

## MED1 NEAR COASTAL – YOUR STUDY CHECKLIST

View the full [Skills & Knowledge](#) required for National Standard for Commercial Vessels orals

Competent	More study	
Outcome	Content	Standards for evaluating (extracts)
<b>Table 2</b> <b>Outcome</b> <b>Elements of Shipboard Safety</b> Safety and Emergencies including survival craft	<b>Safety and Emergencies</b>	
	<input type="checkbox"/>	Apply basic survival skills
	<input type="checkbox"/>	Survive at sea using survival craft
	<input type="checkbox"/>	Fire minimization/fire-fighting
	<input type="checkbox"/>	Risk management & SMS
	Meet WHS requirements (confined spaces)	<ul style="list-style-type: none"> <li>• Practice survival techniques</li> <li>• Operate lifesaving and survival equipment</li> <li>• Undertake/understand risk manage/SMS</li> <li>• Follow safety procedures and take action</li> <li>• Understand/ follow fire minimisation procs</li> <li>• Respond to and fight fires with portable and other fire-fighting appliances including correct use of vessel closure and shutdown systems</li> <li>• Identify/respond to confined space risks</li> </ul>
Competent	More study	
<b>Outcome 13.11 a</b> Identify & demonstrate knowledge of their maint/use	<b>Lifesaving appliances</b>	
	<input type="checkbox"/>	Life-saving appliances
	<input type="checkbox"/>	Launching arrangements for inflatable liferafts including hydrostatic releases
	Maint/checks to keep appliances in condition	Actions to abandon ship/survival appropriate to accepted safety practices/ standards <ul style="list-style-type: none"> <li>• Maintenance procedures for lifesaving appliances meet legislative requirements</li> <li>• Actions to protect/safeguard persons onboard in an emergency, organise drills</li> </ul>
Competent	More study	
<b>Outcome 11.8</b> Demonstrate actions fire/explosion Describe operation/maint of ER equip <b>Outcome 12.9</b> Demonstrate knowledge of the precautions against fire and explosion & methods of dealing with fires	<b>Firefighting</b>	
	<input type="checkbox"/>	Causes, fire triangle, explosion, corrosion
	<input type="checkbox"/>	Minimisation of hazards
	<input type="checkbox"/>	Recognition/uses of portable fire extinguishers
	<input type="checkbox"/>	Fire-fight sys identification & maintenance
	<input type="checkbox"/>	Alarm sys/panels, heat/smoke detectors
	<input type="checkbox"/>	Fixed f-fighting installations, valves closures
	<input type="checkbox"/>	Using fire pumps, mains hoses & nozzles
	<input type="checkbox"/>	Safety precautions during a watch
	<input type="checkbox"/>	Equipment use, management/control of fires
<input type="checkbox"/>	Personnel safety	
	Control- passenger/crew/comms/instructions	<ul style="list-style-type: none"> <li>• Fire control is implemented in accord with maritime safety and vessel op procs whilst maintaining crew safety, vessel stability &amp; operational capability</li> <li>• Actions taken to control fires are based on full/accurate assessment using all info</li> <li>• Priority, timing and actions sequence appropriate to the overall requirements of the incident &amp; minimise damage/potential damage to vessel, injuries to personnel &amp; impairment of the op effectiveness</li> <li>• Maintenance of fire-fighting appliances is in accordance with manufacturer's specs</li> <li>• Alarms are actioned, recorded and reported according to vessel procedures and marine safety requirements</li> </ul>
Competent	More study	
<b>Outcome 13.8 a</b> Demonstrate knowledge of methods of fire protection, detection and extinction	<b>Fire protection</b>	
	<input type="checkbox"/>	Causes of fire onboard a vessel
	<input type="checkbox"/>	Fire hazards during operation and maint.
