COMPETENCY MAPPING

Title ***STCW Table***	***Table A – III / 2*** ***Specifications of minimum standards of competence for chief engineer officers and second engineer officers on ships powered by main propulsion machinery 3,000 kW propulsion power or more***

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 **Circular**	***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.***

Contents of Level of the Simulation

Management - relates to the management of the combination of systems to perform a given job
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
Crisis - task performed when the emergency has developed into a crisis

Color Coding:

THEORETICAL EXAMINATION | SIMULATION ASSESSMENT | LABORATORY ASSESSMENT

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
Function 01: Marine Engineering at the Management Level							
C1 - Manage the operation of propulsion plant machinery	C1.1 Design features and operative mechanism of the following machinery and associated auxiliaries: .1 marine diesel engine .2 marine steam turbine .3 marine gas turbine .4 marine steam boiler	**This KUP is demonstrated by successfully passing the theoretical examination.**			**Refer to MCAS Grading system**	**N/A**	**Theoretical**
C2 - Plan and schedule operations C3 - Operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery	***Theoretical knowledge*** C2.1, C3.1 Thermodynamics and heat transmission C2.2, C3.2 Mechanics and hydromechanics C2.3, C3.3 Propulsive characteristics of diesel engines, steam and gas turbines, including speed, output and fuel consumption	**This KUP is demonstrated by successfully passing the theoretical examination.**			**Refer to MCAS Grading system**	**N/A**	**Theoretical**

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
	C2.4, C3.4 Heat cycle, thermal efficiency and heat balance of the following: .1 marine diesel engine .2 marine steam turbine .3 marine gas turbine .4 marine steam boiler C2.5, C3.5 Refrigerators and refrigeration cycle C2.6, C3.6 Physical and chemical properties of fuels and lubricants C2.7, C3.7 Technology of materials C2.8, C3.8 Naval architecture and ship construction, including damage control						

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
C2 - Plan and schedule operations C3 - Operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery	***Practical knowledge***						
	C2.9, C3.9 Start up and shut down main propulsion and auxiliary machinery including associated systems	At the end of the assessment the candidate must be able to: 1. Plan the start-up of main propulsion and auxiliary machinery including associated systems 2. Conduct efficient operation, surveillance, performance assessment and maintaining safety of propulsion plant and	**F1C2** **Criterion B** The planning and preparation of operations is suited to the design parameters of the power installation and to the requirements of the voyage. **F1C2.9, C3.9** **Criterion C** The methods of preparing for the startup and of making available fuels, lubricants, cooling water and air are the most appropriate. **F1C2.10, C3.10** **Criterion D** Check of pressures, temperatures, and revolutions during the startup and warm up period are in accordance with technical specifications and agreed work plans.	**Criterion B** 1. Acknowledge one-hour notice from the Bridge. 2. Verify the engine pre departure checklist if complied with. **Criteria C, D, E** Prepare, check, and monitor the following: 1. Fuel System 1.1 Prepare and start the fuel system 1.2 Check and monitor the following parameters 1.3 Pressures __bar 1.4 Temperatures __ deg C 1.5 FO Service Tank Level __% 2. Lubricating system 2.1 Prepare and start the lubricating system 2.2 Check and monitor the following parameters .1 Pressures __bar .2 Temperatures __ deg C .3 Cylinder Oil Service Tank Level __% 3. Cooling Water system (HT and LT) 3.1 Prepare and start the Cooling Water System (HT and LT) 3.2 Check and monitor the following parameters .1 Pressures __bar .2 Temperatures __ deg C .3 FW Expansion tank Level __%	Rubrics	Management Communication	Practical (Simulator)

