

Competency Standards for Caribbean Vocational Qualifications (CVQ)

CCMEM20702 Level II in Mechanical Maintenance

Unit Number	Unit Title	Mandatory /Elective	Hours
MEMCOR0051A	Perform related computations – (basic)	Mandatory	20
MEMCOR0081A	Mark off/out (general engineering)	Mandatory	10
MEMCOR0091A	Draw and interpret sketches and simple drawings	Mandatory	20
MEMCOR0111A	Use power tools	Mandatory	15
MEMCOR0121A	Classify engineering materials – (basic)	Mandatory	30
MEMCOR0131A	Undertake interactive workplace communication	Mandatory	20
MEMCOR0141A	Follow principles of Occupational Health and Safety (OH&S) in work environment	Mandatory	20
MEMCOR0161A	Plan to undertake a routine task	Mandatory	10
MEMCOR0171A	Use graduated measuring devices	Mandatory	10
MEMCOR0191A	Use hand tools	Mandatory	5
MEMFAB0041A	Carry out mechanical cutting operations – (basic)	Mandatory	10
MEMMPO0081A	Use workshop machines for basic operations	Mandatory	20
MEMMAH0081A	Perform housekeeping duties	Mandatory	10
MEMMAH0071A	Perform manual handling and lifting	Mandatory	5
MEMSUF0061A	Prepare for the application of protective coatings	Mandatory	5
MEMMRD0041A	Remove/install standard mechanical seals	Mandatory	20
MEMMRD0061A	Remove and replace basic pneumatic system components	Mandatory	40
MEMMRD0071A	Remove and replace basic hydraulic system components	Mandatory	40
MEMMPO0011A	Perform daily operational maintenance of machines/equipment	Mandatory	20
MEMMRD0081A	Remove dismantle, assemble and replace basic engineering components	Mandatory	50
MEMCOR0012A	Plan a complete activity	Mandatory	5
MEMCOR0042A	Interpret standard specifications and manuals	Mandatory	5
MEMCOR0052A	Operate in an autonomous team environment	Mandatory	5
MEMCOR0022A	Perform related computations	Mandatory	20
MEMCOR0122A	Write technical reports (basic)	Mandatory	40
MEMCOR0152A	Use graphical techniques and perform simple statistical computations (basic)	Mandatory	20
MEMMRD0022A	Maintain and overhaul mechanical equipment	Mandatory	40
MEMMRD0032A	Perform fault diagnosis, installation and removal of bearings	Mandatory	20
MEMMRD0042A	Service repair/maintain/and refit engineering	Mandatory	20
MEMMRD0052A	Maintain and repair mechanical drives and mechanical transmission assemblies	Mandatory	20
MEMMRD0062A	Perform levelling and alignment of machines and engineering components	Mandatory	20
MEMMRD0712A	Install and maintain complex mechanical seals	Mandatory	20
MEMMRD0722A	Install and maintain mechanical valves	Mandatory	20
MEMMRD0732A	Install and maintain mechanical pumps	Mandatory	20
MEMMRD0752A	Install and maintain fluid power systems	Mandatory	20
MEMMRD0762A	Install and maintain industrial screens, strainers and filters	Mandatory	20

CCMEM20702 Level II in Mechanical Maintenance (Cont'd)

Unit Number	Unit Title	Mandatory /Elective	Hours
MEMFAB0071A	Undertake fabrication, forming, bending and shaping	Elective	40
MEMMPO0021A	Perform general machining operations	Elective	60
MEMFAB0141A	Develop geometric shapes- (basic)	Elective	20
MEMCOR0101A	Prepare basic engineering drawing	Elective	30
MEMFAB0061A	Perform manual heating and thermal cutting	Elective	20
MEMFAB0051A	Perform brazing and/or silver soldering	Elective	20
MEMFAB0151A	Prepare for oxyacetylene/metal arc welding processes	Elective	20
ITICOR0011A	Carry out data entry and retrieval procedures	Elective	40
MEMFAB0121A	Perform basic welding using oxyacetylene welding process (OAW) - fuel gas welding	Elective	50
MEMFAB0111A	Perform basic welding using manual metal arc welding process (MMAW)	Elective	50
MEMMRD0742A	Install and maintain industrial transmission	Elective	20
MEMMRD0772A	Install and maintain conveyors and associated equipment	Elective	20
MEMMRD0782A	Install and maintain material feeders	Elective	20
MEMMRD0792A	Install and maintain material crushers	Elective	20
MEMMRD0802A	Install and maintain fuel transport equipment	Elective	20
BSBSBM0012A	Craft personal entrepreneurial strategy	Elective	50
MEMMRD0812A	Install and maintain industrial pressure vessels	Elective	20
MEMMRD0822A	Install and maintain turbine (steam, gas)	Elective	20
MEMMRD0832A	Install and maintain internal combustion engines	Elective	20
MEMMRD0842A	Install and maintain hydro turbines	Elective	20
MEMMRD0852A	Conduct generator mechanical maintenance	Elective	20
MEMCOR0063A	Attend to breakdowns in hazardous areas	Elective	20
MEMMAH0073A	Purchase materials	Elective	40
MEMMRD0253A	Monitor essential services operations in remote areas	Elective	20
MEMCOR0013A	Assist in the provision of on the job training	Elective	20
MEMPLN0063A	Coordinate and manage basic installation projects	Elective	40
MEMMRD0383A	Diagnose and repair faults in mechanical equipment	Elective	40

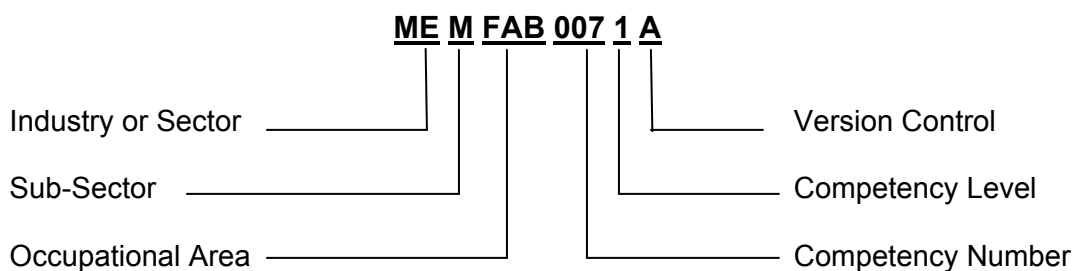
To be awarded this Caribbean Vocational Qualification (CVQ) all core competency standards must be achieved.

Electives achieved with the qualification will be awarded unit statement of competency.

The nominal training hours are a guide for planning the delivery of Training Programmes.

Legend to Unit Code

Example: MEMFAB0071A



KEY: Man – Mandatory; SBM – Small Business Management; FAB – Fabrication; MAH – Machine Handling; INS – Installation; ASY – Assembly; MPO – Machine & Process Operations; SUF - Surface Finishing; MRD – Maintenance Repairs & Diagnostic; PLN - Planning; BSB - Business Sector (Industry); ITI - Information Technology (Industry)

MEMCOR0051A: Perform related computations – (basic)

Competency Descriptor:

This unit deals with the skills and knowledge required to perform basic computations and effectively carry out measurements of work to required tolerance, and applies to all individuals working in the metal engineering and maintenance industry.

Competency Field:

Maintenance and metal fabrication

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

1.	Apply four basic rules of calculation	1.1	Simple calculations are performed using four basic rules, addition, subtraction, multiplication and division.
		1.2	Concepts are understood and simple calculations are performed involving length, perimeter, angles, area and volume.
2.	Perform basic calculations involving fractions and decimals	2.1	Simple calculations are performed involving fractions and mixed numbers using the four basic rules.
		2.2	Simple calculations are performed involving decimal fractions and mixed numbers using the four basic rules.

RANGE STATEMENT

This unit applies to simple projects applicable to:

- metal fabrication
- mechanical maintenance
- electrical/electronic maintenance
- manufacturing

Calculations may be performed using:

- pen
- paper
- calculator
- protractor

Basic numeracy skills below those described in this unit are not covered in these standards and are assumed to be held on entry to the industry. Basic numeracy means the ability to:

- perform simple arithmetic using whole numbers
- apply the four basic rules of:
 - addition
 - subtraction
 - multiplication
 - division

Computations performed in an appropriate application for the industry in which the person is working. Skills may be demonstrated in relation to:

- measurement
- statistical application
- ratio and proportion
- estimation
- calculations with fractions and decimals
- interpretation of drawings
- interpretation of diagrams
- interpretation of mathematical statements and formulae.
- interpretation of numbers and arithmetic operations.

EVIDENCE GUIDE

Competency is to be demonstrated by the effective calculation of measurements and calculation of materials in accordance with range of variables statement relevant to the work orientation.

(1) Critical Aspects of Evidence

During assessment the individual will:

- take responsibility for the quality of their own work
- perform computations in accordance with standard principles
- apply the four basic rules of calculations
- performs basic calculations involving fractions and decimals
- perform computations accurately
- use accepted motor vehicle repair techniques, practices, processes and workplace procedures.

All must be associated with the calculations and computations being performed or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- drawings and specifications
- basic operations in simple geometry,
- measurement and calculations
- costing relative to the automotive trade processes
- numbers and arithmetic operations
- calculations with fractions and decimals
- estimation and measurement
- percentages (some applications)
- ratio and proportion (some applications)
- basic statistics (data, tables, graphs and sales)
- mathematical statements and formulae

Skills

The ability to:

- read and interpret drawings
- measure and calculate manually
- record measurements
- operate electronic calculating devices
- communicate effectively

(4) Resource Implications

The candidate will be provided with:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- present evidence of credit for any off-job training related to this unit.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation activities to which applicant has contributed, or worked on
- training courses on basic math
- examples of authenticated assessments and/or assignments from formal education courses
- self assessment reports
- simulation

Assessor must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

All tasks involved must be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0081A: Mark off/out (general engineering)

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively transfer dimensions from engineering drawings, prints or plans and applies to individuals working in the metal, engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Determine job requirements	1.1	Drawings, job instructions and specifications are interpreted and understood.
		1.2	Appropriate methods and sequencing are selected and are consistent with proposed fabricating process.
2.	Transfer dimensions	2.1	All marking off/out is carried out to specifications using appropriate tools and equipment.
		2.2	Datum points are correctly established.
		2.3	Dimensions transferred are correct and appropriate
3.	Make templates	3.1	Appropriate template materials are selected.
		3.2	Templates are produced to specifications and appropriate to desired use.
		3.3	Correct storage procedures are followed.

RANGE STATEMENT

This unit applies to the marking off/out techniques used for the transfer of dimensions from engineering drawings, prints or plans. Work is undertaken under supervision using predetermined standards of quality, safety and workshop procedures. The task may be performed in the workshop or on site. Marking off/out is undertaken using appropriate tools and equipment; templates and are produced as required. Marking off/out techniques may apply to a range of materials and shapes.

Storage procedures include labelling and identification to standard operating procedures

Marking out covers but not limited to:

- engineering components
- jigs and fixtures
- castings
- templates
- dies and tooling

Equipment may include but not limited to:

- marking out tables
- surface tables
- rotary tables
- dividing heads etc.
- vee blocks
- cylinder squares
- sine bars and the like
- vernier height gauges
- protractors
- straight edge
- set squares
- marking out tools

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use of the marking off/out techniques used for the transfer of dimensions in accordance with the range listed in the range of variables statement, relevant to the work orientation.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the marking off/out of components or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to measure and calculate manually
- demonstrate the ability to transfer and record measurements accurately
- demonstrate the ability to mark off/out accurately
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0091A Draw and Interpret sketches and simple drawings

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- tools
- apparatus
- drawing interpretation
- basic numeracy
- marking off/out techniques
- materials relevant to the engineering process
- basic operations in simple geometry measurement and calculations

Skills

The ability to:

- work safely to instructions
- use marking out tools and equipment
- handle materials
- select tools/equipment
- select material
- transfer measurements
- apply quality assurance
- read and interpret drawings and specifications
- measure and calculate manually
- record measurement

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both in accordance with workplace procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0091A: Draw and interpret sketches and simple drawings

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively draw and interpret sketches and simple drawings, and applies to all individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Prepare freehand sketch	1.1	Sketch is correctly and appropriately drawn.
		1.2	Sketch depicted object or part.
		1.3	Dimensions are obtained correctly.
		1.4	Dimensions are shown clearly.
		1.5	Instructions are shown clearly.
		1.6	Base line or datum point is indicated.
2.	Interpret details from freehand sketch	2.1	Components, assemblies or objects are recognised.
		2.2	Dimensions identified are appropriate to field of employment.
		2.3	Instructions are identified and followed.
		2.4	Material requirements are identified.
		2.5	Symbols are recognised in sketch.
3.	Select correct technical drawing	3.1	Drawing is checked and validated against job requirements or equipment.
		3.2	Drawing version is checked and validated.
4.	Identify drawing requirements	4.1	Requirements and purpose of drawing is determined from customer and/or work specification and associated documents.

- | | | |
|---|-----|--|
| | 4.2 | Identified and collected all data necessary to produce the drawing |
| | 4.3 | Drawing requirements are confirmed with relevant personnel and timeframes for completion established. |
| 5. Prepare or make changes to engineering drawing | 5.1 | Selected appropriate drafting equipment |
| | 5.2 | Applied drafting principles to produce a drawing that is consistent with standard operating procedures within the company. |
| | 5.3 | All work is undertaken to prescribed procedure. |
| | 5.4 | Completed drawing is approved in accordance with standard operating procedures. |

RANGE STATEMENT

Technical drawing interpretation is applied to any of the full range of metal, engineering and maintenance disciplines.

Technical drawings may utilise any of the following techniques:

- perspective
- exploded views
- hidden view

Drawings are to be provided to Engineering Standards and/or their equivalents from the full range of engineering disciplines.

Standard engineering symbols or equivalent and are to be recognised in the field of employment.

Drawing instruments and supplies:

- drafting kit/instruments
- blue prints
- drawings/modules/photographs

Measurement systems:

- inch/foot system
- metric(SI) system

Alphabet of line:

- object line
- hidden line
- centre line
- section line
- dimension
- extension line
- cutting line
- short break line
- phantom line

Geometric construction to include:

- circles
- regular polygons with four, seven and eight sides
- pentagon inscribed within measured circle
- ellipse
- triangles with specified angles
- arcs thru three points tangent to two circles

Multi-view (orthographic 2-D) drawings:

full scale (1:1) orthographic 3-view drawing using third angle projection with top, front and right side view – show all hidden features and centrelines

Pictorial (3-D) drawing to include:

- isometric corner with left and right side lines each 30 degrees up from horizontal and third line at a vertical, with all three lines joining in a common intersection
- full scale (1:1) basic isometric drawing

Dimension reading:

- dimensioning styles and methods: coordinate, linear/datum
- dimensioning 2-D drawing
- dimensioning complex shapes: spheres, cylinders, tapers, pyramids

EVIDENCE GUIDE

Competency is to be demonstrated by developing and effectively reading and interpreting simple drawings and sketches to locate or identify specified features or specifications in accordance with the performance criteria and the range listed within the range statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the drawing and interpretation of exercise of the sketches or other units requiring the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate the ability to identify, understand, read and interpret various types of technical drawings
- demonstrate the ability to identify alphabet of lines, scales, lettering, dimensions, symbols, abbreviations and key features
- demonstrate the ability to identify title panel and reference date of drawings
- take responsibility for the quality of their own work;
- perform all tasks in accordance with standard drafting procedures;
- use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- types and use of drawing instruments and supplies
- identification of alphabet of lines, line type variation, order of usage and application on drawings
- types of scale and proportion and how they are used for measurement
- symbols, dimensions and terminology types of drawings and their applications

Skills

The ability to:

- estimate measurements
- read and interpret simple drawings
- measure accurately
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

(6) Context of Assessment

Competency should be assessed in a classroom environment in accordance with work practices and industry procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0111A: Use power tools

Competency Descriptor:

This unit deals with skills and knowledge required to competently select and use appropriate power tools for hand held operations of the metal engineering and maintenance trades, and applies to all individuals in the industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

1. Use power tools	1.1 Appropriate power tools are selected according to the task requirements.
	1.2 Power tools are used following a determined sequence of operations to produce desired outcomes.
	1.3 All safety requirements are adhered to before, during and after use.
	1.4 Unsafe or faulty tools are identified and marked for repair according to designated procedures.
	1.5 Operational maintenance of tools is undertaken according to standard workplace procedures, principles and techniques.
	1.6 Power tools are stored safely in appropriate location according to standard workshop procedure and manufacturer's recommendations.

RANGE STATEMENT

Work undertaken under supervision or in a team environment using predetermined standards of quality, safety and workshop procedures involving the use of various power tools for applications, maintenance tasks and the finishing of items or components metallic and non-metallic material to size and shape using engineering principles, tools, equipment and procedures to company and regulatory requirements.

Power tools may include but not limited to electric or pneumatic:

- drills
- grinders
- jigsaws
- nibblers
- cutting saws
- threading machine
- sanders
- planers
- routers
- pedestal drills
- pedestal grinders

Applications may include power tools used for

- adjusting,
- dismantling
- assembling
- finishing
- cutting
- scraping
- threading
- cleaning,
- lubricating,
- tightening
- simple tool repairs
- hand sharpening
- adjustments

Operations may include:

- clamping
- aligning
- adjusting
- finish
- size
- shape

Outcomes to job specifications may include

EVIDENCE GUIDE

Competency is to be demonstrated by the safe and effective use of particular power tools listed within the range of variables statement relevant to the work orientation

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of power tools in hand held operations or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to select and use appropriate power tools for hand held operations
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

This unit should not be selected if the power tools used are dedicated to an operation or machine that is nut-runner, air drill, power driver etc. For using hand tools see Unit MEMCOR0191A (Use hand tools).

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements and OH&S legislation
- work shop procedures
- engineering principles
- technical applications
- power tools and equipment
- materials
- materials handling whilst operating tools

Skills

The ability to:

- work safely to instructions
- apply appropriate hand-eye co-ordination in the use of tools
- handle/hold materials during operation of tools
- select appropriate tools for material usage
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0121A: Classify engineering materials – (basic)

Competency Descriptor:

This unit deals with skills and knowledge required to competently select and use appropriate metals for operations and procedures in the metal engineering and maintenance trades, and applies to individuals in the industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Distinguish between the characteristics of engineering materials	1.1	Identified the characteristics of engineering materials.
		1.2	Demonstrated knowledge of the effect external factors has on engineering metals.
2.	Distinguish between the characteristics of metals	2.1	Identified the characteristics of engineering metals.
		2.2	Compared the properties and characteristics of engineering metals.
		2.3	Demonstrated the ability to carry out testing methods for engineering metals.
		2.4	Demonstrated the ability to carry out heat treatment process.
3.	Identify and select engineering metals for specific applications	3.1	Identified common applications of engineering metals.
		3.2	Identified ferrous and non-ferrous metals according to specific requirements.

RANGE STATEMENT

This unit applies to the knowledge of and skills required to classify identify, select and use engineering materials for various procedures and operations in the engineering and maintenance field.

Materials may include both ferrous and non-ferrous metals, plastics ceramics and metal alloys

EVIDENCE GUIDE

Competency is to be demonstrated by classifying engineering in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, maintenance and fabrication associated with the use of materials in engineering operations or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to identify and compare the properties and characteristics of engineering metals
- demonstrate the ability to apply appropriate principles/techniques to identify materials
- demonstrate the ability to carry out specific heat treatment and testing procedures
- Take responsibility for the quality of their own work
- Perform all tasks in accordance with standard operating procedures

Use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR01311A Undertake interactive workplace communication
- MEMCOR0141A Follow principles of occupational Health and Safety (OH&S) in work place

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- workplace and equipment safety requirements and OH&S legislation
- properties and nature of materials
- properties of plastics and ceramics
- properties of metals
- heat treatment procedures
- material testing procedures
- engineering application of metals
- ferrous and non-ferrous metals

Skills

The ability to:

- work safely to instructions
- compare the properties and characteristics of engineering metals
- apply appropriate principles/techniques to identify materials
- select appropriate material for usage
- carry out specific heat treatment and testing procedures
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0131A: Undertake interactive workplace communication

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively undertake interactive communication at the workplace, and applies to all individuals working in the metal, engineering and maintenance industry

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Communicate information about tasks, processes, events or skills	1.1	Information about tasks, processes, events or skills is communicated.
		1.2	Multiple operations involving several topics/areas are communicated.
		1.3	Listening is undertaken without continuous interruptions of the speaker.
		1.4	Questions are used to gain extra information.
		1.5	Correct sources of information are identified.
		1.6	Information is selected and sequenced appropriately.
		1.7	Verbal and written reporting is undertaken where required.
		1.8	Communication is demonstrated in both familiar and unfamiliar situations and to familiar and unfamiliar individuals and groups.
2.	Take part in group discussion to achieve appropriate work outcomes	2.1	Responses sought and provided to others in the group.
		2.2	Constructive contributions are made in terms of the production process involved.
		2.3	Goals and aims are communicated.

RANGE STATEMENT

This unit covers competencies needed for situations where employees must collectively undertake a task eg: three or four assemblers co-operating to assemble a product, a trades person who has to attend a service call, or a group of process workers who undertake a similar task in close proximity to each other.

Techniques that could be used as the subject of communication includes but is not limited to:

- sketches
- drawings
- charts and maps
- telephone
- production schedules
- written machine or job instructions;
- client instructions
- face to face
- signage
- memos
- work schedules/work bulletins

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use of methods of communication relating to instructions, information sources and meeting procedures listed within the range statement relative to the work orientation.

(1) Critical Aspects of Evidence

This unit should be assessed in conjunction with other specialisation or core units and not in isolation. The assessment should be linked with performance of normal workplace activities where the competency covered by this unit is demonstrated concurrently with other core or elective competencies. The communication tasks may be related to any aspect of the job, interacting with team members, receiving instructions, reporting and any other activity that requires communication with individuals or groups.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to undertake interactive workplace communication
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- basic level of ability in speaking
- basic level in reading
- basic level in writing English
- basic numeracy
- work place safety requirements
- the use of work schedules, charts, work bulletins and memos

Skills

The ability to:

- work safely to instructions
- convey information in simple English to invoke correct actions

Basic numeracy means the ability to perform simple arithmetic using whole numbers applying the four basic rules of addition, subtraction, multiplication and division. The unit however does not refer to competence in English but in communication. English language ability should be professionally assessed.

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The communication Activities undertaken should be consistent with the individual's field of work and be based on Interaction with others related to workplace tasks and procedures, tools, equipment, materials and Documentation relevant to that field of work. The competencies covered by this unit should be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0141A: Follow principles of Occupational Health and Safety (OH&S) in work environment

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively perform work activities to conform to Occupational Health and Safety requirements, and applies to all individuals working in the metal, engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Follow safe work practices	<p>1.1 Work is carried out safely and in accordance with company policy and company procedures and industry requirements.</p> <p>1.2 Housekeeping is undertaken in accordance with company procedures.</p> <p>1.3 Responsibilities and duties of employees are understood and demonstrated in day-to-day actions.</p> <p>1.4 Personal protective equipment is worn and stored according to company procedures.</p> <p>1.5 All equipment and safety devices are used according to legislative requirements and company/manufacturer's procedures/instructions.</p> <p>1.6 Safety signs/symbols are identified and followed as per instruction.</p> <p>1.7 All manual handling is carried out in accordance with Industry requirements, company procedures and National Occupational Health & Safety guidelines.</p> <p>1.8 Occupational Health & Safety Commission guidelines demonstrated.</p>
2. Report workplace hazards	<p>2.1 Workplace hazards identified during the course of work are reported to appropriate person according to standard operating procedures/factory act.</p>

- | | | | |
|----|-----------------------------|-----|--|
| 3. | Follow emergency procedures | 3.1 | Means of contacting the appropriate personnel and emergency services in the event of an accident demonstrated. |
| | | 3.2 | Emergency and evacuation procedure understood and carried out when required. |

RANGE STATEMENT

This Occupational Health and Safety (OHS) unit applies to safe working practices as applied to all metal and engineering workplaces. Competencies to be demonstrated must be associated with performance of duties and use of specialist skills. This unit and these standards do not cover the skills of emergency teams such as fire fighting, first aid officer etc

Emergency procedures may include but not limited to the isolation of the following equipment as appropriate.

- electrical,
- mechanical
- hydraulic
- pneumatic
- emergency

- steam and water
- oxy fuel

Quality Assurance requirements may include:

- working environment/fellow workers
- adverse weather conditions
- protection of work personnel
- protection of public

Personal protective equipment may include but is not limited to:

- overalls, safety glasses/goggles, hard hat cap
- dust masks/respirator, gum boots
- ear plugs/muffs

Emergency procedures include:

- fire fighting
- medical and first aid
- evacuation

Ladders and work platforms include:

- extension ladders
- step ladders
- trestle ladders
- simple work platforms

Power connections include:

- E LCB systems
- isolation transformer (safe-T-pack)
- power pole/B4
- switch board area

Safety responsibilities apply to:

- personal protection
- safe interactive work practices (duty of care)
- Occupational Health and Safety (OHS) regulations
- National Environment and Planning agency (NEPA) regulations

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out safe work practices within the range of variables statement relevant to the work orientation

(1) Critical Aspects of Evidence

It is essential that competence is observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- demonstrate application of organizational policies and procedures including Quality Assurance requirements where applicable.
- carry out correct procedures prior to and during work activities.
- safe and effective operational use of tools, plant and equipment.
- carry out appropriate applications in accordance with regulatory and legislative requirements

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- basic level of ability in speaking
- basic level in reading & writing English
- workplace and equipment safety requirements
- material handling requirements
- relevant acts, regulations and codes of practice
- company policy

Skills

The ability to:

- work safely to instructions
- use tools and equipment safely
- select and use material equipment and tools to standards
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. Aspects of this unit will need to be assessed in a work situation.

The context in which the OH & S principles are applied should be consistent with the individual's field of work. The competencies covered by this unit would be demonstrated by an individual working lone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0161A: Plan to undertake a routine task

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively plan to undertake a routine task and applies to all individuals working in the metal, engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Identify task requirements	1.1 Instructions as to procedures are obtained, understood and where necessary clarified. 1.2 Relevant specifications for task outcomes are obtained, understood and where necessary clarified. 1.3 Task outcomes are identified. 1.4 Task requirements such as completion time and quality measures are identified.
2. Plan steps required to complete task	2.1 Based on instructions and specifications provided, the individual steps or activities required to undertake the task are understood and where necessary clarified. 2.2 Sequence of activities required to be completed is identified in plan. 2.3 Planned steps and outcome are checked to ensure conformity with instructions and relevant specifications.
3. Review plan	3.1 Outcomes are identified and compared with (planned) objectives, task instructions, specifications and task requirements. 3.2 If necessary, plan is revised to better meet objectives and task requirements.

RANGE STATEMENT

This unit applies to the activities related to planning to undertake a routine task. The task and associated planning activity are carried out under supervision. The plan may or may not be documented. The task involves one or more steps or functions carried out routinely on a regular basis. The planning activity does not require the exercise of judgement as to priorities or time limitations, it requires that precise information provided in the instructions be accurately followed, steps in the process be completed in the appropriate sequence and that the time limits specified are met.

Instructions may include but not limited to:

- standard operation sheets
- clear specifications and requirements
- quality and time allowances
- standard operating procedures

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use of planning activities relating to instructions, information sources and meeting procedures listed within the range statement relative to the work orientation

(1) Critical Aspects of Evidence

This unit should be assessed in conjunction with other specialisation or core units and not in isolation. The assessment should be linked with performance of normal workplace activities where the competency covered by this unit is demonstrated concurrently with other core or elective competencies. The assessment of this competency may be associated with the assessment of core or elective units that require planning for undertaking a routine task in the individual's field of work.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to plan to undertake a routine task
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- basic level of ability in speaking
- basic level in reading
- basic level in writing English
- basic numeracy
- task requirements
- work place operating procedures
- the use of work schedules, charts, work bulletins and memos

Skills

The ability to:

- work safely to instructions
- convey information in simple English to invoke correct actions
- apply quality procedures
- read and interpret simple drawings, and specifications
- plan a routine task
- undertake a routine task

Basic numeracy means the ability to perform simple arithmetic using whole numbers applying the four basic rules of addition, subtraction, multiplication and division. The unit however does not refer to competence in English but in communication. English language ability should be professionally assessed

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The communication Activities undertaken should be consistent with the individual's field of work and be based on Interaction with others related to workplace tasks and procedures, tools, equipment, materials and Documentation relevant to that field of work. The competencies covered by this unit would be Demonstrated by an individual working alone or as part of a team. Assessment should be Conducted in an environment that the individual is familiar with.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0171A: Use graduated measuring devices

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively measure with graduated devices, and applies to all individuals working in the metal, engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

1. Use a range of graduated devices to measure/determine dimensions or variables	1.1	Selected appropriate device or equipment to achieve required outcome.
	1.2	Used correct and appropriate measuring technique.
	1.3	Measured accurately to finest graduation of instrument. As appropriate to field or area.
2. Maintain graduated devices	2.1	Carried out routine care and storage of devices to manufacturer's specification or standard operating procedure
	2.2	Checked and made routine adjustments to devices eg "zeroing".

RANGE STATEMENT

This unit applies to work undertaken in field, workstation and workshops. Work can be undertaken under supervision or part of team environment. This unit covers measurement skills requiring straightforward application of the measuring device and may utilise the full range of graduations of measuring device.

Measuring devices may include but not limited to:

- verniers,
- feeler gauges
- pressure gauges
- squares
- levels
- micrometers,
- dial indicators
- thermometers
- measuring tapes
- protractors

Measurements undertaken may include but not limited to:

- length /width/depth
- roundness
- squareness
- flatness angle
- angles
- clearances
- measurements that can be read off antilog, digital or other graduated device
- plumb ness

Electrical/electronic devices used are those not requiring the connection or disconnection of circuitry. Measurements may include metric and imperial measurement. All measurements undertaken to standard operating procedures. Adjustment of measuring devices is through external means and includes zero and linear adjustment.

