**Australian Government**

**Department of Education, Employment and Workplace Relations**

# PMA40108 Certificate IV in Process Plant Technology

**Revision Number: 3**

**INDUSTRY SKILLS COUNCILS**
Creating Australia's Future

## PMA40108 Certificate IV in Process Plant Technology

## Modification History

Release 3 - MEM elective unit code corrected: MEM11011B
Release 2 - Addition of new electives: PMASUP244A, PMASUP444A, NWP357B

## Description

The Certificate IV in Process Plant Technology has been developed as a technical qualification for use in the Chemical, Hydrocarbons and Refining Training Package (PMA08).

**Job roles/employment outcomes**

The Certificate IV in Process Plant Technology is intended for plant technicians.

The technician will typically be involved in solving complex problems which require theoretical knowledge, combined with an understanding of the production process and equipment across the plant.

**Application**

This qualification is typically used to develop employees performing a technical role that includes an ability to work independently and conduct technical problem solving according to the needs of the work in the manufactured mineral products industries.

Non-technical team leaders, coordinators and supervisors may be better served by a qualification in competitive manufacturing. The Certificate IV in Competitive Manufacturing MCM40104 is available for team leaders at this level where the job requires sophisticated manufacturing practice skills rather than technical skills.

People with this qualification may be expected to work in one of the following sectors:

- fine chemicals
- heavy chemicals
- petrochemicals
- polymer manufacture
- hydrocarbon extraction
- hydrocarbon transmission
- hydrocarbon processing/refining
- minerals processing/refining
- metals smelting/processing
- other related areas.

Training programs for this qualification are suitable to be undertaken as part of a formal training contract with an employer under an Australian Traineeship or Apprenticeship arrangement.

## Pathways Information

**Pathways into the qualification**

This qualification may be accessed by direct entry. Credit may be granted towards this qualification by those who have completed PMA30110 Certificate III in Process Plant Operation, MSA30107 Certificate III in Process Manufacturing, MSA30208 Certificate III in Manufacturing Technology or other relevant qualifications. Credit for this qualification may also include units contained within relevant skill sets.

**Pathways from the qualification**

Further training pathways from this qualification include PMA50110 Diploma of Process Plant Technology, MSA51108 Diploma of Competitive Manufacturing, MSA50108 Diploma of Manufacturing Technology or other relevant qualifications, including appropriate vocational graduate qualifications.

**Additional qualification advice**

MSA41108 Certificate IV in Competitive Manufacturing is available for team leaders at this level who already possess technical skills and who require additional manufacturing practice skills above those available in this qualification.

# Licensing/Regulatory Information

There are no specific licences that relate to this qualification. However, in some jurisdictions some units of competency in this qualification may have licensing or regulatory requirements. Local regulations should be checked for details.

# Entry Requirements

Not applicable.

# Employability Skills Summary

| Employability Skill | Industry/enterprise requirements for this qualification include: |
|---|---|
| Communication | • maintain communication about multiple subjects and with multiple audiences<br>• complete incident and other reports<br>• communicate technical information<br>• update workplace documentation<br>• maintain workplace records |
| Teamwork | • identify and describe own role and role of other<br>• assist others identify role<br>• lead team teams either formally or on an ad hoc basis<br>• resolve conflicts between teams |
| Problem-solving | • recognise persistent problems or those not definable by direct observation.<br>• determine problems needing priority action.<br>• investigate and analyse problems and potential solutions.<br>• work with technical experts to define problems and develop possible solutions<br>• apply appropriate theory base for problem<br>• follow through items initiated until final resolution has occurred.<br>• identify and isolate faults in entire plant<br>• use a range of formal problem solving techniques |
| Initiative and enterprise | • proactive in fine tuning of entire plant<br>• seeks out areas requiring improvement<br>• anticipate the impact of the process on customers and value chain members |
| Planning and organising | • prioritise actions to achieve required outcomes for plant<br>• plan work requirements for plant<br>• plan plant maintenance or shutdowns/turnarounds<br>• identify tasks to achieve plant goals.<br>• allocate tasks.<br>• monitor completion of allocated tasks<br>• develop and adjust schedules |
| Self-management | • plan own work requirements from plant requirements<br>• operate within appropriate time constraints and work standards<br>• select and use appropriate techniques<br>• identify resource requirements, document and monitor |