	<input type="checkbox"/>	Causes/ prevention of fires/explosion with LPG
	<input type="checkbox"/>	Classes of fires
	<input type="checkbox"/>	Operation of machinery to minimise fire risk
	<input type="checkbox"/>	Operation and maintenance of fire protection, detection and extinguishing equipment
	<input type="checkbox"/>	Fire extinguishers - portable, non-portable & Fff
	<input type="checkbox"/>	Requirements- portable extinguishers for class of fire
	<input type="checkbox"/>	Fire detection and alarms
	<input type="checkbox"/>	Closing devices and remote shut-offs, gas/foam flooding systems
	<input type="checkbox"/>	Control and extinguishment of large compartment fires
	Hazards associated in use of gas flooding sys	<ul style="list-style-type: none"> <li>• Operational effectiveness of all fire detection and extinguishing systems is maintained at all times in accordance with performance specifications and legislative requirements</li> <li>• Fire control is implemented in accordance with maritime safety and vessel operating procedures whilst maintaining crew safety, vessel stability and operational capability</li> <li>• Actions taken to control fires are based on full and accurate assessment of the incident, using all available sources of information</li> <li>• 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</li> <li>• Alarms are actioned, recorded and reported according to vessel procedures and marine safety requirement</li> </ul>

<b>Competent</b>		<b>More study</b>	
<b>Outcome 11.9</b> Demonstrate know/principles of stowage & management <b>Outcome 12.8</b> knowledge of safe handling LPG, fuels	<b>Stowage of Flammables</b>		<ul style="list-style-type: none"> <li>• Stowage of flammable/explosive materials and management, accords with established rules and procs including liquids, gases, solids and other materials normally carried (spare fuel, lubricants, LPG, flares)</li> <li>• Flammable/explosive materials are stowed and managed in accordance with regulations and established rules and procedures</li> </ul>
		Stowage/management	
		Dangers with LPG/petrol vapour/flammables	
		Storage of LPG cylinders	
		Testing of LPG detectors	
		Safety procedures for vessel refuelling	
<b>Competent</b>		<b>More study</b>	
<b>Outcome 13.15 a</b> Manage refuelling	<b>Refuelling</b>		<ul style="list-style-type: none"> <li>• Complete required records</li> <li>• Implement procedures for spills</li> <li>• Measure tank levels</li> <li>• Recognise faulty equip. &amp; take action</li> <li>• Recognise problems/hazards &amp; act</li> <li>• Select and use relevant equipment</li> <li>• Take appropriate action in an accidental spillage, fire or safety incident</li> </ul>
		Plan refuelling or fuel transfer operations	
		Prepare vessel for refuelling/ fuel transfer	
		Complete refuelling operations	
		Manage and emergency	
<b>Competent</b>		<b>More study</b>	
<b>Table 3 Outcome Environment</b> Follow environmental work practices	<b>Writing reports</b>		<ul style="list-style-type: none"> <li>• 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 maritime responsibilities</li> <li>• Antipollution procedures and equipment</li> </ul>
		Environmental workplace practices	
		Maintain environmental records	
		Precautions to prevent pollution & oil spill	
<b>Competent</b>		<b>More study</b>	
<b>Outcome 11.10</b> Maintain logs written reports <b>12.13</b> Calculate fuel con/spd/range	<b>Environ Responsibilities Calculations</b>		<ul style="list-style-type: none"> <li>• Running/ maint. logs completed to vessel &amp; maritime procedures including regular reports</li> <li>• Calculations for fuel capacity, consumption and voyage duration</li> <li>• Calculations - bunkering capacity, fuel, speed, range of a vessel are carried out and accurate to accepted working tolerances</li> </ul>
		Writing of simple reports	
		Keep running and maintenance logs	