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use graduated measuring devices in accordance with the range listed in the range of variables statement, relevant to the work orientation.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling recording and reporting associated with the use of graduated measuring devices or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- Demonstrate safe working practices at all times
- Demonstrate the ability to use graduated measuring devices
- Communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- Take responsibility for the quality of their own work
- Perform all tasks to specification
- Use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(2) Pre-requisite Relationship of Units

For straightforward use of comparison or basic measuring devices Unit MEMCOR0041A (Use comparison and basic measuring devices) should be accessed.

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- comparison devices
- comparison measurements
- comparative measurements
- electrical/electronic devices
- basic measuring devices
- reading
- writing English
- basic numeracy

Skills

The ability to:

- follow safely to instructions
- use power tools and hand tools
- use measuring devices
- adjust measurements
- handle materials
- select material
- apply quality assurance

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both in accordance with workplace procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0191A: Use hand tools

Competency Descriptor:

This unit deals with skills and knowledge required to competently select and use appropriate hand tools of the metal engineering and maintenance trades, and applies to all individuals in the industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Use hand tools	<p>1.1 Selected appropriate hand tools according to the task requirements.</p> <p>1.2 Hand tools used to produce desired outcomes to job specifications which may include finish, tension, size or shape.</p> <p>1.3 Adhered to all safety requirements before, during and after use.</p> <p>1.4 Unsafe or faulty tools identified and marked for repair according to designated procedures before, during and after use.</p> <p>1.5 Carried out routine maintenance of tools, including hand sharpening according to standard operational procedures, principles and techniques.</p> <p>1.6 Hand tools are stored safely in appropriate location according to standard operational procedures and manufacturer's recommendations.</p>

RANGE STATEMENT

Work undertaken under supervision or in a team environment using predetermined standards of quality, safety and workshop procedures involving the use of various hand tools for applications, maintenance tasks and the finishing of items or components metallic and non-metallic material to size and shape using engineering principles, tools, equipment and procedures.

Hand tools may include but not limited to:

- hacksaws
- hammers
- punches
- screwdrivers
- sockets
- wrenches
- scrapers
- chisels
- gouges
- wood planes
- files of all cross-sectional shapes and types.

Applications may include hand tools used for

- adjusting,
- dismantling
- assembling
- finishing
- cutting
- scraping
- cleaning,
- lubricating,
- tightening
- simple tool repairs
- hand sharpening
- adjustments

EVIDENCE GUIDE

Competency is to be demonstrated by the safe and effective use of particular hand tools listed within the range of variables statement relevant to the work orientation.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of hand tools or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to use hand tools
- take responsibility for the quality of their own work
- plan tasks in all situations and review task requirements as appropriate
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

This unit should not be selected if the hand tool is dedicated to a single operation or machine and if only a machine specific/customised tool is used. For using power tools used for hand held operations see Unit MEMCOR0111A (Use power tools).

(3) Underpinning Knowledge and Skills**Knowledge**

Knowledge of:

- workplace and equipment safety requirements and OH&S guidelines
- work shop procedures
- technical applications
- hand tools and equipment
- materials
- materials handling whilst operating tools

Skills

The ability to:

- work safely to instructions
- apply appropriate hand-eye co-ordination in the use of tools
- handle/hold materials during operation of tools
- select appropriate tools for material usage
- communicate effectively
- use tools correctly

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills

MEMFAB0041A: Carry out mechanical cutting operations – (basic)

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively carry out mechanical cutting as applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Determine job requirements	1.1	Job specification and requirements are determined from job sheets and/or instructions.
		1.2	Appropriate method/machine is selected to meet specifications.
		1.3	Machine is loaded and adjusted appropriately for operation and is consistent with standard operating procedures.
2.	Select/set up machine tooling	2.1	Selected most appropriate tooling.
		2.2	Installed tooling correctly using standard operating procedures.
		2.3	Machine is set up and adjusted using standard operating.
3.	Operate mechanical cutting machine	3.1	Appropriate stops and guards are set and adjusted as required.
		3.2	Material is secured and correctly positioned using measuring equipment as necessary.
		3.3	Machine is started and stopped safely to standard operating procedures.
		3.4	Machine is operated to cut/hole material to specifications using standard operating procedures.
		3.5	Lubricant used as required.
		3.6	Appropriate safety precautions are taken.
4.	Check material for conformance to specification	4.1	Material is checked against specification.
		4.2	Machine and/or tooling is adjusted as required

- 4.3 Material is cut and/or holed to within workplace tolerances.
- 4.4 Material used in most economical way.
- 4.4 Codes and standards are observed.

RANGE STATEMENT

This unit may cover the operation of a number of the following activities:

- sawing
- shearing
- cropping
- holing /boring

Materials may include:

- ferrous metals
- non-ferrous metals
- non-metallic products

Examples of machines that could be covered include:

- guillotines
- croppers
- cold saws
- band saws
- automatic saws

Work is undertaken under supervision or as part of a team environment to predetermined:

- standards of quality
- safety
- workshop procedure.

This unit includes the set up and operation of a range of:

- mechanical cutting equipment
- holing /holing equipment

Typical applications of this unit may include cutting for:

- manufacture
- production
- cutting of materials selected from stores in a maintenance environment
- fabrication

EVIDENCE GUIDE

Competency is to be demonstrated safely and effectively when cutting material in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to setting up mechanical cutting equipment and during the cutting process
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in setting up cutting equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective cutting to produce designed cut material

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the mechanical cutting of materials or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

This unit does not cover hand or hand held power tools used for cutting purposes eg: circular saws, nibblers and side grinder. These skills are covered by other units; see Unit MEMCOR0191A (Use hand tools) and Unit MEMCOR0111A (Use power tools).

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements including relevant OH&S legislation and regulations
- cutting equipment
- cutting processes operations or activities
- hand tools and equipment
- materials relative to cutting processes
- materials preparation
- manual handling
- measurement
- drawings, sketches and instructions

Skills

The ability to:

- work safely to instructions
- interpret relative drawings and instructions
- use power tools and hand tools
- select material
- measure relative to cutting processes
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMPO0081A: Use workshop machines for basic operations

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively use workshop machines for basic operations and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

1. Determine job requirements	1.1	Job requirements are interpreted.
	1.2	Appropriate machine is selected to meet requirements.
2. Set up machine	2.1	Tools are selected where appropriate.
	2.2	Cutting tools are sharpened as required.
	2.3	Tools are correctly installed using standard operating procedures.
	2.4	Appropriate guards are set and adjusted as required.
3. Operate machine	3.1	Material to be machined is positioned and secured
	3.2	Machine is operated appropriately to suit job and material requirements.
4. Check finished component	4.1	Machined component are checked against requirements and predetermined finish.

RANGE STATEMENT

Work undertaken under supervision or in a team environment using predetermined standards of quality, safety and workshop procedures. This unit covers basic machining in a maintenance or jobbing environment. The machines include but are not limited to lathe, radial arm drill, etc., and covers the sharpening of tools as required.

Instruments:

- tapes
- ruler
- vernier
- callipers
-
- feeler gauges
- slip gauges
- range of micrometer instruments

Working hold devices including:

- jigs/fixtures
- vices
- chuck/ collets
- mounting direct to table,
- automatic or manual operation

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the manual metal arc welding all process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to perform basic machining processes efficiently.
- communicate information about tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- plan tasks in all situations and review task requirements as appropriate
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Apply principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering)
- MEMCOR0191A Use hand tools

This unit is not to be selected when Units MEMMPO0021A (Perform general machining) or MEMMPO0061A (Operate and monitor machine/process) have already been selected. For hand held/power tools use MEMCOR0111A (Use power tools).

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements including relevant OH&S regulations
- metal properties and classification
- common machine setting/holding tools
- metal lathe machines (capstan, center or turret)
- basic machining techniques
- setting basic metal machines
- machining processes
- hand tools and equipment
- materials preparation
- manual handling and lifting
- measurement
- drawings, sketches and instructions

Skills

The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings and instructions
- use basic machining equipment
- identify/select material/equipment
- identify/select machining processes
- handle material, tools and equipment
- measure relative to machining processes
- identify/select materials suitable for machining processes
- prepare materials relative to the machining process
- perform basic machining processes efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMAH0081A: Perform housekeeping duties

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively perform housekeeping duties. It applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare work	1.1	OH&S requirements associated with application tasks and workplace environment are recognized and adhered to.
		1.2	Appropriate personal protective equipment is selected, correctly fitted and used.
		1.3	Quality Assurance requirements associated with company's operations is recognized and adhered to.
		1.4	Tools and equipment for handling materials/goods, non-toxic waste is selected and is consistent with job requirements.
		1.5	Tools and equipment for handling materials/goods is checked for serviceability and any faults reported to supervisor.
2.	Correctly manual handle, sort and stack engineering /construction material	2.1	Common engineering materials is recognized and selected for sorting and stacking/stockpiling to supervisor's instructions and/or specifications.
		2.2	Handling characteristics of materials are identified and appropriate handling techniques applied.
		2.3	Specific handling requirements for hazardous materials are applied.
		2.4	Materials are stored, stacked/stockpiled and protected clear of traffic ways so they can be easily identified and retrieved
		2.5	Appropriate signage and barricades are erected where applicable in order to isolate stored materials from workplace traffic or access.
		2.6	Correct manual handling techniques are used.

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|----|--|-----|--|
| 3. | Prepare for mechanical handling of materials | 3.1 | Materials are stacked/banded for mechanical handling in accordance with type of material and plant/equipment to be used. |
| | | 3.2 | Rigger is assisted with the loading, unloading, moving, locating and/or installing materials. |
| | | 3.3 | Materials are safely handled with assistance of pallet trolley, forklift or hoist. |
| 4. | Handle and remove waste safely | 4.1 | Waste materials are handled correctly and safely according to OH&S and requirements of regulatory authorities. |
| | | 4.2 | Hazardous materials are identified for separate handling. |
| | | 4.3 | Non-toxic materials are removed using correct procedures. |
| | | 4.4 | Dust suppression procedures are used to minimise health risk to work personnel and others. |
| 5. | Clean up | 5.1 | Tools and equipment are cleaned, maintained, and stored. |
| | | 5.2 | Unused materials are safely stacked/stockpiled stored. |
| | | 5.3 | Waste materials are disposed of safely. |
| | | 5.4 | Site is cleaned and cleared of debris and unwanted material. |

RANGE STATEMENT

Competency is to be demonstrated by the effective use of techniques relating to instructions, information sources and meeting procedures listed within the range statement relative to the work orientation.

Tools and equipment includes but is not limited to:

- Brooms
- hoses
- shovels
- rakes
- wet and dry industrial vacuum cleaners
- wheelbarrows
- pallet trolley
- materials hoists
- forklifts
- buckets



- Engineering materials include but are not limited to:
 - bricks and concrete masonry
 - mortar components – cement, coarse aggregate, sand
 - timber
 - structural steel sections/components
 - concrete
 - scaffolding components, pipe sections
 - plywood and particle board
 - metal sheeting
 - steel reinforcement
 - insulation
 - glass
 - paints and sealants
 - plaster sheeting

Protection of stacked/stored materials may include:

- covering
- tying or banding
- barricades
- signs
- locked away (hazardous materials)

Dust suppression procedures may include:

- spraying with water
- covering
- use of vacuum cleaner

Removal of materials to include processes of recycling and salvage where applicable.

OH&S requirements to be in accordance with (company/industry) guidelines and regulations.

Work to be undertaken as part of a team or individually under supervision of appropriately certificated persons where applicable.

Reporting of faults may be verbal or written.

EVIDENCE GUIDE

Competency is to be demonstrated by the effective handling and storing/stacking of appropriate construction materials listed within the range of variables statement, relevant to the work orientation.

(1) Critical Aspects and Evidence

It is essential that competence is observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations and Industry guidelines applicable to workplace operations
- indicate compliance with organisational policies and procedures including Quality Assurance requirements
- carry out correct procedures prior to and during application of materials handling processes
- demonstrate safe and effective operational use of tools and equipment
- demonstrate safe application in the process of cleaning up
- interactively communicate with others to ensure safe and effective operations

**(2) Pre-requisite Relationship of Units**

- Nil

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements including relevant codes and regulations
- hand tools and equipment
- materials
- materials handling
- Quality Assurance
- range of communication mediums (verbal and non-verbal)

Skills

The ability to:

- work safely to instructions
- use hand and portable tools
- handle materials
- identify/select material
- measure
- communicate effectively
- dispose of material safely
- use disposal equipment and tools as required

(4) Resource Implications

The following resources should be made available:

- general engineering and construction materials relative to construction processes
- plant and equipment appropriate to handling processes
- hand tools appropriate to handling processes
- suitable work area appropriate to construction process
- OHS information

(5) Method of Assessment

Competency shall be assessed while work is being done under direct supervision with regular checks, but may include some autonomy when working as part of a team.

Competency in this unit may be determined concurrently, based on integrated project work.

Assessment may be by intermittent checking at the various stages of the job application in accordance with the performance criteria, or may be at the completion of each process.

(6) Context of Assessment

Competency shall be assessed in the workplace or simulated workplace environment in accordance with work practices and safety procedures.

**CRITICAL EMPLOYABILITY SKILLS**

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMAH0071A: Perform manual handling and lifting

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively manually handle materials as applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Material handling

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Lift materials manually	1.1 Material weight is determined correctly utilising most appropriate technique. 1.2 Lifting techniques are undertaken to safe work standards, standard operating procedures. (Type of movement, methods of movement, storage condition, height and position).
2. Move/shift materials manually	2.1 Appropriate equipment are selected where required 2.2 Material is placed safely and securely on moving equipment 2.3 Material is relocated ensuring safety of personnel and security of material. 2.4 Material is unloaded from moving equipment and placed in a safe and secure manner.

RANGE STATEMENT

Work undertaken under supervision or in a team environment. Material weight is determined utilising scales or interpreting signage. Maximum manual lifting weight limited to safe work standards. All work and work practices undertaken to regulatory and standard requirements and standard operating procedures where applicable.

Moving/shifting equipment may include but not limited to:

- hand trolleys
- wheelbarrows
- motorised/hand pallet trucks (not sit on),
- hand carts
- dedicated production or process lifting equipment
- basket s
- spreader bars
- cradles or the like attached to lifting equipment
- rope

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively manually handling materials in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to handling materials
- demonstrate safe and effective operational use of lifting equipment, tools, and attachments
- demonstrate correct procedures in manual handling
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations demonstrate effective handling technique to produce designed outcome

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling recording and reporting associated with manual handling or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- basic reading
- basic numeracy
- material classification
- manual handling technique(s)/methods
- handling processes
- material identification, transportation and storage
- handling tools and equipment
- materials preparation
- manual handling
- weight determination
- drawings, sketches, signage and instructions

Skills

The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings signage and instructions
- use handling tools and equipment
- identify/select material
- identify/select handling method
- handle material, tools and equipment
- determine weights
- identify/select materials relative to transportation and storage methods
- manual handle material/equipment efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMSUF0061A: Prepare for the application of protective coatings

Competency Descriptor:

This unit deals with the skills and knowledge required for effectively carrying out preparation for application of protective coatings and applies to individuals working in metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan for process	<p>1.1 Quality Assurance requirements of company's/manufacturer's protective coating operations are recognised and adhered to.</p> <p>1.2 Preparation and planning requirements are identified from drawings and/or plans.</p> <p>1.3 Occupational Health and Safety (OH&S) requirements are determined and adhered to in accordance with application tasks and workplace environment.</p> <p>1.4 Safety hazards are identified and correct procedures adopted to minimise risk to self and others.</p> <p>1.5 Materials are selected according to supervisor's instructions and safely handled, stored and ready for application.</p> <p>1.6 Appropriate personal protective equipment are selected, correctly fitted and used.</p> <p>1.7 Tools and equipment are selected and is consistent with job requirements.</p> <p>1.8 Tools and equipment are checked for serviceability and any faults reported to supervisor.</p> <p>1.9 Fixing/fasteners/jigs selected are consistent with job requirements and checked for serviceability.</p>
2. Prepare materials selected for protective coating process	<p>2.1 Activities for material preparation are identified from specifications or supervisor's instructions.</p> <p>2.2 Fasteners/fixing are prepared for installation.</p> <p>2.2 Material preparation is carried out to satisfy requirements of fabrication/manufacturing process.</p>

3.	Prepare work area suitable for protective coating process	3.1	Activities to be carried out in work area are identified from surfaces to be finished and height to be accessed.
		3.2	Work area is prepared for protective coating process to supervisors instructions.
4.	Use tools, plant and equipment appropriate for protective coating	4.1	Regular hand and power tools suitable for the application process is identified with job requirements.
		4.2	Hand and power tools are used safely and effectively to carry out processes.
5.	Assist with initial preparation of surfaces for protective coating	5.1	Sound surfaces are prepared by sanding, blasting, brushing and/or washing
		5.2	Unsound surfaces are prepared by scraping and/or sanding.
6.	Assist with preparing surfaces for final finish	6.1	Stopping/filling materials are applied to a flush and even finish.
		6.2	Surface is sanded by hand/tools.
		6.3	Primer/sealer/undercoats are applied to surface by brush and/or roller.
7.	Clean up	7.1	Materials are stacked /stored for re-use or disposal.
		7.2	Work area is cleared.
		7.3	Tools and equipment are cleaned and stored in a cool place.
		7.4	Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements.

RANGE STATEMENT

This unit applies to the work undertaken in a team environment for the preparation and subsequent application of protective for metal engineering and maintenance trade areas.

Process includes:

- worksite preparation
- surface preparation
- application of prime and intermediate coatings

Tools and equipment may include but not limited to:

- scrapers
- filling
- knives/blades
- putty knives
- duster brushes
- hand sanders
- mechanical sanders
- paint stirrers
- drop sheets
- wire brushes
- hammer
- nail punches
- paint pans/buckets
- spray paint equipment and accessories
- brush-ware accessories
- roller frames
- covers
- roller accessories
- ladders
- trestles
- planks
- hop-ups
- aluminium mobile scaffolding

Materials may include:

- preparatory products
- paints – solvent-borne (alkyd, urethane, urethane/alkyd, urethane oil or modified alkyd resins) and latex (PVA, PVA/acrylic, acrylic and styrene acrylic)

Surfaces to be treated may include common profiles encompassing:

- ply
- building boards (including MDF and particle board)
- fibre cement products, iron and steel
- zinc coated and zinc alloy coated steel products
- masonry products
- clay bricks
- concrete blocks
- concrete surfaces
- cement render
- set plaster
- plaster glass products
- paper-faced gypsum plaster board
- previously coated/treated surfaces
- fabricated steel products

EVIDENCE GUIDE

Competency is to be demonstrated by the safe and effective preparation of materials using the processes listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- indicate compliance with organizational policies and procedures including Quality Assurance requirements
- carry out correct procedures carried out prior to and during application of construction process
- use tools, plant and equipment safely and effectively
- Processes comply with preparation of surfaces for protective coating

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Apply principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0191A Use hand tools
- MEMCOR0111A Use power tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements
- portable power tools
- hand tools and equipment
- materials relevant to application of protective coating
- materials handling
- measurement and calculation
- interpreting simple diagrams
- fixing and fasteners consistent with painting and decorating requirements
- workplace communication requirements

Skills

The ability to:

- work safely to instructions
- use power and hand tools
- handle material
- select material
- communicate effectively
- measure relative to the process
- prepare for the application of protective coating

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0041A: Remove/install standard mechanical seals

Competency Descriptor:

This unit deals with skills and knowledge required to competently remove/install standard mechanical seals and applies to individuals in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Determine mechanical seal requirements	1.1 Principles of mechanical seals are understood. 1.2 Operational function of mechanical seals and components are understood. 1.3 For new mechanical seal installation, specifications are interpreted from engineering drawings etc.
2. Dismantle mechanical seal installations	2.1 Mechanical seal assembly are examined and appropriate dismantling techniques, tools and equipment are selected. 2.2 Mechanical seal assembly is dismantled using correct and appropriate engineering techniques and safe workshop procedures. 2.3 All components and parts are examined for wear to determine need for repair or replacement. 2.4 Where applicable, serviceable items are repaired by appropriate means. 2.5 Primary sealing elements and secondary seals are removed for replacement where required.
3. Select replaceable items	3.1 Replaceable items are selected using manufacturer's catalogues; spare parts lists, engineering specifications or sample.

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|---|---|
| 4. Reassemble mechanical seal installations | 4.1 Mechanical seal components are fitted together including seal head, secondary seals, seat assembly shaft and housing. |
| | 4.2 Mechanical seal assembly is tensioned and adjusted to manufacturer's specifications. |
| | 4.3 Mechanical seal assembly is tested using appropriate methods for compliance with specifications. |

RANGE STATEMENT

Work undertaken under supervision using predetermined standards of quality, safety and workplace procedures.

Tasks involve the checking, installation, removal and replacement of a range of mechanical seals including carbon, stellite, neoprene and other associated materials.

Skills covered by this unit include the knowledge of appropriate applications for a range of mechanical seals and the ability to remove, select, repair or replace all component parts of the seal. All removal and installation practices to be undertaken in conformance to safe workplace practices and procedures, using correct tools and equipment.

Seal replacements selected from manufacturer's catalogues, spare parts lists or engineering specifications. Included is the fitting of mechanical seals in new installations according to specifications interpreted from engineering drawings.

Lubrication requirements attended to according to supplier's instructions and recommendations or specifications.

Mechanical seal assembly tested using appropriate methods for compliance with specifications and operational performance.

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively removing and installing mechanical seals in accordance with the range listed within the range of variables statement.

(1) Critical Aspect of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to removal and installation of mechanical seals
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in removing mechanical seals
- demonstrate correct procedures in installing mechanical seals
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0171A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and simple drawings
- MEMCOR0191A Use hand tools
- MEMCOR0111A Use power tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Occupational Health and Safety regulations
- basic tools for mechanical seals removal/installation
- standard removal/installation tasks
- standard mechanical seals
- standard operational test for mechanical seals
- standard application of mechanical seals
- reading
- writing basic English
- basic numeracy

Skills

The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and installation of mechanical seals

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0061A: Remove and replace basic pneumatic system components

Competency Descriptor:

This unit deals with skills and knowledge required to competently remove and replace pneumatic system components and applies to mechanical maintenance personnel.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Check pneumatic system components	1.1 System components are identified correctly.
	1.2 The characteristics and basic operational function of each component is understood.
	1.3 The operational function of each component is inspected and tested by supervisor.
	1.4 Correct operation of each component assessed against specifications.
2. Identify, remove/replace faulty pneumatic system components	2.1 Faulty system components are identified and malfunction confirmed by supervisors report or inspection and testing.
	2.2 Faulty system components are removed and replaced to manufacturer's/site specifications.
	2.3 Replacement parts are selected from manufacturer's specifications
	2.4 System components are tested for correct operation assessed against specifications.
	2.5 Correct operation of the pneumatic system is confirmed to standard operating procedure.
	2.6 Appropriate follow up procedures are adopted according to standard operating procedure.
	2.7 Where appropriate, service reports are completed using standard operating procedures.

- | | | | |
|----|----------|-----|---|
| 3. | Clean up | 3.1 | Materials/supplies are stacked /stored for re-use or disposal. |
| | | 3.2 | Work area cleared. |
| | | 3.3 | Tools and equipment are cleaned and stored in a cool place. |
| | | 3.4 | Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements company's operating procedures. |

RANGE STATEMENT

Work undertaken under supervision using predetermined standards of safety, quality and work procedures.

Pneumatic system components identified, inspected and assessed using fluid power principles to predetermined specifications interpreted from data sheets and maintenance diagrams.

Removal and replacements to site or manufacturers specifications.

Pneumatic system components may include high pressure seals, linear, rotary actuators, directional control valves, proportional valves, timers, counters, sensors, pneumatic motors, pressure control valves, lines, hoses and other associated equipment.

Location/condition may include:

- workshops
- plants
- in the field
- confined spaces
- elevated positions
- damp and wet situations

Protective clothing may include:

- safety boots
- safety helmet
- welding helmet
- coverall
- leggings
- gloves

Applications may include hand tools used for:

- adjusting,
- dismantling
- assembling
- finishing
- cutting
- scraping
- cleaning
- lubricating
- tightening
- simple tool repairs
- hand sharpening
- adjustments

Hand tools may include but not limited to:

- hacksaws
- hammers
- punches
- screwdrivers
- sockets
- wrenches
- scrapers
- chisels
- gouges
- files of all cross-sectional shapes and types

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively removing and replacing pneumatic system components in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to removal and replacement of pneumatic system components
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in removing pneumatic system components
- demonstrate correct procedures in installing pneumatic system components
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0051A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- Occupational Health and Safety regulations
- basic tools for removal/replacing pneumatic system components
- standard characteristics of basic pneumatic system components
- standard removal/replacing tasks
- standard pneumatic system components
- standard operational test for pneumatic systems
- manufacturers standard specification
- standard application/operation of pneumatic system components
- reading
- writing basic English
- basic numeracy

Underpinning Knowledge and Skills (cont'd)Skills

The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and replacement of pneumatic system components

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0071A: Remove and replace basic hydraulic system components

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively maintain hydraulic system components and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Identify and check hydraulic system components	1.1 System components are identified correctly.
	1.2 The characteristics and basic operational function of each system component are understood.
	1.3 The operational function of each component is inspected and tested by supervisor.
2. Remove and replace faulty hydraulic system components	2.1 Faulty system components are identified and malfunction confirmed by supervisors report or inspection and testing.
	2.2 Faulty system components are removed and replaced to manufacturer's/site specifications.
	2.3 Replacement parts are selected from manufacturer's catalogues according to required specifications.
	2.4 System components are reassembled and tested for correct operation and assessment against specifications.
	2.5 Correct operation of the hydraulic system is confirmed to designated operating procedure.
	2.6 Appropriate follow up procedures are adopted according to standard operating procedure.
	2.7 Where appropriate, service reports are completed using standard operating procedures.
3. Clean up	3.1 Materials/supplies are stacked /stored for re-use or disposal.
	3.2 Work area is cleared.

- 3.3 Tools and equipment are cleaned and stored in a cool place.
- 3.4 Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements and company's operating procedures.

RANGE STATEMENT

Work undertaken under supervision using predetermined standards of safety, quality and work procedures.

Hydraulic system components identified, inspected and assessed using fluid power principles to predetermined specifications interpreted from data sheets and maintenance diagrams.

Removal and replacements carried out to site or manufacturer's specifications.

Hydraulic system components may include high pressure seals, linear, rotary actuators, directional control valves, proportional valves, timers, counters, sensors, pumps, pressure control valves, lines, hoses and other associated components.

RANGE STATEMENT

Competency is to be demonstrated by safely and effectively removing and replacing hydraulic system components in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to removal and replacement of hydraulic system components
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in removing hydraulic system components
- demonstrate correct procedures in replacing hydraulic system components
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0051A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0071A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Occupational Health and Safety regulations
- basic tools for removal/replacing hydraulic system components
- standard characteristics of basic hydraulic system components
- standard removal/replacing tasks
- standard hydraulic system components
- standard operational test for hydraulic systems
- manufacturers standard specification
- standard application/operation of pneumatic system components
- reading
- writing basic English
- basic numeracy

Skills

The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and replacement of pneumatic system components

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMPO0011A: Perform daily operational maintenance of machines/equipment

Competency Descriptor:

This unit deals with skills and knowledge required to competently perform daily operational maintenance of machines/equipment and applies to and applies to individuals in the industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Undertake programmed safety and maintenance checks	1.1 Checks are undertaken safely and to prescribed procedure.
	1.2 Status/report are recorded on check sheet or reported orally.
2. Undertake programmed maintenance	2.1 Removal/replacement of consumable and components are undertaken to prescribed procedure and instructions are followed.
	2.2 Fluids and lubricants are replaced and/or topped up to prescribed schedule.

RANGE STATEMENT

Work undertaken under supervision or in a team environment to predetermined specifications.

Machines/equipment range includes manuals, semi-automatic and automatic machines of a stand-alone continuous production or process nature.

Consumable replacements include air filter, oil wipers, grease containers, tool tips, indicator globes, fluids and lubricants, guides and limit switch actuators.

Adjustments are of a limited nature and include safety guards, stops, wear pads and tool holders, nipping up of glands and adjustment of scrapers and aprons etc.

Hand tools may include but not limited to:

- hacksaws
- hammers
- punches
- screwdrivers
- sockets
- wrenches
- scrapers
- chisels
- gouges
- wood planes
- files of all cross-sectional shapes and types.

Location/condition may include:

- workshops
- plants
- in the field
- confined spaces
- elevated positions
- damp and wet situations

Applications may include hand tools used for

- adjusting,
- dismantling
- assembling
- finishing
- cutting
- scraping
- cleaning,
- lubricating,
- tightening
- simple tool repairs
- hand sharpening
- adjustments

Protective clothing may include:

- safety boots
- safety helmet
- welding helmet
- coverall
- leggings
- gloves

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively performing routine operational maintenance of machines/equipment in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to performing routine operational maintenance of machines/equipment
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing programmed maintenance checks
- demonstrate correct procedures in starting and stopping machines/equipment

- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A (Follow principles of occupational health and safety (OH&S) in work environment)
- MEMCOR0161A (Plan and undertake a routine task)

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- Occupational Health and Safety regulations
- basic measuring devices
- standard machines/equipment range
- standard consumable replacements
- standard machine/equipment adjustments
- reading
- writing basic English
- basic numeracy

Skills

The ability to:

- follow safely to instructions
- use power tools and hand tools
- use measuring devices
- adjust measurements
- handle materials
- select material
- apply quality assurance
- perform operational maintenance of machines/equipment

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0081A: Remove dismantle, assemble and replace basic engineering components

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively remove dismantle, assemble and replace engineering components and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Check engineering components	1.1	System components are identified correctly.
		1.2	The characteristics and basic operational function of each system component are understood.
		1.3	The operational function of each component are inspected and tested by supervisor.
2.	Remove/replace engineering components	2.1	Engineering components are inspected by supervisor and task requirements analysed.
		2.2	Appropriate tools and equipment are selected and component/s are prepared for removal/replacement.
		2.3	Components are removed/replaced using standard operating procedures, tools and equipment.
		3.4	Engineering components are clearly marked to aid reassembly.
3.	Dismantle engineering components	3.1	Engineering components are inspected by supervisor and task requirements analysed.
		3.2	Appropriate tools and equipment are selected and component/s prepared for dismantling.
		3.3	Components are dismantled using standard operating procedures, tools and equipment.
		3.4	Engineering components are clearly marked to aid reassembly.