| | • recognise limitations and seek timely advice |
|---|---|

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| Learning | <ul><li>maintain and develop own competency</li><li>assist others to develop their required competencies</li><li>lead improvement procedures/strategies</li></ul> |
|---|---|
| Technology | <ul><li>improvements to and fine tuning of entire process</li><li>start up and shut down planning and coordinating a shut down/start up of plant</li><li>solving of problems not directly observable</li><li>monitor product/process quality</li><li>function and operating principles of unit, system or plant area</li><li>maintain workplace records</li></ul> |

# Packaging Rules

To be awarded the Certificate IV in Process Plant Technology competency must be achieved in **twenty six (26)** units of competency:

- **five (5)** core units of competency
- **twenty one (21)** elective units of competency hosen as specified below.

**Note**
Where prerequisite units apply, these must be considered in the total number of units chosen.

**Core units of competency**

| Unit code | Unit title |
|---|---|
| MSAENV272B | Participate in environmentally sustainable work practices |
| MSAPMOHS110A | Follow emergency response procedures |
| MSAPMOHS200A | Work safely |
| MSAPMSUP100A | Apply workplace procedures |
| MSAPMSUP102A | Communicate in the workplace |

**Elective units of competency**

Select **twenty one (21)** units as specified below:

- A minimum of **one (1)** from Group A
- The remainder may be chosen from Groups A, B and C (with a maximum of **eighteen (18)** from Group C) to bring the total number of electives to **twenty one (21).**

Note that up to **five (5)** units can be chosen from other qualifications in this Training Package, other endorsed Training Packages and accredited courses, as specified in Groups B and C.

## Group A – Specialist electives

| Unit code | Unit title | Prerequisites |
|---|---|---|
| MSAPMOPS400A | Optimise process/plant area | MSAPMSUP390A |
| MSAPMOPS401A | Trial new process product | |
| PMAOPS402A | Respond to abnormal process situations | MSAPMSUP390A |
| PMAOPS405A | Operate complex control systems | |
| PMAOPS410B | Monitor remote production facilities | |
| PMAOPS411B | Manage plant shutdown and restart | |
| PMAOPS433A | Manage wells and gathering systems | |
| PMAOPS434A | Commission wells and gathering systems | |
| PMAOPS450B | Solve colour problems | |

**One** (**1**) unit may be chosen from Group A in PMA50110 Diploma of Process Plant Technology

## Group B

| Unit code | Unit title | Prerequisites |
|---|---|---|
| MSACMC411A | Lead a competitive manufacturing team | |
| MSACMC413A | Lead team culture improvement | |
| MSACMS401A | Ensure process improvements are sustained | |
| MSACMT430A | Improve cost factors in work practices | |
| MSACMT440A | Lead 5S in a manufacturing environment | |
| MSACMT441A | Facilitate continuous improvement in | |

| | manufacturing | |
|---|---|---|

| MSACMT450A | Undertake process capability improvements | MSACMT452A |
| --- | --- | --- |
| MSACMT451A | Mistake proof a production process | |
| MSACMT452A | Apply statistics to processes in manufacturing | |
| MSACMT460A | Facilitate the use of planning software systems in manufacturing | MSACMT260A |
| MSACMT481A | Undertake proactive maintenance analyses | |
| MSACMT482A | Assist in implementing a proactive maintenance strategy | |
| MSAENV472B | Implement and monitor environmentally sustainable work practices | |
| MSAPMOHS400A | Contribute to workplace OHS management system | MSAPMOHS300A |
| MSAPMOHS401A | Assess risk | |
| MSAPMOPS404A | Co-ordinate maintenance | |
| MSAPMOPS405A | Identify problems in fluid power system | |
| MSAPMOPS406A | Identify problems in electronic control systems | |
| MSAPMPER400A | Coordinate permit process | MSAPMPER300C |
| MSAPMSUP400A | Develop and monitor quality systems | |
| MSL954001A | Obtain representative samples in accordance with a sampling plan | |
| PMAOHS420B | Develop first aid procedures and manage resources | |
| PMAOMIR407B | Audit incident preparedness and established response system | |
| PMAOMIR418B | Coordinate incident response | |
| PMAOMIR424B | Develop and maintain community relationships | |
| PMAOMIR430B | Conduct and assess incident exercises | |