		Calculate capacity/consumption/duration <small>Conversion of volumes to litres, SG, Specific fuel consumption speed and range</small>	
<b>Competent</b>		<b>More study</b>	
<b>Outcome 13.9 a</b> Apply regs to be observed regarding operational or accidental pollution of the marine environment and methods to prevent such pollution	<b>Pollution</b>		Legislative requirements relating to protection of the marine environment are correctly identified and applied <ul style="list-style-type: none"> <li>• Demonstrate knowledge of how international legislative requirements are applied locally</li> <li>• Procedures for monitoring shipboard operations and ensuring compliance with legislative requirements relating to protection of the marine environment are observed</li> </ul>
		Marine pollution regulations	
		Operation of equipment in such a way as to minimise environmental pollution	
		Causes of pollution relating to discharges from engine compartments and vessel operation	
		Statutory requirements regarding the discharge of oil, galley waste, garbage and plastics o/b	
		Methods of prevention of pollution	
		Requirements for reporting incidents	
	Procedures for dealing with an oil spill		
<b>Competent</b>		<b>More study</b>	
<b>Outcome 13.10 a</b> Monitor legislative requirements	<b>Monitor legislative requirements</b>		Certificates, International, State, National and local legislation including NSCV,STCW, Loadline, SOLAS, MARPOL
		Relevant maritime law	
		International Agreements and Conventions	

<b>Competent</b>		<b>More study</b>	
<b>Outcome 11.11</b> Work with others	<b>Work in a group environment</b>		• Work effectively as part of a crew support members, deal with issues, problems and conflict
		Promote team commitment & cooperation,	
<b>Competent</b>		<b>More study</b>	
<b>Outcome 13.16 a</b> Manage an engine room and small engineering team	<b>Manage a team</b>		Demonstrate effective comm 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 WHO/OHS instructions Write reports
		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	
<b>Competent</b>		<b>More study</b>	
<b>Outcome 13.13 a</b> Maintain a safe working environment	<b>Maintain safe working environment</b>		Working practices are in accordance with legislative requirements, codes of practice, permits to work and environmental concerns
		Causes/prevention -accidents with mech.equip.	
		Operating winches/rotating/moving machinery	
		Hazards - safe entry into confined spaces	
		Hazards -safe operation of lifting devices	
		Hazards - radio and radar transmitters	
<b>Competent</b>		<b>More study</b>	
<b>Outcome 11.3</b> Prepare vessel machinery for sea	<b>Prepare for sea, engine watchkeeping</b>		• Prep for start-up inc. fuel, lube, cooling & air comply with vessel op procs. and manufacturer recommend. • Checks of pressures, temp & revs during start/warm-up accord with the tech specs • Prep for shut-down & supervise the cool down of the engine are in accord with op procs. & manufacturer recommendations. • Vessel and machinery are prepared for sea and secured after voyage in accordance with ship and manufacturer's procedures
<b>Outcome 12.11</b> Prepare a vessel for sea and secure a vessel after a voyage		Inspection/checks main/aux mach. & spaces Spares/ stores required for proposed voyage Preparations/checks necessary before sailing	
		Start-up procedures	
		Instrumentation	
		Running checks	
		Keeping of running and maintenance logs	
		Shut down procs, securing after voyage	
<b>Competent</b>		<b>More study</b>	
<b>Outcome 13.14 a</b> Manage vessel stability	<b>Manage stability</b>		• 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 onboard
		Manage dynamic factors vessel to 80 m	
		Calculate stability	
		Control vessel stress and stability	
		Maintain records of stability management	
		Carry out basic calculations	

Competent	More study		
