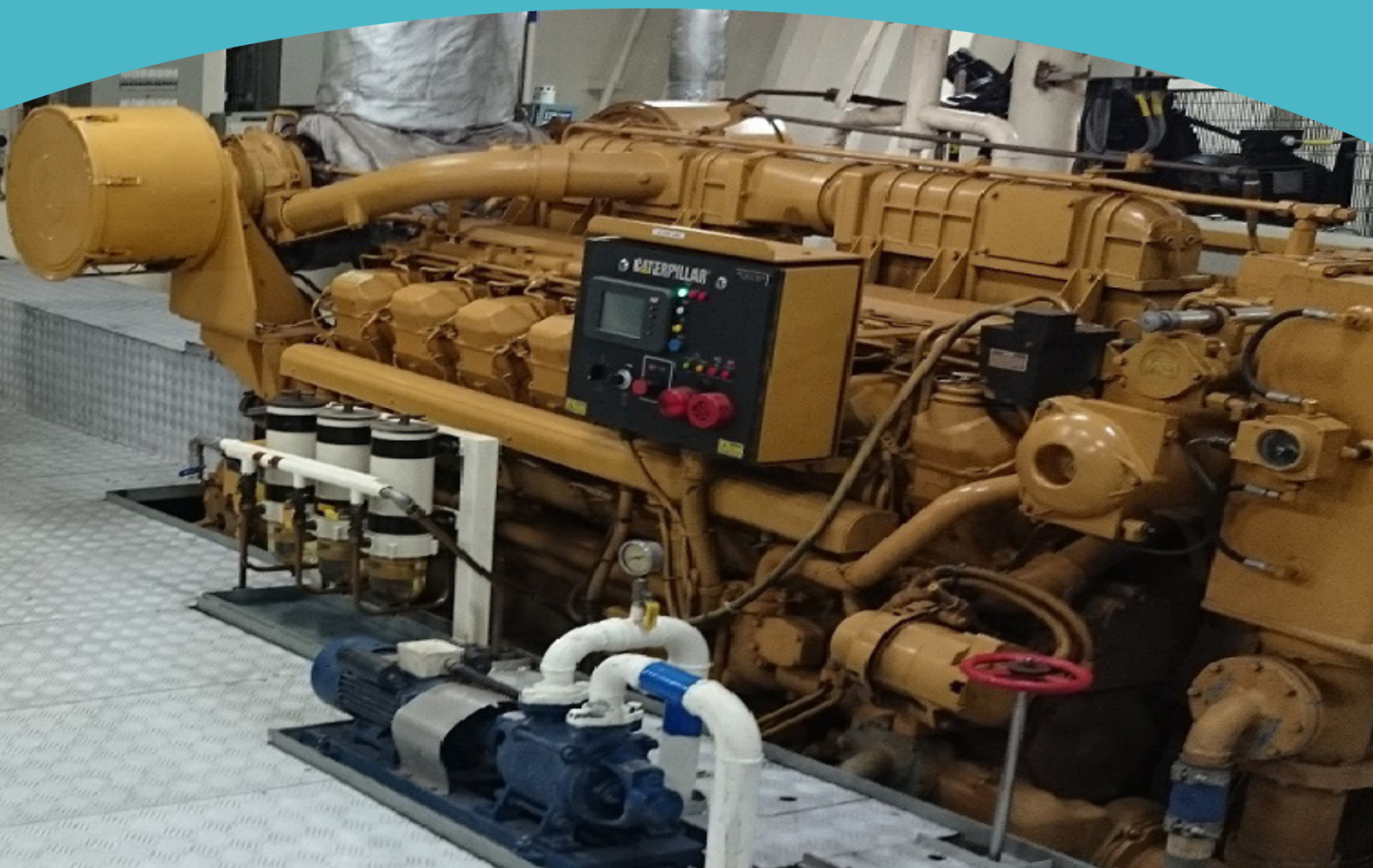
Australian Government
Australian Maritime Safety Authority

Marine Engine Driver Grade 1 Near Coastal

Skills and Knowledge Required for NSCV Certificates of Competency

PART D CREW COMPETENCIES



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The tables in this document are taken directly from AMSA 730 Skills and Knowledge Required for NSCV Certificates of Competency Part D Crew Competencies. Only those tables specific to this certificate of competency are included in this document.

