



Australian Government

Department of Education, Employment and Workplace Relations

TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS

Revision Number: 1

TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS

Modification History

Not applicable.

Unit Descriptor

UNIT DESCRIPTOR:

This unit involves the skills and knowledge required of an Engineer Class 3 to fabricate simple shipboard components where required as part of maintenance of shipboard machinery on commercial vessels powered by main propulsion machinery of less than 3,000 kW of propulsion power within offshore limits.

Application of the Unit

Application of the unit	The unit has applications in the qualification for an Engineer Class 3 as per relevant sections of Part D of the National Standard for Commercial Vessels (NSCV) (i.e. Diploma of Transport&Distribution (Coastal Marine Engineering - Engineer Class 3).
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Licensing/Regulatory Information

Licensing/legislative requirements	The unit is consistent with the relevant sections of State and Territory maritime regulations and NSCV/USL Code for an Engineer Class 3.
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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
1 Obtain specifications and drawing for component	<ul style="list-style-type: none"> a The specifications and drawings for a simple component are obtained or sketched in accordance with established procedures b The specifications and drawings are interpreted and the processes for the fabrication and assembly of the component are planned in accordance with the limits of responsibility of an Engineer Class 3 c Appropriate action is taken to prevent damage in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions d Faulty equipment and components are identified and are reported and appropriate action is initiated as required for isolation, tagging and repair or replacement within the limits of responsibility of an Engineer Class 3 e Decisions are made to carry out temporary or permanent repairs depending on the vessel's position and circumstances f Appropriate consultation is undertaken with classification society and marine administration concerning the nature of the repairs and any contingency or emergency action required g Management of the repair processes and the organisation and control of engine room personnel to facilitate repairs is carried out within the limits of responsibility of an Engineer

ELEMENT	PERFORMANCE CRITERIA
	Class 3
ELEMENT	PERFORMANCE CRITERIA
2 Fabricate required component	<ul style="list-style-type: none"> a Materials and equipment for the planned fabrication processes are selected and obtained b Materials are laid out and marked up in accordance with plans and specifications c Equipment and tools to carry out the fabrication processes are prepared and set up in accordance with manufacturer's instructions and established procedures d Materials are cut to specifications in accordance with planned procedures e Planned fabrication and assembly processes are carried out within the limits of responsibility of an Engineer Class 3 f Fabricated component is checked against specifications g Equipment and unused materials are returned to store after completion of the fabrication tasks h Housekeeping of the work area is completed in accordance with established procedures
3 Complete documentation	<ul style="list-style-type: none"> a Details of the fabrication project are documented in accordance with established maintenance procedures
4 Follow safety and hazard control procedures	<ul style="list-style-type: none"> a Safety, hazard minimisation and pollution control procedures and regulations are followed at all times during fabrication activities b Fabrication hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the

ELEMENT	PERFORMANCE CRITERIA
	environment

Required Skills and Knowledge

REQUIRED KNOWLEDGE

This describes the knowledge required for this unit.

- 1 Applicable sections of relevant maritime regulations
- 2 Relevant OH&S legislation and policies
- 3 Established engineering practice for the fabrication of simple shipboard components
- 4 Simple shipboard components that may need to be fabricated by and Engineer Class 3 on a vessel of less than 3,000 kW propulsion power operating within offshore limits
- 5 Skills and knowledge required to carry out basic fabrication tasks procedures falling within limits of responsibility of an Engineer Class 3, including:
 - a use of hand and power tools
 - b measurement and marking out of work
 - c cutting materials
 - d bending and folding sheet metal
 - e use of machine tools
 - f oxy-welding and MIG welding
 - g brazing techniques

REQUIRED KNOWLEDGE

- 6 Fabrication hazards and problems and appropriate preventative and remedial action and solutions
- 7 Safe procedures for handling heavy loads during fabrication processes
- 8 Safe procedures for the use of hand and power tools and maintenance equipment during fabrication processes
- 9 Safety, environmental and hazard control precautions and procedures relevant to shipboard maintenance operations
- 10 A basic understanding of the properties and application of materials and structures used in the construction of various vessels of less than 3,000 kW propulsion power and their associated operational machinery
- 11 Mathematical techniques to solve basic engineering and maintenance problems procedures falling within limits of responsibility of an Engineer Class 3
- 12 Basic properties of common marine engineering materials and methods of cutting and joining.
- 13 Precautions that must be taken to minimise danger of fire or explosion when carrying out basic fabrication tasks on a vessel
- 14 Principles and procedures for the alignment of machinery and machinery parts.
- 15 Safety precautions that must be taken before entering tanks or confined spaces
- 16 Maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities
- 17 Maritime communication techniques needed during maintenance and repair operations
- 18 Purpose and content of material safety data sheets
- 19 Typical vessel and machinery specifications, machinery drawings, operational manuals and specifications, and electrical and control circuit diagrams

- 17 Maritime communication techniques needed during maintenance and repair operations

REQUIRED SKILLS

This describes the basic skills required for this unit.