<b>Outcome 11.1</b> Demonstrate knowledge of the construction, operation and service of marine internal combustion engines	<b>Engineering - Basic + Med 2</b>		<ul style="list-style-type: none"> <li>• Parts of marine internal combustion engines identified in accord with manuals</li> <li>• 2/4 stroke cycles explained in compliance with manufacturer's specs</li> <li>• Fuel systems managed safely in accordance with regs, manufacturer's instructions and vessel procs to prevent pollution</li> <li>• Marine i.c. engines operated to tech specs</li> <li>• Ops/surveillance of main prop plant and aux systems is sufficient to maintain safe operating conditions</li> <li>• Basic operational faults are recognised/repared or maintenance assistance is organised Maintenance accords with vessel plan, procs and manufacturer's recommendation</li> <li>• Records are maintained in compliance with regulations and vessel recordkeeping procedures</li> </ul>
<b>Outcome 12.1</b> Operate and carry out basic user maintenance of marine internal combustion engines		Marine 2 – and 4 – stroke petrol/diesel engines construction operation/routine maintenance Basic combustion process	
		Petrol/diesel fuel storage and management	
		Tank components, measure, fill, condensation	
		Slack tanks & stability	
		Carburettors- Air filters	
		Diesel injection, timing diagrams/control equip	
		Turbo arrangements & supercharging	
		Basic governor operation	
		Engine protection arrangements	
		Operational practice	
		Performance & fault-finding procedures	
		Maintenance, filters, fault finding & emergency	
	<b>Cooling systems</b>		<ul style="list-style-type: none"> <li>• Cooling systems are operated in accordance with established procedures and prevent pollution of the marine environment</li> <li>• Cooling systems are managed in accordance with manufacturer's recommendations and established procedures</li> </ul>
		Keel cooling/heat raw water cooling systems	
		Construction/maintenance heat exchangers	
		Circulation, pumps and thermostats	
		Ship's side valves	
		Maintenance & Corrosion	
		Instrumentation	
		Emergency procedures	
<b>Outcome 12.6</b> Demonstrate knowledge of the principles of oil and grease lubrication systems	<b>Lubricating systems</b>		<ul style="list-style-type: none"> <li>• The basic principles of lubrication are described in accordance with engineering principles</li> <li>• Lubricating systems are operated &amp; managed in accordance with established procedures and prevent pollution of the marine environment</li> <li>• Maintenance is undertaken in accordance with vessel maintenance plan, vessel procedures and manufacturer's recommendations</li> <li>• Recordkeeping procedures are compliant with regulations</li> </ul>
		Dry sump and wet sump lubrication	
		Lube oil system components	
		Cooling effects, function of oil & grease	
		Lube sys pressure/flow/conditions/problems	
		Lube oil contamination	
		Lube oil management/maint & filter change	
		System quality monitoring/ instrumentation Refuelling operations (enviro, safety, regs)	

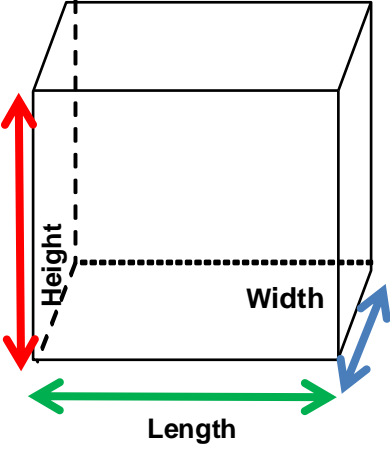
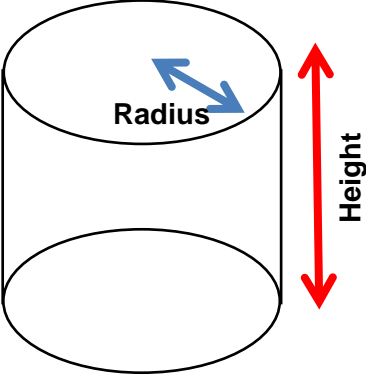
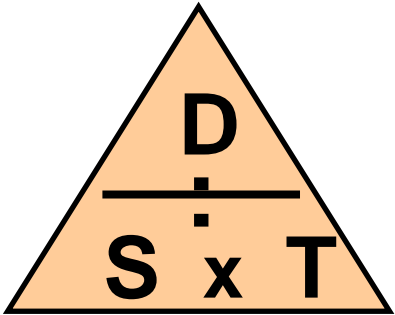
Competent		More study		
<p><b>Outcome 11.2</b> Demonstrate knowledge of the workings of marine prop systems</p> <p>Recognise and takes steps to rectify basic operational faults</p> <p><b>Outcome 12.12</b> Demonstrate knowledge of the methods of propulsion reversal</p>	<b>Power Transmission</b>			
		Gearbox-reverse/reduction & gear train	<ul style="list-style-type: none"> <li>• Marine propulsion systems components are identified and functions explained in simple terms</li> <li>• Describe the operation and servicing of propulsion system within the technical specifications</li> <li>• Basic operational faults are recognised and repair or maintenance assistance is organised</li> <li>• Method of propulsion reversal and the operation of marine gearboxes is in accordance with technical specifications</li> </ul>	