TABLE 2 – ELEMENTS OF SHIPBOARD SAFETY

Outcome	Content	Standards for evaluating competence
Elements of Shipboard Safety Safety and emergencies including survival craft	**Meet operational and emergency safety requirements** • Apply basic survival skills in the event of vessel abandonment • Follow procedures to minimise and fight fire on a vessel • Meet workplace OHS requirements • Survive at sea using survival craft	• Practice survival techniques • Operate lifesaving and survival equipment • Undertake and understand risk management processes including Safety Management System (SMS) operational practices • Follow safety procedures and take action • Understand and follow fire minimisation procedures • Respond to and fight fires with portable and other firefighting appliances including correct use of vessel closure and shutdown systems • Identify and respond to risks associated with confined spaces • Practice survival techniques using survival craft

TABLE 3 – FOLLOW SOUND ENVIRONMENTAL WORK PRACTICES

Outcome	Content	Standards for evaluating competence
Environment Follow environmental work practices	**Environmental Responsibilities** • Follow environmental workplace practices • Contribute to improved environmental work practices • Maintain environmental records • Precautions to prevent pollution • Sensitive sea and restricted sea areas • MARPOL • Oil spill equipment and its limitations	• Identify safe and environmentally acceptable practices for: - Refuelling - Cleaning up fuel or oil spills - Understanding garbage, sewage, noise, anchoring or marine life and other environmental type maritime responsibilities - Antipollution procedures and equipment

TABLE 11 – MARINE ENGINE DRIVING

Outcome	Content	Standards for evaluating competence
Outcome 11.1 Demonstrate knowledge of the construction, operation and service of marine internal combustion engines	**Basic Cycles of Operation and Component Identification of:** • Marine 2- and 4-stroke diesel engines • Marine 2- and 4-stroke petrol engines • Basic timing diagrams - Fuel systems including: - Petrol/diesel - Carburettors/fuel injectors - Fuel storage and management - Injection pumps - Basic governor operation - Fuel system maintenance - Fuel system fault finding and possible emergency operation • Basic combustion process • Air filters • Turbo/supercharging	• Major parts of marine internal combustion engines are identified • Main differences between 2- and 4-stroke cycles of operation are identified • Fuel systems are managed safely in accordance with regulations, manufacturer's instructions and vessel procedures to prevent pollution of the marine environment are applied • Marine internal combustion engines are operated within the technical specifications • Operation and surveillance of main propulsion plant and auxiliary systems is sufficient to maintain safe operating conditions • Basic operational faults are recognized and repair or maintenance assistance is organised
	Cooling Systems, including: • Keel cooling/heat exchangers • Circulating pumps • Ship's side valves • Coolant circulation and thermostats • Corrosion • Maintenance • Instrumentation • Emergency Procedures	• Cooling systems are operated in accordance with established procedures and prevent pollution of the marine environment
	Lubricating Systems, including: • Lube oil circulating systems • Lube oil system components • General lubrication and cooling effects • Lubrication system problems • Lube oil contamination • Lube oil system management and maintenance • Lube oil system instrumentation • Refuelling operations (environment, safety and regulators)	• Lubricating systems are operated in accordance with established procedures and prevent pollution of the marine environment