- 1 Use verbal communication skills required when fabricating simple shipboard components on a small vessel
- 2 Read and interpret standard operating procedures, including all required OH&S procedures and precautions
- 3 Read and interpret vessel and machinery specifications, machinery drawings, operational manuals and specifications and electrical and control circuit diagrams
- 4 Read and interpret material safety data sheets
- 5 Complete any required operational and maintenance records
- 6 Work collaboratively with other crew members when fabricating simple shipboard components
- 8 Plan and organise the work when fabricating simple shipboard components
- 9 Monitor the selection and use of relevant tools and equipment as per instructions
- 10 Recognise faulty equipment and take appropriate action as per operating instructions
- 11 Recognise routine problems when fabricating simple shipboard components on a small vessel and take appropriate action
- 12 Adapt to differences in vessels, equipment and machinery and standard operating and servicing procedures
- 13 Ensure that all safety precautions and procedures are followed when fabricating simple shipboard components on a small vessel

Evidence Guide

Evidence Guide

TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS

Evidence Guide**TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS**

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	<p>Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a Interpret specifications and drawings for the fabrication of simple shipboard components b Plan the processes for the fabrication of simple shipboard components c Carry out planned processes for the fabrication of simple shipboard components in accordance with the limits of responsibility of an Engineer Class 3 d Exercise all required safety, environmental and hazard control precautions and procedures when completing fabrication tasks
2 Evidence required for demonstration of consistent performance	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 1 interpreting specifications and drawings for the fabrication of simple shipboard components 2 planning the processes for the fabrication of simple shipboard components 3 carrying out planned processes for the fabrication of simple shipboard components in accordance with the limits of responsibility of an Engineer Class 3. 4 applying safety precautions relevant to mechanical and electrical machinery and equipment maintenance and repair operations 5 completing mechanical and electrical machinery and equipment maintenance and repair documentation and

Evidence Guide**TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS**

- | | |
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| | records |
| c | Shows evidence of application of relevant workplace procedures, including <ol style="list-style-type: none"> 1 relevant maritime regulations 2 OH&S and pollution control regulations and hazard prevention policies and procedures 3 ISM Code safety management system procedures and work instructions for maintenance and fabrication activities 4 following on-board housekeeping processes 5 waste, pollution and recycling management processes |

Evidence Guide (continued)**TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS**
2 Evidence required for demonstration of consistent performance (continued)

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|---|---|
| d | Action is taken promptly to report and/or rectify any problems or incidents that may arise when fabricating simple shipboard components on a vessel |
| e | Work is completed systematically with required attention to detail |
| f | Recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions among crew and others |

3 Context of assessment

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| 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: |

Evidence Guide (continued)**TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS**

	<ol style="list-style-type: none"> 1 As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations, and 2 Appropriate practical assessment must occur: <ol style="list-style-type: none"> i at the registered training organisation; and/or ii on an appropriate working or training vessel
4 Specific resources required for assessment	<p>Access is required to opportunities to:</p> <ol style="list-style-type: none"> a Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to fabricate simple components within the limits of responsibility of and Engineer Class 3 on a vessel of less than 3,000 kW propulsion power operating within offshore limits; and/or b Fabricate a range of simple components on a commercial or training vessel of less than 3,000 kW propulsion power operating within offshore limits

Range Statement**Range Statement****TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS**

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**

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a. Work must be carried out:	1 in compliance with relevant maritime regulations
b. Work is performed:	1 to established procedures under broad operational requirements within the limits of responsibility of an Engineer Class 3
c. Work involves:	1 the application of marine engineering practice to the fabrication of simple shipboard components. Accountability and responsibility for self and others in achieving the outcomes is involved
d. Work requires:	1 skill to carry out basic engineering fabrication functions. This includes interpretation of specifications and the planning, implementation and checking of fabrication processes

2. WORKSITE ENVIRONMENT

a Components to be fabricated may include:	1 simple components involving processes falling within the limits of responsibility of an Engineer Class 3 on commercial vessels of up to 3,000 kW propulsion power operating within offshore limits
b Fabrication tasks 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 while anchored or moored 5 in dry dock 6 when bunkering

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7 during cargo operations

Range Statement (continued)**TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS**

VARIABLE	SCOPE
c Fabrication tasks are dependent on the type and size of vessel involved and may include:	1 selection of appropriate materials 2 use of hand and power tools 3 marking out and cutting of materials 4 bending and folding of materials 5 basic machining (where relevant) 6 basic welding 7 basic heat treatment 8 checking and quality assurance
d Fabrication tools and equipment may include:	1 hand and power tools 2 measurement and marking out tools 3 cutting, bending and folding tools 4 machine tools 5 basic welding equipment 6 lifting gear and equipment 7 protective clothing and equipment such as:

Range Statement (continued)**TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS**

	<ul style="list-style-type: none"> i eye and ear protection ii safety boots and helmet iii dust and fume masks
e Fabrication hazards may include:	<ul style="list-style-type: none"> 1 moving heavy loads using unsafe lifting procedures 2 welding equipment 3 sharp tools and implements 4 power tools 5 moving and rotating machinery 6 flammable liquids, vapours and fuel 7 faulty load handling equipment and lifting gear 8 using tools and equipment beyond safe working limits 9 poor housekeeping procedures

Range Statement (continued)**TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS**

VARIABLE	SCOPE
e Fabrication hazards may include: (continued)	<ul style="list-style-type: none"> 10 non-compliance with safe working procedures 11 hot and cold pipes and valves (steam, fuel oil, lubricating oil, refrigeration)

Range Statement (continued)**TDMMB3707B FABRICATE SIMPLE SHIPBOARD COMPONENTS**

f Documentation and records may include:	<ol style="list-style-type: none"> 1 safety management system plans, procedures, checklists and instructions 2 maintenance log sheets and records, including computer database of maintenance records 3 machinery and vessel manufacturer's specifications, instructions and recommended procedures 4 instructions of relevant maritime authorities concerning shipboard machinery maintenance and repair 5 relevant Australian engineering standards
g Applicable legislation, regulations and codes may include:	<ol style="list-style-type: none"> 1 sections of relevant maritime regulations dealing with maintenance of vessels of less than 3,000 kW propulsion power 2 relevant Commonwealth, State and Territory OH&S legislation 3 relevant international, Commonwealth, State and Territory engineering practice standards

Unit Sector(s)

Not applicable.

Field

Field B Equipment Checking and Maintenance

Relationship to other units

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