		Gearbox-lube/cooling/filters/strainers		
		Propeller and intermediate shafting alignment		
		Bearing types, materials, installation, lube		
		Shaft seals and glands, packing		
		Couplings types, fitting, keys and keyways		
		Prop types-fitting/keys/locking/cont. pitch		
		Stern drive and water jet drive units		
	Maintenance/inspection/vibration/wear			
	Fault identification & emergency operation			
Competent		More study		
<p><b>Outcome 11.4</b> Identify and operate components of auxiliary systems</p> <p><b>Outcome 12.4</b> Operate and carry out basic user maintenance of steering gear</p> <p><b>Outcome 12.3</b> Operate and carry out basic user maintenance of pumps, bilge and seawater systems</p> <p><b>Outcome 12.8</b> Demonstrate safe handling knowledge of ... refrigerant gases</p> <p><b>WARNING:</b> 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.</p>	<b>Steering Systems</b>			
		Rudder construction and rudder types	<ul style="list-style-type: none"> <li>• Steering arrangements are operated in accordance with manufacturer's instructions, operational procedures and regulations</li> <li>• Maintenance is arranged in accordance with the tech specs</li> <li>• Emergency steering checks accord with vessel maintenance plan, procs and manufacturer's recommendations</li> <li>• Records are maintained in compliance with regulations and vessel recordkeeping procedures</li> </ul>	
		Rudder & stock bearings/glands, packing, seal		
		Tiller arm attachment		
		Operation- rod & gear/cable/hydraulic electro hydraulic		
		Testing/maint of steering, hydraulic systems		
		Emergency steering checks		
		<b>Pumping Systems</b>		
		Seawater/fire/bilge/tank circulating systems	<ul style="list-style-type: none"> <li>• 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</li> <li>• Maintenance is arranged in accordance with the technical specifications</li> <li>• Records are maintained in compliance with regulations and vessel recordkeeping procedures</li> </ul>	
		Bilge arrangements vessels with compartments		
		Pumps- safety devices, capabilities, priming Use of flexible materials, hoses, etc.		
		Drive systems, belts, clutches, motors		
	Valves - construction, servicing, back-flooding Dangers & methods to prevent back-flooding			
	Strainers, mud boxes, foot valves			
	Dual duty systems/cross connection between bilge/ballast/seawater systems and fire main			
	Fault id, maintenance, prevent corrosion			
	Environmental regs & responsibilities			
	<b>Refrigeration systems</b>			
	Hazards of refrigerant gases	<ul style="list-style-type: none"> <li>• Refrigeration sys is op/maintained in accord with manufacturer's recs, regs &amp; vessel op procs to ensure safety &amp; pollution prevention of t environment</li> <li>• Refrigerant gases are stowed &amp; managed in accordance with regs and Aus Standards</li> </ul>		
	Identification of components			
	Environmental responsibilities			

Competent		More study	
<p><b>Outcome 11.5</b> Operate electrical sys</p> <p><b>Outcome 12.7</b> Safely operate and carry out simple maint of electrical sys</p> <p><b>WARNING</b> 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 A.C. or above, OR 120 v DC or above, on a vessel.</p>	<b>Direct Current Systems</b> not exceeding 32 V DC		<ul style="list-style-type: none"> <li>• DC systems are operated and operator preventative maintenance in accordance with manufacturer's recommendations, regulations and vessel operating procedures to ensure safe operation.</li> </ul>
		Electrical systems – Basic care/fault recognition	
		Batteries – types/care/maintenance/hazards/connecting/series/parallel	
		Charging systems – regulators/alarms/indicators	
		Fuses/circuit breakers –select correct capacity	
		Op/maint – Starters/alternators/associated equipment.	
