



Australian Government

Department of Education, Employment and Workplace Relations

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

Revision Number: 1

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

Modification History

Not applicable.

Unit Descriptor

UNIT DESCRIPTOR:

This unit involves the skills and knowledge required to operate main and auxiliary machinery and associated systems on board a commercial vessel, including start up and shut down of main and auxiliary machinery and associated systems on a vessel powered by main propulsion machinery of unlimited propulsion power., identifying malfunctions and taking appropriate action, exercising all required safety and pollution control measures, and keeping all required operational records.

Application of the Unit

Application of the unit	The unit has application in the qualifications for an Engineer Watchkeeper on a vessel greater than 750 kW, i.e. Diploma of Transport&Distribution(Marine Engineering - Engineer Watchkeeper).
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Licensing/Regulatory Information

Licensing/legislative requirements	The unit is consistent with the relevant sections of STCW 95 and Marine Orders under the Australian Navigation Act 1912, describing the role and responsibilities of an Engineer Watchkeeper.
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Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.</i>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
• Operate main and auxiliary machinery and associated systems	- a Work plans for the operation of main and auxiliary machinery and associated and auxiliary systems are as per watchkeeping procedures, operational instructions, vessel and company rules, and marine engineering practice - b Method of preparing the start up of main and auxiliary machinery is as per manufacturer's specifications and instructions and established engineering practice and shipboard procedures - c Procedures for making available fuels, lubricants, cooling water, steam and air for the start up of main and auxiliary machinery are as per manufacturer's specifications and instructions and established engineering practice - d Required precautions are taken prior to start up of main propulsion and auxiliary machinery to minimise and control hazards and operational risks - e Main and auxiliary machinery and associated systems are operated within specified limits as per plans and procedures and manufacturer's instructions and specifications - f The performance of main and auxiliary machinery and associated systems is monitored as per vessel's survey requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance

ELEMENT	PERFORMANCE CRITERIA
• • Operate main and auxiliary machinery and associated systems • (continued) •	- g Malfunctions and deviations from performance norms are identified and appropriate action initiated to report or rectify the problem in accordance with marine engineering practice and vessel's procedures - h Records of performance are maintained on running sheets and operations logs in accordance with vessel's procedures
• • Follow safety and hazard control procedures	- a All required watchkeeping procedures, safety precautions and regulations are followed when operating main and auxiliary machinery and associated systems - b Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment - c Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during the operation of main and auxiliary machinery and associated systems - d Where relevant and in consultation with a senior engineer, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed - e Appropriate action is taken in the event of a failure or emergency associated with main and auxiliary machinery and associated systems to isolate and secure the plant and equipment and the vessel and maintain the safety of the vessel and persons involved - f Shipboard emergency and contingency plans are followed in the event of a failure or emergency associated with main and auxiliary machinery and associated systems

Required Skills and Knowledge

REQUIRED KNOWLEDGE

This describes the knowledge required for this unit.

- 1 National and international regulations, IMO Conventions and Codes, including AMSA Marine Orders applicable to the operation of main and auxiliary machinery and associated control systems on vessels of unlimited propulsion power
- 2 Established engineering practice and procedures for the operation of shipboard main and auxiliary machinery and associated control systems in warm through, manoeuvring, start up, normal running, emergency and shut down situations
- 3 Operational characteristics and performance specifications for the different types of marine main and auxiliary machinery and associated control systems typically on a vessel of unlimited propulsion power
- 4 Elementary principles of internal combustion engine cycles, including:
 - a the operating principles of two stroke and four stroke internal combustion engines
 - b the Otto, diesel and dual combustion cycles
 - c Methods for calculating mean effective pressure using an indicator diagram
 - d the indicated power formula
 - e specific fuel consumption and thermal efficiency
 - f the ideal cycle and air standard efficiency
 - g the effects of insufficient, minimum and excess air on combustion
- 5 The operating cycle of refrigeration and related problems on refrigeration plant performance, including:
 - a the principles of refrigeration
 - b the refrigeration cycle as a pressure/enthalpy diagram
 - c the properties of refrigerants used in refrigeration plants
 - d refrigeration effect and plant capacity