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
	C2.10, C3.10 Operating limits of propulsion plant C2.11, C3.11 The efficient operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery C2.13, C3.13 Functions and mechanism of automatic control for auxiliary machinery including but not limited to: .1 generator distribution systems .2 steam boilers .3 oil purifier	auxiliary machinery 3. monitor the operating limits of propulsion plant. 4. Monitor the functions and mechanism of automatic control for main engine 5. monitor the functions and mechanism of automatic control for auxiliary machinery including but not limited to: .1 generator distribution systems .2 steam boilers		4. Sea Water System 4.1 Prepare and start the Sea Water System 4.2 Check and monitor the following parameters .1 SW Pump discharge pressure __bar .2 SW Inlet temperature to LT Cooler __ deg C 5.Starting Air and Control Air system 5.1 Prepare and start the Starting Air and Control Air System 5.2 Check and monitor the following parameters .1 No.1 Starting Air Bottle Pressure __bar .2 Control Air Bottle Pressure __bar .3 Service Air Pressure __bar **Criterion G** 6. Generators (Diesel Engine, Shaft, and/or turbo) 6.1 Load ___KW 6.2 Current __ Amp 6.3 RPM __rpm 6.4 FO Pressures __bar .5 FO Temperatures __deg C .6 LO Pressures __bar 6.5 LO Temperatures __deg C 6.7 FW Cooling Temp. Inlet __ deg Test responses of engine telegraph against bridge command **Criterion H**			

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
	.4 refrigeration system .5 pumping and piping systems .6 steering gear system .7 cargo-handling equipment and deck machinery C2.12, C3.12 Functions and mechanism of automatic control for main engine	.3 oil purifier .4 refrigeration system .5 pumping and piping systems .6 steering gear system .7 cargo-handling equipment and deck machinery	**Criterion H** Performance is checked against bridge orders. **F1C2.11, C3.11** **Criterion E** Surveillance of main propulsion plant and auxiliary systems is sufficient to maintain safe operating conditions **F1C3.10** **Criterion G** The methods of measuring the load capacity of the engine are in accordance with the technical specification **F1C2.13 C3.13** **Criterion I** Performance level is in accordance with technical specification	10. Testing of telegraph ahead and astern. Bridge telegraph order to be complied within 10 seconds for each movement Parameters of propulsion plant and auxiliary systems is compared with Maker's technical specifications **Criteria C, D, E and G** 7. ME RPM ___ rpm 8. ME Exhaust Temperatures 8.1 Exhaust Temp No.1__deg C 8.2 Exhaust Temp No.2__deg C 8.3 Exhaust Temp No.3__deg C 8.4 Exhaust Temp No.4__deg C 8.5 Exhaust Temp No.5__deg C 8.6 Exhaust Temp No.6__deg C **Criterion I** Check that all parameters are within normal operating conditions in accordance with the technical specification Prepare, operate, maintain and put in AUTO condition the ff:			

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
		5. shutdown the main propulsion and auxiliary machinery, including associated systems	- The planning and preparation of shutting down is suited to the design parameters of the power installation and to the requirements of the voyage. **F1C2.12, C3.12** **Criterion F** The methods of preparing the shutdown and supervising the cooling down of the engine are the most appropriate	○ generator distribution system ○ steam boilers ○ oil purifier ○ refrigeration system ○ pumping and piping systems ○ steering gear system ○ cargo handling equipment and deck machinery 12. Check that no alarms are present **Criterion F** 1. Acknowledge End of Sea Passage 2. Pre arrival checklist is complied 3. Confirm “Finished with Engine” order from the Bridge. 4. Check that main engine is secured and has no active alarms or malfunctions. Check that auxiliary machinery are secured and has no active alarms or malfunctions. Secure and shutdown the Main propulsion and auxiliary machinery including but not limited to the following: .1 Main Engine; .2 Steering Gear System; .3 HFO & LO Purifier Systems; .4 Fuel Oil System; .5 Cooling Water Systems; .6 L.O. System (Optional) .7 Heating Systems; .8 Boiler (as required); .9 1 Auxiliary Engine; .10 Stern tube system;			