Outcome	Content	Standards for evaluating competence
Outcome 11.2 • Demonstrate knowledge of the workings of marine propulsion systems • Recognise and take steps to rectify basic operational faults	**Power Transmission, including:** • Basic reverse/reduction gearbox operation • Types of gear trains • Lubrication and cooling of gearboxes including filters and strainers • Fault identification • Emergency operation • Propeller and intermediate shafting alignment • Bearing types, materials, installation, lubrication • Shaft seals and glands, packing • Coupling types, fitting, keys and keyways • Propeller types, fitting, keys and keyways, securing nuts, locking • Controllable pitch propellers • Stem drive and water jet drive units • Maintenance and inspection • Causes of vibration and undue wear	• Marine propulsion systems components are identified and functions explained in simple terms • Describe the operation and servicing of propulsion system within the technical specifications • Basic operational faults are recognised and repair or maintenance assistance is organised
Outcome 11.3 Prepare a vessel's machinery for sea	**Engine Watchkeeping** • Inspection and checks of main auxiliary machinery and associated spaces • Start-up procedures • Instrumentation • Running checks • Keeping of running and maintenance logs • Shut down procedures	• Methods of preparing for start-up and of making available fuel, lubricants, cooling water and air comply with vessel operating procedures and manufacturer's recommendations • Checks of pressures, temperatures and revolutions during the start-up and warm-up periods are in accordance with the technical specifications • Methods of preparing the shut-down and supervising the cooling down of the engine are in accordance with vessel operating procedures and manufacturer' s recommendations

Outcome	Content	Standards for evaluating competence
Outcome 11.4 Identify and operate components of auxiliary systems	**Steering Systems, including:** • Rudder construction and rudder types • Rudder and stock support bearings • Glands, packing, seals • Tiller arm attachment • Steering operation of hydraulic, cable, rod and gear • Testing of steering and hydraulic systems • Emergency steering checks	• Steering arrangements are operated in accordance with manufacturer's instructions, operational procedures and regulations • Maintenance is arranged in accordance with the technical specifications
	Pumping Systems, including: • Fire/bilge/tank circulating systems • Fault identification, maintenance, prevention of corrosion • Valve types – construction and routine servicing • Back-flooding prevention • Strainers, mud boxes, foot valves • Dual duty systems/cross connection. • Use of flexible materials, hoses, etc. • Drive systems, belts, clutches, motors, etc. • Environmental responsibilities • Regulations and legislative requirements	• Pumping systems are operated in accordance with manufacturer's instructions, operational procedures and regulations to ensure safety of operation and prevention of pollution of the marine environment • Maintenance is arranged in accordance with the technical specifications
	Refrigeration systems, including: • Hazards of refrigerant gases • Identification of components • Environmental responsibilities	• Refrigeration system is operated and maintained in accordance with manufacturer's recommendations, regulations and vessel operating procedures to ensure safety of operation and prevention of pollution of the environment **WARNING**: *Relevant Commonwealth, local and State/Territory training and qualification requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work.*

Outcome	Content	Standards for evaluating competence
Outcome 11.5 Operate electrical systems	**Direct Current Systems (not exceeding 32 V DC), including:** • Batteries – types, care and maintenance, hazards • Basic care of electrical systems in general – fault recognition • Charging systems – regulators, alarms/indicators • Uses of fuses and circuit breakers – selection of correct capacity • Connecting batteries • Starter motors, alternators and associated equipment – operation maintenance	• DC systems are operated and operator preventative maintenance in accordance with manufacturer's recommendations, regulations and vessel operating procedures to ensure safe operation. **WARNING**: *Relevant State/Territory electrical licensing requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of electrical circuits or systems that are 50 V AC or above, or 120 V DC or above, on a vessel.*
	Electric Systems (above 32 V DC and up to 415 V AC), including: • Protective devices on switchboards • Personal safety • Shore power connection • Fault identification, location, and safety implications	• Electrical systems are operated in accordance with manufacturer's recommendations, regulations and vessel operating procedures to ensure safe operation • Electrical system faults are recognised and where necessary steps are taken to make them immediately safe **WARNING**: *Relevant State/Territory electrical licensing requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of electrical circuits or systems that are 50 V AC or above, or 120 V DC or above, on a vessel.*
Outcome 11.6 Use deck machinery	**Use of Deck Machinery** • Lifting equipment • Winches, capstans • Safe working procedures • Basic hydraulic systems, their operation and user-maintenance • Legislation affecting lifting equipment	• Lifting equipment and deck machinery is operated and user-maintenance is carried out in accordance with manufacturer's recommendations, regulations and vessel operating procedures
Outcome 11.7 Demonstrate knowledge of the basic techniques of hull maintenance	**Hull Maintenance** • Basic hull inspection and maintenance • Use of sacrificial anodes	• Maintenance procedures and techniques for hulls are in accordance with regulations and vessel operating procedures