| PMAOMIR444B | Develop incident containment tactics | |
| PMAOMIR449B | Monitor legal compliance obligations during incidents | |
| PMASUP410B | Develop plant documentation | |
| PMASUP420B | Minimise environmental impact of process | |
| PMASUP432B | Coordinate pipeline projects | |
| PMASUP440B | Commission/recommission plant | |
| PMASUP441C | Decommission plant | |
| PMASUP444A | Plan plant preparation and isolation | |
| PMASUP445A | Participate in HAZOP studies | PMAOPS280A |
| TAEASS401A | Plan assessment activities and processes | |
| TAEASS402A | Assess competence | |
| TAEASS403A | Participate in assessment validation | |

Up to **one (1)** relevant unit may be chosen from this Training Package, other endorsed Training Packages and accredited courses, where that unit is available at Certificate IV or Diploma.

**Group C**

| Unit code | Unit title | Prerequisites |
|---|---|---|
| FDFPHGMP1A | Follow work procedures to maintain Good Manufacturing Practice | |
| FDFPHGMP2B | Implement Good Manufacturing Practice procedures | |
| FDFPHGMP3A | Monitor the implementation of Good Manufacturing Practice procedures | |
| MEM05012C | Perform routine manual metal arc welding | |

| MEM07033B | Operate and monitor basic boiler | |
|---|---|---|
| MEM07034A | Operate and monitor intermediate class boiler | MEM07033B |
| MEM09002B | Interpret technical drawing | |
| MEM09003B | Prepare basic engineering drawing | MEM09002B |
| MEM11011B | Undertake manual handling | |
| MEM16005A | Operate as a team member to conduct manufacturing, engineering or related activities | |
| MEM18011C | Shutdown and isolate machines/equipment | |
| MSACMS201A | Sustain process improvements | |
| MSACMT230A | Apply cost factors to work practices | |
| MSACMT231A | Interpret product costs in terms of customer requirements | |
| MSACMT240A | Apply 5S procedures in a manufacturing environment | |
| MSACMT250A | Monitor process capability | |
| MSACMT251A | Apply quality standards | |
| MSACMT260A | Use planning software systems in manufacturing | |
| MSACMT270A | Use sustainable energy practices | |
| MSACMT271A | Use sustainable environmental practices | |
| MSACMT280A | Undertake root cause analysis | |
| MSACMT281A | Contribute to the application of a proactive maintenance strategy | |
| MSAPMOHS100A | Follow OHS procedures | |
| MSAPMOHS205A | Control minor incidents | |
| MSAPMOHS210B | Undertake first response to non-fire incidents | |
| MSAPMOHS212A | Undertake first response to fire incidents | |

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|---|---|---|
| MSAPMOHS216A | Operate breathing apparatus | |
| MSAPMOHS217A | Gas test atmospheres | |
| MSAPMOHS220A | Provide initial first aid response | |
| MSAPMOHS300A | Facilitate the implementation of OHS for a work group | |
| MSAPMOPS100A | Use equipment | |
| MSAPMOPS102A | Perform tasks to support production | |
| MSAPMOPS200A | Operate equipment | |
| MSAPMOPS212A | Use enterprise computers or data systems | |
| MSAPMPER200C | Work in accordance with an issued permit | |
| MSAPMPER201A | Monitor and control work permits | |
| MSAPMPER202A | Observe permit work | |
| MSAPMPER205C | Enter confined space | |
| MSAPMPER300C | Issue work permits | RIIRIS201A |
| MSAPMSUP101A | Clean workplace or equipment | |
| MSAPMSUP106A | Work in a team | |
| MSAPMSUP172A | Identify and minimise environmental hazards | |
| MSAPMSUP200A | Achieve work outcomes | |
| MSAPMSUP201A | Receive or despatch goods | |
| MSAPMSUP204A | Pack products or materials | |
| MSAPMSUP205A | Transfer loads | |
| MSAPMSUP210A | Process and record information | |
| MSAPMSUP240A | Undertake minor maintenance | |
| MSAPMSUP280A | Manage conflict at work | |
| MSAPMSUP291A | Participate in continuous improvement | |