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COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
C4 - Manage fuel, lubrication and ballast operations	C4.1 Operation and maintenance of machinery, including pumps and piping systems	1. Administer the operation of fuel and lubrication system so as to prevent pollution of the marine environment 2. Administer the operation of the ballast system	**F1C4.1** **Criterion J** 1. Fuel and ballast operations meet operational requirement and are carried out so as to prevent pollution of the marine environment	**Criterion J** 1. Supervise the operation of the FO & LO transfer considering the following: a. No oil spills b. No pollution c. No comingling or mixing of fuel d. Oil is sufficient to complete the voyage e. The transfer is in accordance with the approved piping diagram and/or Safety Management System (SMS) f. All oil transfer operation must be recorded in Oil Record Book. 2. Supervise the ballast operation considering the following: a. As per requirement and coordination with deck duty officer b. Ballasting and de-ballasting operation in accordance with the Ballast Water Management Regulation. c. All ballast transfer must be recorded.	Rubrics	Management Communication	Theoretical And Practical (Simulator)

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
Function 02: Electrical, Electronic and Control Engineering at the Management Level							
C5 - Manage operation of electrical and electronic control equipment	C5.1 Marine electro technology, electronics, power electronics, automatic control engineering and safety devices C5.2 Design features and system configurations of automatic control equipment and safety devices for the following: .1 main engine .2 generator and distribution system .3 steam boiler C5.3 Design features and system configurations of operational control equipment for electrical motors	At the end of the assessment the candidate must be able to: 1. Administer the operation of marine electro technology, electronics, power electronics, automatic control engineering and safety devices; 2. Evaluate the design features and system configurations of automatic control equipment and safety devices for the following: .1 main engine .2 generator and distribution system .3 steam boiler 3. Evaluate the design features and system configurations of operational	**Criterion K** Operation of equipment and system is in accordance with operating manuals **Criterion L** Performance levels are in accordance with technical specifications	**Criterion K and L** Operate, maintain within normal operating condition and put in AUTO mode all Electrical, electronic and automatic instrumentation and control devices of the following: 10.1 generator distribution system; 10.2 steam boilers; 10.3 oil purifier; 10.4 refrigeration system; 10.5 pumping and piping systems; 10.6 steering gear system; 10.7 cargo handling equipment; and deck machinery.	Rubrics	Management Communication	Theoretical And Practical (Simulator)

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
		control equipment for electrical motors;					
	C5.4 Design features of high-voltage installations	4. Evaluate the design features of high-voltage installations; and	**Criterion K** Operation of equipment and system is in accordance with operating manuals **Criterion L** Performance levels are in accordance with technical specifications	**Criterion K and L** Manage that the operation of the High voltage installations is properly planned and carried out in accordance with the technical specifications. 1. Check the high voltage requirements during the operation. 2. Prepare the stand by generator. 3. Start stand by generator. 4. Check the parameters of the generator before loading the generator. 5. Synchronize the incoming generator to running generator. 6. Check for proper load sharing 7. Close all essential circuit breaker for the operational requirement. Manage the 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	Rubrics	Management Communication	Practical (Simulator / Laboratory)

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
	C5.5 Features of hydraulic and pneumatic control equipment	5. Evaluate the features of hydraulic and pneumatic control equipment.	**Criterion K** Operation of equipment and system is in accordance with operating manuals **Criterion L** Performance levels are in accordance with technical specifications	**Criterion K and L** Operate, maintain within normal operating condition and put in AUTO mode all Electrical, electronic and automatic instrumentation and control devices of the following: 1. Steering gear hydraulic system. 2. Main and auxiliary compressor.	Rubrics	Management Communication	Practical Simulator
C6 - Manage trouble shooting, restoration of electrical and electronic control equipment to operating condition	***Practical knowledge***						
	C6.1 Trouble shooting of electrical and electronic control equipment	At the end of the assessment the candidate must be able to: 1. Administer the trouble-shooting of electrical equipment	**F2 C6** **Criterion M** Maintenance activities are correctly planned in accordance with technical, legislative, safety and procedural specifications. **Criterion N** Inspection, testing and troubleshooting of equipment are appropriate	**Criterion M & N** Plan troubleshooting activities of electrical equipment in accordance with technical, legislative, safety and procedural specifications Supervise inspection, testing and troubleshooting of the electrical equipment are appropriate 1. Issue Permit to work, 2. Ensure appropriate checklist is complied with 3. Appropriate PPEs and electrical measuring tools and instruments are identified and prepared	Rubrics	Management Emergency	Theoretical and Practical (Laboratory / Simulator)
	C6.2 Function test of electrical, electronic control equipment and safety devices	2. Administer the trouble-shooting of electronic equipment		**Criterion M & N** Plan troubleshooting activities of electrical equipment in accordance with technical, legislative, safety and procedural specifications			