REQUIRED KNOWLEDGE

- 6 The psychrometric chart and the cycle of operation and working principles of air-conditioning plants, including the meaning of psychrometric terms such as relative humidity, and dry and wet bulb temperatures
- 7 The types, properties, tests, applications and treatment of fuels, lubricants, solvents and chemicals used on board vessel, including a basic understanding of the working principles, construction, maintenance and safe operation of centrifuges, filters, and other treatment devices
- 8 Basic principles of operation of boilers and steam systems, including:
 - a understanding of how combustion occurs in a boiler, and related safety procedures, including the importance of purging a boiler and other safety precautions taken when firing a boiler
 - b principles of boiler operation in normal and emergency situations
 - c typical feed systems for marine boilers, including all components normally found in such systems
 - d a basic understanding of the various fittings mounted on auxiliary boilers, including:
 - i the common operating routines of local water level indicators, including methods of blowing a gauge glass, clearing blockages, and overhaul of these devices
 - ii the effects of blockages in the water, steam and drain cocks of water level indicators
 - e how a boiler is flashed up from cold and put in line
 - f the purpose of all alarms and shut downs incorporated in a marine boiler
 - g typical configurations of, and operating principles applying to, the various steam distribution systems found aboard vessel
 - h the checks which should be made regularly during routine turbine operation

- i the common operating routines of local water level indicators, including methods of blowing a gauge glass, clearing blockages, and overhaul of these devices
- 9 The nature and causes of typical malfunctions and/or poor performance main and auxiliary machinery and associated control systems and the available methods for their detection and rectification
- 10 Basic principles of operation of turbine systems and auxiliary steam plant, including:
 - a the methods of turbine control, including safety devices
 - b the symptoms, causes, effects, and actions to be taken of defects of auxiliary steam turbines
 - c the construction and operation of auxiliary steam turbines
 - d methods of lubricating the principal components of a marine steam turbine and its associated gearing, and evaluate common faults, including common lubrication faults, symptoms, causes, and actions to be taken with such faults
- 11 Types of operational and performance evaluation records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities
- 12 Maritime communication techniques needed during the operation of main and auxiliary machinery and associated systems
- 13 Procedures for the reading and interpretation of readings and indications of the performance of main and auxiliary machinery and associated systems
- 14 Typical vessel and machinery specifications, machinery design drawings, operational manuals, specifications and electrical and control circuit diagrams
- 15 Purpose and content of material safety data sheets
- 16 Basic principles of diesel engine to a level suitable for a Watchkeeper Engineer, including:
 - a typical starting air and manoeuvring systems of diesel engines, including all components normally found therein:
 - i starting methods of marine diesel engines and how propulsion manoeuvring is achieved
 - ii requirements for diesel engines for propulsion, power generation, and emergency use

- i the common operating routines of local water level indicators, including methods of blowing a gauge glass, clearing blockages, and overhaul of these devices
 - iii methods of reversing direct reversing engines with their interlocks and other safety arrangements
 - iv common faults and appropriate action to be taken with starting/manoeuvring systems
 - b typical diesel engine lubrication systems, including:
 - i all components normally found therein
 - ii normal operational pressures and temperatures which should be expected
 - iii methods of lubricating the principal components of a marine diesel engine, with its associated gearing and/or chain drives, including common lubrication faults, symptoms, causes, and actions to be taken with such faults.
 - c the operating principles and adjustments of diesel engine fuel injection equipment, including common service faults, symptoms, and causes of diesel fuel injection problems, and appropriate actions to be taken.
 - d means of pressure charging diesel engines, including common service faults and give appropriate actions to these faults and emergency operation and isolation procedures.
 - e different methods of cooling marine diesel engines, including common requirements of cooling.
 - f common faults and appropriate action to be taken with cooling of diesel engines.
 - g the causes of crankcase and air-line explosions, scavenge and uptake fires.
- 17 The causes, symptoms, means of preventing, detecting, and extinguishing fires and the correct procedures to be taken upon their detection, including:
- a scavenge fires.
 - b crankcase explosions in both diesel and dual fuel engines.
 - c starting air-line explosions.
 - d the risks of continued service with an isolated waste heat unit.

