Wear personal protective equipment. 3. Prepare drawings of equipment for reference. 4 Change all damage parts and fabricate. Select appropriate materials; Fabricate desired components at designated tolerances; Use appropriate hand tools, machine tools, measuring instrument, and safety equipment; **Criterion AB & AC** 1. Wear proper protective equipment. 2. Clean the material for inspection. 3. Apply the appropriate procedure to determine fault of the equipment.	Rubric	Operational Functional	Practical LABORATORY

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	measuring instruments C8.6 Use of hand tools, machine tools, and measuring instruments C8.7 Use of various types of sealants and packings.	environment and for using hand tools, machine tools and measuring instruments - use hand tools, machine tools and measuring instruments - use various types of sealants and packings.		4. Once the inspection is completed, clean the equipment and make ready for spare.			
C9 Maintenance and repair of shipboard machinery and equipment	C9.1 Safety measures to be taken for repair and maintenance including the safe isolation of shipboard machinery and equipment required before personnel are permitted to work on such machinery or equipment C9.2 Appropriate basic mechanical knowledge and skills C9.3	At the end of the assessment the candidate must be able to: - apply safety measures for repair and maintenance including the safe isolation of shipboard machinery and equipment required before personnel are permitted to work on such machinery or equipment - apply appropriate basic	**F3C9.1** **Criterion AD** Safety procedures followed are appropriate. **F3C9.2** **Criterion AE** Selection of tools and spare gear is appropriate. **F3C9.3 & F3C9.4** **Criterion AF** Dismantling, inspecting, repairing and reassembling equipment is in accordance with manuals and good practice. **F3C9.5**	Follow appropriate safety procedures; Select appropriate tools and spare gear; Dismantle, inspect, repair and reassemble equipment in accordance to manuals and good practice;	Rubric	Operational Functional	Practical LABORATORY

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	Maintenance and repair, such as dismantling, adjustment, and reassembling of machinery and equipment C9.4 The use of appropriate specialized tools and measuring instruments C9.5 Design characteristics and selection of materials in the construction of the equipment C9.6 Interpretation of machinery drawings and handbooks C9.7 The interpretation of piping, hydraulic, and pneumatic diagrams	mechanical knowledge and skills - implement maintenance and repair, such as dismantling, adjustment and reassembly of machinery and equipment - use appropriate specialized tools and measuring instruments - apply design characteristics and select appropriate materials in construction of equipment - read and interpret machinery drawings and handbooks - read and interpret piping, hydraulic and pneumatic diagrams	**Criterion AG** Re-commissioning and performance testing is in accordance with manuals and good practice. **F3C9.6 & F3C9.7** **Criterion AH** Selection of materials and parts is appropriate.	Re-commission and performance test in accordance to manuals and good practice; Select appropriate materials and parts; **Criteria AD and AE** 1. Check the equipment measurements and compare to given specification on the drawings. 2. Record the result and compare with the operating limits on the given specification of the drawings. **Criteria AF & AG** 1. Prepare the working permits before commencing the given work. 2. Permits should be properly signed.			

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Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
Function 04: Controlling the Operation of the Ship and Care for Persons on Board at the Operational Level							
C10 Ensure compliance with pollution prevention requirements	C10.1 Prevention of pollution of the marine environment C10.2 Knowledge of the precautions to be taken to prevent pollution of the marine environment C10.3 Anti-pollution procedures and all associated equipment. C10. 4 Importance of proactive measures to protect the marine environment	At the end of the assessment the candidate must be able to: 1. Apply precautions to be taken to prevent pollution of the marine environment	**F4C10** **Criterion AI** Procedure for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed **F4C10** **Criterion AJ** Actions to ensure that a positive environment reputation is maintained	***Clustered to C16 Performance Standard – Bunkering Operation*** **Criteria AI and AJ** 1. Monitor the vessel surroundings regularly and SOPEP materials must be prepared prior bunkering as precaution to prevent pollution of the environment by ships 2. Engine Crew must know their duties in case of oil spill emergency occur. These duties must be discussed during toolbox meeting			Theoretical and Practical (SIMULATOR)
C11 Maintain seaworthiness of the ship	C11.1 Ship Stability .1 Working knowledge and application of stability, trim and stress table, diagrams and stress-calculating equipment	At the end of the assessment the candidate must be able to: 1. apply working knowledge of stability, trim and stress tables, diagrams and	**F4C11.1** **Criterion AK** The stability conditions comply with the IMO intact stability criteria under all conditions of loading. **F4C11.1** **Criterion AL**	Check that the stability conditions comply with the IMO intact stability criteria under all conditions of loading;	Rubric	Operational Functional Communication	Theoretical and Practical (SIMULATOR)