| | | |
|---|---|---|
| MSAPMSUP292A | Sample and test materials and product | |
| MSAPMSUP300A | Identify and implement opportunities to maximise production efficiencies | MSAPMSUP200A |
| MSAPMSUP301A | Apply HACCP to the workplace | |
| MSAPMSUP303A | Identify equipment faults | |
| MSAPMSUP309A | Maintain and organise workplace records | |
| MSAPMSUP310A | Contribute to development of plant documentation | |
| MSAPMSUP330A | Develop and adjust a production schedule | |
| MSAPMSUP382A | Provide coaching/mentoring in the workplace | |
| MSAPMSUP383A | Facilitate a team | |
| MSAPMSUP390A | Use structured problem solving tools | |
| MSL952001A | Collect routine site samples | |
| MSL973001A | Perform basic tests | |
| NWP357B | Monitor, operate and control reverse osmosis and nano-filtration processes | |
| PMAOHS211B | Prepare equipment for emergency response | |
| PMAOHS213B | Undertake fire control and emergency rescue | |
| PMAOHS214B | Undertake helicopter safety and escape | |
| PMAOHS215B | Apply offshore facility abandonment and sea survival procedures | |
| PMAOHS221B | Maintain first aid supplies and records | |
| PMAOHS310B | Investigate incidents | |
| PMAOHS311B | Lead emergency teams | |
| PMAOHS312B | Command the operation of survival craft | |
| PMAOHS320C | Provide advanced first aid response | |
| PMAOHS321B | Provide first aid response in remote and/or | |

| | isolated area | |
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| PMAOMIR210B | Control evacuation to muster point | |
| PMAOMIR301B | Undertake initial rescue | |
| PMAOMIR302B | Respond to a helideck incident | |
| PMAOMIR317B | Facilitate search and rescue operations | |
| PMAOMIR320B | Manage incident response information | |
| PMAOMIR321B | Manage communication systems during an incident | |
| PMAOMIR346B | Assess and secure an incident site | |
| PMAOPS101C | Read dials and indicators | |
| PMAOPS105C | Select and prepare materials | |
| PMAOPS201B | Operate fluid flow equipment | |
| PMAOPS202B | Operate fluid mixing equipment | |
| PMAOPS203B | Handle goods | |
| PMAOPS204B | Use utilities and services | |
| PMAOPS205B | Operate heat exchangers | |
| PMAOPS206B | Operate separation equipment | |
| PMAOPS207B | Operate powered separation equipment | |
| PMAOPS208B | Operate chemical separation equipment | |
| PMAOPS210B | Operate particulates handling equipment | |
| PMAOPS211B | Operate manufacturing extruders | |
| PMAOPS213B | Package product/material | |
| PMAOPS216B | Operate local control system | |
| PMAOPS217B | Operate wet milling equipment | |
| PMAOPS220B | Monitor chemical reactions in the process | |
| PMAOPS221B | Operate and monitor prime movers | |