- 4. Replace faulty components
 - 4.1 Specifications for components are obtained from appropriate source and verified by supervisor.
 - 4.2 Damaged or faulty components are assessed by supervisor against specifications.
 - 4.3 Faulty components are identified for repair, replacement or adjustment.
- 5. Select replacement components
 - 5.1 Where applicable, replacement and/or repaired parts are selected for reassembly.
- 6. Assemble basic engineering components into assemblies or sub-assemblies
 - 6.1 Appropriate techniques are applied in the preparation, assembly and adjustment of components.
 - 6.2 Correct lubrication, packing and sealing materials are applied correctly and in conformance to job specifications and supervisor instructions.
 - 6.3 Final component is assembly inspected, tested and adjusted as necessary for compliance with operational specifications.
 - 6.4 Final component is returned to use according to standard operating procedure.
- 7. Clean up
 - 7.1 Materials/supplies are stacked /stored for re-use or disposal.
 - 7.2 Work area is cleared.
 - 7.3 Tools and equipment are cleaned and stored in a cool place.
 - 7.4 Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements and company's operating procedures.

RANGE STATEMENT

Work undertaken under supervision or in a team environment using predetermined standards of quality, safety and workshop procedures.

This unit involves the dismantling, inspection, replacement, assembling of engineering components.

All specifications interpreted from manufacturers' manuals, engineering drawings, detailed/technical sketches and associated data sheets.

Tasks are undertaken utilising engineering principles, designated procedures, appropriate tools, equipment and safe workshop practices.

Replacement parts are proved by supervisor and selected from manufacturers' catalogues, etc.

Appropriate techniques utilised in the assembly of component parts using fastening equipment and methods which ensure conformance to specifications, operational performance, quality and safety; this may include the straightforward removal and replacement of pre-manufactured bearings and seals.

Appropriate lubrication, packing, sealing materials are selected and applied in conformance to standard operating procedure.

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively removing, dismantling, assembling and replacing engineering components in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to undertaking task
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in removing/replacing engineering components
- demonstrate correct procedures in dismantling and assembling engineering components
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0051A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0071A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Occupational Health and Safety regulations
- basic tools for removal, replacing, dismantling and assembling engineering system components
- standard characteristics of basic engineering system components
- standard removal/replacing tasks
- standard engineering system components
- standard operational test for basic engineering systems
- manufacturers standard specification
- standard application/operation of pneumatic system components
- reading
- writing basic English
- basic numeracy

Skills

The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and replacement of engineering system components

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) **Context of Assessment**

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0012A: Plan a complete activity

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively plan a complete activity to required objectives/guidelines and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

1. Identify activity requirements	1.1	Instructions as to objectives and performance required are identified.
	1.2	Relevant specifications for activity outcomes are obtained, understood and where necessary clarified.
	1.3	Activity outcomes are identified.
	1.4	Activity requirements, including overall timeframe for activity, quality requirements and criteria for acceptable completion are identified.
2. Plan process to complete activity	2.1	Based on instructions as to objectives, performance requirements and specifications, the individual components of the activity are identified and prioritised.
3. Modify plan	3.1	Plan if necessary may be modified to overcome unforeseen difficulties or developments that occur as work progresses.

RANGE STATEMENT

Instructions may include timeframe, quality requirements, outcome requirements and performance requirements. Instructions carried out in accordance with established procedures. However, the activities may require a response and modification of procedures or choice of different procedures to deal with unforeseen developments.

The activity may require prioritising of the individual components to facilitate the meeting of the objectives. Examples of activities to be planned may include: fault diagnosis and repair of an item of equipment, a modification of an established sequence of assembly tasks.

Activities are normally performed by the individual undertaking the planned activity and associated reports are completed as required. Instructions refer to either formal or informal information about the task required.

Planning will be related to familiar work tasks and environments and be performed to standard operating procedures.

EVIDENCE GUIDE

Competency is to be demonstrated by individuals planning a complete activity in accordance with the performance criteria and as related to the work environment.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling recording and reporting associated with hand forging or other units requiring the exercise of skills and knowledge covered by this unit.

During assessment the individual will:

- take responsibility for the quality of their own work
- carry out instructions in accordance with established procedures
- plan a complete task in accordance with standard principles
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0161A Plan to undertake a routine task

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- quality systems in a workplace
- typical loss and damage control systems
- environmental standard framework and environmental licence provisions.
- work planning processes
- OH&S regulations/requirements,
- equipment, material and personal safety requirements processes at the worksite
- enterprise quality systems and processes
- operations environmental procedures and key constraints
- operations environment control measures
- research and interpretative skills
- plain English literacy and communication techniques
- technical literacy and communication skills
- basic problem solving skills

Skills

The ability to:

- to locate, interpret and apply relevant operational quality and environmental information
- question and actively listen, for example when obtaining information of quality and environmental working practices
- communication in plain English skills in relation to dealing with others involved in the work.
- to interpret and apply common industry terminology, and interpret symbols used for quality and environmental signage
- to assess quality and environmental issues
- to plan a complete activity

(4) Resource Implications

The candidate will be provided with:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- present evidence of credit for any off-job training related to this unit.

Assessor must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

All tasks involved must be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0042A: Interpret standard specifications and manuals

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively interpret quality specifications and manuals to achieve required objectives/guidelines and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Identify and access all documentation	1.1	Documentation covering all of the tiers of quality within the company are identified and used.
2.	Interpret documentation	2.1	Quality specification for specific processes and related systems are interpreted.
		2.2	The company quality improvement system related to the formal documentation are understood and used according to standard operating procedures.
3.	Explain documentation	3.1	Documentation relating to quality control/assurance is explained to appropriate personnel.
		3.2	Instructions based on documentation are given to appropriate personnel.
4.	Monitor quality processes/systems	4.1	Quality improvement systems are monitored and maintained.

RANGE STATEMENT

This standard covers a wide range of processes/systems and enterprises. It covers the interpretation of all of the tiers of quality documentation from the national factory act through to manuals, procedures and work instructions.

EVIDENCE GUIDE

Competency is to be demonstrated by individual interpreting quality specifications and manuals in accordance with the performance criteria and as related to the work environment.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the supervision and maintenance of the application of quality procedures or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- take responsibility for the quality of their own work
- Interpret quality specifications and manuals to achieve required objectives
- perform interpretation accurately
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- MEMCOR0091 Interpret sketches and technical drawings

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- design theory and its application to the workplace
- common engineering terminology and maintenance safety requirements
- relevant OH&S regulations/requirements
- equipment, material and personal safety requirements
- engineering drawing procedures and interpretative techniques
- plain English literacy and communication techniques
- technical literacy and communication skills
- basic problem solving skills

Skills

The ability to:

- to locate, interpret and apply relevant operational quality and environmental information.
- Question and actively listen, for example when obtaining information of quality and environmental working practices.
- communication in plain English skills in relation to dealing with others involved in the work
- to interpret and apply common industry terminology, and interpret symbols used for quality and environmental signage.
- to assess quality and environmental issues.
- to interpret quality specifications and manuals

(4) Resource Implications

The candidate will be provided with:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- present evidence of credit for any off-job training related to this unit

Assessor must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

All tasks involved must be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0052A: Operate in an autonomous team environment

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively operate in an autonomous team environment to achieve required objectives and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Determine work roles of team members	1.1 Team role and scope are determined and understood using standard operating procedure. 1.2 Role of self and team members are understood and where appropriate clarified by all team participants.
2. Participate in team planning	2.1 Appropriate methods are used to plan team activity or a number of related team activities. 2.2 Planning activity is undertaken on an individual or shared basis, incorporating individual's technical skills, knowledge and competence. 2.3 Effective and appropriate contributions are made to the total planning process.
3. Operate as team member	3.1 Effective and appropriate forms of communication are used to liaise with team members. 3.2 Contributed to the determination of time lines, quality standards and production requirements for the team. 3.3 Real or perceived issues are resolved by effective and appropriate contributions from team member. 3.4 Effective and appropriate contributions are made by team member to achieve team objectives, based on member's own technical skills, knowledge and competence.
4. Monitor and review team performance	4.1 Participated effectively in the planning and development of team review process.

	4.2	Appropriate data is collected on an individual and team basis using standard operating procedure.
	4.3	Data collected, is analysed and used by team and individual team members to evaluate team performance and determine future strategies.
5	Implement team performance improvements	5.1 Performance improvement processes appropriate to team activities are implemented on a collective and individual basis using standard operating procedure.

RANGE STATEMENT

This unit applies the skills necessary for effective participation by an individual in an autonomous team environment. Team parameters, constraints and objectives are determined by sources external to the team. Where as a result of team discussions or planning, team parameters require adjustment, then appropriate authorisation and approvals are established using standard operating procedures. Individual team participants would be already competent with technical aspects of team activities.

EVIDENCE GUIDE

Competency is to be demonstrated by

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with working in an autonomous team environment or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- take responsibility for the quality of their own work
- operate in an autonomous team environment to achieve required objectives
- demonstrate safe working practices at all times
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- plan tasks in all situations and review task requirements as appropriate
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0031A Operate in a work based team environment

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- operation work procedures.
- group dynamics and the impact of working effectively with others on individual and group performance.
- enterprise work systems, equipment, management and facility operating systems.
- enterprise policies and procedures and standard requirements in regard to workplace ethics
- basic analytical, problem solving, negotiation and conflict management techniques in relation to working with others.
- plain English and communication techniques

Skills

The ability to:

- communicate in relation to reading and understanding workplace documents.
- do basic analytical, problem solving, negotiation and conflict management tasks in relation to working with others.

(4) Resource Implications

The candidate will be provided with:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- present evidence of credit for any off-job training related to this unit.

Assessor must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

All tasks involved must be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. The individual would already be competent with the technical aspects of team activities.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0022A: Perform related computations

Competency Descriptor:

This unit deals with the skills and knowledge required to perform related computations and effectively carry out measurements of work to required tolerance, and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Estimates approximate answers	1.1	Answers are checked by using estimating techniques.
		1.2	Simple rounding off operations is performed when estimating.
2.	Performs basic calculations involving percentages	2.1	Simple calculations are performed to obtain percentages from information expressed in either fractional or decimal format.
3.	Applies the four basic rules to algebraic expression	3.1	Simple calculations on algebraic expressions are performed using the four basic rules - addition, subtraction, multiplication, and division.
4.	Performs basic calculations involving proportions	4.1	Simple calculations involving ratios and proportion are performed using whole numbers, fractions and decimal fractions.
		4.2	Information extracted from charts and graphs are used as a basis for decision-making.
5.	Interpret charts and graphs	5.1	Interpret information extracted from charts and graphs are interpreted correctly.
		5.2	Information extracted from charts and graphs are used as a basis for decision-making.
6.	Produces charts and graphs from given information	6.1	Information is used to produce simple charts and graphs as required.
7.	Perform basic calculation involving geometry	7.1	Calculations are performed to determine angles and linear dimensions.

RANGE STATEMENT

Calculations may be performed using pen and paper or on a calculator. All problems should have appropriate applications depending on the workplace. Interpretation of charts and graphs would usually extend to simple histograms, control charts, pie charts, etc. Data may be generated from readings taken or computer generated. Applications can include computation of pressure, volume, temperature, heat, speed, density, mass, force, efficiency etc.

Areas for discussion may include but not limited to:

- fraction, decimals and percentages
- costing and pricing
- ratio and proportion
- measurements and mensuration
- performing algebraic operation
- statistics
- geometry
- trigonometry

EVIDENCE GUIDE

Competency is to be demonstrated by individual performing computations in accordance with the performance criteria and as related to the work environment.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the computations being performed or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- take responsibility for the quality of their own work
- perform computations in accordance with standard principles
- perform computations accurately
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0051 Perform computations basic

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- numbers and basic arithmetic operations
- drawings and specifications
- basic operations in simple geometry,
- algebra
- costing and pricing
- ratio and proportion
- basic statistics (charts, tables scales and graphs)
- interpretation of measurement and calculations
- trigonometry
- geometry
- statistics
- data relative to the metal engineering and maintenance trade processes
- applications relevant to engineering skills trades e.g. pressure, volume, temperature, mass efficiency circuit computations, perimeters and areas etc.

Skills

The ability to:

- read and interpret drawings
- measure and calculate manually
- interpret measurements and calculations
- relate to and or perform calculations on related applications.
- communicate effectively

(4) Resource Implications

The candidate will be provided with:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- present evidence of credit for any off-job training related to this unit.

Assessor must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

All tasks involved must be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. An individual working alone should demonstrate the competencies covered by this unit or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0122A: Write technical reports (basic)

Competency Descriptor:

This unit applies to the skills and knowledge necessary to write reports effectively in a wide range of different contexts in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

- | | |
|------------------------------------|--|
| 1. Communicate concepts in writing | 1.1 Reports are written using appropriate terminology where required. |
| | 1.2 Reports discussed alternatives, difficulties and suggestions when required. |
| | 1.3 Reports are coherent and based on any analysis or research undertaken. |
| | 1.4 Conclusions are based on the facts in the report and recommendations are made if required. |
| | 1.5 Reports are completed within specified time. |
| | 1.6 References are acknowledged as required. |

RANGE STATEMENT

Report is used to denote any required written communication that goes beyond a simple recording of facts (such as completion of a pro forma shift production schedule) to include level of analysis and/or research.

Reports may be of a technical or non-technical nature. If the report is technical, it should be based on the writer having technical knowledge.

Conclusions and/or recommendations where required are based on research or analysis of data

Reports include graphs, charts, tables, etc. as required.

The analysis and conclusions should be consistent with the level of skill and knowledge of an employee working at that level. Simple analysis and work would be required

Grammar and usage may include:

- types and functions of sentences
- phrases and their functions
- subordinate clauses (adverbial adjectival, noun)
- subject and verb (focus on compound subjects, indefinite pronoun as subject collective noun as subject)
- pronouns and their antecedents
- verbs – action, linking, regular, irregular
- tenses- present, past, future, present perfect, past perfect, future perfect.
- adjectives and adverbs
- sentence faults – fragments and run-on

Communication skills may include:

- good listening skills
- effective listening skills (eliciting feedback, developing objectivity, learning to empathize)
- kinds of communication barriers
- clear logical reasoning
- identification and evaluation of propaganda techniques
- formal report/speech

Mechanics, vocabulary and spelling may include:

- rules governing the use of capitalization, punctuation and abbreviation
- punctuation marks – end marks, commas, semi-colon and colon, quotation marks, dashes and parentheses, hyphen, apostrophes.
- Abbreviations – symbols, measurements, time, number
- Spell words and interpret meanings through context clues and word analysis, prefixes, suffixes, root (focus on words used in skill area)

Writing skills may include:

- Methods of paragraph development – chronological, order of importance, spatial order, comparison or contrast
- Paragraphs with – topic sentences and supporting sentences, unity and coherence, linking expressions and connectives, sentence length and structure
- Different types of reports

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use of report writing skills in accordance with the range listed in the range of variables statement, relevant to the work orientation.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units applicable to the individual's work.

During assessment the individual will:

- demonstrate the ability to write technical reports
- demonstrate effective writing style
- demonstrate the ability to identify main points
- demonstrate the ability to expand main points
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- use accepted engineering communication techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0131A Undertake interactive work place communication

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- grammar and mechanics
- spelling
- writing styles (technical or non-technical)
- communication skills
- information systems
- reports including graphs, charts, tables

Skills

The ability to:

- communicate concepts in writing
- identify main points
- expand main points
- write technical and non-technical reports

(4) Resource Implications

The candidate will be provided with:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- present evidence of credit for any off-job training related to this unit.

Assessor must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

All tasks involved must be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination both.

The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0152A: Use graphical techniques and perform simple statistical computations (basic)

Competency Descriptor:

This unit deals with the skills and knowledge required to use statistics to aid in making decisions, drawing conclusion and making reports and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Reads and constructs graphs from given or determined data	1.1	Complex information is extracted from graphical representation
		1.2	Data is analysed with respect to emerging trends
		1.3	Graphs are constructed as required from data and drawn with respect to scale and accepted method
		1.4	Significant features of graphical representation are understood such as limit lines, gradients (straight line graphs), intercepts, maximum and minimum values
		1.5	Constructs a wide variety of graphs as required including histograms, control charts, straight line graphs and parabolic graphs
2.	Performs basic statistical calculations	2.1	Calculates mean, median and mode from given data
		2.2	Calculates standard deviation and understands the significance of 1, 2 and 3 sigma limits

RANGE STATEMENT

Graphs and charts may be applied to information from various work contexts, quality processes, production and market trends and other engineering applications. A range of devices may be used to assist with calculations. Given relevant data the individual should be able to use statistics to aid in making decisions, drawing conclusion and making reports.

Activities may include but not limited to:

- using graphical methods to organise data (straight line graph, bar chart, pie chart)
- reading and interpreting graphic data
- determining quantities from graphical information
- developing data collection instrument for statistical analysis
- compiling and tallying score from raw data collected
- formatting raw data into statistical information using tables

EVIDENCE GUIDE

Competency is to be demonstrated by individual performing computations in accordance with the performance criteria and as related to the work environment.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the computations being performed or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- take responsibility for the quality of their own work
- perform computations in accordance with standard principles
- perform computations accurately
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0051 Perform computations basic
- MEMCOR022A Perform related computations

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- numbers and basic arithmetic operations
- drawings and specifications
- graphical methods
- graphic data
- data collection instruments for statistical analysis
- basic statistics (charts, tables scales and graphs)
- compiling and tallying score from raw data
- formatting raw data into statistical information using tables

Knowledge

Knowledge of: (Cont'd)

- data relative to the metal engineering and maintenance trade processes
- applications relevant to engineering skills trades e.g. pressure, volume, temperature, mass efficiency circuit computations, perimeters and areas etc.

Skills

The ability to:

- read and interpret drawings
- measure and calculate manually
- use graphical methods to organise data (straight line graph, bar chart, pie chart)
- read and interpreting graphic data
- determine quantities from graphical information
- develop data collection instrument for statistical analysis
- compile and tally score from raw data collected
- format raw data into statistical information using tables
- interpret measurements and calculations
- relate to and or perform calculations on related applications.
- communicate effectively

(4) Resource Implications

The candidate will be provided with:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- present evidence of credit for any off-job training related to this unit.

Assessor must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

All tasks involved must be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0022A: Maintain and overhaul mechanical equipment

Competency Descriptor:

This unit deals with skills and knowledge required to competently maintain and overhaul mechanical equipment and applies to and applies to individuals in the industry.

Competency Field:

Metal, Engineering, Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Perform preventative maintenance tasks and adjustments	1.1 Preventative maintenance schedule read and task requirements determined. 1.2 Routine maintenance tasks are performed on mechanical equipment, components or sub-assemblies. 1.3 Mechanical equipment, components, sub-assemblies are checked visually and with test equipment. 1.4 Adjustments are made to equipment or components to ensure specifications are met using acceptable fitting techniques and procedures.
2. Diagnose and locate faults	2.1 Equipment component function are determined and understood by reference to engineering drawings, technical manuals and or consultation with appropriate personnel. 2.2 Maintenance reports are checked, reviewed and faults diagnosed. 2.3 Consultation with operators and other relevant plant personnel is carried out to assist in locating faults. 2.4 Where appropriate, test equipment are selected and applied in accordance with defined requirements and procedures to assist fault location. 2.5 Fault condition is diagnosed and localised at component level using appropriate test equipment and procedures. 2.6 Faulty conditions are evaluated and appropriate corrective action taken. 2.7 Faults are documented to standard operating procedures.

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|----|--------------------------------------|------|---|
| 3. | Repair or overhaul mechanical system | 3.1 | Machine or equipment is isolated safely or checked for isolation. |
| | | 3.2 | Faulty equipment, component or sub-assembly are removed from system using appropriate engineering principles, tools, equipment and procedures. |
| | | 3.3 | Replaceable items are selected from manufacturer's catalogues and obtained by appropriate means. |
| | | 3.4 | Correct repair procedure, tools and equipment are selected and prepared for use on serviceable items. |
| | | 3.5 | Serviceable items are repaired or overhauled to manufacturer' or company specifications. |
| | | 3.6 | Components are checked with precision instruments to ensure conformance to specifications where applicable. |
| 4. | Fit and adjust mechanical equipment | 4.1 | All electrical, safety and site requirements are adhered to throughout maintenance cycle. |
| | | 4.2 | Maintenance report are completed to standard operating procedures and conveyed to designated personnel. |
| | | 4.3 | Fitting requirements are determined and sequential assembly planning is carried out where applicable. |
| | | 4.4. | Sound fitting principles and techniques are applied in the preparation and assembly of component. |
| | | 4.5 | Correct gland packing, jointing, gasket materials are selected and applied correctly in conformance to specifications and operational requirements. |
| | | 4.6 | Correct lubrication requirements are determined by appropriate means and attended to where applicable using mechanical or manual applications. |
| | | 4.7 | Appropriate wedges and levelling devices are used to level mechanical equipment. |
| | | 4.8 | Correct alignment and balancing functions are performed where appropriate. |
| | | 4.9 | Final adjustments are performed on mechanical equipment to align to operational specifications. |

- 4.10 Mechanical equipment is tested for accuracy and correct operation.
- 4.11 Mechanical equipment is returned to service to specifications using acceptable procedures
- 4.12 Appropriate work and safety clearances are obtained throughout maintenance cycle.

RANGE STATEMENT

This unit should be selected where an integrated level of skills in maintenance and overhaul of most types of mechanical equipment required.

This unit is meant to build on skills covered by the specialist prerequisites.

Where individual skills are required, specialist units should be selected.

Work is undertaken autonomously or in a team environment using predetermined standards of safety, quality and workshop procedures.

Where applicable all replacement items are selected from manufacturer's catalogues in conformance to specifications and operational requirements.

Specifications interpreted from engineering drawings, detailed technical sketches and sources of technical data.

Maintenance may include:

- repair
- inspection
- modification
- overhaul
- lubrication
- servicing
- test running
- sealing
- machining
- identifying and replacing defective components and valve packing
- refurbishment/replacement of bearings (plain, white meal, anti-friction)
- seals (hydrogen, labyrinth)
- complex seals
- couplings
- coolers
- pipe work
- barring gear
- inspection

Mechanical drives may include:

- electrical
- mechanical
- pneumatic
- hydraulic or manual

Isolations can refer to:

- electrical/mechanical
- other associated processes

Work completion details may include:

- plant and maintenance records,
- job cards,
- check sheets,
- on device labelling updates and reporting and/or documenting equipment defects

Precision measuring equipment may include:

- inside/outside micrometers and verniers
- dial gauges
- depth gauges
- slip gauges and feeler gauges

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively maintaining and overhauling mechanical equipment in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to undertaking task
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate the ability to maintain mechanical equipment
- demonstrate correct procedures in overhauling mechanical equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0171A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Occupational health and safety standards
- related plant and equipment
- operating principles of mechanical equipment/systems
- lubrication principles
- seals, gaskets and packing
- hand and portable power tools
- precision measuring equipment
- rigging and lifting equipment
- specialised maintenance tools
- advanced balancing
- levelling and aligning techniques
- technical drawings and data
- diagnostic and testing techniques
- mechanical drives and accessories
- transmissions/couplings
- hazardous materials
- valves
- fluid power systems
- pipe work
- torquing techniques
- isolation procedures
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- use hand and portable power tools
- use precise measuring equipment
- use rigging and lifting equipment
- use specialised mechanical tools
- apply advanced balancing
- levelling and aligning techniques
- use drawings and data
- manufacture and install gaskets and seals
- inspect equipment
- identify hazardous materials
- identify components
- recognise worn, damaged or faulty components
- sequentially assemble and disassemble
- work to fine tolerances
- apply fluid power control principles
- apply torquing techniques
- apply maintenance techniques;
- apply data analysis techniques and tools
- c ommunicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0032A: Perform fault diagnosis, installation and removal of bearings

Competency Descriptor:

This unit deals with skills and knowledge required to competently perform fault diagnosis installation and removal of bearings and applies to and applies to individuals in the industry.

Competency Field:

Metal Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Perform routine bearing checks during operation and non-operation	1.1	Bearing installation is inspected and task requirements are determined by most appropriate means.
		1.2	Bearing installation is checked during operation using standard procedures of listening, feeling, observing and/or correct and appropriate test equipment.
		1.3	Seal condition is checked for seal and wear leaks using correct and appropriate means.
		1.4	Lubricating devices are checked for correct operation using correct and appropriate tools and techniques.
2.	Diagnose bearing faults	2.1	Visual and sensory inspection of bearing arrangement performed.
		2.2	Where appropriate, given manufacturer's specifications and diagnostic equipment, bearings tested for correct operation or malfunction using acceptable techniques tools and procedures.
		2.3	Using appropriate knowledge of engineering principles, faulty bearings identified for replacement.
		2.4	Where appropriate, causes of failure identified using correct and appropriate techniques and equipment.
		2.5	Where appropriate corrective action taken to avoid reoccurrences.
3.	Identify bearing requirements for replacement or installation	3.1	Bearing installation inspected and task requirements determined.

- 3.2 Using appropriate knowledge of bearings and engineering principles, operational function of bearings to be installed or replaced is determined and understood.
- 3.3 Correct and appropriate bearing removal techniques and tools determined.
- 3.4 Bearings removed from shafts or bearing housings using correct and appropriate technique, minimising damage to component.
- 3.5 Condition of serviceable items such as shafts and housings inspected using correct and appropriate measuring and test equipment.
- 3.6 Serviceable items repaired using correct and appropriate engineering, techniques, tools and equipment.
- 4. Install plain bearings
 - 4.1 Standard replaceable items for plain, wrapped, flanged, split bush and thrust bearings selected from manufacturer's parts lists, catalogues or engineering drawings.
 - 4.2 Correct and appropriate installation techniques and tools selected.
 - 4.3 Bearing sized to correct clearance using correct and appropriate technique, tools and equipment.
 - 4.4 Lubrication requirements catered for to meet specification and/or application requirements.
 - 4.5 Bearing fitted using correct and appropriate installation techniques, tools and equipment.
 - 4.6 Bearing tensioned down and run following standard operating procedures or manufacturer's recommendations.
 - 4.7 Final clearance, adjustments and lubrication checked and correct and appropriate action taken where required.
- 5. Install anti-friction bearings
 - 5.1 Standard replaceable ball and roller anti-friction bearings selected from manufacturer's catalogues, spare parts lists or interpreted from engineering drawing to meet specifications.

- 5.2 Bearing inside/outside diameters determined from specifications or manufacturer's catalogue and checked using appropriate measuring instruments.
- 5.3 Shafts and housings size checked for correct fit and clearances using appropriate measuring instruments.
- 5.4 Correct and appropriate installation techniques selected.
- 5.5 Using appropriate engineering principles bearings fitted to shafts or housings using correct and appropriate tools, equipment, techniques to meet specifications.
- 5.6 Bearing sealed and capped where appropriate, to specifications.

RANGE STATEMENT

Work undertaken autonomously using predetermined standards of quality, safety and workshop procedures involving the installation and replacement of plain, ball and roller bearings.

Rotational plain bearings include:

- plain bush
- wrapped bush
- flanged bush
- split bush
- self-lubricating and thrust bearings for radial
- thrust and combination radial and thrust loading applications.

Tasks include may include:

- routine bearing checks during operation
- non-operation bearing fault diagnostics
- bearing removal
- replacement
- installation and lubrication using acceptable engineering principles, correct tools and equipment.

Methods may include:

- the use of press
- dowel
- keys
- keeper plate
- heat
- shrink and associated methods
- the use of hydraulic and mechanical mounting and dismantling tools is included.

Ball and roller bearings may include, but are not limited to:

- | | |
|---|---|
| <ul style="list-style-type: none"> • self-aligning ball bearings with cylindrical bore • taper bore (and adaptor sleeve) • taper bore (and unthreaded adaptor sleeve) • single row deep groove ball bearings • magneto bearings (separable ball bearings) • single row angular contact ball bearings • double row angular contact ball bearings • linear ball bearings • needle roller bearings • taper roller bearings • single thrust ball bearings • double thrust ball bearings | <ul style="list-style-type: none"> • single thrust ball bearings with spherical housing washer and seating ring • spherical roller thrust bearings • radial bearings with cylindrical tapered bore (and adaptor or withdrawal sleeve) and associated bearings for radial applications. |
|---|---|

Spherical roller bearings, including:

- narrow type and C design
- spherical roller bearings (NV, N NS Type)
- double row cylindrical roller bearings

All bearing replacements selected from spare parts lists, manufacturer's catalogues, engineering drawings and data sheets.

All lubrication requirements attended to according to bearing manufacturer's specifications, standard operating procedures and lubricant supplier's instructions.

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively removing, dismantling, assembling and replacing engineering components in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to undertaking task
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate the ability to diagnose bearing problems
- demonstrate correct procedures in removing/replacing bearings
- demonstrate correct procedures in installing bearings
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0171A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Occupational Health and Safety regulations
- basic tools for removal, replacing, dismantling and assembling engineering system components
- standard characteristics of basic engineering system components
- standard removal/replacing tasks
- standard engineering system components
- standard operational test for basic engineering systems
- manufacturers standard specification
- standard application/operation of pneumatic system components
- reading
- writing basic English
- basic numeracy

Skills

The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and replacement of bearings
- perform the installation of bearings

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation activities to which applicant has contributed, or worked on
- training courses on performing fault diagnosis, installation and removal of bearings
- examples of authenticated assessments and/or assignments from formal education courses
- self assessment reports
- simulation

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0042A: Service repair/maintain/and refit engineering

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively service repair maintain and refit engineering components and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Dismantle and inspect engineering components	1.1	Components are inspected and task requirements analysed.
		1.2	Components are clearly marked to aid in reassembly.
		1.3	Appropriate tools and equipment selected and component/s prepared for dismantling.
		1.4	Components dismantled using appropriate engineering principles, techniques, procedures, tools and equipment.
		1.5	Operational specifications for components obtained from appropriate source and interpreted and understood.
		1.6	Damaged or faulty components assessed against operational specifications.
		1.7	Faulty components identified for repair, replacement, adjustment or manufacture.
2.	Repair/Replace faulty components	2.1	Faulty components repaired or adjusted to conform to specifications.
		2.2	Method of repair determined as appropriate.
		2.3	Where applicable replacement parts selected from manufacturers' catalogue and assessed against specifications.
3.	Assemble and fit parts/components	3.1	Parts/component specifications determined by most appropriate means.
		3.2	Materials selected to meet specification requirements.