	<b>Electric Systems</b> above 32 V DC and up to 415 V AC		<ul style="list-style-type: none"> <li>• Electrical systems are operated in accordance with manufacturer's recommendations, regulations and vessel operating procedures to ensure safe operation</li> <li>• Electrical system faults are recognised and where necessary steps are taken to make them immediately safe</li> <li>• Records are maintained in compliance with regulations and vessel recordkeeping procedures</li> </ul>
		Electrical distribution systems	
		Single and three phase AC power	
		Faults with electrical systems	
	Fault id, location, and safety implications		
	Switchboards, earth indicating devices		
	Protection devices, isolation of circuits		
	Multi-meter testing for voltage & continuity		
	Personal safety		
	Connection to shore power		
Competent		More study	
<p><b>Outcome 11.6</b> Use deck machinery</p> <p><b>Outcome 13.6 a</b> Maintain deck equipment and machinery</p>	<b>Use/maintain of deck machinery</b>		<ul style="list-style-type: none"> <li>• Lifting equip &amp; deck mach operated &amp; user-maintenance carried out to manufacturer's recs, regs and vessel procs</li> <li>• Deck equip/machinery maintained to tech. specs and with regard to safety</li> <li>• Causes of machinery malfunctions are identified (fault finding) &amp; resultant restrictions applied to operations are justified and conveyed to Master</li> <li>• Actions for safety of the ship and plant having due regard to conditions</li> </ul>
		Op/maint lifting equipment, winches, capstans	
		Safe op. procs, safeguards/protective devices	
		Legislation affecting lifting equipment	
		Basic hydraulic systems, operation/user-maint	
	Carry out welding/brazing/cutting/machining		
<p><b>Outcome 11.7</b> Demonstrate basic hull maint knowledge</p> <p><b>Outcome 12.10</b> Recog/correct deteriorated fittings/mach</p>	<b>Deterioration &amp; hull maintenance</b>		<ul style="list-style-type: none"> <li>• Maintenance procedures and techniques for hulls are in accordance with regs and operating procedures</li> <li>• Maintenance activities are planned in accordance with technical, legislative, safety and procedural specifications</li> <li>• Maintenance is carried out in compliance with manufacturer's specifications</li> </ul>
		Basic hull inspection and maintenance	
		Corrosion, prevention, sacrificial anodes	
		Pipework repairs	
		Recognition/measure of tail shaft wear	
	Machinery log keeping		
Competent		More study	
<p><b>Outcome 13.12 a</b> Employ damage control techniques for hull damage</p>	<b>Practice of correct damage control procedures following hull damage</b>		<ul style="list-style-type: none"> <li>• Emergency procedures are in accordance with the established plans for emergency situations, for example fire, collision, explosion, grounding</li> <li>• Ship construction related to damage control</li> </ul>
		Methods of damage control with specific reference to action taken in event of flooding	

Competent	More study		
<p><b>Outcome 13.3 a</b> Operate and maintain marine internal combustion engines and propulsion transmission systems up to 1500 kW</p> <p><b>Outcome 13.4 a</b> Operate and maintain auxiliary machinery systems up to 1500 kw, including steering gear and refrigeration systems</p> <p><b>Outcome 13.5 a</b> Operate, test and maintain electrical and control equipment</p>	<b>Engineering - Med 1- 1500kW</b>		<ul style="list-style-type: none"> <li>• Marine internal combustion engines and transmission systems are operated and maintained within technical specifications and in accordance with accepted practices and procedures</li> <li>• The causes of machinery malfunctions are identified (fault finding) and any resultant restrictions applied to operations are justified and conveyed to the vessel Master</li> <li>• Actions are to ensure the overall safety of the ship and plant having due regard to the prevailing circumstances and conditions</li> </ul>
		Simple constructional details	
		Cycles/timing diagrams 2/4 stroke diesel eng.	
		Care and management 2/4 stroke diesel eng.	