- ii normal operational pressures and temperatures which should be expected
- 18 Relevant safety, environmental and hazard control legislation, precautions and procedures relevant to the operation of main and auxiliary machinery and associated systems
 - 19 Typical operating precautions for main and auxiliary machinery and associated control systems to ensure operational performance is in compliance with the bridge orders, technical specifications, survey requirements and established safety and anti-pollution rules and regulations. Main and auxiliary machinery monitoring and protection devices.
 - 20 Hazards and problems that can occur during the operation of main and auxiliary machinery and associated control systems and appropriate preventative and remedial action and solutions
 - 21 Basic thermodynamics as it relates to the responsibilities of an officer on the engineering watch, including:
 - a basic thermodynamic properties of common working fluids.
 - b methods of heat transfer and related problems
 - c principles of heat transfer by conduction, convection and radiation and their application to marine systems
 - d elementary principles of steam plants
 - e saturated dry and wet steam, dryness fraction, superheated steam, enthalpy, steam tables. Evaporation.
 - f basic steam plant cycles and the function of each component
 - g the combustion process and the calorific value of fuels
 - h the operating cycle of single stage reciprocating air-conditioners, including methods for calculating the mass of air delivered
 - i clearance volume, its effect on volumetric efficiency and methods of calculating the volumetric efficiency
 - j advantages of multi-staging and intercooling
 - k meaning of gauge and absolute pressure
 - l temperature and temperature scales
 - m SI units and common thermodynamic terms and principles.

- h the operating cycle of single stage reciprocating air-conditioners, including methods for calculating the mass of air delivered
- 22 Compression and expansion of gases, including gas laws, Boyle's Law, Charles Law, characteristic gas equation, gas constant, isothermal, adiabatic and polytropic processes, and specific heat capacity.
- 23 Basic principles of mechanics as they relate to machine operation, including:
- a statics, force as a vector, triangle and polygon of forces, the principle of moments, application to simply supported beams and cranked levers, moments of force, couples, centroids and centres of gravity limited to geometrical shapes, resultant and equilibrant of a system of concurrent coplanar forces
 - b laws of friction for dry surfaces, coefficient of friction (horizontal plane only), lubrication of bearings and plain surfaces
 - c linear displacement, time speed, velocity and acceleration, angular motion
 - d problems with constant force or force with linear variation, torque, work, energy, power, conservation of energy, potential and kinematic energy, Newton's laws of motion, momentum, rate of change of momentum, centrifugal force
 - e simple lifting machines, graphs of load-effort and load-efficiency, linear law, velocity ratio, mechanical advantage and efficiency of the following machines: wheel and axle, differential pulley blocks, screw jack, Warwick screw, hydraulic jack, worm driven chain blocks and single and double purchase crab winches, reduction gearing
 - f direct stress and strain, Hooke's law, modulus of elasticity, elastic limit, ultimate tensile strength, yield stress, limit of proportionality, safety factor, shear stress
 - g circumferential and longitudinal stress in thin cylindrical and spherical shells subject to internal pressure
- 24 Basic principles of naval architecture
- a transverse stability, elementary treatment of transverse stability, shift of centre of gravity due to addition, removal, or transfer of masses, qualitative treatment of free surface effect, water accumulation, and their effect on stability
 - b structural strength, variation of fluid pressure with depth, loading due to head of liquid
 - c vessel construction, common terms used in the measurement of steel vessels,

- h the operating cycle of single stage reciprocating air-conditioners, including methods for calculating the mass of air delivered
 - definitions of shipbuilding terms in general use and types of vessels
- 25 Precautions necessary before entering empty oil fuel or ballast tanks

REQUIRED SKILLS

This describes the basic skills required for this unit.

- 1 Communicate effectively with other personnel when operating main and auxiliary machinery and associated control systems
- 2 Communicate with multilingual crew where applicable using established techniques
- 3 Interpret and follow procedures for the operation of main and auxiliary machinery and associated control systems
- 4 Read and interpret equipment performance readings and instrumentation
- 5 Interpret and follow all safety management procedures and precautions when operating main and auxiliary machinery and associated control systems
- 6 Read and interpret material safety data sheets
- 7 Read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams
- 8 Work collaboratively with other shipboard personnel when operating main and auxiliary machinery and associated control systems
- 9 Identify problems that can occur during the operation of main and auxiliary machinery and associated control systems and take appropriate action
- 10 Carry out calculations required when operating main and auxiliary machinery and associated control systems
- 11 Adapt to differing types of main and auxiliary machinery from different manufacturers and associated control systems from one vessel to another and when equipment and systems are changed
- 12 Take appropriate precautions to prevent pollution of the marine environment
- 13 Select and use tools and equipment required for the operation of main and auxiliary machinery and associated control systems