- | | | |
|--|-----|--|
| | 3.3 | Materials marked out according to specification using most appropriate tools, methods and equipment. |
| | 3.4 | New components drilled, scraped, filed, reamed, tapped, threaded etc. in conformance to specifications using appropriate workshop practices. |
| 4. Assemble and fit engineering components into assemblies or sub-assemblies | 4.1 | Appropriate techniques are applied in the preparation, assembly and adjustment of components. |
| | 4.2 | Correct lubrication, packing and sealing materials are applied correctly and in conformance to job specifications and supervisor instructions. |
| | 4.3 | Final component is assembly inspected, tested and adjusted as necessary for compliance with operational specifications. |
| | 4.4 | Final component is returned to use according to standard operating procedure. |
| 5. Clean up | 5.1 | Materials/supplies are stacked /stored for re-use or disposal. |
| | 5.2 | Work area is cleared. |
| | 5.3 | Tools and equipment are cleaned and stored in a cool place. |

RANGE STATEMENT

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures.

This unit includes the fitting and maintenance of engineering components involving the dismantling, repair, replacement, assembling and final fitting of items, sub-assemblies and assemblies.

All specifications interpreted from engineering drawings, detailed/technical sketches and associated data sheets.

Tasks undertaken utilising engineering and maintenance principles, designated procedures, correct and appropriate tools, equipment and safe workshop practices.

Where applicable replacement parts selected from manufacturer's catalogues in conformance with specifications and operational requirements.

Appropriate fitting principles and techniques are utilised in the assembly of component parts using fastening equipment and methods which ensures conformance to specifications, operational performance, quality and safety. This includes the straight forward removal and replacement of pre-manufactured bearings and seals.

Using acceptable maintenance procedures, appropriate lubrication, gland packing, jointing/gaskets, seals, materials are selected and applied in conformance to application requirements and specifications as applicable.

Using acceptable workshop practices new components manufactured including by:

- marking out
- drilling
- scraping
- filing
- reaming
- tapping or threading to specifications

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively removing, dismantling, assembling and replacing engineering components in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the dismantling, repairing, replacing, assembling and fitting of engineering components, or other units requiring the exercise of the skills and knowledge covered by his unit. Competence in this unit cannot be claimed until all prerequisites have been satisfied.

(2) Pre-requisite Relationship of Units

- MEMCOR0051A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0071A Use hand tools
- MEMMRD0081A Remove dismantle, assemble and replace basic engineering components

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- Occupational Health and Safety regulations
- basic tools for removal, replacing, dismantling and assembling engineering system components
- standard characteristics of basic engineering system components
- standard removal/replacing tasks
- standard engineering system components
- standard operational test for basic engineering systems
- manufacturers standard specification
- standard application/operation of pneumatic system components
- reading
- writing basic English
- basic numeracy

Skills
The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and replacement of engineering system components

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation activities to which applicant has contributed, or worked on
- training courses on performing fault diagnosis, installation and removal of bearings
- examples of authenticated assessments and/or assignments from formal education courses
- self assessment reports
- simulation

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0052A: Maintain and repair mechanical drives and mechanical transmission assemblies

Competency Descriptor:

This unit deals with skills and knowledge required to competently maintain and repair mechanical drives and mechanical transmission assemblies and applies to individuals in the industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Undertake maintenance checks of mechanical drives and mechanical transmission components	1.1 Principles of mechanical drives and mechanical transmission components demonstrated.
	1.2 The function of the main parts of the designated mechanical drive/transmission assembly demonstrated.
	1.3 Mechanical drive/transmission components are checked for wear, distortion, tensions, misalignment, fatigue, lubrication, slackness, tooth wear breakages and other related malfunctions.
	1.4 Assembly identified as requiring further diagnosis, repair or adjustment and findings are documented by appropriate means.
2. Adjust mechanical drives and transmission assemblies	2.1 Adjustment requirements are determined by appropriate means.
	2.2 Adjustment tools and equipment are selected according to the type of assembly being serviced.
	2.3 Drives/transmission components are tensioned aligned balanced or adjusted to workshop practices.
	2.4 Drive/transmission assembly are checked after adjustment for correct operation.
	2.5 Service report completed.
	2.6 Further diagnosis or repair requirements actioned by appropriate means.

- 3. Diagnose faults
 - 3.1 Service reports are read and inspection of the drive/transmission assembly undertaken.
 - 3.2 Drive/transmission assembly is tested using sound maintenance principles and procedures.
 - 3.3 Faults are localised at the component level.
 - 3.4 Fault causes are analysed
 - 3.5 Preventative measures to avoid reoccurrence of faults are developed
 - 3.6 Fault causes are documented and actioned by appropriate means.
 - 3.7 Requirements for repair or replacement are actioned by appropriate means.
- 4. Repair mechanical drives/transmission assemblies
 - 4.1 Service reports are read and inspection of the drive/transmission assembly undertaken.
 - 4.2. Task requirements are ascertained.
 - 4.3 Tools and equipment are selected according to the type of assembly being serviced.
 - 4.4 Mechanical drive/transmission assembly are dismantled.
 - 4.5 Serviceable items are repaired using appropriate maintenance procedures.
 - 4.6 Standard replaceable items are selected.
 - 4.7 Component parts are refitted to mechanical drive/transmission assembly.
- 5. Final adjustment and commissioning
 - 5.1 Drive/transmission components are tensioned, balanced aligned or adjusted.
 - 5.2 Drive/transmission assembly are checked after adjustment and operational performance analysed.
 - 5.3 Assembly is commissioned on conformance to specifications.
 - 5.4 Service reports are completed by appropriate means.

RANGE STATEMENT

Workshop procedures may include:

- the adjustment,
- repair, replacement of mechanical drives/transmission assemblies and associated components.

Drive devices may include:

- chain couplings
 - universal joints
 - bevel gearing
 - rack and pinion gearing
 - dog toothed clutches
 - cone type clutches
 - expanding shoe type clutches
 - friction/plate type clutches
 - centrifugal clutches
 - toggle action linkages
 - magnetic clutches
 - sprag clutches
 - band type brakes and other associated drive components
- Spare parts replacements selected from manufacturer's catalogues or engineering specifications.
 - All adjustments, removal, repair, replacement and installation practices in conformance to safe workshop practices utilising appropriate maintenance principles, techniques, tools, equipment and procedures

Work is undertaken autonomously or in a team environment using predetermined standards of quality, safety

Mechanical drives may include:

- belt drives
- chain Drives
- gears
- couplings
- clutches and brakes

- Lubrication requirements attended to according to supplier's instructions and recommendations.

- Assemblies tested using appropriate methods for conformance to specifications and operational requirements.

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively maintaining and repairing mechanical transmission assemblies in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to undertaking task
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate the ability to maintain mechanical drives and mechanical transmission assemblies
- demonstrate correct procedures in repairing drives and mechanical transmission assemblies
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0171A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- | | |
|--|-------------------------------------|
| • Occupational health and safety standards | • specialised maintenance tools |
| • related plant and equipment | • advanced balancing |
| • operating principles of mechanical equipment/systems | • levelling and aligning techniques |
| • lubrication principles | • technical drawings and data |
| • seals, gaskets and packing | • diagnostic and testing techniques |
| • hand and portable power tools | • mechanical drives and accessories |
| • precision measuring equipment | • transmissions/couplings |
| • rigging and lifting equipment | • hazardous materials |
| • isolation procedures | • valves |
| • communication principles | • fluid power systems |
| | • pipe work |
| | • torquing techniques |

Underpinning Knowledge and Skills (cont'd)**Skills**

The ability to:

- apply occupational health and safety standards
- use hand and portable power tools
- use precise measuring equipment
- use rigging and lifting equipment
- use specialised mechanical tools
- apply advanced balancing
- levelling and aligning techniques
- use drawings and data
- manufacture and install gaskets and seals
- inspect equipment
- identify hazardous materials
- identify components
- recognise worn, damaged or faulty components
- sequentially assemble and disassemble
- work to fine tolerances
- apply fluid power control principles
- apply torquing techniques
- apply maintenance techniques;
- apply data analysis techniques and tools
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0062A: Perform levelling and alignment of machines and engineering components

Competency Descriptor:

This unit deals with skills and knowledge required to competently perform levelling and alignment of machines and engineering components and applies to individuals in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Undertake levelling and alignment measurements/readings	1.1 Principles of levelling and alignment are understood and utilised.
	1.2 Task requirements are determined by inspection of equipment to be levelled and/or components to be aligned.
	1.3 Correct appropriate levelling and/or alignment procedure are selected.
	1.4 Correct and appropriate levelling or alignment devices/equipment are selected and set up to standard operating procedures or manufacturer's recommendation.
	1.5 Measurements/readings taken accurately and recorded correctly to standard operating procedures.
2. Perform levelling and/or alignment tasks	2.1 Correct and appropriate engineering principles, techniques, tools and equipment selected.
	2.2 Levelling realignment calculations performed using correct and appropriate method for levelling/alignment application.
	2.3 Equipment levelled to specifications using correct and appropriate technique.
	2.4 Levelling and alignment task completed to specifications.

RANGE STATEMENT

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures involving the levelling of equipment and the alignment of component parts.

The use of appropriate engineering principles, techniques, tools and equipment is integral to all application tasks.

Included is the setting up and use of alignment measuring devices and precision levelling devices.

Level or out of alignment calculation performed using most appropriate means for the type of application being performed.

Level and alignment specifications obtained from engineering drawings, data sheets or manufacturers specifications.

All adjustments performed according to designated procedures in conformance to specifications.

Included is the use of a variety of tools and equipment not limited to:

- precision levels
- spirit levels
- line levels
- optical levels
- electronic levels
- laser levels
- dial indicators
- special type dial indicator fixtures
- magnetic bases
- feeler gauges
- bench centres
- vee blocks
- plumb and line
- folding wedges
- straight edges
- shim pack materials
- dumpy levels and other associated levelling and alignment equipment

Installation techniques:

- surface mount
- underground
- PVC piping
- metal
- on masonry
- on steel
- in pavements
- with clamps
- with saddles
- on/in walls
- in floors
- overhead
- access ways
- wood

Background surfaces for the leveling and alignment of machines and engineering components may include:

- concrete
- concrete block work
- brickwork/stonework
- pavements
- underground

Personal protective equipment may include:

- overalls
- waterproof pants and jacket
- boots
- water (rubber) boots
- gloves
- dust masks/respirators
- hard hat/cap
- safety goggle

Representative range of applications may include such things as:

- fixtures
- equipment
- valves
- regulators
- metering devices
- refrigeration units
- machinery
- plant
- warehousing
- power plants

Levelling process includes:

- preparation of pipes and tubing
- preparation of surfaces
- finish of surfaces
- workplace preparation

Working conditions may include but are not limited to:

- domestic/commercial new and existing
- at height as per industry standards
- in confined space
- temperature variation
- damp and wet conditions
- indoors and out doors

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively performing routine operational maintenance of machines/equipment in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to performing routine operational maintenance of machines/equipment
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing leveling of machines and engineering components
- demonstrate correct procedures in performing alignment of machines and engineering components
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Occupational Health and Safety regulations
- basic measuring devices
- standard machines/equipment range
- levelling principles
- levelling techniques
- alignment principles
- alignment techniques
- standard consumable replacements
- standard machine/equipment adjustments
- reading
- writing basic English
- basic numeracy

Skills

The ability to:

- follow safely to instructions
- use power tools and hand tools
- use measuring devices
- adjust measurements
- handle materials
- select material
- apply quality assurance
- perform operational maintenance of machines/equipment

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0712A: Install and maintain complex mechanical seals

Competency Descriptor:

This unit refers to the knowledge and skills required for all work associated with the installation and maintenance of complex mechanical seals and may involve faultfinding, diagnosis and repairs.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare for the work	1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection.
		1.2	Work requirements are clarified/confirmed with appropriate parties or by site inspection.
		1.3	Occupational health and safety standards are identified, applied and monitored throughout the work procedure.
		1.4	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.
		1.5	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
		1.6	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.
		1.7	Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.
		1.8	Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.
		1.9	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.
		1.10	Work area is prepared in accordance with work requirements and site procedures.

- 2. Remove seals for maintenance
 - 2.1 Required isolations are confirmed where appropriate, in accordance with site requirements.
 - 2.2 Seals are identified in accordance with the work plan.
 - 2.3 Seals are removed in a manner, which will assist in replacement in accordance with the work plan.
 - 2.4 Seals are inspected for abnormalities in accordance with the work plan.
- 3. Maintain complex seals
 - 3.1 Maintenance is performed in accordance with manufacturers' specifications and site procedures.
 - 3.2 Seal assemblies are dismantled in accordance with the job plan and site requirements.
 - 3.3 Component parts are clearly marked and sketches produced as required for identification in accordance with the job plan and site requirement
 - 3.4 Swear and clearances are determined in accordance with manufacturers' specifications and site requirements.
 - 3.5 Components found to be faulty are repaired, replaced and/or adjusted to conform with manufacturers' specifications and site requirements.
 - 3.6 New components are inspected for compliance to required specifications and prepared for reassembly according to manufacturers' specifications/site requirements.
 - 3.7 Component parts are refitted to seal assemblies according to manufacturers' specifications/site requirements.
 - 3.8 Modifications/alterations are undertaken in accordance with site requirements.
- 4. Replace/install complex seals
 - 4.1 Site is prepared for seal replacement in accordance with the work plan.
 - 4.2 Seals are replaced in accordance with the work plan and manufacturers specifications.

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| | 4.3 | All fastenings are torque in accordance with manufacturers specifications and site requirements |
| | 4.4 | Machinery/plant is test run, monitored and adjusted as required in accordance with manufacturers' specifications and site requirements. |
| 5. | Complete the work | 5.1 Work is completed and appropriate personnel notified in accordance with site/enterprise requirements |
| | 5.2 | Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | 5.3 | Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | 5.4 | Work completion details are finalised in accordance with site/enterprise procedures. |

RANGE STATEMENT

Complex/specialised seals may include:

- generator hydrogen seals
- double acting mechanical seals
- floating seals and turbine labyrinth glands

Tools and equipment may include:

- micrometers,
- verniers,
- dial test indicators,
- slip gauges,
- hand tools,
- customised mandrels,
- digital height gauges,
- internal micrometers,
- oxyacetylene gear,
- depth gauges,
- air grinders,
- jigs and fixtures,
- customised spanners,
- electronic internal micrometers,
- appropriate lifting devices,
- heated oil bath and induction heaters

Test equipment may include feeler gauge:

- dial gauge
- bearing blue
- micrometers
- flexi gauge
- leads and go/no-go gauges

Details of maintenance may be:

- clarified by diagnosis and work place inspection

Maintenance may include:

- repair,
- inspection,
- modification,
- overhaul,
- lubrication,
- servicing and test running

Work completion details may include:

- plant/maintenance records
- job cards
- check sheets
- on device labelling updates and reporting/documenting equipment defects

Work site environment may be affected by nearby plant or processes, e.g.:

- chemical
- heat, dust
- noise
- gas and oil
- Isolations can refer to electrical/mechanical or other associated processes

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively performing routine operational maintenance of machines/equipment in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to performing routine operational maintenance of machines/equipment
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing leveling of machines and engineering components
- demonstrate correct procedures in performing alignment of machines and engineering components
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Occupational health and safety
- complex mechanical seals
- precision measuring equipment
- seals and gaskets (types and materials)
- bearings (anti-friction and plain)
- quality assurance/quality control
- specialised tools and jigs
- levelling and aligning principles
- rigging and lifting techniques
- relevant materials and components
- technical drawings and data
- data recording techniques
- hand and portable power tools
- diagnostic and testing techniques
- relevant plant and systems
- isolation procedures
- heating techniques
- communication principles

Skills

The ability to:

- Apply occupational health and safety standards
- identify and use measuring equipment
- apply sealing principles
- manufacture and install seals and gaskets
- install bearings (anti-friction and plain)
- use technical drawings and data
- identify and select materials and components
- use hand and portable power tools
- apply diagnostic and testing techniques
- apply dismantling and reassembling techniques
- apply installation and maintenance procedures
- apply data analysis techniques
- recognise worn/damaged components
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation and maintenance activities to which a applicant has contributed, or worked on
- training courses on the installation and maintenance of complex mechanical seals
- examples of authenticated assessments and/or assignments from formal education courses
- self assessment reports
- simulation

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0722A: Install and maintain mechanical valves

Competency Descriptor:

This unit refers to the skills and knowledge required for the fault finding, diagnosis, repair and/or overhaul of mechanical valves, but excluding any associated servo or actuating unit as applied to the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare for the work	<p>1.1 Work requirements are identified from request/work orders or equivalent clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.2 Work requirements are clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.3 Occupational health and safety standards are identified, applied and monitored throughout the work procedure.</p> <p>1.4 Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.</p> <p>1.5 Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.</p> <p>1.6 Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.</p> <p>1.7 Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.</p> <p>1.8 Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.</p> <p>1.9 Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.</p>

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|----|-------------------------------|-----|--|
| 2. | Remove valves for maintenance | 2.1 | Required isolations are confirmed where appropriate in accordance with site requirements. |
| | | 2.2 | Valve is disconnected in accordance with the work plan. |
| | | 2.3 | Valve is removed in a manner, which will assist in replacement in accordance with the work plan. |
| | | 2.4 | Valve is inspected for abnormalities in accordance with the work plan. |
| 3. | Perform valve maintenance | 3.1 | Maintenance is performed in accordance with manufacturers specifications and the work plan. |
| | | 3.2 | Valve is dismantled, clearly marked for identification and relevant sketches drawn in accordance with the work plan. |
| | | 3.3 | Components are correlated in preparation for re-assembly in accordance with manufacturers drawings/manuals. |
| | | 3.4 | New components are inspected to ensure compliance with manufacturers specifications. |
| | | 3.5 | Dimensional inspection is performed with precision measuring devices to ensure compliance with manufacturers specifications and site requirements. |
| | | 3.6 | Components are reassembled for testing in accordance with manufacturers specifications and site requirements. |
| | | 3.7 | Modifications/alterations are undertaken in accordance with manufacturers specifications and site requirements. |
| | | 3.8 | Components are leveled, aligned, coupled and connected in accordance with manufacturers specifications and site requirements. |
| | | 3.9 | Valves are pressure tested, monitored and adjusted if required in accordance with manufacturers specifications and the work plan. |
| 4. | Repl ace/install valves | 4.1 | Site is prepared for valve replacement in accordance with the work plan. |
| | | 4.2 | Valve is replaced in accordance with the work plan and manufacturers specifications. |

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|----|-------------------|--|---|
| | 4.3 | Valve is connected in accordance with the work plan and manufacturers specifications. | |
| | 4.4 | Final job inspection is completed and any permits relinquished in accordance with the work plan. | |
| 5. | Complete the work | 5.1 | Work is completed and appropriate personnel notified in accordance with site/enterprise requirements. |
| | | 5.2 | Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | | 5.3 | Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | | 5.4 | Work completion details are finalised in accordance with site/enterprise procedures. |

RANGE STATEMENT

Valves may include:

- high and low pressure temperature valves that are flanged and bolted
- dampers and hydro regulating valves
 - gate
 - globe
 - wafer
 - uni-flow
 - plug
 - ball
 - knife
 - rotary
 - piston (ported)
 - diaphragm
 - non-return
 - pinch
 - pressure relief
 - regulating
 - isolating
 - slide dampers
 - isolating and regulating blade dampers
 - gas regulating or isolating dampers
 - hydro turbine guide vanes
 - and shutters

Testing may include:

- pressure testing (hydraulic and vacuum),
- blue check

Valve may control solutions which may include :

- gases
- solids
- fluids and chemicals such as caustic soda, chlorine
- ammonia
- sulphuric acid
- sodium hypochlorite
- hydrazine
- diethylamine
- citric acid
- hydrofluoric acid
- ammonium molybdate
- trisodium phosphate
- hydrogen
- nitrogen
- carbon dioxide
- water
- fly-ash
- slurry
- compressed air

Precision measuring devices may include:

- inside/outside micrometers
- verniers
- engineers rule
- dial gauges
- depth gauges and feeler gauges
- brine
- oil
- steam (superheated and saturated), hydrogen, propane and carbon dioxide
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Valve drives may include:

- electrical
- mechanical
- pneumatic
- hydraulic or manual

Work completion details may include:

- plant and maintenance records
- job cards
- check sheets
- on device labelling updates and reporting and/or documenting equipment defects

Isolations can refer to:

- electrical/mechanical
- or other associated processes

Details of maintenance may be clarified by diagnosis and workplace inspection

Maintenance may include:

- repair
 - inspection
 - modification, overhaul
 - lubrication
 - servicing
 - test running
 - sealing
 - machining
- identifying and replacing defective components and valve packing

Work site environment may be affected by nearby plant or processes, e.g.

- chemical
- heat
- dust
- noise
- gas and oil

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EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of mechanical valves in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of mechanical valves
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of mechanical valves
- demonstrate correct procedures in maintaining mechanical valves
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- valve operating and seating arrangements;
- hydraulic and pneumatic principles;
- measuring equipment;
- glands,
- seals and gaskets;
- bearings;
- occupational health and safety standards;
- quality assurance/quality control;
- specialised tools and jigs;
- levelling and aligning
- rigging and lifting equipment
- valve materials and components
- technical drawings and data
- data recording techniques
- hand and portable power tools
- diagnostic and testing techniques
- protective coatings
- plant and systems
- communication principles

Skills

The ability to:

- identify and use precision measuring equipment
- manufacture and install seals and gaskets
- apply dismantling and assembly techniques
- select appropriate maintenance techniques
- manufacture and use specialised tools and jigs
- level and align mechanical valves and components
- use and update technical drawings and data
- identify and select materials and components
- use hand and portable power tools
- apply diagnostic and testing techniques and rectify faults
- interpret and apply valve operational techniques
- apply occupational health and safety procedures
- recognise worn/damaged components and parts
- apply effective maintenance procedures
- apply data analysis techniques and tools
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement .
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0732A: Install and maintain mechanical pumps

Competency Descriptor:

This unit refers to the skills and knowledge required for the installation and maintenance of all pumps, compressors and blowers and the installation of which requires no more than basic alignment as applied to the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare for the work	1.1	Work requirements are identified from request/work orders or equivalent clarified/confirmed with appropriate parties or by site inspection.
		1.2	Work requirements are clarified/confirmed with appropriate parties or by site inspection.
		1.3	Occupational health and safety standards are identified, applied and monitored throughout the work procedure.
		1.4	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.
		1.5	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
		1.6	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.
		1.7	Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.
		1.8	Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.
		1.9	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.

- 2. Remove pumps for maintenance
 - 2.1 Required isolations are confirmed where appropriate in accordance with site requirements.
 - 2.2 Pump is disconnected in accordance with the work plan.
 - 2.3 Pump is removed in a manner, which will assist in replacement in accordance with the work plan.
 - 2.4 Pump is inspected for abnormalities in accordance with the work plan.
- 3. Maintain pumps
 - 3.1 Maintenance is performed in accordance with manufacturers' specifications and site procedures.
 - 3.2 Pump is dismantled for maintenance in accordance with manufacturers' specifications and site procedures.
 - 3.3 Sketches are made, data noted and components marked for identification and/or re-assembly in accordance with job requirements and site procedures.
 - 3.4 New components are obtained and inspected for compliance with manufacturers specifications.
 - 3.5 Dimensional inspection is performed with precision measuring devices to ensure compliance with specifications and results recorded in accordance with job requirements and site procedures.
 - 3.6 Pump is reassembled applying appropriate principles and techniques in accordance with manufacturers' specifications and site requirements.
 - 3.7 Modifications/alterations are undertaken in accordance with site requirements.
- 4. Replace/install pumps
 - 4.1 Site is prepared for pump replacement in accordance with the work plan.
 - 4.2 Pump is replaced in accordance with the work plan and manufacturers specifications.
 - 4.3 Pump is levelled, aligned, coupled and connected in accordance with the work plan.

- 4.4 All fastenings are torqued in accordance with manufacturers specifications and site requirements
- 4.5 Machinery/plant and pump are test run, monitored and adjusted as required in accordance with manufacturers' specifications and site requirements.
5. Complete the work
 - 5.1 Work is completed and appropriate personnel notified in accordance with site/enterprise requirements.
 - 5.2 Work area is cleared of waste, cleaned, restored and secured in accordance with site/company procedures.
 - 5.3 Plant, tools and equipment are maintained and stored in accordance with site/company procedures.
 - 5.4 Work completion details are finalised in accordance with site/company procedures.

RANGE STATEMENT

Pumps may include:

- single stage,
- centrifugal,
- screw and gear,
- positive,
- non-positive,
- partial and variable displacement,
- vane,
- diaphragm,
- roots and pistons

Pump drives may include:

- electrical,
- internal combustion,
- hydraulic,
- pneumatic or steam

Tools may include:

- micrometers,
- verniers,
- dial test indicators,
- slip gauges,
- hand tools,
- hydraulic spanners,
- customised mandrels,
- digital height gauges,
- internal micrometers,
- depth gauges,
- air grinders,
- jigs and fixtures,
- customised spanners,
- thermal blankets,
- induction heaters,
- thermal crayons,
- digital thermometers,
- oxyacetylene gear and appropriate lifting devices

Work completion details may include:

- plant and maintenance records,
- job cards,
- check sheets,
- on device labelling updates and reporting and/or documenting equipment defects

Isolations can refer to:

- electrical/mechanical
- other associated processes

Details of maintenance may be clarified by:

- diagnosis and workplace inspection

Maintenance can include:

- repair,
- inspection,
- modification,
- lubrication,
- servicing,
- test running,
- identifying and replacing defective components

Plant and equipment may include:

- jigs for dismantling and oxyacetylene heating equipment

Work site environment may be affected by nearby plant or processes e.g.

- chemical,
- heat,
- dust,
- noise and oil

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of mechanical pumps in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of mechanical valves
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of mechanical pumps
- demonstrate correct procedures in maintaining mechanical pumps
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Pumps and compressors
- Measuring equipment
- Seals and gaskets
- Bearings
- Occupational health and safety standards
- Quality assurance/quality control
- Specialised tools and jigs
- Levelling and alignment
- Rigging and lifting equipment
- Materials and components of pumps
- Fluid dynamics
- Torque techniques
- Technical drawings and data
- Data recording techniques
- Hand and portable power tools
- Diagnostic and testing techniques
- Protective coatings; Heating techniques
- Defined tolerances and fits
- Balancing techniques
- Isolation procedures
- Communication principles

Skills

The ability to:

- identify and use precision measuring equipment
- manufacture and install seals and gaskets
- apply fluid dynamics principles
- install bearings
- use specialised tools and jigs
- level and align
- use technical drawings and data
- identify and select materials and components
- apply data analysis techniques and tools
- use hand and portable power tools
- apply diagnostic and testing techniques
- use heat application equipment
- apply dismantling and reassembling techniques
- work to defined tolerances
- apply occupational health and safety procedures
- recognise worn/damaged components
- apply effective maintenance procedures
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation and maintenance activities in which a applicant has contributed, or worked on
- training courses on the installation and maintenance of mechanical pumps
- examples of authenticated assessments and/or assignments from formal education courses
- simulation
- self assessment reports

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0752A: Install and maintain fluid power systems

Competency Descriptor:

This unit refers to the fault finding, diagnosis, repair and/or maintenance of fluid power systems and components on stationary/mobile equipment.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare for the work	<p>1.1 Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.2 Work requirements are clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.3 Occupational health and safety standards are identified, applied and monitored throughout the work procedure.</p> <p>1.4 Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.</p> <p>1.5 Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.</p> <p>1.6 Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.</p> <p>1.7 Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.</p> <p>1.8 Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.</p> <p>1.9 Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.</p>
2. Remove assemblies or sub-assemblies from plant	<p>2.1 Required isolations are confirmed where appropriate in accordance with site requirements.</p> <p>2.2 Fluid power systems are disconnected in accordance with the work plan.</p>

- 2.3 Assemblies or sub-assemblies are removed in a manner, which will assist in replacement in accordance with the work plan.
- 2.4 Assemblies or sub-assemblies are inspected for abnormalities in accordance with the work plan.
- 3. Maintain fluid power systems
 - 3.1 System components, assemblies or sub-assemblies are identified and prepared for maintenance in accordance with the work plan.
 - 3.2 Visual inspections and testing are carried out applying hydraulic and pneumatic principles in accordance with the work plan.
 - 3.3 Maintenance is performed in accordance with manufacturers' specifications and site requirements.
 - 3.4 Components or sub-assemblies are dismantled, cleaned and examined to verify tolerances using appropriate techniques and procedures to determine replacement, overhaul, or repair in accordance with the work plan.
 - 3.5 Dimensional inspection is performed with precision measuring devices to ensure compliance with specifications and results recorded in accordance with the work plan.
 - 3.6 Faulty items are identified, repaired/overhauled using appropriate techniques and standards in accordance with the work plan.
 - 3.7 Replacement items are selected, inspected and prepared for installation in accordance with manufacturers' specifications and the work plan.
 - 3.8 Alterations/corrections are undertaken with approval of appropriate authority and in accordance with enterprise procedures.
 - 3.9 Routine modifications/alterations are undertaken in accordance with requirements and/or enterprise procedures.
 - 3.10 Components or sub-assemblies are refitted in accordance with manufacturers' specifications and the work plan.