Outcome	Content	Standards for evaluating competence
Outcome 11.8 • Demonstrate the actions to be taken in the event of fire or explosion • Describe actions for the operation and maintenance of fire-fighting equipment in the engine space	• Firefighting systems • Fire/explosion, corrosion • Fire triangle • Minimisation of hazards • Identification and maintenance of fire- fighting equipment • Use of fire-fighting equipment • Management/control of fires • Personnel safety • Emergency shut-offs and closures • Fire alarm systems – heat/smoke detectors • Alarm panels • Fixed fire-fighting installations • Control of passengers/crew • Communications, instructions, etc.	• Fire control is implemented in accordance with maritime safety and vessel operating procedures whilst maintaining crew safety, vessel stability and operational capability • Actions taken to control fires are based on full and accurate assessment of the incident, using all available sources of information • Priority, timing and sequence of actions are appropriate to the overall requirements of the incident and to minimise damage and potential damage to the vessel, injuries to personnel and impairment of the operational effectiveness of the vessel • Maintenance of fire-fighting appliances is in accordance with manufacturer's specifications • Alarms are actioned, recorded and reported according to vessel procedures and marine safety requirements
Outcome 11.9 Demonstrate knowledge of the principles of the stowage and management of explosive and flammable materials	• Stowage and management of flammable/ explosive liquids, gases, solids and other materials normally carried onboard (spare fuel, lubricants, LPG cooking gas, flares) • Dangers inherent with the above materials	• Stowage of flammable/explosive materials and their management, is in accordance with established rules and procedures
Outcome 11.10 Maintain running log including fuel calculations and written reports	• Writing of simple reports • Keeping of running and maintenance logs • Working out simple calculations for fuel capacity, consumption and voyage duration	• Running and maintenance logs are completed according to vessel and maritime procedures including regular reports • Calculations for fuel capacity, consumption and voyage duration
Outcome 11.11 Work effectively with others	• Work in a group environment promoting team commitment and cooperation, supporting team members and dealing effectively with issues, problems and conflict	• Work effectively as part of a crew

TABLE 12 – ENGINEERING, VESSEL CONSTRUCTION AND MACHINERY

Outcome	Content	Standards for evaluating competence
Outcome 12.1 Operate and carry out basic user maintenance of marine internal combustion engines	• Diesel engine construction • Diesel engine operation and routine maintenance • Turbocharging arrangements • Diesel engine fuel injection, timing and control equipment • Engine protection arrangements • Engine performance and reasons for lack of performance (fault-finding procedures) • Planned maintenance • Operational practice	• Constructional parts of marine internal combustion engines are identified in accordance with manufacturer's manuals • Two- and four-stroke cycles of operation are explained in compliance with manufacturer's specifications • Marine internal combustion engines are operated within the technical specifications • Surveillance and operation of main propulsion plant and auxiliary systems is within the operating limits specified by vessel procedures or manufacturer's recommendations • Operational faults are recognised and rectified in accordance with manufacturer's specifications and fault-finding procedures • Maintenance is undertaken in accordance with vessel maintenance plan, vessel procedures and manufacturer's recommendations • Records are maintained in compliance with regulations and vessel recordkeeping procedures
Outcome 12.2 Operate and carry out basic user maintenance of lubricating oil and cooling-water systems	• Dry sump and wet sump lubrication systems • Correct pressure and flow conditions • Oil quality monitoring • Oil filter changing procedures • Heat exchanger, keel cooler, and raw water cooling systems • Construction and maintenance of heat exchangers • Corrosion prevention	• Lubricating systems are managed in accordance with established Regulations, manufacturers' instructions and vessel operating procedures and so as to prevent pollution of the marine environment • Cooling systems are managed in accordance with manufacturer's recommendations and established procedures • Maintenance is undertaken in accordance with vessel maintenance plan, vessel procedures and manufacturer's recommendations • Recordkeeping procedures are compliant with regulations