Evidence Guide

Evidence Guide TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

1 Critical aspects of evidence required to demonstrate competency in this unit	Assessment must confirm appropriate knowledge and skills to: - a Ensure a safe engineering watch during the operation of main and auxiliary machinery and associated systems - b Operate shipboard main and auxiliary machinery and associated control systems within specifications - c Identify malfunctioning main and auxiliary machinery and associated control systems and, in consultation with a senior engineer, initiate appropriate action for repair or replacement - d Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation of main and auxiliary machinery and associated systems - e Identify typical operational problems and hazards when operating main and auxiliary machinery and associated control systems and take appropriate action - f Communicate effectively with others during operation of main and auxiliary machinery - g Ensure adherence to applicable maritime regulations
2 Evidence required for demonstration of consistent performance	- a Performance is demonstrated consistently over a period of time and in a suitable range of contexts - b Consistently applies underpinning knowledge and skills when: 1 maintaining a safe engineering watch involving the operation of main and auxiliary machinery and

Evidence Guide

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

- associated systems
- 2 assessing operational performance of main and auxiliary machinery and associated systems
- 3 assisting in the identification of operational problems with main and auxiliary machinery and associated system and taking remedial action
- 4 taking action, in consultation with a senior engineer, to minimise any damage and safety risk that could be caused by malfunctions in main and auxiliary machinery and associated systems
- 5 identifying and implementing improvements to procedures for the operation of main and auxiliary machinery and associated systems
- 6 applying safety precautions relevant to the operation of main and auxiliary machinery and associated systems
- 7 completing operations documentation and records
- c Shows evidence of application of relevant workplace procedures, including:

Evidence Guide (continued)

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Evidence 2 required for demonstration of consistent performance (continued)

- 1 relevant sections of applicable maritime regulations
- 2 OH&S regulations and hazard prevention policies and procedures
- 3 ISM Code safety management system procedures, quality procedures and work instructions on the operation of main and auxiliary machinery and associated systems
- 4 following on-board housekeeping processes
- d Action is taken promptly to report and assist in the rectification of malfunctions in main and auxiliary machinery and associated systems, non-conformities,

Evidence Guide (continued)

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

	accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code e Work is managed, controlled and completed systematically with required attention to detail f Recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions between crew and others
3 Context of assessment	a Assessment of competency must comply with the assessment requirements of the relevant maritime regulations b Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: 1 As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations, and 2 Appropriate practical assessment must occur: - i at the registered training organisation; and/or - ii on an appropriate working or training vessel
4 Specific resources required for assessment	Access is required to opportunities to: a participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to operate main and auxiliary machinery and associated control systems typically found on a vessel of unlimited propulsion power; and/or b operate the main and auxiliary machinery and associated control systems in a range of operational situations while keeping a safe engineering watch on a commercial or training vessel of unlimited propulsion power

Range Statement

Range Statement TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

VARIABLE

SCOPE

1. GENERAL CONTEXT

a. Work must be carried out:	1 in compliance with mandatory rules and regulations and IMO Conventions and Codes, including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account
b. Work is performed:	1 relatively independently in consultation with a senior engineer, within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes
c. Work involves:	1 the application of marine engineering practice to the operation of main and auxiliary machinery and associated systems across a wide and often unpredictable variety of operational contexts. Monitoring and supervising the implementation of a broad plan or strategy for the operation of main and auxiliary machinery and associated systems is required. Defined accountability and responsibility for self and others in achieving the outcomes is involved

Range Statement

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

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| d. Work requires: | 1 some responsibility for overseeing the operation of operation of shipboard main and auxiliary machinery and associated systems. This includes supervision and control of personnel, hazard minimisation, analysis of performance and operational situations, and related decision making |
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2. WORKSITE ENVIRONMENT

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| a The operation of shipboard main and auxiliary machinery and associated systems may be undertaken: | 1 on an Australian or international commercial vessel of unlimited propulsion power |
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Range Statement (continued)

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

VARIABLE	SCOPE
b Safe watchkeeping procedures and the operation of shipboard main and auxiliary machinery and associated systems may be carried out:	1 by day or night in both normal and emergency situations 2 under any permissible conditions of weather 3 while underway 4 during berthing and unberthing operations 5 while anchored or moored 6 while in dry dock 7 when bunkering 8 during cargo operations

Range Statement (continued)

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

c Propulsion plant configurations may include:

- 1 low speed, medium and high speed diesel propulsion
- 2 stern tube bearing
- 3 fixed pitch and CPP
- 4 direct drive shaft
- 5 diesel electric
- 6 steam plant
- 7 gas turbine
- 8 reduction gears
- 9 thrust blocks, detuners and shaft bearings

d Main and auxiliary machinery and associated systems may include:

- 1 steam turbine, diesel, diesel electric and gas turbine propulsion systems and controls
- 2 steam boilers
- 3 steering gear, stabilisers, bow thrusters, rudders
- 4 fluid power systems and controls
- 5 pumps and pumping systems
- 6 auxiliary systems and controls, including
 - i fresh and salt water cooling systems
 - ii lubricating oil cooling systems
 - iii fuel, oil, gas, coal systems and centrifuges
 - iv air compressor and air starting systems
 - v lubrication

Range Statement (continued)

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

VARIABLE	SCOPE
d Main and auxiliary machinery and associated systems may include: (continued)	- vi on-board air compressors and compressed air and control air systems - vii waste management and pollution control systems - vii sewage plant - i 7 portable and fixed firefighting installations and fire control systems
e Potential hazards during operation of main and auxiliary machinery and associated systems may include:	1 cold pipes and valves (refrigeration and liquefied gas cargoes) 2 dangerous atmosphere 3 electrical wiring and systems 4 faulty machinery equipment handling equipment and lifting gear 5 flammable liquids, vapours and fuel 6 hot pipes and valves (water, steam, gas, fuel oil, lubricating oil) 7 machinery overload 8 moving and rotating machinery 9 moving heavy loads using unsafe lifting procedures 10 non-compliance with safe working procedures 11 noxious and dangerous cargoes 12 operating equipment beyond safe working limits

Range Statement (continued)

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

	13 overspeeding of machinery (electrical generation and main propulsion)
	14 emergency trips
	15 poor housekeeping procedures
	16 power tools and other sharp tools and implements
	17 slippery deck
	18 unsecured machinery, components or equipment
	19 using equipment beyond safe working limits
	20 working at heights and in confined spaces
f Emergencies may include:	1 loss of propulsion or steering
	2 flooding of engine room
	3 fire or explosion in engine room
	4 loss of refrigeration
	5 loss of water making ability

Range Statement (continued)

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

VARIABLE	SCOPE
f Emergencies may include: (continued)	6 fuel oil, lubrication oil, steam and gas leaks
	7 loss of electrical power
	8 pump failure
	9 overheating and overspeed of machinery, governors,

Range Statement (continued)

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

	emergency trips 10 electric shock 11 machinery failure (main or auxiliary)
g Testing and repair equipment may include:	1 meters and gauges (including micrometers, vernier callipers, rules) 2 computer displays of performance parameters 3 hand tools, such as spanners, wrenches, screwdrivers, hacksaws, etc. 4 greasing and lubrication tools 5 electric power tools, such as grinders, lathes, drills, etc. 6 pneumatic power tools, such as grinders, sanders, drills, etc. 7 welding equipment 8 block and tackle 9 portable and manual lifting equipment and hydraulic jacks 10 material safety data sheets 11 protective clothing and equipment such as: i eye and ear protection and safety boots ii dust and fume masks iii safety helmet iv boilersuit/overalls

Range Statement (continued)

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

h Documentation and records may include	1	ISM Code safety management system plans, procedures, checklists and instructions
	2	vessel and company's planned pumping systems, operational procedures and instructions
	3	pumping equipment and vessel manufacturer's specifications, instructions and recommended procedures
	4	pumping systems running sheets, operations logs and other operational records, including computer database of running information, where relevant
	5	vessel's survey (class and statutory) procedures and instructions as they relate to shipboard main and auxiliary machinery and associated systems

Range Statement (continued)

TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

VARIABLE	SCOPE
h Documentation and records may include (continued)	6 vessel's safety and emergency contingency plans and procedures
	7 relevant sections of national and international maritime regulations,
	8 instructions of relevant maritime authorities and class societies concerning shipboard main and auxiliary machinery and associated systems operation

Range Statement (continued)**TDMMR1107B OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS**

i Applicable regulations and legislation may include	1	sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the operation of main and auxiliary machinery and associated systems on vessels of unlimited propulsion power
	2	relevant international, Commonwealth, State and Territory OH&S legislation
	3	relevant international, Commonwealth, State and Territory engineering practice standards

Unit Sector(s)

Not applicable.

Field

Field R Carry Out Operations on Equipment and Systems

Relationship to other units

Relationship to other units	The unit must be assessed in conjunction with other units that relate to the functions of the occupation(s) concerned.
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