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	.2 Understanding of the fundamentals of watertight integrity .3 Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy	stress-calculating equipment 2 apply the fundamentals of watertight integrity 3. take actions to be taken in the event of partial loss of intact buoyancy	Actions to ensure and maintain the watertight integrity of the ship are in accordance with the accepted practice.	Perform actions to maintain watertight integrity of the ship in accordance to accepted practice; **Criterion AK** 1. Perform ballast water operation for correcting the ship's trim and stability. **Criterion AL** 2. Check that no alarms are activated indicating possible pollution of the seas. Perform fundamental actions to be taken in the event of partial loss of intact buoyancy			
	C11.2 Ship Construction .1 General Knowledge of the principal structural members of a ship and the proper names of the various parts	**This KUP is demonstrated by successfully passing the theoretical examination.**					
C12 Prevent, control, and fight fires on board	**Prevent, control, and fight fires on board shall be addressed by presenting valid COP in Advance Training in Firefighting (ATFF).**						

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C13 Operate life-saving appliances	**Operate life-saving appliances shall be addressed by presenting valid COP in Proficiency in survival and Rescue Boats, other than Fast Recue Boats (PSCRB).**						
C14 Apply medical first aid onboard ships	**Apply medical first aid onboard ships shall be addressed by presenting valid COP in Medical First Aid (MEFA).**						
C15 Monitor compliance with legislative requirements	C15.1 Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment.	**This KUP is demonstrated by successfully passing the theoretical examination.**					
C16 Application of leadership and teamworking skills	C16.1 Working knowledge of shipboard personnel operational and training C16.2 A knowledge of related international maritime conventions and recommendations, and national legislation	**This KUP is demonstrated by successfully passing the theoretical examination.**					
C16 Application of leadership and teamworking skills	C16.3 Ability to apply task and workload management, including:	At the end of assessment, the candidate should be able to:	**F4C16.3 Criterion AS** The crew are allocated duties and inform of expected standards of work and behavior in a	***Bunkering Operations:** Bunkering operations is successfully completed considering the following direction and order of Management Level Engine Officer:	Automatic or Rubric	Operational Functional Communication	Practical SIMULATOR

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	planning and co-ordination personnel assignment time and resource constraints prioritization C16.4 Knowledge and ability to apply effective resource management: allocation, assignment, and prioritization of resources effective communication onboard and shore decisions reflect consideration of team experiences assertiveness and leadership, including motivation obtaining and maintaining situational awareness	1. apply task and workload management, including: 1.1 planning and coordination 1.2 personnel assignment 1.3 time and resource constraints 1.4 prioritization 2. apply effective resource management: 2.1 allocation, assignment, and prioritization of resources 2.2 effective communication on board and ashore 2.3 decisions reflect consideration of team experiences 2.4 assertiveness and leadership, including motivation 2.5 obtaining and maintaining situational awareness 3. apply effective decision-making techniques: 3.1 situation and risk assessment	manner appropriate to individuals concerned. **F4C16.3** **Criterion AT** Training objectives and activities are based on assessment of current competence and capabilities and operational requirements. **F4C16.3** **Criterion AU** Operations are demonstrated to be in accordance with applicable rules **F4C16.4 & F4C16.5** **Criterion AV** Operations are planned and resources are allocated as needed in correct priority to perform necessary tasks **F4C16.4 & F4C16.5** **Criterion AW** Communication is clearly and unambiguously given and received **F4C16.4 & F4C16.5** **Criterion AX**	1. Attend tool box meeting prior bunkering operation. 2. Perform respective tasks as documented in bunkering plan. 3. Perform the expected standards of work. 4. Work/rest hours of are complied with. 5. Perform duty in accordance with bunkering plan. 6. Use of communication system that is available and communication is clear. 7. No oil spill or overflow should occur. 8. Get the final sounding as instructed by Chief Engineer. 9. Check that all valves/fittings are secured. 10. Inform Chief Engineer that all orders are carried out satisfactorily. Accomplish allocated duty and resources as needed in correct priority to perform necessary task: Crew perform duties of expected standards of work and behavior in a manner appropriate to the individuals concerned; Understand training objectives and activities based on assessment of current competence and capabilities and operational requirements;			

Competence	KUP	Assessment Outcome	Performance Criteria	Performance Standard	Scoring Procedure	Level of Simulation	Methods of Assessment
	C16.5 Knowledge and ability to apply decision-making techniques: situation and risk assessment identify and consider generated options selecting course of action evaluation of outcome effectiveness	3.2 identify and consider generated options 3.3 selecting course of action 3.4 evaluation of outcome effectiveness	Effective leadership behaviors are demonstrated **F4C16.4 & F4C16.5 Criterion AY** Necessary team member(s) share accurate understanding of current and predicted vessel state and operational status and external environment. **F4C16.4 & F4C16.5 Criterion AZ** Decisions are most effective for the situation.	Performs ship operations in accordance to applicable rules; Execute the planned operations and the allocated resources as needed in correct priority to perform necessary tasks; Communicates clearly and unambiguously; Utilize effective leadership behaviors;			
C17 Contribute to the safety of personnel and ship	**Contribute to the safety of personnel and ship should be addressed by presenting valid COP in Basic Training (BT).**						