- | | | | |
|----|--------------------------------------|-----|---|
| 4. | Replace assemblies or sub-assemblies | 4.1 | Site is prepared for fluid power system replacement in accordance with the work plan. |
| | | 4.2 | Fluid power system is replaced in accordance with the work plan and manufacturers specifications. |
| | | 4.3 | Fluid power system is aligned and connected in accordance with the work plan. |
| | | 4.4 | All connections are leak/pressure tested in accordance with manufacturers' specifications and site requirement and fluid power system is test run, monitored and adjusted as required in accordance with manufacturers' specifications and site requirements. |
| | | 4.5 | Alterations/corrections are undertaken with approval of appropriate authority and in accordance with enterprise procedures. |
| | | 4.6 | Routine modifications/alterations are undertaken in accordance with requirements and/or enterprise procedures. |
| 5. | Complete the work | 5.1 | Work is completed and appropriate personnel notified in accordance with site/enterprise requirements. |
| | | 5.2 | Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | | 5.3 | Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | | 5.4 | Work completion details are finalised in accordance with site/company procedures. |

RANGE STATEMENT

Fluid power systems may include:

- turbine control oil,
- multiloop pneumatic control

Pneumatic components may include:

- actuators,
- relays,
- rams,
- tools and compressors

Pneumatic principles may include:

- both small signal control
- power systems

Measuring tools may include:

- micrometers,
- dial test indicators,
- slip gauges,
- surface plate,
- depth gauges
- verniers

Maintenance may include:

- repair,
- inspection, modification, overhaul, lubrication, servicing and test running

Work site environment may be affected by:

- nearby plant or processes
- chemical,
- heat,
- dust,
- noise,
- gas and oil

Details of maintenance may be:

- clarified by diagnosis,
- work place inspection
- consultation with other parties/operators

Work completion details may include:

- plant and maintenance records,
- job cards, check sheets, on device labelling updates and reporting and/or documenting equipment defects

Isolations can refer:

- to electrical/mechanical
- or other associated processes

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of fluid power systems in accordance with the range listed within the range of variables.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of mechanical valves
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of fluid power systems
- demonstrate correct procedures in maintaining fluid power systems
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety
- pneumatic equipment/systems
- pumping principles
- properties of liquids and gases
- precision measuring equipment
- seals and gaskets
- valves and porting principles
- quality assurance/quality control
- hydraulic/pneumatic principles
- specialised tools and jigs
- bearings
- balancing
- levelling and alignment
- rigging and lifting equipment
- relevant materials and components
- technical drawings and data;
- data recording techniques
- hand and portable power tools
- diagnostic and testing techniques
- plant and systems
- design and construction of pipe work
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- identify and use precision measuring equipment;
- identify and select tools and materials;
- identify and use relevant test equipment;
- manufacture and install seals and gaskets;
- apply pumping principles;
- select and use specialized tools and jigs
- balance
- level and align
- use and/or update technical drawings and data
- apply data analysis techniques
- use hand and portable power tools
- apply diagnostic and testing techniques
- apply hydraulic and pneumatic principles
- dismantle and assemble components to specified tolerances
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0762A: Install and maintain industrial screens, strainers and filters

Competency Descriptor:

This unit refers to the skills and knowledge required for the faultfinding diagnosis, repair and/or overhaul of industrial screens, strainers and filters as applied the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare for the work	1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection.
		1.2	Work requirements are clarified/confirmed with appropriate parties or by site inspection.
		1.3	Occupational health and safety standards are identified, applied and monitored throughout the work procedure.
		1.4	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.
		1.5	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
2.	Remove plant/equipment for maintenance	2.1	Required isolations are confirmed where appropriate in accordance with site requirements.
		2.2	Screens, strainers and filters are disconnected in accordance with the work plan.
		2.3	Screens, strainers and filters are removed in a manner, which will assist in replacement in accordance with the work plan.
		2.4	Screens, strainers and filters are inspected for abnormalities in accordance with the work plan.
3.	Maintain plant/equipment	3.1	Equipment isolation and de-pressurization is confirmed visually and manually, as required in accordance with the job plan and site requirements.
		3.2	Plant/equipment components, assemblies or sub-assemblies are identified and prepared for maintenance in accordance with the work plan.

- 3.3 Equipment is removed, cleaned and marked for identification in accordance with the job plan and site requirement.
 - 3.4 Faulty items are repaired/overhauled, using appropriate principles, techniques and standards in accordance with the job plan and site requirements.
 - 3.5 Replacement items for installation are selected and inspected in accordance with manufacturers specifications.
 - 3.6 Out of specification modifications/alterations approved by appropriate authority and in accordance with requirements.
 - 3.7 Component failures are identified and probable causes reported using appropriate techniques and equipment in accordance with the job plan.
 - 3.8 Components or sub-assemblies are refitted in accordance with manufacturers specifications and site requirementsElement069.3.9.
 - 3.9 All fastenings are torqued in accordance with manufacturers specifications and site requirements.
4. Replace/install screens, strainers and filters
- 4.1 Site is prepared for screens, strainers and filters replacement in accordance with the work plan.
 - 4.2 Out of specification modifications/alterations approved by appropriate authority and in accordance with requirements.
 - 4.3 Screens, strainers and filters are replaced in accordance with the work plan and manufacturers specifications.
 - 4.4 Screens, strainers and filters are levelled, aligned and coupled in accordance with the work plan.
 - 4.5 All fastenings are torqued in accordance with manufacturers specifications and site requirements.
 - 4.6 Machinery/plant is test run, monitored and adjusted as required in accordance with manufacturers specifications and site requirements.

- | | | | |
|----|-------------------|-----|--|
| 5. | Complete the work | 5.1 | Work is completed and appropriate personnel notified in accordance with site/company requirements. |
| | | 5.2 | Work area is cleared of waste, cleaned, restored and secured in accordance with site/company procedures. |
| | | 5.3 | Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | | 5.4 | Work completion details are finalised in accordance with site/company procedures. |

RANGE STATEMENT

Screens may include:

- vibratory,
- rotary ,
- fixed
- basket

Filters may include:

- water trap
- lube oil filters
- element
- oil purifiers
- paper
- resin
- sand

Details of maintenance may be:

- clarified by diagnosis
- work place inspection

Strainers may include:

- Basket
- rotary
- element

Plant may include:

- electrostatic precipitators
- economiser hopper;
- air conditioner;
- water coolers

Maintenance may include:

- repair
- inspection
- modification
- overhaul
- lubrication
- servicing and test running

Work completion details may include:

- plant and maintenance records
- job cards
- check sheets;
- on device labelling updates and reporting; documenting equipment defects

Work site environment may be:

- affected by nearby plant or processes
- chemical
- heat
- dust
- noise
- gas and oil

Isolations can refer to:

- electrical/mechanical
- or other associated processes

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of industrial screens, strainers and in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of mechanical valves
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of screens, strainers and filters
- demonstrate correct procedures in maintaining screens, strainers and filters
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety
- filters and filtration system
- measuring equipment
- screen and filter types and materials
- quality assurance/quality control
- technical drawings and data
- data recording techniques
- hand and portable power tools
- specialised tools and jigs
- anode and cathode protection
- alignment procedures
- rigging and lifting techniques
- relevant materials and components
- fault finding and diagnostic techniques
- appropriate test procedures
- plant and system
- balancing procedures
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- identify and use measuring equipment;
- use hand portable power tools;
- use technical drawings and data;
- apply data analysis techniques
- install and remove bearings;
- dismantle and assemble components;
- apply installation and maintenance procedures;
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement .
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0071A: Undertake fabrication, forming, bending and shaping

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively undertake fabrication, forming, bending and shaping as applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Select and set up forming/shaping equipment for a specific operation	1.1 Most appropriate tools and equipment are selected. 1.2 Equipment are correctly set up and adjusted for operation 1.3 Allowances for shrinkage, thickness, inside/outside measurements are correctly made.
2. Operate forming/shaping equipment	2.1 Machine is safely started and shut down to standard operating procedure. 2.2 Material and safety guards are correctly positioned. 2.3 Equipment are correctly operated and adjusted.
3. Form and shape material	3.1 Material is levelled, straightened, rolled, pressed or bent to specifications/drawings. 3.2 Correct hot or cold-forming procedures are followed. 3.3 Final form/shape is checked for compliance to specification and adjusted as necessary to standard operating procedure.

RANGE STATEMENT

Work may be undertaken under supervision or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures.

A wide range of shapes and products are formed which may include but not limited to:

- pipe-work chamfers
- cylinders
- cones,
- angles
- hoppers
- ductwork
- "square to round" "transitions"
- "lobster backs"
- all forms of tubular shapes
- hand rails,
- reticulation pipe-work, mufflers et

Forming, shaping and bending operations may be conducted on:

- plate
- section or sheet
- tube
- pipes
- components

Materials may include:

- ferrous and non ferrous
- non-metallic substances

A variety of tools and equipment may be used including

- presses
- shapers
- vices
- benders
- drop hammers

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively undertaking fabrication, forming, bending and shaping operations in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to undertaking fabrication, forming, bending and shaping processes

Critical Aspects of Evidence (Cont'd)

- demonstrate correct procedures in setting up
- demonstrate safe and effective operational use of tools, plant and equipment
- forming, bending and shaping equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material and tools
- interactively communicate with others to ensure safe operations
- demonstrate effective fabrication, forming, bending and shaping technique to produce designed outcome

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the forming and shaping of fabricated components or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering
- MEMCOR0091A Draw and interpret sketches and simple drawing
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements including relevant OH&S legislation and regulations
- fabrication, forming, bending and shaping technique
- fabrication, forming, bending and shaping equipment
- hand tools and equipment
- materials /consumables relative to fabrication, forming, bending and shaping procedures
- materials preparation
- manual handling
- measurement
- technical drawings, sketches and instructions

Skills

The ability to:

- work safely to instructions
- interpret related drawings and instructions
- use power tools and hand tools
- select material and equipment
- measure relative to fabrication, forming, bending and shaping processes
- communicate effectively
- fabricate, form, bend and shape efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working under supervision or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMPO0021A: Perform general machining operations

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively perform general machining operations as applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Determine job requirements	1.1	Job specification requirements are determined from job sheets and/or instructions.
	1.2		Appropriate method/machine/tools are selected to meet specifications
		1.3	Parts and material are obtained and checked
		1.4	Work area is prepared
		1.5	Machine is loaded and adjusted appropriately for operation consistent with standard operating procedures.
2.	Follow sequence of operations	2.1	Sequence of operations are followed including job set up for maximum efficiency and to meet job specifications
		2.2	Machine operating instructions are followed (start-up, normal close down, emergency close down, operating sequence)
		2.3	Appropriate material is selected and datum established a required
3.	Select and mount tools	3.1	Appropriate tools for the job is selected, sharpened and shaped as required
		3.2	Tools are mounted and positioned correctly
4.	Perform machining operations	4.1	Basic marking out techniques is used where required
		4.2	Machining parameters are set for job requirements and maximum tool life

		4.3	Work is held or correctly clamped without damage to product.
		4.4	Machining is performed in a safe manner utilising all guards, safety procedures and personal protective clothing and equipment
5.	Measure components	5.1	Components are checked with appropriate instruments or gauges to ensure compliance with specifications
6	Adjust and maintain machine	6.1	Routine maintenance and adjustments are carried out as required which may include slide and collar adjustment, cleaning and lubrication.
7.	Clean up	7.1	Materials are stacked/stored for re-use or disposed of.
		7.2	Work area is cleared.
		7.3	Tools and equipment are cleaned, maintained and stored.

RANGE STATEMENT

Machining is undertaken on one or more of a range of standard machine tools.

Work is undertaken under supervision to predetermined specifications and standards of quality and safety.

Machines may include lathes, mills, planers, shapers, drills, slotters, surface grinders, etc.

Materials may include standard ferrous and non-ferrous materials.

Operations and set up carried out on those machines are straightforward and may include parallel cutting, slotting, planing, drilling, knurling, cutting flats, non-precision surface grinding operations etc.

Surface grinding operations covered by this unit are those requiring magnetic chucks and grinding of flat surfaces.

Machining parameters include speeds, feeds, stops, coolant and cutting lubricants etc.

Source of information:

- Appropriate job specification
- oral information/instructions
- Written and diagrammatic
- process sheets
- job cards
- operation sheets
- drawings
- specifications
- schedules

Safe working practices and

- Safety equipment
- protective clothing
- job instruction
- company/statutory regulations
- health and safety instruction

Instruments:

- measuring tapes
- steel ruler
- vernier callipers
- feeler gauges
- slip gauges
- internal, external, depth and height instruments
- range of micrometer instruments

Hand tools and equipment to include:

- laying out tools
- hacksaws
- range of machining files
- vices
- wire brushes
- try-squares
- bench and pedestal grinders,
- taps
- dies
- stud extractors
- drifts
- spanners, screwdrivers
- hammers
- mallets
- pliers
-

Activities may include:

- Preparing to undertake machining operation
- Carrying out benchwork fitting operations
- Cut and shape material to finished size using hand tools
- Sharpen hand tools using off hand grinding machine
- Using common machine setting tools
- Milling Materials/Components On Horizontal Milling Machines
- Setting up Metal Lathe Machines
- Turning Metal Materials/Components on Capstan, Centre or Turret Lathe

Work environment:

- workshop situations
- plant locations

Working hold devices Including:

- jigs/fixtures
- vices
- chuck/ collets
- mounting direct to table,
- automatic or manual operation

- centre punches, scribes, chisels, centre gauges,
- measuring (verniers, callipers, drill bits)
- bench and pedestal grinders,
- conventional milling machine
- conventional metal turning lathes
- tongue wrenches,
- hand drills
- punches
- allen keys
- pipe wrenches

EVIDENCE GUIDE

Competency is to be demonstrated safely and effectively when performing general machining operations in accordance with the range listed within the range of variables statement

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to performing general machining operations and during the machining process
- demonstrate safe and effective operational use of measuring instruments, tools, plant and equipment
- demonstrate correct procedures in using milling machinery
- demonstrate the correct procedures in using metal turning machinery
- demonstrate the ability to shape materials/components on milling machines
- demonstrate the ability to turn and shape materials/components on metal turning lathes
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective machining to produce designed cut/shape material

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the machining of materials or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering)
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- materials (ferrous and non-ferrous)
- bench, pedestal and surface grinders
- conventional milling machine
- conventional metal turning lathes
- general machining processes operations or activities
- hand tools, measuring instruments and equipment
- materials relative to cutting processes
- materials preparation
- manual handling
- engineering measurement
- related calculations
- drawings, sketches and instructions

Skills

The ability to:

- work safely to instructions
- interpret relative drawings and instructions
- use common engineering power tools and hand tools
- use standard engineering measuring instruments
- select/prepare material
- measure relative to machining processes
- perform calculations relative to machining process
- communicate effectively
- use accepted engineering techniques, practices, processes and workplace procedures.
- perform general machining operations

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures.
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0141A: Develop geometric shapes – (basic)

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively develop basic geometric shapes and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Transfer dimensions from a sketch or simple drawing to work piece	1.1	Specifications and work requirements are identified and understood using correct and appropriate calculations.
		1.2	Development is carried out to specifications or standard operating procedures using appropriate tools and equipment.
		1.3	Datum points are correctly established.
2.	Make templates as required	2.1	Appropriate template material is chosen.
		2.2	Templates are produced to specification.
		2.3	Correct storage procedures are followed including labelling and identification to standard operating procedures.
3.	Develop patterns as required	3.1	Parallel line, radial line and triangulation development methods are chosen and applied.
		3.2	Allowances for fabrication and assembly are correctly transferred.
4.	Identify relevant codes, standards and symbols	4.1	Relevant standards/codes and symbols are identified.
		4.2	Requirements of standards/codes are applied to materials and processes.
5.	Collect quantities of materials from storage area	5.1	Materials are correctly identified.
		5.2	Quantities are estimated from sketches and simple drawings.
		5.3	Material wastage is minimised.

RANGE STATEMENT

This unit applies to marking out of general fabrications using geometric development. Work is undertaken under supervision using predetermined standards of quality, safety and workshop procedures.

The task may be performed in the workshop or site. Marking out is undertaken using appropriate tools and equipment, and templates and patterns are produced as required.

Marking out covers but not limited to:

- engineering components
- jigs and fixtures
- castings
- templates
- dies and tooling
- marking out tables
- surface tables
- rotary tables
-

Sketches or simple drawings may include:

- circles
- regular polygons with four, seven and eight sides
- pentagon inscribed within measured circle
- ellipse
- triangles with specified angles
- arcs thru three points; tangent to two circles

Patterns and templates made from:

- wood
- paper (firm)
- plastics

Equipment may include but not limited to:

- sine bars and the like
- vernier height gauges
- protractors
- straight edge
- set squares
- marking out tools
- dividing heads etc.
- vee blocks
- cylinder squares

Relevant codes/standards and symbols may include:

- object line
- hidden line
- centre line
- section line
- dimension
- extension line
- cutting line
- short break line
- phantom line

Measurement systems:

- inch/foot system
- metric(SI) system

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively by marking out of general fabrications using geometric development in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the fabrication process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to develop basic geometric shapes relative to the fabrication process
- communicate information about fabrication processes, being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all related tasks in accordance with standard operating procedures
- perform tasks efficiently and to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0171A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0051A Perform related computations – (basic)

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- tools
- drawing interpretation
- basic numeracy
- marking off/out techniques
- materials relevant to the engineering process
- basic operations in simple geometry measurement and calculations
- basic development processes

Skills

The ability to:

- work safely to instructions
- use marking out tools and equipment
- handle materials
- select tools/equipment
- select material
- transfer measurements apply quality assurance
- read and interpret drawings and specifications
- measure and calculate manually
- record measurement

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures.
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both in accordance with workplace procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages processes Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0101A: Prepare basic engineering drawing

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively prepare basic engineering drawing, and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Identify drawing requirements	1.1	Requirements and purpose of drawing are determined from customer and/or work specification and associated documents.
		1.2	Identified and collected all data necessary to produce the drawing.
		1.3	Drawing requirements are confirmed with relevant personnel and timeframes for completion established.
2.	Prepare or make changes to engineering drawing	2.1	Drafting equipment selected are appropriate to the drawing method chosen.
		2.2	Drafting principles is applied to produce a drawing that is consistent with standard operating procedures within the enterprise.
		2.3	All work safely is undertaken to prescribed procedure
		2.4	Completed drawing is approved in accordance with standard operating procedures.
3.	Prepare engineering parts list	3.1	Components and parts are identified and organised by component type and/or in accordance with organisation/customer requirements.
4.	Issue drawing	4.1	Completed drawings and or parts lists are in accordance with standard operating procedures.
		4.2	Copied/issued approved drawings and or parts lists to relevant personnel in accordance with standard operating procedures.
		4.3	Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures.

RANGE STATEMENT

This unit applies to any of the full range of engineering disciplines;

- mechanical
- electrical/electronic
- fabrication

Drawing records may include

- cataloguing
- issuing security classifications
- filing
- preparing
- distribution lists
- drawings

Copies may be issued as:

- hard copy
- photographic
- slide or transparency form
- presentation
- a single drawing and/or
- with other drawings
- support documentation as a package

Geometric construction to include:

- circles
- regular polygons with four, seven and eight sides
- pentagon inscribed within measured circle
- ellipse
- triangles with specified angles
- arcs thru three points; tangent to two circles

Multi-view (orthographic 2-D) drawings:

- full scale (1:1) orthographic 3-view drawing using third angle projection with top, front and right side view – show all hidden features and center lines

Consultations may include reference to appropriate personnel including

- technical supervisory
- manufacturers
- suppliers
- contractors
- customers

Specifications may be obtained from

- design information
- customer deals/concepts/expectations/requirements
- sketches
- preliminary layouts

Drawing instruments and supplies:

- drafting kit/instruments
- blue prints
- drawings/modules/photographs

Alphabet of line:

- object line
- hidden line
- centre line
- section line
- dimension
- extension line
- cutting line
- short break line
- phantom line

Pictorial (3-D) drawing to include:

- isometric corner with left and right side lines each 30 degrees up from horizontal and third line at a vertical, with all three lines joining in a common intersection
- full scale (1:1) basic isometric drawing

Dimension reading:

- dimensioning styles and methods: co-ordinate, linear/datum
- dimensioning 2-D drawing
- dimensioning complex shapes: spheres, cylinders, tapers, pyramids

EVIDENCE GUIDE

Competency is to be demonstrated by developing and effectively preparing basic engineering drawings in accordance with the performance criteria and the range listed within the range statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation of basic engineering drawings or other units requiring the exercise of the skills and knowledge covered by this unit.

It is essential that competence is observed in the following aspects:

- prepare and understand various types of drawings
- prepare alphabet of lines, scales, lettering, dimensions, symbols, abbreviations and key features
- prepare title panel and reference date of drawings
- prepare basic engineering drawings

(2) Pre-requisite Relationship of Units

- MEMCOR0091A Draw and interpret sketches and simple drawings

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- types and use of drawing instruments and supplies
- identification of alphabet of lines, line type variation, order of usage and application on drawings
- types of scale and proportion and how they are used for measurement
- symbols, dimensions and terminology
- types of engineering drawings and their applications
- constructing plane geometry, loci and ellipse

Skills

The ability to:

- estimate measurements
- read and interpret working drawings
- prepare basic engineering drawing
- measure accurately
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

Competency should be assessed in a classroom environment in accordance with work practices and safety procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyze and organize information	Level 1	
Communicate ideas and information	Level 1	
Plan and organize activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills

MEMFAB0061A: Perform manual heating and thermal cutting

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively perform manual heating and thermal cutting and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

1. Assemble/disassemble plant, equipment for manual heating and thermal cutting	1.1	Appropriate cutting process and/or procedure for material are selected.
	1.2	Accessories and equipment are correctly selected and assembled.
2. Operate heating and thermal cutting equipment	2.1	All safety procedures are observed.
	2.2	Equipment start up procedures is followed correctly and to standard operating procedures.
	2.3	Equipment adjustments are made correctly using standard operating procedures.
	2.4	Appropriate cutting allowances are made.
	2.5	Materials are used in the most economical way.
	2.6	Defects are recognised and corrective action taken to standard operating procedures.
	2.7	Materials are heated and cut to specification shape/size/length and to accepted workplace standards.

RANGE STATEMENT

Work is undertaken under supervision or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures.

- Manual, straight line cutting standards observed.
- Manual or automatic processes used to cut and heat to specifications

Cutting may include flame gouging by hand. All work carried out to standard and regulatory requirements.

Cutting may be applied to material of various thicknesses and types including ferrous, non-ferrous and non-metallic materials by a variety of methods, which may include fuel gas oxy fuel gas and air fuel gas.

Cutting may include use of hand held and self-propelled straight-line cutters.

Heating may be applied to material of various thicknesses and types including ferrous, non-ferrous and non-metallic materials by a variety of methods, which may include fuel gas, oxy fuel gas and air fuel gas.

Materials welded may include:

- low carbon steel
- cast iron

Setting up may include the correct connection of:

- hoses
- blowpipes
- regulators
- settings of gas mixtures

Preparation of materials would be minimal and may include but not limited to:

- preheating
- setting up jigs
- setting up fixtures
- setting up clamps

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively performing routine manual heating and thermal cutting in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to setting up equipment and during the heating and cutting process
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in setting up and shutting down equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective heating and thermal cutting techniques to produce designed outcome

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual heating and thermal cutting or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0081A Mark off/out (general engineering)
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- heating medium/technique
- heating/cutting processes
- oxy-fuel equipment identification, transportation and storage
- hand tools and heating/cutting equipment
- materials/consumables relative to oxy-fuel heating and thermal cutting procedures
- materials preparation
- manual handling
- measurement
- drawings, sketches and instructions

Skills

The ability to:

- work safely to instructions
- communicate effectively
- interpret relative drawings and instructions
- use power tools and hand tools
- set up heating cutting equipment
- use heating cutting equipment
- identify/select material
- identify/select heating/cutting processes
- measure relative to heating and thermal cutting processes
- heat/cut efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills

MEMFAB0051A: Perform brazing and/or silver soldering

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively perform brazing and /or silver soldering as applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Prepare materials and equipment	1.1	Job requirements are determined from specifications and/ or instructions.
		1.2	Materials are correctly prepared using appropriate tools and techniques.
		1.3	Materials are correctly assembled/aligned to meet specifications as required.
		1.4	Distortion prevention measures are identified and appropriate action taken as required.
		1.5	Heating equipment is assembled and set up safely and correctly in accordance with standard operating procedures.
		1.6	Correct and appropriate consumables are selected and prepared.
		1.7	Test run undertaken and verified as required.
2.	Braze and/or silver solder	2.1	Correct and appropriate processes are selected to meet specifications.
		2.2	Materials are preheated as required.
		2.3	Consumables are applied using correct and appropriate techniques.
		2.4	Jointing material is applied correctly and in appropriate quantities to meet job/specifications.
		2.5	Used correct temperature and appropriate techniques.

- | | | | |
|---|----------------|-----|--|
| 3 | Inspect joints | 3.1 | Excess jointing materials are removed using correct and appropriate techniques. |
| | | 3.2 | Inspection of joints is undertaken using standard operating procedures and meeting specifications. |
| | | 3.3 | Inspection results are reported/recorded using standard operating procedures as required. |

RANGE STATEMENT

Work undertaken in a production, engineering or maintenance environment using predetermined standards of quality, safety and work procedures. Work may be undertaken under supervision or within a team environment. All work undertaken to standard requirements

Appropriate assembly of heating equipment may include:

- cylinders
- connections
- hoses
- tips
- nozzles

Materials:

- low carbon steel (mild steel) up to 10 gauge
- low carbon steel plate up to 5mm
- steel and galvanised pipes up to 50mm

Work activities:

- measuring,
- marking,
- grinding
- lifting,
- welding

Heating medium and appropriate consumables can include:

- oxyacetylene
- fuel gas
- fluxes (resin or powder)
- all types of silver solder and brazing rods

Location/condition:

- workshop
- plant
- fieldwork at ground level
- elevated positions
- dry
- humid and wet conditions
- construction environment
- agricultural environment
- food processing environment

- cutting
- aligning,
- shaping,
- filing,
- general machining

Specification:

- welding procedure
- weld profile regular in width
- even/regular ripple formation
- uniform in appearance,
- free from excessive undulations
- smooth stop/starts, tack incorporated,
- adequate penetration
- no excess undercut
- no craters

Types of welding joints:

- fillet weld
- lap weld
- butt weld,
- single and multi-run

Welding position:

- flat,
- vertical
- horizontal
- overhead

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively performing routine oxyacetylene welding (fuel gas welding) in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to setting up oxy acetylene equipment and during the brazing and or silver soldering process
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in setting up and shutting down oxy acetylene equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective brazing and or silver soldering technique to produce designed outcome

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling recording and reporting associated with brazing and/or silver soldering or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR01611A Plan and undertake a routine task
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- metal properties and classification
- heating medium/technique
- brazing/soldering processes
- oxy-fuel equipment identification, transportation and storage
- hand tools and equipment
- materials /consumables relative to brazing and silver soldering procedures
- materials preparation
- manual handling
- measurement
- drawings, sketches and instructions

Skills

The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings and instructions
- use brazing and soldering equipment
- identify/select material
- identify/select brazing soldering processes
- handle material, tools and equipment
- measure relative to brazing and or silver soldering processes
- identify/select materials relative to the brazing and or soldering process
- prepare materials relative to the brazing and or soldering process
- braze and or silver solder efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0151A: Prepare for oxyacetylene/metal arc welding processes

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively prepare the process for carrying out oxyacetylene/metal arc welding processes and applies to individuals working in metal engineering and maintenance industry.

Competency Field:

Metal Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

- | | |
|---|--|
| 1. Plan for installation process | 1.1 Quality Assurance requirements of engineering /maintenance operations are recognized and adhered to. |
| | 1.2 Preparation and planning requirements are identified from drawings/work location and/or supervisor's instructions. |
| | 1.3 OH&S requirements are identified and adhered to in accordance with application tasks and workplace environment. |
| | 1.4 Safety hazards are identified and correct procedures adopted to minimise risk to self and others. |
| | 1.5 Materials are selected, safely handled and stored/located ready for application. |
| | 1.6 Appropriate personal protective equipment are selected, correctly fitted and used. |
| | 1.7 Tools and equipment selected are consistent with the job requirements, |
| | 1.8 Tools and equipment selected are checked for serviceability and any faults reported to supervisor. |
| | 1.9 Materials/components selected consistent with the job requirements where applicable and checked for damage. |
| 2. Prepare equipment selected for welding process | 2.1 Activities for equipment preparation are identified from specifications or supervisor's instructions. |
| | 2.2 Equipment preparations are carried out to satisfy requirements of welding process. |

- | | | |
|--|-----|--|
| 3. Prepare material selected for welding process | 3.1 | Activities for material preparation are identified from specifications or supervisor's instructions. |
| | 3.2 | Material preparation is carried out to satisfy requirements of welding process. |
| 4. Prepare work area suitable for welding process | 4.1 | Activities to be carried out in work area are identified from welding technique, method of welding and access to area. |
| | 4.2 | Work area is prepared for welding process according to supervisor's instructions. |
| 5. Set up tools, plant and equipment appropriate for welding process | 5.1 | Regular tools/measuring devices suitable for application processes are identified to job requirements. |
| | 5.2 | Regular tools/measuring devices are set up safely and effectively to carry out processes where applicable. |
| 6. Select materials, cut and prepare sections | 6.1 | Materials are obtained as per instruction. |
| | 6.2 | Correct manual handling techniques is used to move and place materials. |
| | 6.3 | Materials are safely moved to work area. |
| | 6.4 | Appropriate techniques used to accurately cut/bend/prepare/secure components to same length or given instruction. |
| 7. Distribute components | 7.1 | Components are distributed and stacked to suit job location and sequence. |
| 8. Clean up | 8.1 | Materials are stacked/stored for re-use or disposed of. |
| | 8.2 | Work area is cleared. |
| | 8.3 | Tools and equipment are cleaned, maintained and stored. |

RANGE STATEMENT

This unit applies to the preparation processes carried out in preparing for welding processes using oxyacetylene and or metal arc welding techniques as per instructions.