		Safety devices fitted to propulsion engines	
		Engine fuel systems	
		Engine and gearbox cooling/lube sys	
		Transmission sys- engine output shaft to prop	
		Engine malfunctions and corrective action	
		<b>Auxiliaries - Med 1- 1500kW</b>	
	Pumps, pumping sys, safety devices		
	Hydraulic systems/circuits inc. steering gear		
	Maintenance of hydraulic systems		
	Electro-hydraulic steering gear		
	Emergency op - electrical or hydraulic failure		
	Refrigeration plant, op. & id components		
	The refrigeration cycle- types of refrigerant		
	Identification of faults in refrigeration systems		
	<b>Electrics - Med 1- 1500kW</b>		<ul style="list-style-type: none"> <li>• Electrical and control equipment is operated/maintained within tech. specs, to regs, accepted practices and procedures and with regard to safety</li> </ul> <p><b>WARNING:</b> <i>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 A.C. or above, OR 120 v D.C. or above, on a vessel</i></p>
	DC equipment		
	Electrical principles and circuits		
	Op/manage safely AC generation, protective devices and shore power		
	Operate 240 to 440 voltage AC		
Competent	More study		
<p><b>Outcome 13.7 a</b> Organise maintenance and repairs</p>	<b>Organise repair &amp; maintenance</b>		<p>Maintenance and repair procedures are organised within technical specifications, accepted practices and vessel procedures</p> <ul style="list-style-type: none"> <li>• The organisation and preparation of operations is suited to the design parameters of the power installation and to the requirements of the voyage</li> <li>• Detect and diagnose faults</li> </ul>
		I.d. & use of manufacturer's manuals	
		Plan/prep for maint. incl. systematic isolation/dismantling/ reassembly	
	Inspections undertaken on a vessel's hull during slipping		





Competent	More study	
<b>Outcome 11.10</b> Working out simple calculations for fuel capacity, consumption and voyage duration <b>MARC001</b> Converting units to multiples of base units, fractions to decimals, volume/capacity of regular shaped tanks, consumption of fuel /lube oil, hourly fuel consumption, theoretical steaming times/distances, the area of circle, RD/SG to convert quantity in litres and volume to mass		
<b>1.</b> Calculate specific fuel consumption in gms/bhp/hour for an engine using 100 litres per hour at 2000 rpm and producing 300 HP. Use specific gravity 0.8.		$80000/(300 \times 1) = 267 \text{ g/bhp/hr}$
<b>2.</b> Calculate amount of fuel in litres in a rectangular tank 1.0m x 1.0m x 1.0m with an ullage of 0.2 or 0.5 or 0.7 m from the top of the tank.		800 litres, 500 litres or 300 ltrs
<b>3.</b> Calculate amount of fuel in litres in a circular tank with a diameter of 500 mm, height of 1 metre and a sounding of 200 mm from top of the tank.		$(3.14/4) \times 0.5 \times 0.5 \times 0.8 \times 1000 = 157 \text{ litres}$
<b>4.</b> What is the time taken to travel 200 miles at 10 knots? What is the weight of fuel required if the single engine's rated specific fuel consumption at 250 kW is 0.25ltr/kW/hr? Allow 25% reserve. The fuel's specific gravity is 0.8.	$\text{Volume of cylinder} = \pi r^2 h$ $\pi = 3.142$	$200/10=20\text{hr. } 20+25\%=25\text{hr}$ $25\text{hr} \times 250 \times 0.25 = 1562.5 \times 0.8 = 1250\text{kilo}$
<b>5.</b> What is the time taken to travel 400 miles at 20 knots? What is the weight of fuel required if the single engine uses 15ltr/hr? Allow 25% reserve. The fuel's specific gravity is 0.8.		$400/20=20\text{hr. } 20+25\%=25\text{hr}$ $25\text{hr} \times 15 = 375 \times 0.8 = 300\text{kilo}$
<b>6.</b> What is the time taken to travel 150 miles at 15 knots? What is the safe weight of fuel required if the twin engines use 9ltr/hr each? Allow 25% reserve. The fuel's specific gravity is 0.8.		$150/15=10\text{hr. } 10+25\%=12.5\text{hr}$ $12.5\text{hr} \times 9 = 112.5 \times 0.8 = 90\text{kilo}$
<b>7.</b> A vessel routinely uses 175 litres on its daily 7 hour passage? Today the tank was sounded pre start-up (332 litres) and on return (147 litres). How much fuel was used today? Explain why?		$332 - 147 = 185 - 175 = +10$ Tide, wind, fouling, tuning
<b>8.</b> What is the safe amount of fuel required for a voyage of 100 miles and return, if the specific fuel consumption is 250 gm/bhp/hr and engine is producing average 250 bhp with a speed of 10 knots over the entire voyage. S.g. = 0.8		$250 \times 250 / (0.8 \times 1000) = 76 \text{ ltr/hour}$ $200/10 = 20 \text{ hours}$ $\text{qty} = 76 \times 20 = 1520 \text{ ltr.}$ Safety margin, add 25% $Q = 1.25 \times 1520 = 1900 \text{ ltr.}$