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
				Supervise inspection, testing and troubleshooting of the electrical equipment are appropriate Administer the following in a wye-delta, forward reverse, direct online motor controls: 1. Inspect 2. Isolate 3. Lock out/Tag out 4. Troubleshooting 5. Function Test 1. Issue Permit to work, 2. Ensure appropriate checklist is complied with 3. Appropriate PPEs and electronic measuring tools and instrument are identified and prepared			
	C6.3 Trouble shooting of monitoring systems	3. Conduct trouble shooting of monitoring system		Plan the troubleshooting activities in accordance with technical, legislative, safety and procedural specifications Supervise the inspection, testing and troubleshooting of the monitoring system Administer the following: 1. Inspect 2. Isolate 3. Lock out/Tag out 4. Troubleshooting 5. Function Test 1. Issue Permit to work, 2. Ensure appropriate checklist is complied with			

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
	C6.4 Software version control	4. Configuring of software version		3. Appropriate PPEs and instrument are identified and prepared Administer the following using at least two of the listed sensors (PT 100, thermocouple, pressure transmitter, flow sensor, pick-up sensor, level transmitter) 1. Inspect 2. Isolate 3. Lock out/Tag out 4. Troubleshooting 5. Function Test Control measures are in accordance with technical legislative safety and procedural specifications 1. Secure permission from the office or manufacturer regarding configuration 2. Report the updates made on the software control system to the company.			

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COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
Function: 03 – Maintenance and Repair at the Management Level							
C7 - Manage safe and effective maintenance and repair procedures	***Theoretical knowledge***						
	C7.1 Marine engineering practice	**This KUP is demonstrated by successfully passing the theoretical examination.**			**Refer to MCAS Grading system**	**N/A**	**Theoretical**
	Practical knowledge						
C7 - Manage safe and effective maintenance and repair procedures	C7.2 Manage safe and effective maintenance and repair procedures C7.3 Planning maintenance, including statutory and class verifications C7.4 Planning repairs	At the end of the assessment the candidate must be able to: 1. Administer safe and effective maintenance and repair procedures 2. Administer planning of maintenance and repair activities	**F3C7.2, 7.3, 7.4** **Criterion O** Maintenance activities are correctly planned and carried out in accordance with technical, legislative, safety and procedural specifications **Criterion P** Appropriate plans, specifications, materials and equipment are available for maintenance and repair. **Criterion Q** Action taken leads to the restoration of plant by the most suitable method	**Criterion O, P, Q** Plan maintenance and repair activities 1. Issue or secure appropriate permit for the maintenance or repair activities 2. Accomplish appropriate checklist and risk assessments 3. Appropriate tools, spare parts, equipment and PPE for the activities areidentified and prepared 4. Conduct tool box meeting Supervise restoration of plant by the most suitable method 1. Secure relevant valves, pumps, and power supply prior maintenance 2. Administer the maintenance and repair if in accordance with the manufacturer manuals and safety management system 3. Test the newly restored machinery for functionality. 4. Report to the Master that restoration, of plant is completed Plan maintenance and repair activities including statutory and class verifications 1. Monitor that all machinery that require regular maintenance including Statutory and Class verifications are updated as per Survey listing.	Rubrics	Management	Practical (Laboratory)