Source of information:

- Specific work instructions/equipment manual
- health and safety requirements

Safety:

- personal safety
- hand tool safety
- welding safety
- manual lifting and handling

Types of hazards:

- faulty equipment
- premises,
- tools - obstructions
- hazardous substances
- faulty storage
- electrical wiring

Material to include:

- sheet metal
- steel plates
- pipes
- tubing

Work areas:

- fabrication layout
- maintenance
- welding
- finishing

Tools/equipment to include:

- power tools
- oxyacetylene welding and cutting equipment
- Angle grinders, pedestal grinders, surface grinders, rotary wire brushes
- hand and drill press
- cold chisel & files
- ball peen hammer
- arc welding equipment
- safety equipment
- work benches
- hack saw
- screwdrivers
- spirit level
- vices
- marking out tools
- chipping hammer

Protective clothing:

- coverall
- goggles
- gloves
- Safety boots
- safety helmet

Type of site and working conditions to include:

- workshop and on site
- at height as per industry standards
- in confined space
- indoors and out doors

Work is to be undertaken either as part of a team or individually, under supervision with instruction being as part of the supervisor's directions either verbal or written.

Reporting of faults may be verbal or written.

OH&S requirements to be in accordance with the Statutory regulations.

EVIDENCE GUIDE

Competency is to be demonstrated by carrying out the safe and effective preparation for oxyacetylene/metal arc welding processes accordance with performance criteria using any of the range of materials and processes listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- indicate compliance with organisational policies and procedures including Quality Assurance requirements
- carry out correct procedures prior to and during application of oxyacetylene/metal arc welding processes
- demonstrate safe working practices at all times
- demonstrate the ability to prepare for oxyacetylene/metal arc welding processes
- demonstrate the ability to apply appropriate principles/techniques to welding environment
- demonstrate the ability to carry out specific measurement and preparation procedures
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- use accepted engineering techniques, practices, processes and workplace procedures.
- demonstrate safe and effective operational use of tools, measuring devices and equipment
- interactively communicate with others to ensure safe and effective workplace operations

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Apply principles of Occupational Health and safety (OH&S) in work environment
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- workplace and equipment safety requirements
- drawings and specifications
- measuring devices
- hand tools and equipment
- materials relative to welding process
- materials handling
- measurement relative to welding process
- welding techniques consistent with oxyacetylene/metal arc welding processes
- workplace communications

Skills

The ability to:

- work safely to instructions
- use hand tools
- use measuring devices
- handle material
- select material
- communicate effectively
- measure relative to process
- prepare for oxyacetylene/metal arc welding processes

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activity

(6) Context of Assessment

Competency should be assessed in the workplace or simulated workplace environment in accordance with work practices and safety procedures.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

ITICOR0011A: Carry out data entry and retrieval procedures

Competency Descriptor:

This unit deals with the skills and knowledge required to operate computer to enter, manipulate and retrieve data and to access information and communicate via the Internet.

Competency Field: Information Technology and Communications - Operations

ELEMENT OF COMPETENCY PERFORMANCE CRITERIA

1. Initiate computer system	1.1	Equipment and work environment are correctly checked for readiness to perform scheduled tasks.
	1.2	The hardware components of the computer and their functions are correctly identified.
	1.3	Equipment is powered up correctly.
	1.4	Access codes are correctly applied.
	1.5	Appropriate software is selected or loaded from the menu.
2. Enter data	2.1	Types of data for entry correctly identified and collected.
	2.2	Input devices selected and used are appropriate for the intended operations.
	2.3	Manipulative procedures of Input device conform to established practices.
	2.4	Keyboard/mouse is operated within the designated speed and accuracy requirements.
	2.5	Computer files are correctly located or new files are created, named and saved.
	2.6	Data is accurately entered in the appropriate files using specified procedure and format.
	2.7	Data entered is validated in accordance with specified procedures.
	2.8	Anomalous results are corrected or reported in accordance with specified procedures.
	2.9	Back-up made in accordance with operating procedures.

- 3. Retrieve data
 - 3.1 The identity and source of information is established.
 - 3.2 Authority to access data is obtained where required.
 - 3.3 Files and data are correctly located and accessed.
 - 3.4 Integrity and confidentiality of data are maintained.
 - 3.5 The relevant reports or information retrieved using approved procedure.
 - 3.6 Formats to retrieved report or information conform to that required.
 - 3.7 Copy of the data is printed where required.
- 4. Amend data
 - 4.1 Source of data/information for amendment is established.
 - 4.2 Data to be amended is correctly located within the file.
 - 4.3 The correct data/Information is entered, changed or deleted using appropriate input device and approved procedures.
 - 4.4 The Integrity of data is maintained.
- 5. Use document layout and data format facilities
 - 5.1 Requirements for document are verified where necessary.
 - 5.2 The given format and layout are appropriately applied.
 - 5.3 Facilities to achieve the desired format and layout are correctly identified, accessed and used.
 - 5.4 Data manipulating facilities are used correctly.
 - 5.5 Format reflects accuracy and completeness.
- 6. Monitor the operation of equipment
 - 6.1 The system is monitored to ensure correct operation of tasks.
 - 6.2 Routine system messages are promptly and correctly dealt with.
 - 6.3 Non-routine messages are promptly referred in accordance with operating requirements.

	6.4	Error conditions within level of authority are dealt with promptly, and uncorrected errors are promptly reported.
	6.5	Output devices and materials are monitored for quality.
7. Access and transmit information via the Internet	7.1	Access to the Internet is gained in accordance with the provider's operating procedures.
	7.2	Evidence of the ability to negotiate web sites to locate and access specified information and other services is efficiently demonstrated.
	7.3	E-Mail is sent and retrieved competently.
8. Close down computer system	8.1	The correct shut down sequence is followed.
	8.2	Problem with shutting down computer is reported promptly.
	8.3	All safety and protective procedures are observed.
	8.4	The system integrity and security are preserved.
9. Maintain computer equipment	9.1	Cleaning materials and/or solutions used meet specified recommendation.
	9.2	The equipment is cleaned as directed.
	9.3	Wear and faults identified are promptly reported to the appropriate personnel.

RANGE STATEMENT

This unit applies to activities associated with essential operations linked to using and maintaining basic computer equipment.

Equipment:

- install supplied computer
- install supplied peripherals

Work environment:

- equipment
- furniture
- cabling
- power supply

Input devices:

- keyboard
- mouse
- scanner
- microphone
- camera

Software systems to include for:

- word processing
- spread sheet
- internet access

Files save on:

- network
- magnetic media
- personal PC

Data:

- textual
- numerical
- graphical

File operations:

Naming, updating, archiving, traversing field and records in database, use of search, sort, print

Maintenance:

- cleaning: enclosures, screen, input devices, output devices
- checking cables, etc

EVIDENCE GUIDE

Competency is to be demonstrated by the ability to accurately carry out basic data entry and retrieval operations on a computer system in accordance with the performance criteria and the range listed within the range of variables statement .

(1) Critical Aspects and Evidence

It is essential that competence be observed in the following aspects:

- Initiate the use on the equipment.
- Use document layout and data format facilities.
- Locate and access data.
- Use file operations.
- Manipulate input devices.
- Key-in and format reports.
- Access to the internet.

(2) Pre-requisite Relationship of Units

The pre-requisite for this unit is:

- Nil

(3) Underpinning Knowledge and SkillsKnowledge

knowledge of:

- safety for working with and around computers
- computer hardware and software systems
- procedure for initiating and closing down computer
- the operation of the data entry management system
- methods of locating files
- organisation's standards applicable to accessing files
- files operations and their applications
- file operation in database setting
- creating, locating and saving files
- using input devices
- using data checking devices
- formatting functions of software
- layout function of software
- graphic productions and manipulation
- regard for accuracy and security of information
- functions on the internet

Skills

The ability to:

- identify computer hardware
- manipulate data input devices
- access data
- use file operations
- key-in and format reports and letters
- retrieve data
- amend data
- print data
- save data
- search and receive data from the internet
- send and receive E-Mail

(4) Resource Implications

Files saved on network, magnetic media, personal Computer

Input devices: Keyboard, mouse, other selection devices

(5) Method of Assessment

Competency shall be assessed while work is undertaken under direct supervision with regular checks, but may include some autonomy when working as part of a team.

Competencies in this unit may be determined concurrently. Assessment must be in accordance with the performance criteria .

(6) Context of Assessment

This unit may be assessed on or off the job. Assessment should include practical demonstration either in the workplace or through a simulation. A range of methods to assess underpinning knowledge should support this

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices .

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level -	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level -	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0121A: Perform basic welding using oxyacetylene welding process (OAW) - fuel gas welding

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively perform basic welding using oxyacetylene welding (OAW) and applies to individuals working in the metal engineering and maintenance

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Prepare materials for welding	1.1 Weld requirements are identified from specifications and/or drawings. 1.2 Material is correctly prepared using appropriate tools and techniques. 1.3 Materials are assembled/aligned to specifications where required.
2. Assemble and set up welding equipment	2.1 Welding equipment is assembled and set up safely and correctly in accordance with standard operating procedures. 2.2 Test runs are undertaken and verified in accordance with specifications.
3. Select welding equipment, settings and consumables	3.1 Welding settings and consumables are selected against job requirements, welding procedures, specifications and/or technical drawings.
4. Identify distortion prevention measures	4.1 Distortion prevention measures are identified. 4.2 Appropriate action is taken to minimise and rectify distortion.
5. Weld joints to standard or equivalent	5.1 Welds are deposited correctly in flat and vertical position to specifications and industry standard (or equivalent). 5.2 Correct action is undertaken to minimise distortion. 5.3 Joints are cleaned to specifications using correct and appropriate tools and techniques.

- | | | | |
|----|----------------|-----|--|
| 6. | Inspect welds. | 6.1 | Weld joints are visually inspected against specifications. |
| | | 6.2 | Weld defects are identified. |
| 7 | Correct faults | 7.1 | Remedial action taken as required. |
| | | 7.2 | Correct remedial action taken and appropriate techniques and tools used. |

RANGE STATEMENT

Oxyacetylene welding (OAW) would be carried out using a range of material for heavy or light fabrication. The person would work under supervision or within a team environment using predetermined standards of quality, safety, work and welding procedures and the skills applied to a range of fabrication activities. Weld quality must meet required industry standards or equivalent outcomes.

Preparation of materials would include preheating, setting up of jigs, fixtures, clamps etc.

Remedial action using thermal processes may include oxyacetylene and arc air equipment. Grinding devices may also be used.

Setting up may include the correct connection of hoses, blowpipes, regulators etc. and correct settings of gas mixtures.

Appropriate assembly of heating equipment may include:

- cylinders
- connections
- hoses
- tips
- nozzles

Materials:

- low carbon steel (mild steel) up to 10 gauge
- low carbon steel plate up to 5mm
- steel and galvanised pipes up to 50mm

Heating medium and appropriate consumables can include:

- oxyacetylene
- fuel gas
- fluxes (resin or powder)
- all types of silver solder and brazing rods

Location/condition:

- workshop
- plant
- fieldwork at ground level
- elevated positions
- dry
- humid and wet conditions
- construction environment
- agricultural environment
- food processing environment

Work activities:

- measuring,
- marking,
- grinding
- lifting,
- welding
- cutting
- aligning,
- shaping,
- filing,
- general machining

Specification:

- welding procedure
- weld profile regular in width
- even/regular ripple formation
- uniform in appearance,
- free from excessive undulations
- smooth stop/starts, tack incorporated,
- adequate penetration
- no excess undercut
- no craters

Types of welding:

- fillet weld
- lap weld
- butt weld,
- single and multi-run

Welding position:

- flat,
- vertical
- horizontal
- overhead

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively weld using oxyacetylene welding (fuel gas welding) in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the oxyacetylene welding process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to identify/select materials relative to the oxyacetylene welding process
- communicate information about oxyacetylene welding processes, being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all related tasks in accordance with standard operating procedures
- perform oxyacetylene welding tasks efficiently and to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering
- MEMCOR0191A Use hand tools

Where welds are performed in the overhead position then Unit MEMFAB0072A (Perform advanced welding using oxyacetylene welding process) should be selected.

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- metal properties and classification
- heating medium/techniques
- welding techniques
- welding processes
- oxy-fuel equipment identification, transportation and storage
- hand tools and equipment
- materials /consumables relative to oxyacetylene welding procedures
- materials preparation
- manual handling and lifting
- measurement
- drawings, sketches and instructions

Skills

The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings and instructions
- use oxyacetylene welding equipment
- identify/select material
- identify/select welding processes
- handle material, tools and equipment
- measure relative to welding soldering processes
- identify/select materials relative to the welding process
- prepare materials relative to the welding process
- weld using oxyacetylene process efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0111A: Perform basic welding using manual metal arc welding process (MMAW)

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively perform welding using basic manual arc welding processes and applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Prepare materials for welding	1.1 Weld requirements are identified from specifications and/or drawings.
	1.2 Material is correctly prepared using appropriate tools and techniques.
	1.3 Materials are assembled/aligned to specification where required.
2. Select welding machine settings and electrodes	2.1 Welding machine and electrodes are identified against pre determined welding procedures and specifications and/or technical drawings.
3. Assemble and set up welding equipment	3.1 Welding equipment is assembled and set up safely and correctly in accordance with standard operating procedures.
	3.2 Test runs undertaken and verified in accordance with specifications.
4. Identify distortion prevention measures	4.1 Distortion prevention measures are identified.
	4.2 Appropriate action taken to minimise and rectify distortion.
5. Weld materials by correct process to quality described in General Purpose or equivalent	5.1 Welds are deposited correctly in flat, horizontal and vertical can position and to specifications.
	5.2 Distortion, preventative action taken where required.
	5.3 Joints are cleaned to specifications using correct and appropriate tools and techniques.

- | | | | |
|----|----------------|-----|--|
| 6. | Inspect welds | 6.1 | Weld joints are visually inspected against specifications. |
| | | 6.2 | Weld defects are identified. |
| 7. | Correct faults | 7.1 | Defects are removed with minimum loss of sound metal using correct and appropriate techniques and tools. |

RANGE STATEMENT

Manual metal arc welding (MMAW) would be carried out using a range of material for heavy or light fabrication.

Materials used may include carbon steel Material:

- low carbon steel plate up to 10 gauge
- low carbon steel plate up to 7mm
- steel and galvanised pipes up to 50mm

Hand tools to include:

- chipping hammer
- ball peen hammer
- wire brushes
- measuring tape
- steel rule
- files
- cold chisels
- tin snips
- centre punch
- scriber
- pliers
- adjustable wrenches
- allen keys
- vice grips
- slip joint pliers
- vice grip clamp
- divider
- compass
- screwdrivers

Protective clothing and equipment:

- safety boots
- coverall
- goggles
- dust mask
- safety helmet
- leggings
- welding helmet

Work activities may include:

- measuring
- marking
- cutting
- filing
- levelling
- hammering
- squaring
- straightening metal

Preparation of materials may include:

- preheating
- setting up of jigs
- fixtures
- clamps etc.

Welding machines:

- AC and DC arc welding plant - electrical and portable engine driven

Joint preparation:

- lap joints
- vee joints
- butt joints
- tee joints

Location/condition:

- workshops
- plants
- in the field
- confined spaces
- elevated positions
- damp and wet situations

Weld procedures may include

- amperage setting
- earthing
- electrode flux condition etc.

Machine attachments:

- welding leads
- grounding clamp
- electrode holder

Condition for satisfactory weld:

- pre-heating
- arc strike/travel/length
- electrode angle
- arc dynamic/electrical stability

Welding type may include:

- fillet weld
- lap weld
- butt weld

Welding position may include:

- flat
- vertical up and down horizontal

The person would work under supervision or within a team environment using predetermined standards of quality, safety, work and welding procedures and the skills applied to a range of fabrication activities.

Remedial action using thermal processes may include oxyacetylene and air arc equipment.

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the manual metal arc welding all process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to perform manual arc and/or gas metal arc welding in the flat, horizontal and vertical position and to specifications.
- demonstrate correct procedures in setting up and shutting down manual arc welding equipment
- communicate information about tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering)
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0191A Use hand tools

Where welding is carried out in the overhead position, then UnitMEMFAB0042A (Perform advanced welding using manual metal arc welding process (MMAW), should also be selected.

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- workplace and equipment safety requirements including relevant OH&S legislation and regulations
- metal classification
- welding technique
- welding processes
- manual welding equipment identification, transportation and storage
- hand tools and equipment
- materials /consumables relative to perform routine manual arc and/or gas metal arc welding
- manual handling and lifting
- measurement
- drawings, sketches and instructions

Skills

The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings and instructions
- use power tools and hand tools
- identify/select material
- identify/select welding processes
- handle material, tools and equipment
- measure relative to welding processes
- identify/select materials relative to manual arc and/or gas metal arc welding
- perform manual arc and/or gas metal arc welding

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0742A: Install and maintain industrial transmission

Competency Descriptor:

This unit refers the skills and knowledge required to carry out all work associated with the installation and maintenance of industrial transmissions and may involve faultfinding, diagnosis and repairs as applied to the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare for the work	<p>1.1 Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.2 Work requirements are clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.3 Occupational health and safety standards are identified, applied and monitored throughout the work procedure.</p> <p>1.4 Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.</p> <p>1.5 Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.</p> <p>1.6 Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.</p> <p>1.7 Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.</p> <p>1.8 Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.</p> <p>1.9 Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.</p>

- 2. Remove transmissions / plant for maintenance
 - 2.1 Required isolations are confirmed where appropriate in accordance with site requirements.
 - 2.2 Transmission/plant is disconnected in accordance with the work plan.
 - 2.3 Transmission/plant is removed in a manner, which will assist in replacement in accordance with the work plan.
 - 2.4 Transmission/plant is inspected for abnormalities in accordance with the work plan.
- 3. Maintain industrial transmission
 - 3.1 Maintenance is performed in accordance with manufacturers' specifications and site procedures.
 - 3.2 Mechanical drive/transmission assembly is dismantled using appropriate engineering principles and technical procedures in accordance with the job plan and site requirements.
 - 3.3 Component parts are clearly marked, and sketches produced as required, for identification in accordance with the job plan and site requirements.
 - 3.4 Component wear and clearances are determined using precise measuring techniques and appropriate test equipment in accordance with manufacturers' specifications and site requirements.
 - 3.5 Components found to be faulty are repaired, replaced and/or adjusted to conform with manufacturers' specifications and site requirements.
 - 3.6 New components are inspected for compliance to required specifications and prepared for re-assembly in accordance with manufacturers' specifications/site requirements.
 - 3.7 Component parts are refitted to mechanical drive/transmission assembly in accordance with manufacturers' specifications/site requirements.
 - 3.8 Modifications/alterations are undertaken in accordance with site requirements.

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| 4. Repl ace/install transmission | 4.1 Site is prepared for transmission replacement in accordance with the work plan. |
| | 4.2 Transmission is replaced in accordance with the work plan and manufacturers specifications. |
| | 4.3 Transmission is levelled, aligned, coupled and connected in accordance with the work plan. |
| | 4.4 All fastenings are torqued in accordance with manufacturers specifications and site requirements |
| | 4.5 Machinery/plant and transmission are test run, monitored and adjusted as required in accordance with manufacturers specifications and site requirements. |
| 5. Complete the work | 5.1 Work is completed and appropriate personnel notified in accordance with site/enterprise requirements. |
| | 5.2 Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | 5.3 Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | 5.4 Work completion details are finalised in accordance with site/enterprise procedures. |

RANGE STATEMENT

Transmissions may include:

- gear drives
-
- fluid drives
- gear boxes and variable speed drives

Test equipment may include:

- feeler gauge,
- dial gauge,
- bearing blue,
- micrometers,
- flexi gauge,
- leads and go/no-go gauges

Drive devices may include:

- worm and worm wheel
- line shafts
- plummet blocks
- pulleys
- sprockets
- belts
- taper bush assemblies
- roller chains
- chain drives,
- mechanical and hydraulic couplings
- compression couplings
- disc type flexible couplings
- spider type, flexible couplings
- chain couplings
- universal joints
- bevel gearing
- rack and pinion gearing
- dog toothed clutches
- cone type clutches
- expanding shoe type clutches
- friction plate type clutches
- centrifugal clutches
- toggle action linkages
- magnetic clutches
- sprag clutches
- band type brakes and other associated drive components

Maintenance may include:

- repair
- inspection
- modification
- overhaul
- lubrication
- servicing and test running

Tools and equipment may include:

- micrometers
- verniers
- dial test indicators
- slip gauges
- hand tools
- customised mandrels
- digital height gauges
- internal micrometers
- oxyacetylene gear
- depth gauges
- air grinders
- jigs and fixtures
- customised spanners
- electronic internal micrometers
- appropriate lifting devices
- heated oil bath and induction heaters

Details of maintenance may be clarified by:

- diagnosis and work place inspection of industrial transmission

Work completion details may include:

- plant and maintenance records
- job cards
- check sheets
- on device labelling updates and reporting and/or documenting equipment defects

Work site environment may be affected by:

- nearby plant or processes e.g.
- chemical
- heat
- dust
- noise
- gas and oil

Reconnection of transmission may require:

- advanced levelling and alignment

Isolations can refer to

- electrical/mechanical or other associated processes

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of industrial in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of mechanical valves
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of industrial transmission
- demonstrate correct procedures in maintaining industrial transmission
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety
- gearing and power transmission principles
- precision measuring equipment
- seals and gaskets; Bearings (anti-friction and plain)
- quality assurance/quality control
- specialised tools and jigs
- advanced levelling and alignment
- rigging and lifting
- relevant materials and components
- technical drawings and data
- data recording techniques
- hand and portable power tools
- diagnostic and testing techniques
- relevant plant and systems
- isolation procedures
- heating techniques
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- identify and use measuring equipment
- apply gear and power transmission principles
- manufacture and install seals and gaskets
- install bearings (anti-friction and plain)
- apply levelling and alignment techniques
- use technical drawings and data
- identify and select materials and components
- apply data analysis techniques
- use hand and portable power tools
- apply diagnostic and testing techniques
- apply dismantling and reassembling techniques
- apply installation and maintenance procedures
- recognise worn/damaged components
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0772A: Install and maintain conveyors and associated equipment

Competency Descriptor:

This unit refers to the skills and knowledge required for fault finding, diagnosis and repair, adjustments, exchange of rollers and preparations for belt splicing/repairs as applied to the metal engineering and maintenance.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare for the work	<p>1.1 Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.2 Work requirements are clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.3 Occupational health and safety standards are identified, applied and monitored throughout the work procedure.</p> <p>1.4 Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.</p> <p>1.5 Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.</p> <p>1.6 Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.</p> <p>1.7 Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.</p> <p>1.8 Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.</p> <p>1.9 Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.</p>

- 2. Remove equipment to facilitate maintenance
 - 2.1 Where appropriate, faulty components and parts are identified and required isolations are confirmed where appropriate in accordance with site requirements.
 - 2.2 Associated equipment is disconnected in accordance with the work plan.
 - 2.3 Associated equipment is removed in a manner which will assist in replacement in accordance with the work plan.
 - 2.4 Conveyors and associated equipment are inspected for abnormalities in accordance with the work plan.
- 3. Maintain conveyors and/or associated equipment
 - 3.1 Belt tensioning equipment is released and secured to facilitate maintenance in accordance with the work plan.
 - 3.2 Sketches are made, data noted and components marked for identification and/or re-assembly in accordance with manufacturers' specifications and the work plan.
 - 3.3 Out of specification modifications /alterations approved in accordance with requirements.
 - 3.4 New components are installed and inspected for compliance with job specifications and prepared for re-assembly in accordance with site requirements.
 - 3.5 Dimensional inspection is performed using precision measuring devices to determine compliance with the job plan.
 - 3.6 Machinery/conveyors are levelled, aligned and tensioned in accordance with the job plan and site requirements.
- 4. Replace/install conveyors and/or associated equipment
 - 4.1 Where appropriate, faulty components and parts are identified and site is prepared for conveyors and associated equipment to be replaced in accordance with the work plan.
 - 4.2 Conveyors and associated equipment are replaced in accordance with the work plan and manufacturers specifications.

- 4.3 Conveyors and associated equipment are levelled, aligned and coupled in accordance with the work plan.
- 4.4 All fastenings are torqued in accordance with manufacturers' specifications and site requirements.
- 4.5 Conveyors and associated equipment are test run, monitored and adjusted as required in accordance with manufacturers' specifications and site requirements.
- 5. Complete the work
 - 5.1 Work is completed and appropriate personnel notified in accordance with site/enterprise requirements.
 - 5.2 Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures.
 - 5.3 Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures.
 - 5.4 Work completion details are finalised in accordance with site/enterprise procedures.

RANGE STATEMENT

Conveyors may be:

- fixed
- shuttle or multi-directional,
- rubber belts
- or drag link

Details of maintenance may be:

- clarified by diagnosis or work place inspection

Associated plant/components may include:

- rollers,
- idlers,
- pulleys,
- self tracking devices,
- scrapers,
- skirting rubbers,
- chutes,

Maintenance may include:

- repair,
- inspection,
- modification,
- overhaul, lubrication,
- servicing,
- test running,
- belt cleaning and roller changes

- magnetic detectors,
- wear plates,
- ploughs,
- sprays for dust suppression,
- anti-slip devices,
- clipping rubber belts and flop gates

Work completion details may include:

- plant and maintenance records,
- job cards,
- check sheets,
- on device labelling updates
- and reporting and/or
- documenting equipment defects

Work site environment may be:

- affected by nearby plant
- or processes,
- e.g. chemical,
- heat,
- dust,
- noise,
- gas and oil

Isolations can refer to:

- electrical/mechanical or other associated processes

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of fluid power systems in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of conveyors and associated equipment
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of conveyors
- demonstrate correct procedures in maintaining conveyors and associated equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety
- conveyor types and their operating principles
- conveyor tracking principles
- conveyor tensioning techniques
- conveyor operations/systems
- bearings
- precision measuring equipment
- quality assurance/quality control
- technical drawings and data
- data recording techniques
- hand and portable power tools
- specialised tools and jigs
- levelling and alignment principles
- rigging and lifting techniques
- materials and components
- diagnostic and testing techniques
- balancing procedures
- isolation procedures
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- identify and use measuring equipment
- use hand and portable power tools
- use and/or update technical drawings and data
- apply data analysis techniques and tools
- select and use specialised tools and jigs
- level and align
- identify and select materials and components
- apply diagnostic and testing techniques
- track
- align and tension conveyors and associated equipment
- install and remove bearings
- dismantle
- exchange and reassemble components and parts
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0782A: Install and maintain material feeders

Competency Descriptor:

This unit refers to the skills and knowledge required for the -servicing faultfinding, diagnosis and out of service inspection (internal/external), repairs and/or overhaul of material feeders.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare for the work	1.1	Work requirements are identified from request/work orders or equivalent clarified/confirmed with appropriate parties or by site inspection.
		1.2	Work requirements are clarified/confirmed with appropriate parties or by site inspection.
		1.3	Occupational health and safety standards are identified, applied and monitored throughout the work procedure.
		1.4	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.
		1.5	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
		1.6	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.
		1.7	Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.
		1.8	Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.
		1.9	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.
2.	Conduct in-service testing	2.1	In-service tests are carried out in accordance with the work plan.
		2.2	Faults are located using appropriate tools, equipment and testing techniques, being mindful of personnel safety and plant integrity.

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- 2.3 Testing and faultfinding results are analysed to establish suitable repairs or ascertain serviceability.
 - 3. Remove equipment to facilitate maintenance
 - 3.1 Required isolations are confirmed where appropriate in accordance with site requirements.
 - 3.2 Material feeders are disconnected in accordance with the work plan.
 - 3.3 Material feeders are inspected for abnormalities in accordance with the work plan.
 - 4. Maintain material feeders
 - 4.1 Maintenance is performed in accordance with manufacturers' specifications and site requirements.
 - 4.2 Components or sub-assemblies are dismantled, cleaned and examined to verify tolerances
 - 4.3 Equipment is dismantled in a manner that will facilitate re-assembly in accordance with the work plan.
 - 4.4 Component parts are clearly marked for identification in accordance with job requirements.
 - 4.5 Component parts are clearly marked for identification in accordance with job requirements.
 - 4.6 New components are inspected for compliance with manufacturers' specifications and prepared for assembly in accordance with the job plan and site requirements.
 - 4.7 Modifications/alterations are undertaken in accordance with site requirements.
 - 4.8 Components are reassembled in accordance with work plan and site requirements.
 - 5. Replace/install feeders
 - 5.1 Site is prepared for material feeders to be replaced in accordance with the work plan.
 - 5.2 All fastenings are torqued in accordance with manufacturer's specifications and site requirements.
 - 5.3 Material feeders are test run and monitored as required in accordance with manufacturer's specifications and site requirements.

6. Complete the work

- 6.1 Work is completed and appropriate personnel notified in accordance with site/enterprise requirements.
- 6.2 Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures.
- 6.3 Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures.
- 6.4 Work completion details are finalised in accordance with site/enterprise procedures.

RANGE STATEMENT

Feeders may include:

- Vibro
- apron,
- rotary,
- table type and belt type (gravimetric and volumetric)

Metering techniques may include:

- electromagnetic
- elliptical and variable speed

Maintenance may include:

- repair,
- inspection,
- modification,
- overhaul,
- lubrication,
- servicing and test running

Work site environment may be:

- affected by nearby plant or processes

e.g. chemical

- heat
- dust
- noise
- gas and oil

Feeder processes may involve:

- coal and hot air

Details of maintenance may be:

- clarified by diagnosis and work place inspection

Work completion details may include:

- plant and maintenance records,
- job cards
- check sheets
- on device labelling updates and reporting and/or documenting equipment defects

Isolations can refer to

- electrical/mechanical or other associated processes

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of material feeders in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of material feeders
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of material feeders
- demonstrate correct procedures in maintaining material feeders
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- occupational health and safety standards
- gearboxes
- seals and gaskets
- bearings (anti-friction and plain)
- lubricants
- feeder types and operating principles
- precision measuring equipment
- quality assurance / quality control
- technical drawings and data
- data recording techniques
- Communication principles
- hand and power tools
- specialised tools and jigs
- advanced levelling and alignment principles
- rigging and lifting techniques
- relevant materials and components
- diagnostic and testing techniques
- plant and systems
- isolation procedures
- balancing procedures

Skills

The ability to:

- apply occupational health and safety standards
- manufacture gaskets and seals
- identify and use precision measuring equipment
- apply feeder-operating principles when setting equipment
- use hand and portable power tools
- use technical drawings and data
- apply data analysis techniques
- select and use specialised tools and jigs
- level and align
- identify and select materials and components
- apply diagnostic and testing techniques
- adjust feeder for desired material feed rate
- install and remove bearings
- dismantle and reassemble components
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0792A: Install and maintain material crushers

Competency Descriptor:

This unit refers to the skills and knowledge required for the -servicing faultfinding, diagnosis and out of service inspection (internal/external), repairs and/or overhaul of material crushers.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare for the work	1.1	Work requirements are identified from request/work orders or equivalent clarified/confirmed with appropriate parties or by site inspection.
		1.2	Work requirements are clarified/confirmed with appropriate parties or by site inspection.
		1.3	Occupational health and safety standards are identified, applied and monitored throughout the work procedure.
		1.4	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.
		1.5	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
		1.6	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.
		1.7	Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.
		1.8	Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.
		1.9	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.