Outcome	Content	Standards for evaluating competence
Outcome 12.3 Operate and carry out basic user maintenance of pumps, bilge and seawater systems	• Types of pumps and safety devices required • Pump capabilities and requirements for priming • Bilge pumping arrangements for vessels with several compartments • Dangers associated with back-flooding and methods to prevent back-flooding • Seawater circulating systems • Cross connections between seawater systems and bilge systems • Cross connections between bilge/ ballast/seawater systems and fire main	• Pumping systems are managed in accordance with established rules and procedures to ensure safety of operation and prevention of pollution of the marine environment • Maintenance is undertaken in accordance with vessel maintenance plan, vessel procedures and manufacturer's recommendations • Records are maintained in compliance with regulations and vessel recordkeeping procedures
Outcome 12.4 Operate and carry out basic user maintenance of steering gear	• Electro-hydraulic steering gear • Common faults in steering gear • Testing of steering gear • Routine maintenance on steering systems • Emergency steering	• The steering arrangements are operated and maintained in accordance with the technical specifications • Emergency steering checks are in accordance with vessel maintenance plan, vessel procedures and manufacturer's recommendations • Records are maintained in compliance with regulations and vessel recordkeeping procedures
Outcome 12.5 Operate and manage fuel and fuel oil systems	• Arrangement of fuel oil systems and filters • Fuel oil tank components • Methods of fuel oil tank content • Fuel tank filling • Condensation in fuel tanks • The effect of slack tanks on vessel stability	• Fuel systems are managed in accordance with established rules and procedures to ensure safety of operation and avoid pollution of the marine environment • Records are maintained in compliance with regulations and vessel recordkeeping procedures
Outcome 12.6 Demonstrate knowledge of the principles of oil and grease lubrication systems	• Functions of lubricating oil • Functions of grease	• The basic principles of lubrication are described in accordance with engineering principles

Outcome	Content	Standards for evaluating competence
Outcome 12.7 Safely operate and carry out simple maintenance of electrical systems	• Main faults that can occur in electrical systems • Earth indicating devices • Maintenance and operation of batteries • Connecting batteries in series and parallel • Electrical distribution systems • Single and three phase AC power • Isolation of electrical circuits • Connection to shore power • Use of multi-meter to test voltage and continuity • Protection devices	• Electrical systems are operated and marinated in accordance with electrical regulations • Records are marinated in compliance with regulations and vessel recordkeeping procedures **WARNING**: *Relevant/Territory electrical licensing requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of electrical circuits or systems that are 50 V AC or above, or 120 V DC or above, on a vessel.*
Outcome 12.8 Demonstrate knowledge of the safe handling of LPG, liquid fuels and refrigerant gases	• Dangers associated with LPG and petrol vapour • Storage of LPG cylinders • Testing of LPG detectors • Safety procedures for vessel Refuelling • Dangers of refrigerant gas leaks in confined spaces	• Flammable/explosive materials are stowed and managed in accordance with regulations and established rules and procedures • Refrigerant gases are stowed and managed in accordance with regulations and Australian Standards **WARNING**: *Relevant Commonwealth, local and State/Territory training and qualification requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work.*
Outcome12.9 • Demonstrate knowledge of the precautions against fire and explosion • Demonstrate the methods of dealing with fires	• Major causes of fire and explosion onboard • Recognition and uses of different types of portable fire extinguishers • Fire pumps and fire main systems • Use of hoses and nozzles • Fixed installations, closing appliances and remote shut-offs • Safety precautions to be observed during a watch and immediate actions to be taken in the event of a fire or accident	• Fire control is implemented in accordance with maritime safety and vessel operating procedures whilst maintaining crew safety, vessel stability and operational capability • Actions taken to control fires are based on full and accurate assessment of the incident, using all available sources of information • Order of priority, timing and sequence of actions is appropriate to the overall requirements of the incident and to minimise damage and potential damage to the vessel • Maintenance of fire-fighting appliances is in accordance with manufacturer's specifications • Alarms are actioned, recorded and reported according to vessel procedures and marine safety requirements