| PMAOPS222B | Operate and monitor pumping systems and equipment | Co-requisite unit PMAOPS221B |
| PMAOPS223B | Operate and monitor valve systems | |
| PMAOPS224B | Provide fluids for utilities and support | |
| PMAOPS230B | Monitor, operate and maintain pipeline stations and equipment | |
| PMAOPS231B | Control gas odourisation | |
| PMAOPS232B | Produce product by filtration | |
| PMAOPS233A | Monitor wells and gathering systems | |
| PMAOPS234A | Monitor and operate low pressure compressors | |
| PMAOPS240B | Store liquids in bulk | |
| PMAOPS241A | Operate Joule-Thomson effect device | |
| PMAOPS280B | Interpret process plant schematics | |
| PMAOPS290B | Operate a biotreater | |
| PMAOPS300B | Operate a production unit | |
| PMAOPS301B | Produce products by distillation | PMAOPS201B Co-requisite PMAOPS205B |
| PMAOPS302B | Operate reactors and reaction equipment | |
| PMAOPS303B | Operate furnaces to induce reaction | |
| PMAOPS304B | Operate and monitor compressor systems and equipment | Co-requisite unit PMAOPS221B |
| PMAOPS305B | Operate process control systems | |
| PMAOPS307B | Transfer bulk fluids into/out of storage facility | PMAOPS201B |
| PMAOPS308B | Organise storage and logistics of general materials | |
| PMAOPS309B | Operate particulates handling/ storage equipment | |

| PMAOPS312B | Undertake ship loading/unloading operations | |
| PMAOPS319A | Adjust batch | |
| PMAOPS320B | Conduct artificial lift | |
| PMAOPS321B | Undertake well management | |
| PMAOPS323A | Operate and monitor heating furnace | |
| PMAOPS324A | Operate a gas turbine | |
| PMAOPS325B | Generate electrical power | |
| PMAOPS326B | Produce product using gas absorption | |
| PMAOPS327B | Produce product using fixed bed dehydration | |
| PMAOPS329B | Produce product using liquid extraction | |
| PMAOPS330B | Communicate pipeline control centre operations | |
| PMAOPS333A | Operate wells and gathering systems | |
| PMAOPS335A | Conduct pipeline pigging | |
| PMAOPS340B | Operate cryogenic processes | |
| PMAOPS350B | Match and adjust colour | |
| PMAOPS390B | Operate a biochemical process | |
| PMASMELT260B | Form carbon anodes | |
| PMASMELT261B | Bake carbon anodes | |
| PMASMELT262B | Clean and strip anode rods | |
| PMASMELT263B | Spray carbon anodes | |
| PMASMELT264B | Start up reduction cells | |
| PMASMELT265B | Operate reduction cells | |
| PMASMELT266B | Deliver molten metal | |
| PMASMELT267B | Cast aluminium ingots | |

| PMASMELT268B | Vertical direct casting | |
| PMASMELT269A | Operate cell tending equipment | |
| PMASMELT270A | Supply product from reduction cells | |
| PMASUP236B | Operate vehicles in the field | |
| PMASUP237B | Undertake crane, dogging and load transfer operations | |
| PMASUP241B | Maintain pipeline easements | |
| PMASUP242B | Monitor pipeline civil works | |
| PMASUP243B | Monitor and maintain pipeline coatings | |
| PMASUP244A | Prepare and isolate plant | |
| PMASUP305A | Operate offshore cranes | |
| PMASUP311A | Operate communications hub | |
| PMASUP341B | Monitor and maintain instrument and control systems | MSAPMPER300C |
| PMASUP342B | Monitor and maintain electrical systems | MSAPMPER300C |
| PMASUP343B | Monitor and maintain cathodic protection systems | |
| PMASUP344B | Monitor and control repairs and modifications on operational pipe | |
| PMASUP345A | Monitor vibration | |
| PMASUP346A | Control corrosion | |
| PMASUP347A | Undertake corrosion inspection in a petrochemical environment | |
| PSPGOV308B | Work effectively with diversity | |
| RIIOHS204A | Work safely at heights | |
| RIIRIS201A | Conduct local risk control | |
| TAEASS301A | Contribute to assessment | |

| TAEDEL301A | Provide work skill instruction | |
| TLID1007C | Operate a forklift | |
| UEPOPS319A | Operate and Monitor Gas Production Plant | |
| UEPOPS340A | Operate and Monitor a Steam Turbine | |

Up to **four (4)** relevant units may be chosen from this Training Package, other endorsed Training Packages and accredited courses where those units are available at Certificates III and IV.