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| 2. | Conduct in-service testing | 2.1 | In-service tests are carried out in accordance with the work plan. |
| | | 2.2 | Faults are located using appropriate tools, equipment and testing techniques, being mindful of personnel safety and plant integrity. |
| | | 2.3 | Testing and faultfinding results are analysed to establish suitable repairs or ascertain serviceability. |
| 3. | Remove equipment to facilitate maintenance | 3.1 | Required isolations are confirmed where appropriate in accordance with site requirements. |
| | | 3.2 | Material crushers are disconnected in accordance with the work plan. |
| | | 3.3 | Material crushers are inspected for abnormalities in accordance with the work plan. |
| 4. | Maintain material feeders | 4.1 | Maintenance is performed in accordance with manufacturers' specifications and site requirements. |
| | | 4.2 | Components or sub-assemblies are dismantled, cleaned and examined to verify tolerances |
| | | 4.3 | Equipment is dismantled in a manner that will facilitate re-assembly in accordance with the work plan. |
| | | 4.4 | Component parts are clearly marked for identification in accordance with job requirements. |
| | | 4.5 | Component parts are clearly marked for identification in accordance with job requirements. |
| | | 4.6 | New components are inspected for compliance with manufacturers' specifications and prepared for assembly in accordance with the job plan and site requirements. |
| | | 4.7 | Modifications/alterations are undertaken in accordance with site requirements. |
| | | 4.8 | Components are reassembled in accordance with work plan and site requirements. |

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|-----------------------------|-----|---|
| 5. Replace/install crushers | 5.1 | Site is prepared for material crushers to be replaced in accordance with the work plan. |
| | 5.2 | All fastenings are torqued in accordance with manufacturer's specifications and site requirements. |
| | 5.3 | Material feeders are test run and monitored as required in accordance with manufacturer's specifications and site requirements. |
| 6. Complete the work | 6.1 | Work is completed and appropriate personnel notified in accordance with site/enterprise requirements. |
| | 6.2 | Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | 6.3 | Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | 6.4 | Work completion details are finalised in accordance with site/enterprise procedures. |

RANGE STATEMENT

Crusher types may include:

- Impact
- ball mills
- bowl mills
- hammer
- jaw crushers
- pulverisers
- rotary breaker
- roller crusher and tines

Metering techniques may include:

- electro magnetic
- elliptical and variable speed

Maintenance may include:

- repair
- inspection
- Modification
- Overhaul
- lubrication
- servicing and test running

Details of maintenance may be:

- clarified by diagnosis and work place inspection

Maintenance may include:

- repair,
- inspection,
- modification,
- overhaul,
- lubrication,
- servicing and test running

Work site environment may be affected by nearby plant or processes, e.g. chemical

- heat
- dust
- noise
- gas and oil

Work completion details may include:

- plant and maintenance records,
- job cards
- check sheets
- on device labelling updates and reporting and/or documenting equipment defects

Isolations can refer to

- electrical/mechanical or other associated processes

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of material crushers in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of material crushers
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of material crushers
- demonstrate correct procedures in maintaining material crushers
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety standards
- gearboxes
- seals and gaskets
- bearings (anti-friction and plain)
- lubricants
- lubrication systems
- crusher types and operating principles
- measuring equipment
- quality assurance / quality control
- technical drawings and data
- data recording techniques
- Communication principles
- hand and power tools
- specialised tools and jigs
- levelling and alignment principles
- rigging and lifting techniques
- relevant materials and components
- diagnostic and testing techniques
- torquing technique
- plant and systems
- isolation procedures
- balancing procedures

Skills

The ability to:

- apply occupational health and safety standards
- manufacture gaskets and seals
- identify and use measuring equipment
- apply crusher-operating principles when setting equipment
- use hand and portable power tools
- use technical drawings and data
- apply data analysis techniques
- select and use specialised tools and jigs
- level and align equipment
- identify and select materials and components
- apply diagnostic and testing techniques
- adjust crusher for desired material rate
- install and remove bearings
- dismantle and reassemble components
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0802A: Install and maintain fuel transport equipment

Competency Descriptor:

This unit refers to the skills and knowledge required for the installation and repair/overhaul of fuel carriage/delivery and associated systems.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare for the work	<p>1.1 Work requirements are identified from request/work orders or equivalent clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.2 Work requirements are clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.3 Occupational health and safety standards are identified, applied and monitored throughout the work procedure.</p> <p>1.4 Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.</p> <p>1.5 Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.</p> <p>1.6 Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.</p> <p>1.7 Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.</p> <p>1.8 Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.</p> <p>1.9 Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.</p>
2. Remove systems and associated equipment	<p>2.1 Required isolations are confirmed where appropriate in accordance with site requirements.</p> <p>2.2 Fuel transport systems are disconnected in accordance with the work plan.</p>

- 2.3 Fuel transport systems are removed in a manner, which will assist in replacement in accordance with the work plan.
 - 2.4 Fuel transport systems are inspected for abnormalities in accordance with the work plan.
- 3. Maintain fuel delivery systems
 - 3.1 Maintenance is performed in accordance with the work place and site procedures.
 - 3.2 Equipment is dismantled in a manner that will facilitate re-assembly in accordance with the work plan.
 - 3.3 Faulty components are replaced in accordance with the work plan and site requirements.
 - 3.4 Equipment is reassembled in accordance with the work plan and site requirements.
- 4. Replace systems and associated equipment
 - 4.1 Site is prepared for fuel transport systems to be replaced in accordance with the work plan.
 - 4.2 Fuel transport systems are replaced in accordance with the work plan and manufacturers specifications.
 - 4.3 Fuel transport systems are test run and monitored as required in accordance with manufacturers' specifications and site requirements.
- 5. Complete the work
 - 5.1 Work is completed and appropriate personnel notified in accordance with site/enterprise requirements.
 - 5.2 Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures.
 - 5.3 Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures.
 - 5.4 Work completion details are finalised in accordance with site/enterprise procedures.

RANGE STATEMENT

Metal and Engineering Competency Standards
Fuel delivery systems
may include:

- pipe
- work
- raffle boxes
- burners and ducting

Fuel may include:

- pulverized fuel
- liquids (heavy and light oil) and gas

Work site environment may be affected by:
nearby plant or processes, e.g.

- chemical
- heat
- dust
- noise
- gas and oil

Associated systems may include:

- products of combustion disposal

Work completion details may include:

- plant and maintenance records
- job cards, check sheets
- on device labelling updates and reporting and/or documenting equipment defects

Isolations can refer to:

- electrical/mechanical or other associated processes

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of fuel transportation equipment in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of fuel transportation system
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of fuel transportation equipment
- demonstrate correct procedures in maintaining fuel transportation equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety;
- fuel transport systems;
- appropriate tools and jigs;
- measuring equipment;
- engineering principles;
- levelling and aligning principles;
- rigging and lifting equipment;
- relevant materials and components;
- quality assurance/quality control;
- technical drawings and data;
- data recording techniques;
- hand and portable power tools;
- isolation procedures;
- welding equipment;
- gaskets and seals;
- communication principles;
- pipe bending and development techniques;
- support systems (pipe work and duct work)

Skills

The ability to:

- apply occupational health and safety standards
- identify and use precision measuring equipment
- use hand and portable power tools
- use technical drawings and data
- select and use appropriate tools and jigs
- level and align
- identify and select relevant materials and components
- select and use gaskets and seals
- dismantle and assemble components
- apply welding techniques
- apply installation and maintenance procedures
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

BSBSBM0012A: Craft personal entrepreneurial strategy

Competency Descriptor:

This unit deals with the skills and knowledge required to craft an entrepreneurial strategy that fits with the attitudes, behaviours, management competencies and experience necessary for entrepreneurs to meet the requirements and demands of a specific opportunity.

Competency Field: Small Business Operations

ELEMENT OF COMPETENCY PERFORMANCE CRITERIA

1. Demonstrate knowledge of the nature of entrepreneurship	1.1	Concepts associated with entrepreneurship are clearly defined.
	1.2	Factors which influence entrepreneurship in and outside of Jamaica are correctly identified and explained.
	1.3	The importance of entrepreneurship to economic development and employment is explained clearly.
	1.4	The findings of research conducted on entrepreneurial ventures and successes in the Caribbean region are clearly presented in an appropriate format.
	1.5	Differences between wage employment and entrepreneurial ventures are correctly stated.
2. Identify and assess entrepreneurial characteristics	2.1	Relevant research is carried out and required entrepreneurial characteristics identified.
	2.2	Entrepreneurial characteristics identified are assessed and ranked.
	2.3	An understanding of the process and discipline that enable an individual to evaluate and shape choices and to initiate effective action is correctly demonstrated.
	2.4	Factors that will help an entrepreneur to manage the risk and uncertainties of the future, while maintaining a future orientated frame of mind, are identified.

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| 3. | Develop self-assessment profile | 3.1 | Self-assessment tools/methods to identify personal entrepreneurial potential are identified and properly used. |
| | | 3.2 | The ability to apply creativity, problem-solving techniques and principles to solve business related problems are demonstrated. |
| | | 3.3 | Feedback from others for the purpose of becoming aware of blind spots and for reinforcing or changing existing perceptions of strengths/ weaknesses is appropriately obtained. |
| 4. | Craft an entrepreneurial strategy | 4.1 | A profile of the past that includes accomplishments and preferences in terms of life and work styles, coupled with a look into the future and an identification of what one would like to do is developed. |
| | | 4.2 | Commitment, determination and perseverance; orientation towards goals; taking initiative and accepting personal responsibility; recognizing management competencies and identifying areas for development are determined. |
| | | 4.3 | Written guidelines to obtain feedback that is solicited, honest, straightforward, and helpful but not all positive or negative are developed to facilitate reviews. |
| | | 4.4 | Framework and process for setting goals which demand time, self-discipline, commitment, dedication and practice are developed. |
| | | 4.5 | Goals established are specific and concrete, measurable, relate to time, realistic and attainable. |
| | | 4.6 | Priorities, including identifying conflicts and trade-offs and how these may be resolved are established. |
| | | 4.7 | Potential problems, obstacles and risks in meeting goals are identified. |
| | | 4.8 | Specified action steps that are to be performed in order to accomplish goals are identified. |
| | | 4.9 | The method by which results will be measured is indicated. |

- 4.10 Milestones for reviewing progress and tying these to specific dates on a calendar are established.
- 4.11 Sources of help to obtain resources are identified.
- 4.12 Evidence of the ability to review process and periodically revise goals is demonstrated.

RANGE STATEMENT

At this stage of the entrepreneurial process the entrepreneur must be able to conduct a self-assessment profile, examine the frame work for self assessment, develop a personal entrepreneurial strategy, identify data to be collected in the self-assessment process and learn about receiving feedback and setting goals.

Concepts associated to include:

- risk
- entrepreneurship
- macro-screening
- micro-screening
- competition
- wage employment

Influencing factors to include:

- market conditions
- markets – demand/supply
- global trends
- level of economic activities
- funding
- economic stability
- social stability
- resources availability

The entrepreneur must be able to:

- understand the extreme complexity in predicting or aligning him/herself to specific careers in an environment of constant change
- determine the kind of entrepreneur he or she wants to become based on attitudes, behaviours, competencies, experience and how these fit with the requirements and demands for a specific opportunity
- evaluate thoroughly his or her attraction to entrepreneurship
- effectively develop personal plan
- utilize available information that will enhance his or her ability to achieve success

The entrepreneur may encounter setbacks if the planning process is not effectively pursued.

Pitfalls may include:

- proceeding without effective planning which may result in commitment to uncertainty
- commitment to a premature path with the desirability of flexibility can lead to disaster
- personal plans fail for the same reasons as business plans including frustration if the plan appears not to be working immediately and the challenges of changing behaviour from an activity-oriented routine to one that is goal oriented
- developing plans that fail to anticipate obstacles, and those that lack progress milestones and reviews

EVIDENCE GUIDE

Competency is to be demonstrated when the entrepreneur is able to undertake a personal entrepreneurial assessment exercise to determine if he or she possesses the necessary credentials to be a successful entrepreneur. This stage of the entrepreneurial process is critical since experience has shown that the founder is one of the deciding forces if the venture is to succeed and prosper.

(1) Critical Aspects of Evidence

The entrepreneur will be assessed by his/her action in developing an orchestrated plan in order to effectively pursue the business concept.

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- personal entrepreneurial profile systems
- effective management systems: marketing, operations/productions, finance, administration, law
- how to measure feedback
- the method of developing a personal plan and a business plan
- understanding the difference between entrepreneurial culture and management culture

Skills

The ability to:

- determine barriers to entrepreneurship
- minimize exposure to risk
- exploit any available resource pool
- tailor reward systems to meet a particular situation
- effectively plan and execute activities
- use computer technology to undertake assessments

(4) Resource Implications

The following resources should be made available:

Personal computer with access to the internet and appropriate software that will enable one to conduct the necessary analysis using the internet

(5) Method of Assessment

A useful method of assessment is to determine if the venture can stand up to the test of critical evaluation.

(6) Context of Assessment

This stage of the entrepreneurial process is assessed when comparisons are made between actual outcomes and plans/projections.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1	Level 2	Level 3
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0812A: Install and maintain industrial pressure vessels

Competency Descriptor:

This unit refers to the skills and knowledge required for the installation and maintenance of boiler pressure parts, pressure vessels and associated components.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

- | ELEMENT OF COMPETENCY | PERFORMANCE CRITERIA |
|----------------------------------|--|
| 1. Plan and prepare for the work | 1.1 Work requirements are identified from request/work orders or equivalent clarified/confirmed with appropriate parties or by site inspection.
1.2 Work requirements are clarified/confirmed with appropriate parties or by site inspection.
1.3 Occupational health and safety standards are identified, applied and monitored throughout the work procedure.
1.4 Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.
1.5 Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
1.6 Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.
1.7 Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.
1.8 Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.
1.9 Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures. |

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| 2. | Remove associated equipment to facilitate maintenance | 2.1 | Equipment isolation and depressurization is confirmed visually and manually, as required in accordance with the work plan. |
| | | 2.2 | Pressure vessels are disconnected in accordance with the work plan. |
| | | 2.3 | Pressure vessel associated equipment is removed in a manner, which will assist in replacement in accordance with the work plan. |
| | | 2.4 | Pressure vessel is inspected for abnormalities in accordance with the work plan. |
| 3. | Dismantle and maintain pressure vessel | 3.1 | Hazardous material is identified and arrangements made for clearance from work site in accordance with statutory requirements. |
| | | 3.2 | Internal and external components are systematically dismantled, marked and recorded in accordance with work plan. |
| | | 3.3 | Components are refurbished, catalogued and stored for re-assembly in accordance with work plan and manufacturers specifications. |
| | | 3.4 | Gasket and seal requirements are assessed, manufactured or obtained in accordance with the work plan and manufacturers specifications. |
| | | 3.5 | Vessel mountings are maintained as required in accordance with the work plan and manufacturers specifications. |
| | | 3.6 | Internal piping or tubing is tested and expanded, or replaced as required in accordance with the work plan and manufacturers specifications. |
| 4. | Re-assemble pressure vessel | 4.1 | Internal/external components are systematically reassembled in accordance with the work plan and manufacturers specifications. |
| | | 4.2 | Associated equipment is aligned and replaced in accordance with the work plan. |

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| | 4.3 | Fastenings are torque in accordance with specifications and the work plan. |
| | 4.4 | Vessel is pressure tested, monitored and adjusted if required in accordance with the work plan and site/statutory requirements. |
| 5. | Complete the work | |
| | 5.1 | Work is completed and appropriate personnel notified in accordance with site/enterprise requirements. |
| | 5.2 | Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | 5.3 | Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | 5.4 | Work completion details are finalised in accordance with site/enterprise procedures. |

RANGE STATEMENT

Pressure vessels may include:

- air/steam receivers
- boilers
- HP and LP heaters
- condensers
- ash transport vessels, heat exchangers and tanks

Details of maintenance may be clarified by:

- diagnosis and work place inspection

Potential hazards may include:

- materials within pressure vessels

Isolations can refer to:

- electrical/mechanical
- or other associated processes

Associated equipment may include:

- valves
- inspection plates
- drains
- cladding/insulation and pipe work

Maintenance may include:

- repair
- inspection
- modification
- overhaul
- lubrication
- servicing
- diagnosing and test running

Work completion details may include:

- plant and maintenance records
- job cards
- check sheets on device labelling updates and reporting and/or documenting equipment defects

Work site environment may be affected by:

- nearby plant or processes e.g.
- chemical
- heat
- dust
- noise
- gas and oil

Circuit component including:

- fans
- motors
- heaters
- transformers
- electrical distribution panels

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of industrial pressure vessel in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of industrial pressure vessels
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of industrial pressure vessels
- demonstrate correct procedures in maintaining industrial pressure vessels
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety standards
- Clean Air Act requirement for chimneys and flue designs
- properties of solids
- liquids and gases under pressure
- hand and portable power tools
- gaskets and seals
- relevant materials and components
- diagnostic and testing techniques
- non-destructive testing
- pressure system characteristics
- rigging and lifting
- specialised tools
- torquing techniques
- hazardous materials
- data recording
- levelling and aligning principles
- pressure vessels terminology
- heat transfer in industrial pressure vessels
- types of industrial pressure vessels
- valves and pressure system components
- plant and systems
- engineering concepts
- technical drawings and data
- isolation procedures
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- manufacture and install gaskets/seals
- apply diagnostic and testing techniques
- work with hazardous substances
- work safely on pressurised systems
- apply levelling and aligning principles
- identify and apply correct torquing techniques
- work on valves and mountings
- identify/repair/install pressure system components
- use hand and portable power tools
- select and use specialised tools and jigs
- use and sketch technical drawings and data
- dismantle and reassemble components
- apply non-destructive testing techniques
- apply data analysis techniques
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 1	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0822A: Install and maintain turbine (steam, gas)

Competency Descriptor:

This unit refers to the skills and knowledge required for the repair and overhaul of HP, LP, SFPT, cylinders and rotors on gas and steam units.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare for the work	1.1	Work requirements are identified from request/work orders or equivalent clarified/confirmed with appropriate parties or by site inspection.
		1.2	Work requirements are clarified/confirmed with appropriate parties or by site inspection.
		1.3	Occupational health and safety standards are identified, applied and monitored throughout the work procedure.
		1.4	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.
		1.5	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
		1.6	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.
		1.7	Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.
		1.8	Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.
		1.9	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.

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| 2. Disassemble turbine | 2.1 Required isolations are confirmed where appropriate in accordance with enterprise/site procedures. |
| | 2.2 Turbine is disassembled in accordance with manufacturers' specifications and work requirements. |
| | 2.3 Turbine components are removed in appropriate priority in accordance with manufacturers' specification and work requirements. |
| | 2.4 Disassembly is carried out in a manner that will facilitate assembly in accordance with the work plan. |
| | 2.5 Components are measured and clearances taken to determine conformity to manufacturers' limits, and to ensure assembly is in accordance with manufacturers specifications. |
| | 2.6 Measurements and clearances are recorded in accordance with manufacturers' specifications and work requirements. |
| 3. Inspect turbine components | 3.1 Components are cleaned and inspected in accordance with the work plan. |
| | 3.2 Faults are identified and recorded in accordance with the work plan. |
| | 3.3 New components are inspected for compliance to manufacturers' specifications and work requirements. |
| | 3.4 Components are prepared for assembly in accordance with the work plan. |
| 4. Repair turbine /components | 4.1 Repairs are carried out in accordance with the work plan. |
| | 4.2 Repairs are tested and results analyzed to ensure conformance to specifications and in accordance with the work plan. |
| | 4.3 Data from testing is recorded in accordance with the work plan and enterprise/site procedures. |
| 5. Reassemble turbine | 5.1 Site is prepared for re-assembly of turbine in accordance with the work plan and site procedures. |
| | 5.2 Components are refitted in accordance with the work plan and manufacturers specifications. |

- 5.3 Turbine is assembled in accordance with the work plan and manufacturers specifications.
- 5.4 Turbine is test run and operating characteristics are monitored to ensure compliance with manufacturers' specifications and enterprise requirements.
- 6. Complete the work
 - 6.1 Work is completed and appropriate personnel notified in accordance with site/enterprise requirements.
 - 6.2 Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures.
 - 6.3 Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures.
 - 6.4 Work completion details are finalised in accordance with site/enterprise procedures.

RANGE STATEMENT

Turbines may be steam:

- industrial gas turbine
- or air derivative turbine

Components may include:

- white metal bearings
- tilting pad bearings
- lubrication system components
- governor system components
- cooling systems components
- transmissions and couplings

Work completion details may include:

- plant and maintenance records
- job cards,
- check sheets,
- on device labelling updates and reporting and/or documenting equipment defects

Assembly may entail:

- complex/advanced leveling and aligning procedures

Test equipment may include:

- optical fibre scope
- gas analysers
- pressure recorders and vibration monitors

Work site environment may be:

- affected by nearby plant
- or processes
- e.g.
 - chemical
 - heat
 - dust
 - noise
 - gas and oil

Isolations can refer to:

- electrical/mechanical
- or other associated processes

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of turbine (steam, gas) in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of turbine (steam, gas)
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of turbine (steam, gas)els
- demonstrate correct procedures in maintaining turbine (steam, gas)
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety standards
- related plant and equipment
- hand and portable power tools
- precision measuring equipment
- rigging and lifting equipment
- specialised tools and jigs
- advanced levelling and aligning techniques
- technical drawings and data
- diagnostic and testing techniques
- gaskets and seals
- bearings (white metal and pad tilting)
- reaction blading principles
- thermal and differential expansion principles
- quality assurance/quality control
- transmissions
- couplings
- hazardous materials
- optical fibre scope equipment
- non-destructive testing
- fundamental principles of electrical generation
- valves
- fluid power systems
- pipe work
- torquing techniques
- data recording techniques
- isolation procedures
- greases and oils
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- use hand and portable power tools
- use precise measuring equipment
- use rigging and lifting equipment
- use specialised tools and jigs
- apply advanced balancing
- levelling and aligning techniques
- use and sketch drawings and data
- diagnose and test
- manufacture gaskets and seals
- inspect
- scrape and blue-check bearings
- identify hazardous materials
- identify components
- recognize worn
- damaged or faulty components
- sequentially assemble and disassemble
- work to fine tolerances
- apply fluid power control principles
- apply non-destructive testing
- use optical fibre scope
- apply torquing techniques
- apply maintenance techniques
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation activities to which applicant has contributed, or worked on
- training courses on performing installation and maintenance of turbine (steam, gas)
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0832A: Install and maintain internal combustion engines

Competency Descriptor:

This unit refers to the maintenance and major overhauls of fixed or pad mounted internal combustion engines.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

- | | | | |
|----|-------------------------------|------|---|
| 1. | Plan and prepare for the work | 1.1 | Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection. |
| | | 1.2 | Occupational health and safety standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure. |
| | | 1.3 | Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications. |
| | | 1.4 | Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan. |
| | | 1.5 | Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications. |
| | | 1.6 | Work is planned in detail including sequencing and prioritizing and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements. |
| | | 1.7 | Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work. |
| | | 1.8 | Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures. |
| | | 1.9 | Work area is prepared in accordance with work requirements and site procedure. |
| | | 1.10 | Where appropriate, the team and individual's roles and responsibilities within the team are identified and, where required, assist in the provision of on-the-job training. |

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|----|---------------------------|-----|--|
| 2. | Assess engine condition | 2.1 | Engine is run and components are assessed visually and/or aurally to determine condition of engine under load in accordance with the work plan. |
| | | 2.2 | Engine condition is tested whilst under load using appropriate test equipment and procedures according to manufacturers' specifications and the work plan. |
| 3. | Remove auxiliary systems | 3.1 | Required isolations are confirmed where appropriate in accordance with enterprise/site procedures. |
| | | 3.2 | Auxiliary systems are removed, marked and labeled to facilitate replacement in accordance with the work plan. |
| | | 3.3 | Load device is uncoupled and removed in accordance with the work plan. |
| 4. | Overhaul/maintain engine | 4.1 | Engine is systematically dismantled and component parts are clearly marked for identification in accordance with the work plan. |
| | | 4.2 | Engine components are examined and dimensional inspection is performed to determine conformance to manufacturers' specifications. |
| | | 4.3 | Faulty components are replaced in accordance with manufacturers' specifications. |
| | | 4.4 | Engine components are reassembled and necessary adjustments made in accordance with manufacturers' specifications and enterprise requirements. |
| 5. | Replace auxiliary systems | 5.1 | Load device is coupled in accordance with manufacturers' specifications and enterprise requirements. |
| | | 5.2 | Auxiliary equipment is maintained as required in accordance with manufacturers' specifications and the work plan. |
| | | 5.3 | Auxiliary equipment is aligned and installed in accordance with manufacturers' specifications and the work plan. |
| | | 5.4 | Engine is started and function tested in accordance with manufacturers' specifications and enterprise requirements. |

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|----|-------------------|-----|--|
| 6. | Complete the work | 5.5 | Engine operating characteristics are monitored, recorded and adjustments made as required to obtain optimum performance in accordance with manufacturers specifications and enterprise requirements. |
| | | 5.6 | Where appropriate auxiliary equipment and/or components are overhauled in accordance with manufacturers specifications and enterprise requirements. |
| | | 6.1 | Work is completed and appropriate personnel notified in accordance with site/enterprise requirements. |
| | | 6.2 | Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | | 6.3 | Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | | 6.4 | Work completion details are finalised in accordance with site/enterprise procedures. |

RANGE STATEMENT

Internal combustion engines may refer to:

- medium speed diesels
- high speed diesels
- petrol engines
- gas engines or dual fuel (gas/diesel) powered engines

Engine components may include:

- bearings (shell and white metal) pistons
- cylinders
- valves
- cams
- lifters
- springs
- timing gear
- crankshaft
- pumps gaskets and seals
- coolers
- filters and governors

Engine auxiliary systems may include:

- cooling systems
- lubrication systems
- fuel systems and induction and exhaust systems

Measuring equipment may include:

- micrometers
- verniers (internal/external) dial indicators
- bore gauges
- depth and height gauges and optical fibre scope

Test equipment may include:

- pressure and vacuum gauges
- gas analysers
- timing light
- injector tester and dyno test equipment

Maintenance may include:

- repair
- inspection
- modification
- overhaul
- lubrication
- servicing
- diagnosing and test running

Work completion details may include:

- plant and maintenance records
- job cards
- check sheets
- on device labelling updates and reporting and/or documenting equipment defects

Isolations can refer to:

- electrical/mechanical
- or other appropriate processes

Running checks may include:

- cylinder peak pressure
- exhaust gas temperature
- lube oil flow checks and fuel injection timing

Re-assembly techniques may include:

- crankshaft deflections
- advanced levelling and alignment

Work site environment may be:

- affected by nearby plant or processes e.g.
 - chemical
 - heat
 - dust
 - noise
 - gas and oil

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures.

- preparation and planning of work
- performance assessment techniques
- removal techniques and procedures
- overhaul and maintenance techniques and procedures
- replacement techniques and procedures
- diagnostic and testing techniques and procedures
- completion of work procedures

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety standards
- relevant plant and equipment
- hand and portable power tools
- precision measuring equipment
- rigging and lifting
- specialised tools and jigs
- levelling and aligning
- technical drawing and data
- data recording techniques
- diagnostic and testing techniques
- gaskets and seals
- bearings (radial and thrust)
- diesel fuel injection systems
- quality assurance/quality control
- governor systems
- hazardous materials
- optical fibre scope equipment
- non-destructive testing
- couplings
- valves
- fluid power systems
- pipe work
- spare parts
- torquing techniques
- pumps (gear and centrifugal)
- speed control mechanisms
- balancing and vibration analysis
- maintenance procedures
- dismantling and reassembling techniques
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- select resources
- inspect and identify correct materials
- tools and components
- apply dismantling techniques to work requirements
- apply re-assembly techniques to work requirements
- apply repair techniques
- apply maintenance techniques
- observe isolation procedures
- use hand and portable power tools
- use precise measuring equipment
- use rigging and lifting equipment
- use specialised tools and jigs
- level and align
- use drawings and data
- diagnose and test
- manufacture gaskets and seals
- inspect
- scrape and blue-check bearings
- identify hazardous materials
- use optical fibre scope
- apply torquing techniques
- apply data recording techniques
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation activities to which applicant has contributed, or worked on
- training courses on performing installation and maintenance of internal combustion engines
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0842A: Install and maintain hydro turbines

Competency Descriptor:

This unit refers to the skills and knowledge required for the inspection, repair and overhaul of hydro turbines.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare for the work	<p>1.1 Work requirements are identified from request/work orders or equivalent.</p> <p>1.2 Work requirements are clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.3 Occupational health and safety standards are identified, applied and monitored throughout the work procedure.</p> <p>1.4 Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.</p> <p>1.5 Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.</p> <p>1.6 Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.</p> <p>1.7 Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.</p> <p>1.8 Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.</p> <p>1.9 Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.</p>
2. Disassemble turbine	<p>2.1 Required isolations are confirmed where appropriate in accordance with enterprise/site procedures.</p> <p>2.2 Turbine is disassembled in accordance with manufacturers' specifications and work requirements.</p>

- 2.3 Turbine components are removed in appropriate priority in accordance with manufacturers' specifications and work requirements.
 - 2.4 Disassembly is carried out in a manner that will facilitate assembly in accordance with the work plan.
 - 2.5 Components are measured and clearances taken to determine conformity to manufacturers limits, and to ensure assembly is in accordance with manufacturers specifications.
 - 2.6 Measurements and clearances are recorded in accordance with manufacturers specifications and work requirements.
- 3. Inspect turbine components
 - 3.1 Components are cleaned and inspected in accordance with the work plan.
 - 3.2 Faults are identified and recorded in accordance with the work plan.
 - 3.3 New components are inspected for compliance to manufacturer's specifications and work requirements.
 - 3.4 Components are prepared for assembly in accordance with the work plan.
- 4. Repair turbine/ components
 - 4.1 Repairs are carried out in accordance with the work plan.
 - 4.2 Repairs are tested and results analyzed to ensure conformance to specifications and in accordance with the work plan.
 - 4.3 Data from testing is recorded in accordance with the work plan and enterprise/site procedures.
- 5. Re-assemble turbine
 - 5.1 Site is prepared for re-assembly of turbine in accordance with the work plan and site procedures.
 - 5.2 Components are refitted in accordance with the work plan and manufacturers specifications.
 - 5.3 Turbine is assembled in accordance with the work plan and manufacturers specifications.
 - 5.4 Turbine is test run and operating characteristics are monitored to ensure compliance with manufacturers' specifications and enterprise requirements.