Outcome	Content	Standards for evaluating competence
Outcome 12.10 Recognise and correct deteriorated fitting and machinery	• Corrosion and means of prevention • Pipework repairs • Recognition and measurement of tail shaft weardown • Machinery log keeping	• Maintenance activities are planned in accordance with technical, legislative, safety and procedural specifications • Maintenance is carried out in compliance with manufacturer's procedures
Outcome 12.11 Prepare a vessel for sea and secure a vessel after a voyage	• Spares and stores required for proposed voyage • Preparations and checks necessary before sailing • Shutting down machinery • Securing vessel after voyage	• Vessel and machinery are prepared for sea and secured after voyage in accordance with ship and manufacturer's procedures
Outcome 12.12 Demonstrate knowledge of the methods of propulsion reversal	• Construction and operation of: - Reverse-reduction gearboxes; and - Controllable pitch propellers	• Method of propulsion reversal and the operation of marine gearboxes is in accordance with technical specifications
Outcome 12.13 Calculate consumption of fuel, speed and range of vessels	• Calculation of volumes • Conversion of volumes to litres • Specific gravity • Specific fuel consumption • Calculations involving specific fuel consumption, speed and range	• Calculations with bunkering capacity, consumption of fuel, speed and the range of a vessel are carried out and accurate to accepted working tolerances

TABLE 13 – PRACTICAL MATHEMATICS

Outcome	Content	Standards for evaluating competence
Outcome 13.1 Calculate fuel consumption and storage	• Consumption of fuel and lubricating oil for a particular voyage, using quantity in litres and mass in tonnes and specified regular shaped tanks • Hourly fuel consumption • Remaining steaming times • Requirements for replenishing lubricating oil in oil tanks • The volumes of regular shaped tanks • Tank capacities and pumping capacities for tank filling and emptying • Relationship between theoretical vessel speed, propeller pitch and R.P.M. • Calculations involving specific fuel consumption, power, speed and range • Calibration tables	• Calculations as per the "content statement" are carried out and conform to accepted engineering tolerances
Outcome 13.2 Carry out engineering calculations	• Common SI units such as: kilogram, tonne, newton, newton-metre, pascal, joule, watt, and metre • Conversion of units to multiples of base units • Convert fractions to decimals • Calculations to determine the area and circumference of a circle • Calculations involving the volume and capacity of regular shaped tanks • Use calibration tables to measure quantities in tanks • Use of relative density/specific gravity to convert quantity in litres and volume to mass • Calculations involving pumping capacities for tank filling and emptying • Calculations involving the consumption of fuel and lubricating oil, hourly fuel consumption, theoretical steaming times and distances covered • Calculations involving the relationship between theoretical vessel speed, propeller pitch and engine speed • Terminology of simple levers • Calculations involving mechanical advantage, load, effort, moments • Understanding of terminology of material technology • Calculations involving stress, strain and safe working load	• Calculations as per the "content statement" are carried out and conform to accepted engineering tolerances