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
				2. Issue Permit to work, 3. Appropriate checklist is complied with 4. Appropriate PPEs and tools are identified and prepared			
C8 - Detect and identify the cause of machinery malfunctions and correct faults	***Practical knowledge***						
	C8.1 Detection of machinery malfunction, location of faults and action to prevent damage	At the end of the assessment the candidate must be able to: 1. demonstrate methods to detect machinery malfunction, locate faults and act to prevent damage	**F3C8.1** **Criterion R** The methods of comparing actual operating conditions are in accordance with recommended practices and procedures **F3C8.2** **Criterion S** Actions and decisions are in accordance with recommended operating specifications and limitations	Administer recommended practices and procedures of comparing actual operating conditions; Take actions in accordance with recommended operating specifications and limitations **Criteria R and S** 1. Identify and acknowledge the alarm 2. Address and rectify the fault. 3. Function test the machinery after rectification 4. Resume normal operation after successful function test of the machinery.	Rubrics	Management	Theoretical and Practical (Laboratory / Simulator)
	C8.2 Inspection and adjustment of equipment	2.perform inspection and adjustment of equipment		**Criteria R and S** 1. Measure the actual condition and compare with the limits as per makers specification 2. Adjust the parameter or change the components, if required, as per the result of the comparison 3. Run test the equipment and if found satisfactory, resume normal operation.			

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COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
C8 - Detect and identify the cause of machinery malfunctions and correct faults	C8.3 Non-destructive examination	At the end of the assessment the candidate must be able to: 1. carry out non-destructive examination	**F3C8.3** **Criterion R** The methods of comparing actual operating conditions are in accordance with recommended practices and procedures **F3C8.3** **Criterion S** Actions and decisions are in accordance with recommended operating specifications and limitations	Supervise recommended practices and procedures of comparing actual operating conditions; Act, decide and make corrections in accordance with recommended operating specifications and limitations **Criteria R and S** 1. Tests the equipment using non-destructive method. 2. Record the result of the test; 3. Compare the test result with the operating limits on the given specification. 4. Make decisions out of the result of the test.	Rubrics	Management	Theoretical and Practical (Laboratory)
C9 - Ensure safe working practices	***Practical knowledge***						
	C9.1 Safe working practices	At the end of the assessment the candidate must be able to: .1 apply safe working practices in all phases of maintenance, troubleshooting and repair scenarios	**F1C9.1** **Criterion T** Working practices are in accordance with legislative requirements, Code of safe working practices, permits to work and environmental regulations	Check that working practices are in accordance to legislative requirements, Code of safe working practices, permits to work and environmental regulations procedure **Criterion T** 1. Issue the working permits before commencing the given work. 2. Ensure PPE's are donned. 3. Ensure all specified working tools are prepared. 4. Ensure all possible hazards are identified. 5. Ensure qualified and number of personnel to perform the job.	Rubrics	Management	Theoretical and Practical (Laboratory)

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
Function 04: Controlling the Operation of the Ship and Care for Person at the Management Level							
C10 - Control trim, stability and stress	**C10.1** Understanding of fundamental principles of ship construction and the theories and factors affecting trim and stability and measures necessary to preserve trim and stability **C10.2** Knowledge of the effect on trim and stability of a ship in the event of damage to, and consequent flooding of, a compartment and countermeasures to be taken	At the end of assessment, the candidate should be able to: 1. Trim, stability and stress are controlled at all times 2. take measure to counter the effect on trim and stability in the event of damage and consequent flooding.	**F4C10.1, F4C10.2** **Criterion U** Stability and stress conditions are maintained within safety limits at all times	**Criterion U** 1. Bunkering plan is submitted to Master for approval. 2. Internal transfer of fuel is in coordination with the deck department. 3. Bunker consumption is in accordance with the voyage plan. 4. Ballasting is in accordance with the guidance of deck department 1. Ordering engine personnel to keep all watertight doors close in engine room area as per C/E standing order. 2. Brief regularly all engine personnel on the countermeasures to be done during flooding as per contingency plan.	Rubrics	Management Communication	Theoretical and Practical (Simulator)
C10 - Control trim, stability and stress	C10.3 Knowledge of IMO recommendations concerning ship stability	**This KUP is demonstrated by successfully passing the theoretical examination.**			**Refer to MCAS Grading system**	**N/A**	**Theoretical**
C11 - Monitor and control compliance with legislative requirements and measures	C11.1 Knowledge of relevant international maritime law embodied in	At the end of assessment, the candidate should be able to: 1. Monitor compliance with	**Criterion V** Procedures for monitoring operations	***Clustered to C14 Performance Standard – Bunkering Operation*** **The following international maritime requirements must be met while conducting bunkering operation:**	Rubrics	Management Communication	Theoretical and Practical (Simulator)