- | | | | |
|----|-------------------|-----|---|
| 6. | Complete the work | 6.1 | Work is completed and appropriate personnel notified in accordance with site/enterprise requirements. |
| | | 6.2 | Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | | 6.3 | Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | | 6.4 | Work completion details are finalised in accordance with site/enterprise procedures. |

RANGE STATEMENT

Hydro turbine types may include:

- Pelton wheel
- Francis and Kaplan

Assembly may entail:

- basic and complex/advanced levelling and aligning procedures

Test equipment may include:

- optical fibre scope
- pressure recorders and vibration monitors

Isolations can refer to:

- electrical/mechanical or other associated process

Work site may be affected by:

nearby plant or processes, e.g. water, noise, oil, confined space and ambient temperatures

Components may include:

- white metal bearings
- tilting pad bearings
- lubrication system components
- governor system components
- transmissions and couplings

Work completion details may include:

- plant and maintenance records
- job cards
- check sheets
- on device labelling updates and reporting and/or documenting equipment defects

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out the installation and maintenance of hydro turbines in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to installation and maintenance of hydro turbines
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing installation of hydro turbines
- demonstrate correct procedures in maintaining hydro turbines
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- occupational health and safety standards
- related plant and equipment
- hand and portable power tools
- precision measuring equipment
- specialised tools and jigs
- levelling and aligning techniques
- technical drawings and data
- diagnostic and testing techniques
- protective coatings
- gaskets and seals
- bearings (white metal and pad tilting)
- quality assurance / quality control
- transmissions/couplings
- hazardous materials
- optical fibre scope equipment
- non-destructive testing
- fundamental principles of electrical generation
- valves
- fluid power systems
- pipe work
- torquing techniques
- data recording techniques
- isolation procedures
- rigging equipment and techniques
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- use hand and portable power tools
- use precision measuring equipment
- use rigging and lifting equipment
- use specialised tools and jigs
- apply levelling and aligning techniques
- use drawings and data; Diagnose and test
- manufacture gaskets and seals
- inspect
- scrape and blue-check bearings
- identify hazardous materials
- identify components
- recognise worn
- damaged or faulty components
- apply fluid power control principles
- apply non-destructive testing
- use optical fibre scope
- apply torquing techniques
- apply maintenance techniques
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation activities to which applicant has contributed, or worked on
- training courses on performing installation and maintenance of hydro turbines
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0852A: Conduct generator mechanical maintenance

Competency Descriptor:

This unit refers to the skills and knowledge required for the maintenance of an electrical generating unit.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare for the work	1.1	Work requirements are identified from request/work orders or equivalent.
		1.2	Work requirements are clarified/confirmed with appropriate parties or by site inspection.
		1.3	Occupational health and safety standards are identified, applied and monitored throughout the work procedure.
		1.4	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.
		1.5	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
		1.6	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.
		1.7	Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity.
		1.8	Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.
		1.9	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.
2.	Remove associated equipment	2.1	Required notations are confirmed where appropriate in accordance with site requirements.
		2.2	Associated equipment is disconnected in accordance with the work plan.

- 2.3 Associated equipment is removed in a manner that will assist in replacement in accordance with the work plan.
 - 2.4 Associated equipment is inspected for abnormalities in accordance with the work plan.
- 3. Perform generator maintenance
 - 3.1 Maintenance is performed in accordance with manufacturers' specifications and the work plan.
 - 3.2 Generator is dismantled, clearly marked for identification and relevant data/sketches noted/drawn in accordance with the work plan.
 - 3.3 Components are correlated in preparation for re-assembly in accordance with manufacturers' drawings/manuals.
 - 3.4 New components are inspected to ensure compliance with manufacturers specifications.
 - 3.5 Dimensional inspection is performed on generator and components to ensure compliance with manufacturers specifications.
 - 3.6 Components are reassembled for any testing required in accordance with manufacturers' specifications and the work plan.
 - 3.7 Components are levelled, aligned and coupled in accordance with manufacturers' specifications and the work plan.
- 4. Replace generator associated equipment
 - 4.1 Associated equipment is replaced and connected in accordance with the work plan.
 - 4.2 Generator is rotated and checks carried out to ensure operating conditions are in accordance with manufacturers specifications.
 - 4.3 Out of specification modifications/alterations are approved by appropriate authority and recorded and documented in accordance with site/enterprise requirements.
 - 4.3 Final job inspection is completed and any permits relinquished in accordance with the work plan.

- | | |
|----------------------|---|
| 5. Complete the work | 5.1 Work is completed and appropriate personnel notified in accordance with site/enterprise requirements. |
| | 5.2 Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | 5.3 Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | 5.4 Work completion details are finalised in accordance with site/enterprise procedures. |

RANGE STATEMENT

Details of maintenance may be clarified by:

- diagnosis and/or workplace inspection

Isolations can refer to:

- electrical/mechanical or other associated processes

Generator maintenance may require:

- the removal of the rotor and subsequent replacement would involve complex levelling and alignment techniques

Work completion details may include:

- plant and maintenance records
- job cards
- check sheets and on device labelling updates

Maintenance may include:

- refurbishment/replacement of bearings (plain, white meal, anti-friction)
- seals (hydrogen, labyrinth)
- complex seals
- couplings
- coolers
- pipe work
- barring gear
- inspection
- lubrication and test running

Precision measuring equipment may include:

- inside/outside micrometers and verniers
- dial gauges
- depth gauges
- slip gauges and feeler gauges

Worksite environment may be affected by:

nearby plant or processes,

e.g.

- heat
- noise
- dust
- oil
- water and chemical

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively conduct generator mechanical maintenance in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to conduct generator mechanical maintenance
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in conducting generator mechanical maintenance
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- Occupational health and safety standards
- related plant and equipment
- operating principles of an electrical generator
- hand and portable power tools
- precision measuring equipment
- rigging and lifting equipment
- specialised tools and jigs
- advanced balancing
- levelling and aligning techniques
- technical drawings and data
- diagnostic and testing techniques
- gaskets and seals
- including complex seals
- bearings (white metal and pad tilting)
- transmissions/couplings
- hazardous materials
- optical fibre scope equipment
- valves
- fluid power systems
- pipe work
- torquing techniques
- isolation procedures
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- use hand and portable power tools
- use precise measuring equipment
- use rigging and lifting equipment
- use specialised tools and jigs
- apply advanced balancing
- levelling and aligning techniques
- use drawings and data
- diagnose and test
- manufacture and install gaskets and seals
- including complex seals
- inspect
 - scrape and blue-check bearings
 - identify hazardous materials
- identify components
 - recognise worn, damaged or faulty components
 - sequentially assemble and disassemble
 - work to fine tolerances
 - apply fluid power control principles
 - use optical fibre scope
 - apply torquing techniques
 - apply maintenance techniques;
 - apply data analysis techniques and tools
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation activities to which applicant has contributed, or worked on
- training courses on performing mechanical maintenance of generators
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0063A: Attend to breakdowns in hazardous areas

Competency Descriptor:

This unit applies to the skills and knowledge necessary to attend to breakdowns in hazardous areas in a wide range of different contexts in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Prepare to attend breakdown	1.1	Nature of the breakdown is confirmed with appropriate personnel to establish the need to enter the hazardous area.
		1.2	Safety plan to enter the hazardous area is established in accordance with established procedures and
		1.3	Relevant clearance to do the work is obtained.
		1.4	Testing devices and tools, anticipated as being needed for the work, are obtained and checked for correct operation and safety.
2.	Evaluate extent of work	2.1	OH&S policies and procedures for working in a hazardous area are followed.
		2.2	Other personnel required to determine cause and rectify breakdown is ascertained from available evidence and arrangements made for their attendance where applicable.
		2.3	Extent of repair work is ascertained from available evidence and confirmed with appropriate personnel.
		2.4	Limits of repair work that can be carried out in-situ are established with regards to explosion risk and in accordance with established procedures and requirements.
3.	Arrange repair work	3.1	Equipment is isolated in accordance with established procedures.
		3.2	Circuits of equipment being withdrawn from service are terminated or isolated safely and in manner approved for the classification of the area.

		3.3	Certification documentation for replacement equipment is sighted to ensure that it is identical with the equipment it replaces and is in accordance with the explosion-protection system design.
4 Confirm	completion	4.1	Explosion-protected equipment and systems are inspected and tested after repairs are completed to ensure the integrity of the system.
		4.2	Appropriate personnel are notified of the completion of the repair work and details are documented in accordance with established procedures and requirements.

RANGE STATEMENT

This unit recognises the commonality of skills and knowledge that exists for the unit as well as the additional specific outcome; which is to be reported on. Therefore, competency can be displayed on one, some or all of the following categories and in addition to the respective common underpinning knowledge associated with the selected specialisation.

In order to maintain currency in this unit on-going competency development is to occur. This would include keeping abreast of any changes in standards, regulations, procedures, technology and the like related to the scope and application of this unit

Source of information:

- Working drawings/sketches
- Oral/written work instructions
- Maintenance schedules
- Maintenance records

Locations/conditions:

- trenches
- confined spaces
- elevated positions
- hot cold
- damp and wet situations

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively attending to breakdown in hazardous areas in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

Achievement of this unit of competence is based on each of the following conditions being met:

- demonstrating consistent performance for each element of the unit.
- meeting the performance criteria associated with each element of competence by employing the techniques, procedures, information and resources available in the workplace.
- demonstrating an understanding of the Underpinning knowledge and skills identified in the section, of this unit titled 'Underpinning knowledge'.

Competence must be demonstrated in relation to the technique for which competency is sought. It is essential that working safely in a potentially hazardous area is demonstrated in relation to:

- work permits and clearance
- hazard monitoring and evacuation procedures
- plant and electrical isolation
- evaluating extent of breakdown
- interpreting certification documentation in relation to repair and replacement
- following established breakdown procedures

During assessment the individual will:

- demonstrate safe working practices at all times;
- demonstrate the ability to attend to breakdown in hazardous areas as related to the metal engineering and maintenance industry
- communicate information about tasks being undertaken to ensure a safe and efficient working environment;
- take responsibility for the quality of their own work;
- perform all tasks in accordance with standard operating procedures;
- perform all tasks to specification;
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0131A Undertake interactive workplace communication
- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0191A Use hand tools
- MEMCOR0062A Attend to break down

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Safe working requirements and procedures
- definition of a hazardous area;
- conditions that lead to an explosion meaning of the terms "combustion", "detonation" and "propagation"
- OH&S& NEPA responsibilities;
- parties responsible for safety of hazardous areas;
- definition of classes and zones
- combustible properties of materials
- electrical protection devices
- temperature limitations of wiring and equipment
- limitations on non-metallic and specific alloy enclosures
- requirements for detailed initial/sample and close/visual inspections standards and procedures for terminating and connecting cables
- standards and requirements for the installation of equipment and wiring
- selection and application of sealing compounds
- standards for wiring systems in hazardous areas
- arrangements for approval for use of equipment in a hazardous area

Skills

The ability to:

- use company documentation and record systems including the use of computers, information systems and business equipment technologies
- operate plant and equipment associated with a given workplace
- attend to breakdown as related to the metal engineering and maintenance industry
- identify classes, zones and groups characteristics of a hazardous areas
- Identify the responsibilities of OH&S & NEPA
- Attend to breakdowns in hazardous areas efficiently.

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

Competency will be determined on evidence of having consistently performed across a representative range of activities and where required support the outcomes of other units within a qualification structure.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMAH0073A: Purchase materials

Competency Descriptor:

This unit applies to the skills and knowledge necessary to purchase materials in a wide range of different contexts in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Determine purchasing requirements	1.1 Consulted with client, customer or user as appropriate. 1.2 Material specifications are determined from orders, instructions and/or technical drawings. 1.3 Quantities, price limitations and delivery requirements are determined from orders/instructions.
2. Prepare purchase order/list	2.1 Purchase order/list is developed to standard operational procedure.
3. Purchase material	3.1 Standard operational procedures are followed. 3.2 Supplier/vendor is informed of requirements and specifications. 3.3 Purchasing schedules are adjusted where required to standard operational procedures. 3.4 Appropriate paperwork/contracts are exchanged to standard operational procedure. 3.5 Records/files are maintained accurately using standard operating procedures.

RANGE STATEMENT

Purchasing schedules developed to operating procedures and for pre-contracted suppliers/vendors.

Contracts/paperwork generated manually or electronically utilising on-site system.

Purchasing can cover one-off or multiple quantities of raw materials, components, equipment etc.

Purchasing specifications are determined from standard engineering drawings and data sheets, instructions written or verbal.

All work and work practices undertaken to regulations or standard requirements.

EVIDENCE GUIDE

Competency is to be demonstrated by purchasing materials within the range statement relative to the work orientation

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the purchasing of materials or other units requiring the exercise of the skills and knowledge covered other units requiring the exercise of the skills and knowledge.

(2) Pre-requisite Relationship of Units

- MEMCOR0131A Undertake interactive workplace communication
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0042A Interpret standard specifications and manuals
- MEMMAH0042A Order materials
- ICTCOR0011A Carry out data entry and retrieval procedures)

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- written/oral communication techniques
- basic computation methods
- interpreting standard specifications and manuals
- documentation and record systems including the use of computers, information systems and business equipment technologies, as appropriate to ordering and purchasing of materials
- supplier/vendor/sources for required material
- purchase orders

Skills

The ability to:

- work safely and accurately to instructions
- communicate effectively
- order materials relevant to related trade
- use documentation and record systems including the use of computers, information systems and business equipment technologies
- interpret orders, instructions manuals quality specifications and/or technical drawings
- purchase materials relevant to related area

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0253A: Monitor essential services operations in remote areas

Competency Descriptor:

This unit deals with the skills and knowledge required for monitoring the readings of instruments and gauges and general operating conditions of a remote area essential service operation involving power and/or other industrial application in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

- | | | | |
|----|---------------------------------|-----|--|
| 1. | Plan and prepare for monitoring | 1.1 | Monitoring is planned and prepared for to ensure OH&S policies and procedures are followed and the work is appropriately sequenced in accordance with requirements. |
| | | 1.2 | Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved on the work site. |
| | | 1.3 | Location in which monitoring is to be carried out is determined from job requirements. |
| | | 1.4 | Tools, equipment and testing devices needed to carry out the monitoring work are obtained in accordance with established procedures and checked for correct operation and safety, if needed. |
| | | 1.5 | Observations are undertaken to ensure no damage has previously occurred to plant or equipment. |
| 2. | Monitor operations | 2.1 | OH&S policies and procedures for monitoring operations are followed. |
| | | 2.2 | Monitoring is carried out in accordance with requirements, without damage or distortion to equipment or the surrounding environment or related services. |
| | | 2.3 | Unplanned events or conditions are responded to in accordance with established procedures. |
| | | 2.4 | Approval is obtained in accordance with established procedures from appropriate personnel before any contingencies are implemented. |
| | | 2.5 | On-going checks of the quality of the work are undertaken in accordance with established procedures. |

- | | | | |
|----|---------------------------------------|-----|---|
| 3. | Inspect and notify completion of work | 3.1 | Final inspections are undertaken to ensure the monitoring conforms to requirements. |
| | | 3.2 | Work completion is notified in accordance with established procedures. |

RANGE STATEMENT

Work undertaken autonomously or in a team environment, using predetermined standards of quality, safety and workshop procedures.

Tasks may be performed in plant or in an on-site environment using electrical and electronic test equipment.

Tasks involve plant or site work safely utilising:

- solid
- liquid and gaseous samples for calibration
- electronic test equipment
- associated tools
- calibration charts
- plant or site data
- manufacturers' data sheets.

Employs the use of:

- high pressure gas cylinders
- liquid chemicals and associated equipment during calibration
- the interpretation of operating sequences for program operated devices is included.
- the use of specific calibration devices for laboratory and process analysers employing the principles of spectrometry (infra-red, visible, ultraviolet) both dispersive and non-dispersive, chromatography (gas, liquid), optical refraction, atomic radiation and x-rays.

Plant operations or site environment may include:

- power station instrument/meter reading
- information displayed by the instruments/meters in the power station
- generating equipment (diesel engine) – engine lubrication system oil pressure, engine cooling system coolant temperature (in and out)
- fuel pressure
- interpretation of electrical and electronic circuit diagrams
- switchboard – amperes, voltage, kilowatt, kilowatt hours, frequency hertz (Hz), engine running hours
- station services: fuel tank dip; lubricating oil tank level; fuel flow meter
- use of the information gathered from the instruments/meters for ordering of – fuel, lubricating oil, coolant schedule regular servicing and maintenance for – engine oil and filter changes, fuel filters, drive belt (condition/adjustment), valve

EVIDENCE GUIDE

It is essential that competence is assessed in the critical aspects of the knowledge and application of relevant sections of occupational, health and safety guidelines, industry regulation, company/site safety procedures and company/site emergency procedures

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- attain electrical licence, where appropriate, deeming competency associated with electrical work
- adopt and carry out correct procedures prior to undertaking task
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate the ability to identify remote essential services
- demonstrate correct procedures for checking system and system components
- demonstrate correct procedures maintaining system and system components
- demonstrate correct procedures for the monitoring of remote essential services operations
- demonstrate correct procedures in removing, replacing and aligning system and system components
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies/equipment
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0051A Use graduated measuring devices
- MEMCOR0071A Use electrical/electronic measuring devices
- MEMCOR0091A Draw and interpret sketches and simple drawings
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- Occupational health and safety standards
- relevant statutory requirements and codes of practice
- relevant industry standards
- equipment and material required to perform the work
- isolation procedures
- general layout of plant/work site and operation of its equipment
- maintenance techniques for the equipment
- principles of spectrometry (infra-red, visible, ultraviolet) both dispersive and non-dispersive
- electronic instrument equipment
- regulatory aspects
- electrical fundamentals
- electrical and electronic circuit diagrams
- test and measurement instruments
- circuit plan appreciation
- instrumentation electronics
- engineering and workshop practice
- distributed control
- programmable control
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- follow relevant statutory regulations and codes of practice
- locate and interpret plans, drawings and text
- use tools and relevant equipment
- use test and measurement instruments
- use correct maintenance procedures
- use correct calibration procedures
- identify and select materials for the job
- apply regulatory aspects theory
- apply instrumentation electronics theory
- apply electrical fundamentals theory
- apply distributed control theory
- apply programmable control theory
- carry out work completion details
- communicate effectively
- apply data analysis techniques and tools
- maintain and repair scientific analysis equipment

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify supervisors or colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both in accordance with work place procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 3	
Communicate ideas and information	Level 3	
Plan and organise activities	Level 3	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 3	
Use technology	Level 2	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0013A: Assist in the provision of on the job training

Competency Descriptor:

This unit applies to the skills and knowledge necessary to assist in the provision of on the job training in a wide range of different contexts in the metal engineering and maintenance industry

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan for delivery of on-the-job training	1.1	Objectives of training and competency to be achieved are identified.
		1.2	Role in provision of training is clarified.
2.	Deliver on-the-job training	2.1	Training objectives are explained to trainee.
		2.2	Training is carried out using appropriate techniques.
		2.3	Trainee progress is monitored and constructive feedback provided to trainee.
3.	Review training program	3.1	Training program is evaluated according to standard operating procedure.
		3.2	Training data is recorded according to standard operating procedure.
		3.3	Training is reported on according to standard operating procedure.
		3.4	Training is promoted according to standard operating procedure.

RANGE STATEMENT

Training is delivered in a one-to-one or small group situation.

The training may be structured or informal and based on co-operation between trainer and other training personnel.

The training covers both underpinning knowledge and practical skills.

Training may be applied to technical, orientation, OH&S, or other areas.

Techniques that could be used as the subject of training includes but is not limited to:

- sketches
- drawings
- charts and maps
- logical presentation
- feedback
- production schedules
- written machine or job instructions
- client instructions
- signage
- memos
- work schedules/work bulletins
- explanation
- sound communication methods
- demonstration/practice

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively assisting in the provision of on the job training in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

This unit should be assessed in conjunction with other specialisation or core units and not in isolation. The assessment should be linked with performance of normal workplace activities where the competency covered by this unit is demonstrated concurrently with other core or elective competencies. The communication tasks may be related to any aspect of the job, interacting with team members, receiving instructions, reporting and any other activity that requires communication with individuals or groups.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to assist in the provision of on the job training as related to the metal engineering and maintenance industry
- communicate information about tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0131A undertake interactive workplace communication

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- basic level of ability in speaking
- basic level in reading
- basic level in writing English
- basic numeracy
- work place safety requirements
- the use of work schedules, charts, work bulletins and memos

Skills

The ability to:

- work safely to instructions
- convey information in simple English to invoke correct actions
- assist in the provision of on the job training

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

Competency will be determined on evidence of having consistently performed across a representative range of activities and where required support the outcomes of other units within a qualification structure

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMPLN0063A: Coordinate and manage basic installation projects

Competency Descriptor:

This unit applies to the skills and knowledge necessary to coordinate and manage basic installation projects in a wide range of different contexts in the metal engineering and maintenance industry

Competency Field:

Planning

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare to manage projects	1.1	Management of projects OH&S policies and procedures are planned and prepared to ensure these are followed.
		1.2	Project schedules are managed in accordance with requirements.
		1.3	Appropriate personnel are consulted to ensure projects are managed effectively.
		1.4	Projects are managed against requirements.
		1.5	Contribution is made to determine human resource and procurement management plans for projects in accordance with established procedures and checked against requirements.
2.	Manage projects	2.1	Mechanisms are used to measure, record and report progress of activities in relation to the agreed project schedules and plans.
		2.2	Projects are managed in accordance with established procedures and requirements to achieve designated objectives.
		2.3	Records and documentation of project activities are maintained in accordance with established procedures to facilitate quality management and to provide an audit trail.
		2.4	Results of project activities are documented and evaluated in accordance with established procedures to determine compliance with agreed quality standards.
		2.5	Shortfalls in quality outcomes are reported in accordance with established procedures to enable appropriate action to be initiated.

- | | | | |
|----|---------------------------------------|-----|---|
| 3. | Inspect and notify completion of work | 3.1 | Quality management issues and responses are reported in accordance with established procedures. |
| | | 3.2 | Completion of projects are notified in accordance with established procedures. |

RANGE STATEMENT

This unit recognises the commonality of skills and knowledge that exists for the unit as well as the additional specific outcome; which is to be reported on. Therefore, competency can be displayed on one, some or all of the following categories and in addition to the respective common underpinning knowledge associated with the selected specialisation:

Project objectives may include:

- project manager responsibility
- behavioral aspect of project in terms of project personnel and coordinator
- work breakdown structure in coordinating projects
- tools and techniques for keeping the project on course
- pros and cons of working on projects

Projects may include:

- computer systems
- electrical equipment and systems
- electronics apparatus and systems
- instrumentation systems
- mechanical systems
- metal fabrication
- refrigeration and air conditioning systems

Nature of project may include:

- project plan
- project control
- project schedule (Gantt Chart/ Pert/CPM schedule network)
- the budget control

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use of techniques to coordinate and manage basic installation projects within the range statement relative to the work orientation.

(1) Critical Aspects of Evidence

Achievement of this unit of competence is based on each of the following conditions being met:

- demonstrating consistent performance for each element of the unit in the related category and specialisation which is to be exhibited across a representative range of applications; autonomously and to requirements
- meeting the performance criteria associated with each element of competence by employing the techniques, procedures, information and resources available in the workplace for each of the categories and areas of specialisation undertaken from those listed in the Range statement or evidence guide
- demonstrating an understanding of the underpinning knowledge and skills identified for the categories and related specialisation undertaken in the section, of this unit titled 'Underpinning knowledge'

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- OH&S policies and procedures
- basic level of ability in speaking
- basic level in reading
- basic level in writing English
- basic numeracy
- work place safety requirements
- organizations policy and procedures
- project schedules
- mechanisms used to measure, record and report progress of activities in relation to the agreed project schedules and plans
- tools and techniques for keeping the project on course
- pros and cons of working on projects
- budget control

Skills

The ability to:

- listen effectively
- work safely to instructions
- convey information in simple English to invoke correct actions
- prepare project schedules
- perform project control activities
- Coordinate and manage basic installation projects

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication,

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both.

The communication activities undertaken should be consistent with the individual's field of work and be based on interaction with others related to workplace tasks and procedures, tools, equipment, materials and documentation relevant to that field of work.

The competencies covered by this unit should be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> Establishes principles and procedures Evaluates and reshapes process Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills

MEMMRD0383A: Diagnose and repair faults in mechanical equipment

Competency Descriptor:

This unit refers to the skills and knowledge required for the diagnosing and repairing of faults in a range of mechanical equipment and may entail the work to be carried out whilst machinery/plant is on line.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY**PERFORMANCE CRITERIA**

- | | | | |
|----|-------------------------------|-----|---|
| 1. | Plan and prepare for the work | 1.1 | Work requirements are identified from request/work orders or equivalent and |
| | | 1.2 | Work requirements are clarified/confirmed with appropriate parties or by site inspection. |
| | | 1.3 | Occupational health and safety standards are identified, applied and monitored throughout the work procedure. |
| | | 1.4 | Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications. |
| | | 1.5 | Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan. |
| | | 1.6 | Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications. |
| | | 1.7 | Work is planned in detail including sequencing and prioritizing for the maintenance of plant security and capacity. |
| | | 1.8 | Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work. |
| | | 1.9 | Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures. |

2. Verify the fault
 - 2.1 Normal performance and function of the equipment is ascertained by consulting appropriate reference sources in accordance with the work plan.
 - 2.2 Fault indicators and appropriate technical information/diagnostic techniques are used to verify reported symptoms/faults in accordance with the work plan.
 - 2.3 Symptoms are reproduced and monitored if possible, whilst due regard for personnel safety and plant security is observed in accordance with the work plan.
3. Find the fault
 - 3.1 Required isolations are confirmed where appropriate in accordance with site requirements.
 - 3.2 Faultfinding is carried out in conjunction with others involved in, or affected by, the work in accordance with enterprise/job requirements.
 - 3.3 Equipment components, pipe work, fittings and support fixings are inspected for obvious faults in accordance with the work plan.
 - 3.4 All appropriate fault finding/diagnostic techniques are identified, selected and used to determine the fault in accordance with the work plan.
 - 3.5 Test and measurement instruments are used in accordance with manufacturers' instructions and job requirements.
4. Determine cause of fault
 - 4.1 All appropriate personnel are consulted in order to obtain as many details relating to the faulty equipment as possible in accordance with the work plan.
 - 4.2 Appropriate use is made of any information from fault indicators and maintenance records in accordance with the work plan.
 - 4.3 Valid conclusions about the nature and cause of the fault are reached from analysis of available evidence in accordance with the work plan.

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|----|-----------------------------|-----|---|
| 5. | Repair or rectify the fault | 5.1 | Required isolations are confirmed where appropriate in accordance with site requirements. |
| | | 5.2 | Appropriate repair procedures are undertaken in conjunction with others involved in, or affected by, the work in accordance with the work plan. |
| | | 5.3 | Faulty, worn, damaged or unsecured components are replaced, repaired or secured in accordance with the work plan. |
| | | 5.4 | Parts and components are selected and replaced as required in accordance with appropriate specifications and the work plan. |
| | | 5.5 | All faults are repaired or rectified in accordance with the work plan. |
| | | 5.6 | Final job inspection is performed and permits are relinquished as required in accordance with the work plan. |
| 6. | Complete the work | 6.1 | Work is completed and appropriate personnel notified in accordance with site/enterprise requirements. |
| | | 6.2 | Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures. |
| | | 6.3 | Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures. |
| | | 6.4 | Work completion details are finalised in accordance with site/enterprise procedures. |

RANGE STATEMENT

Inspection on running plant should be:

- planned with appropriate parties to determine access and conditions

Work site environment may be affected by: nearby plant or processes e.g.

- chemical
- heat
- noise
- gas
- dust and oil

Test and measurement instruments may refer to:

- temperature and pressure indicators/recorders
- vibration monitors or flow indicators

Work completion details may include:

- plant and maintenance records
- job cards
- check sheets and on-device labelling updates

Fault indicators may refer to:

- indication lamps
- LEDs
- alarms and flag relays

Mechanical equipment may be:

Machinery and mechanical equipment, such as engines, motors, pneumatic tools, conveyor systems, and production machines and equipment, using hand tools, power tools, and precision-measuring and testing instruments.

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively diagnose and repair faults in mechanical equipment in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to diagnosing and repairing of mechanical equipment
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing the diagnosing of mechanical equipment
- demonstrate correct procedures in the repairing of mechanical equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMMAH0071A Perform manual handling and lifting

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- occupational health and safety standards
- relevant statutory requirements and codes of practice
- equipment and material required to perform the work
- layout of plant and operation of its equipment
- performance and function of the equipment
- fault finding and diagnostic techniques
- repair techniques
- relevant plans
- drawings and texts
- communication principles

Skills

The ability to:

- apply occupational health and safety standards
- observe relevant statutory requirements and codes of practice
- identify equipment and material required to perform the work
- locate and interpret plans
- drawings and texts
- carry out work in a logical manner
- use tools and relevant equipment
- use test and measurement instruments
- verify and identify faults
- apply fault finding and diagnostic techniques
- determine cause of faults
- repair faults
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

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Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.