TABLE 13A – ENGINE DRIVING AND REGULATIONS

Outcome	Content	Standards for evaluating competence
Outcome 13.3a Operate and maintain marine internal combustion engines and propulsion transmission systems up to 1500 kW	• Simple constructional details • Cycles and timing diagrams for two- and four-stroke diesel engines • Care and management of two- and four- stroke diesel engines • Safety devices fitted to propulsion engines • Engine fuel systems • Engine and gearbox lubricating systems • Engine and gearbox cooling systems • Transmission systems from engine output shaft to propeller • Engine malfunctions and corrective action	• Marine internal combustion engines and transmission systems are operated and maintained within technical specifications and in accordance with accepted practices and procedures • The causes of machinery malfunctions are identified (fault finding) and any resultant restrictions applied to operations are justified and conveyed to the vessel Master • Actions are to ensure the overall safety of the ship and plant having due regard to the prevailing circumstances and conditions
Outcome 13.4a Operate and maintain auxiliary machinery systems up to 1500 kw, including steering gear and refrigeration systems	• Pumps and pumping systems for bilge, fuel oil, freshwater and seawater systems • Types of pumps and associated safety devices • Hydraulic systems including steering gear • Electro-hydraulic steering gear • Emergency operation in the event of electrical or hydraulic failure • Simple hydraulic circuits • Maintenance of hydraulic systems • Refrigeration plant and its operation • Identification of refrigeration system components • The refrigeration cycle • Types of refrigerant • Identification of faults in refrigeration systems	• Auxiliary machinery systems are operated and maintained within technical specifications, in accordance with accepted practices and vessel procedures to ensure safety of operation and avoid pollution of the marine environment • Hydraulic systems and steering gear are operated and maintained in accordance with technical specifications to ensure safety of operation and avoid pollution of the marine environment • Refrigeration systems are operated in accordance with technical specifications to ensure safety of operation and avoid pollution **WARNING**: *Relevant Commonwealth, local and State/Territory training and qualification requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work.*

Outcome	Content	Standards for evaluating competence
Outcome 13.5a Operate, test and maintain electrical and control equipment	• DC equipment • Electrical principles and circuits • Operate and manage in a safe manner, the AC generation, protective devices and shore power arrangements • Operate 240 to 440 voltage alternating current electrical systems	• Electrical and control equipment is operated and maintained within technical specifications, in accordance with regulations, accepted practices and procedures and with regard to safety **WARNING**: *Relevant State/Territory electrical licensing requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of electrical circuits or systems that are 50 V AC or above, OR 120 V DC or above, on a vessel*
Outcome 13.6a Maintain deck equipment and machinery	• Operation and maintenance of deck machinery • Winches and windlass • Safeguards/protective devices for winches • Causes and rectification of problems • Carry out basic welding • Carry out basic brazing • Cary out basic cutting • Carry out basic machining • Safe operating practices	• Deck equipment and machinery are maintained in accordance with technical specifications and with regard to safety • The causes of machinery malfunctions are identified (fault finding) and any resultant restrictions applied to operations are justified and conveyed to the vessel Master • Actions are to ensure the overall safety of the ship and plant having due regard to the prevailing circumstances and conditions
Outcome 13.7a Organise maintenance and repairs	• Identification and use of manufacturer's manuals • Planning and preparation for maintenance including systematic isolation, dismantling and reassembly of plant • Inspections undertaken on a vessel's hull during slipping or dry-docking	• Maintenance and repair procedures are organised within technical specifications, accepted practices and vessel procedures • The organisation and preparation of operations is suited to the design parameters of the power installation and to the requirements of the voyage • Detect and diagnose faults

Outcome	Content	Standards for evaluating competence
Outcome 13.8a Demonstrate knowledge of methods of fire protection, detection and extinction	• Operation and maintenance of fire protection, detection and extinguishing equipment • Operation of machinery in such a way as to minimise fire risk • Causes of fire onboard a vessel • Fire hazards aboard a vessel during operation and maintenance periods • Causes and methods of prevention of fires/explosion associated with LPG • Classes of fires • Types of fire extinguishers for marine use, including portable, non-portable and fixed fire-fighting installations • Requirements for particular types of portable extinguishers for different classes of fire • Fire detection and alarms • Closing devices and remote shut-offs, gas/foam flooding systems • Control and extinguishment of large compartment fires • Hazards associated with the use of gas flooding systems	• Operational effectiveness of all fire detection and extinguishing systems is maintained at all times in accordance with performance specifications and legislative requirements • Fire control is implemented in accordance with maritime safety and vessel operating procedures whilst maintaining crew safety, vessel stability and operational capability • Actions taken to control fires are based on full and accurate assessment of the incident, using all available sources of information • The order of priority, timing and sequence of actions are appropriate to the overall requirements of the incident and to minimise damage and potential damage to the vessel, injuries to personnel and impairment of the operational effectiveness of the vessel • Alarms are actioned, recorded and reported according to vessel procedures and marine safety requirements
Outcome 13.9a Apply regulations to be observed regarding operational or accidental pollution of the marine environment and methods to prevent such pollution	• Marine pollution regulations • Operation of equipment in such a way as to minimise environmental pollution • Causes of pollution particularly relating to discharges from engine compartments and vessel operation • Statutory requirements regarding the discharge of oil, galley waste, garbage and plastics overboard • Methods of prevention of pollution • Requirements for reporting incidents • Procedures for dealing with an oil spill	• Legislative requirements relating to protection of the marine environment are correctly identified and applied • Demonstrate knowledge of how international legislative requirements are applied locally • Procedures for monitoring shipboard operations and ensuring compliance with legislative requirements relating to protection of the marine environment are observed