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
to ensure safety of life at sea, security and the protection of the marine environment	international agreements and conventions Regard shall be paid especially to the following subjects: C11.1.1 certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and the period of their legal validity C11.1.2 responsibilities under the relevant requirements of the International Convention on Load Lines, 1966, as amended C11.1.3 responsibilities under the relevant requirements of the International Convention for	relevant international maritime law embodied in international agreements and conventions 2. Monitor compliance especially to the following: .1 certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and the period of their legal validity .2 responsibilities under the relevant requirements of the International Convention on Load Lines, 1966, as amended .3 responsibilities under the	and maintenance comply with legislative requirements **Criterion W** Potential non-compliance is fully identified **Criterion X** Requirements for renewal and extension of certificates ensure continued validity of survey items and equipment	**C11.1.1, C11.1.5** 1. Engine crew involved in the operation must have valid certificates and must be medically-fit to comply with International Health Regulations requirements **C11.1.2, C11.1.8** 2. Request the officer and/or duty-able seafarer deck to monitor the forward, middle and aft draft and compute for the trim before, during and after bunkering operation to comply with International Convention on Load Lines, 1966, as amended **C11.1.3, C11.1.6** 3. Prepare firefighting equipment e.g. fire extinguisher prior to start of bunkering operation to comply with the International Convention for Safety of Life at Sea **C11.1.4, C11.1.7** 4. Monitor the vessel surroundings regularly and SOPEP materials must be prepared prior bunkering as precaution to prevent pollution of the environment by ships			

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
	Safety of Life at Sea, 1974, as amended C11.1.4 responsibilities under the International Convention for the Prevention of Pollution from Ships, as amended C11.1.5 maritime declarations of health and the requirements of the International Health Regulations C11.1.6 responsibilities under international instruments affecting the safety of the ships, passengers crew or cargo C11.1.7 methods and aids to prevent pollution of the environment by ships	relevant requirements of the International Convention for Safety of Life at Sea, 1974, as amended .4 responsibilities under the International Convention for the Prevention of Pollution from Ships, as amended .5 maritime declarations of health and the requirements of the International Health Regulations .6 responsibilities under international instruments affecting the safety of the ships, passengers crew or cargo .7 methods and aids to prevent					

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
	C11.1.8 knowledge of national legislation for implementing international agreements and conventions	pollution of the environment by ships .8 knowledge of national legislation for implementing international agreements and conventions					
C12 - Maintain safety and security of the vessel, crew and passengers and the operational condition of life-saving, fire-fighting and other safety systems	C12.1 A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea)	**This KUP is demonstrated by successfully passing the theoretical examination.**			**Refer to MCAS Grading system**	**N/A**	**Theoretical**
	C12.2 Organization of fire and abandon ship drills						
	C12.3 Maintenance of operational condition of life-saving, firefighting and other safety systems						
	C12.4 Actions to be taken to protect and safeguard all persons on board in emergencies						
	C12.5 Actions to limit damage and save the ship						