Outcome	Content	Standards for evaluating competence
Outcome 13.10a Monitor legislative requirements	• Relevant maritime law • International agreements and conventions	• Certificates, how they are obtained and periods of validity • Responsibilities affecting safety of passengers and crew • Responsibilities under relevant International Conventions including but not restricted to: - *Marine Safety (Domestic Commercial Vessel) National Law Act 2012*, Regulations and Marine Orders - National Standard for Commercial Vessels - STCW, Loadline, SOLAS, MARPOL - Other State, National and local legislation
Outcome 13.11a Identify the life-saving appliances required and demonstrate knowledge of their maintenance and use life-saving appliances	• Life-saving appliances • Launching arrangements for inflatable liferafts including hydrostatic releases • Maintenance and checks necessary to keep life-saving appliances in correct operating condition	• Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances and conditions and comply with accepted safety practices and standards • Maintenance procedures for life- saving appliances meet legislative requirements • Actions to protect and safeguard all persons onboard in an emergency • Organise fire and abandon ship drills
Outcome 13.12a Employ damage control techniques for hull damage	• Practice of correct damage control procedures following hull damage • Methods of damage control with specific reference to action to be taken in the event of flooding	• Emergency procedures are in accordance with the established plans for emergency situations, for example fire, collision, explosion, grounding • Ship construction related to damage control
Outcome 13.13a Maintain a safe working environment	• Causes of accidents with marine mechanical equipment • Methods of prevention • Operating procedures for use of winches and other rotating/ moving machinery • Hazards associated with, and, the procedures for safe entry into confined spaces • Hazards associated with, and, the procedures for the safe operation of lifting devices • Hazards associated with radio and radar transmitters	• Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns

Outcome	Content	Standards for evaluating competence
Outcome 13.14a Manage vessel stability	• Manage the dynamic factors affecting the stability of a vessel up to 80m • Calculate stability • Control vessel stress and stability • Maintain records of stability management • Carry out basic calculations	• Manage loading and weight distribution of a vessel to ensure assigned load line conditions are not exceeded • Manage stability of vessel in a range of conditions • Recognise problems affecting vessel stability • Stowage arrangements for bringing stores on board
Outcome 13.15a Manage refuelling	• Plan refuelling or fuel transfer operations • Prepare vessel for refuelling or fuel transfer operations • Complete refuelling operations • Manage an emergency	• Complete required records • Implement procedures for dealing with spills • Measure tank levels • Recognise faulty equipment and take appropriate action • Recognise problems and hazards and take appropriate actions • Select and use relevant equipment • Take appropriate action in an accidental spillage, fire or safety incident
Outcome 13.16a Manage an engine room and small engineering team	• Lead and develop a small engineering team • Organise engine room for departure • Manage daily engine room routine • Manage engineering team • Manage engineering procedures in port • Manage engineering emergencies	• Demonstrate effective communication techniques • Lead team members and demonstrate sound personal management • Monitor and review activity • Plan and organise activity • Read and interpret maritime regulations, rules, instructions, MSDS, safety data sheets (SDS) and WHS/OHS instructions • Write reports

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