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
	following a fire, explosion, collision or grounding						
C13 - Develop emergency and damage control plans and handle emergency situations	C13.1 Ship construction including, damage control C13.2 Methods and aids for fire prevention, detection and extinction C13.3 Functions and use of life-saving appliances	**This KUP is demonstrated by successfully passing the theoretical examination.**			**Refer to MCAS Grading system**	**N/A**	**Theoretical**
C14 - Use of leadership and managerial skills	C14.1 Knowledge of shipboard personnel management and training C14.2 A knowledge of international maritime conventions, recommendations and related national legislation	At the end of assessment, the candidate should be able to: 1. Apply leadership and managerial skills on bunkering operations 2. apply international maritime conventions and recommendation, and related national legislation	**F4C14.1 Criterion A1** The crew are allocated duties and informed of expected standards of work and behavior in a manner appropriate to the individuals concerned **F4C14.2 Criterion C1** Operations are demonstrated to be in accordance with applicable rules **F4C14.3 Criterion D1** Operations are planned and resources are	***Bunkering Operations:** Bunkering operations is successfully completed considering the following direction and order of Management Level Engine Officer: 1. Conduct tool box meeting prior bunkering operation including risk analysis. 2. Assign engine personnel respective tasks as documented in bunkering plan. 3. Discuss the expected standards of work to all engine personnel involve 4. Work/rest hours of engine personnel are complied with. 5. Ensure the correct grade and specification of bunker fuel ordered. 6. Bunkering operation is in accordance with bunkering plan.	Rubrics	Management Communication Emergency Crisis	Theoretical and Practical (Simulator)

COMPETENCE	KUP	ASSESSMENT OUTCOME	PERFORMANCE CRITERIA	PERFORMANCE STANDARD	SCORING PROCEDURE	LEVEL OF SIMULATION	METHOD OF ASSESSMENT
	C14.3 Ability to apply task and workload management, including: .1 planning and coordination .2 personnel assignment .3 time and resource constraints .4 prioritization C14.4 Knowledge and ability to apply effective resource management: .1 allocation, assignment, and prioritization of resources .2 effective communication on board and ashore	3. perform task and workload management including: 3.1 planning and coordination; 3.2 personnel assignment; 3.3 time and resource constraints; and 3.4 prioritization. 4. perform effective resource management including: 4.1 allocation, assignment, and prioritization of resources; 4.2 effective communication on board and ashore; 4.3 decisions reflect consideration of team experience; 4.4 assertiveness and leadership, including motivation; 4.5 obtaining and maintaining situation awareness.	allocated as needed in correct priority to perform necessary tasks **F4C14.4** **Criterion E1** Communication is clearly and unambiguously given and received **F4C14.6** **Criterion F1** Effective leadership behaviors are demonstrated **F4C14.3** **Criterion G1** Necessary team member(s) share accurate understanding of current and predicted vessel state and operational status and external environment **F4C14.5** **Criterion H1** Decisions are most effective for the situation	7. Ensure communication system is available and communication is clear to all involved engine personnel. 8. Direct all personnel that no oil spill or overflow should occur. 9. Direct one personnel to get the final sounding. 10. Direct personnel that all valves/fittings are secured. 11. Inform the bridge that bunkering operation is completed. Assess the performance of engine personnel including their weaknesses and strengths and recommend relevant training.			

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	.3 decisions reflect consideration of team experience .4 assertiveness and leadership, including motivation .5 obtaining and maintaining situation awareness C14.5 Knowledge and ability to apply decision-making techniques: .1 situation and risk assessment .2 identify and generate options .3 select course of action .4 evaluation of outcome effectiveness C14.6 Development, implementation and oversight of standard operating procedures	5. Apply effective decision-making techniques including: 5.1 situation and risks assessment; 5.2 identify and generate options; 5.3 select course of action; and 5.4 evaluation of outcome effectiveness. 6. develop, implement and oversee the standard operating procedures. train shipboard personnel	**Criterion I1** Operations are demonstrated to be effective and in accordance with applicable rules **Criterion B1** Training objectives and activities are based on assessment of current competence and capabilities and operational requirements				