



Australian Government

PMASUP244 Prepare and isolate plant

Release: 1

PMASUP244 Prepare and isolate plant

Modification History

Release 1. Supersedes and is equivalent to PMASUP244A Prepare and isolate plant

Application

This unit of competency covers the skills and knowledge required to isolate and prepare plant for maintenance work and return to service.

This unit of competency applies to operators, maintainers, maintenance personnel, and those in similar roles who are required to execute the authorised isolation and preparation plan, hand over plant for work and accept handover after work, execute authorised return to service plan and complete required paperwork.

The person will have detailed operational and process knowledge but is not required to demonstrate 'hands on' operation of equipment as part of this competency.

This unit of competency applies to an individual working alone or as part of a team or group and working in liaison with other shift team members, the control room operator, relevant experts and stakeholders as appropriate. They would be part of a team during start-up and shutdown procedures.

This unit of competency applies to preparation and isolation of hazardous plant, such as a major hazard facility. However, it can also be applied with appropriate contextualisation to the preparation and isolation of lower hazard plants and mobile plant.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 **Perform the isolations**

1.1 Communicate with panel operator and other stakeholders

- 1.2 Execute authorised isolation plan
 - 1.3 Remove materials and energy, as required
 - 1.4 Control any releases to the environment in accordance with plant procedures
 - 1.5 Prove the effectiveness of the isolation
 - 1.6 Decontaminate plant and equipment, as required
 - 1.7 Recognise and take action on any inconsistencies
 - 1.8 Test for residual hazards
 - 1.9 Complete required paperwork
 - 1.10 Sign-off isolations, as required
 - 1.11 Hand over to/from shift, as required
- 2 **Prepare plant for the work**
 - 2.1 Execute authorised preparation plan
 - 2.2 Recognise and take action on any inconsistencies
 - 2.3 Confirm plant is ready for the work
 - 2.4 Hand over plant to the work party
 - 2.5 Monitor work and plant, as required
- 3 **Prepare plant for return to service**
 - 3.1 Confirm work is complete and site/plant has been left in acceptable condition
 - 3.2 Accept handover from work party
 - 3.3 Obtain authority to de-isolate
 - 3.4 Execute authorised de-isolation plan
 - 3.5 Sign off the de-isolation, as required
 - 3.6 Reverse purge as required by plan for return to service
 - 3.7 Execute authorised plan for return to service

- 3.8 Test readiness for return to service
- 3.9 Advise plant is ready for service
- 3.10 Complete required paperwork

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Regulatory framework

The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used, and include one or more of the following:

- legislative requirements, including work health and safety (WHS)
- industry codes of practice and guidelines
- environmental regulations and guidelines
- Australian and other standards
- licence and certification requirements

All operations to which this unit applies are subject to stringent health, safety and environment (HSE) requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Procedures

All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, include one or more of the following:

- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

Hazards

Hazards include one or more of the following:

- electricity
- gases and liquids under pressure
- structural hazards
- structural collapse
- equipment failures
- industrial (machinery, equipment and product)
- equipment or product mass
- noise, rotational equipment or vibration
- plant services (steam, condensate and cooling water)
- limited head spaces or overhangs
- working at heights, in restricted or confined spaces, or in environments subjected to heat, dusts or vapours
- flammability and explosivity
- hazardous products and materials
- unauthorised personnel
- sharp edges, protrusions or obstructions
- slippery surfaces, spills or leaks
- extreme weather
- other hazards that might arise

Isolation

Isolation is a process for ensuring no energy or material can enter the isolated area.

Plant energy sources

Plant energy sources include, as appropriate to the plant, one or more of the following:

- electricity (mains, solar and by generator)
- chemicals and fuels
- heat and steam
- pressure, such as compressed air and water, hydraulic oil and other

- fluids under pressure
- energy storing devices, such as batteries, springs, flywheels, accumulators and capacitors
- gravity (and its ability to cause items to fall)
- radiation

Control release procedures Control release procedures will define the release action to be taken for the plant and/or any specified conditions, including one or more of the following:

- preventing any release
- containing any release
- recovery and reuse or disposal of any release

Preparation plan Preparation plan will define processes to ensure plant and equipment is in a safe and appropriate condition for the required work, including as appropriate to the plant:

- draining
- purging
- inerting
- ventilating
- controlling atmosphere (e.g. to ensure it is breathable and is not within the flammable range)
- adjusting temperature to make a workable environment
- adjusting pressure (usually to atmospheric)
- ensuring adequate access and egress

Isolation plan Execution of the isolation plan includes, as appropriate to the plant:

- confirming availability of plant, equipment and/or systems
- verifying plant, equipment and/or systems
- verifying isolation location
- securing and identifying isolation points
- labelling isolation points
- doing the isolations
- managing the isolations
- managing lock out/tag out to procedure
- cross checking isolations
- undertaking self-isolation, where appropriate

Remove materials and energy	Removing materials and energy includes, as appropriate to the plant: • draining, purging and venting of process materials • mitigation of stored energy • appropriately catching and disposing of any removed materials
Effectiveness of isolation	Proving the effectiveness of the isolation includes, as appropriate to the plant: • checking that any leaks are acceptable • proving depressuring • proving purging • checking bleed from double block and bleed, where appropriate • proving the atmosphere is as required • using gas detectors/meters • proving the isolation is effective • surveillance of isolations
Test readiness for return to service	Testing readiness for return to service includes, as appropriate to the plant: • pressure and leak testing • atmosphere/gas testing • testing the restoration of utilities and services
Required paperwork	Required paperwork will conform to site requirements and document control systems and are paper, electronic or other approved format. Paperwork must include: • isolation register • lock out/tag out register • sign-offs • any reports, permits/work packs, documentation required by the job/organisation • filing of documentation

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875>

Assessment Requirements for PMASUP244 Prepare and isolate plant

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria, and include the ability to:

- implement prepared isolation/de-isolation plan
- read and interpret technical documentation and drawings/graphics
- interpret safety data sheets (SDS)
- undertake tests and interpret test results
- complete required paperwork
- apply procedures to control releases and remove energy and materials.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- isolation philosophy of organisation
- isolation and preparation plan for work
- plant energy sources and their methods of being de-energised and isolated
- hierarchy of isolations
- methods of proving isolations
- methods and equipment used for purging and ventilation
- decontamination methods and requirements for various materials and situations
- as low as reasonably practicable (ALARP) concept
- importance of appropriate rates of change for pressure and temperature for vessels and other plant
- significance of time allowed for draining, purging and ventilation
- fluid dynamics relating specifically to draining piping systems, including:
 - the ability of a liquid to ‘hang-up’ in pipework, the importance of identifying high point vents to release gas/vapours and low point drains to release liquids
 - determining the amount of liquid drained from a piping section to ascertain that draining has been effective/prove drainage
 - the potential effects (e.g. damage to tanks or vessels) of vacuum by not draining correctly (e.g. by pulling a vacuum behind a slug of liquid)
- organisation procedures, including those covering:
 - safety, emergency and hazard control
 - work permit systems

- communications
- environmental management
- standard operating procedures (SOPs).

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence.
- The collection of performance evidence is best done from a report and/or folio of evidence drawn from:
 - a single project which provides sufficient evidence of the requirements of all the elements and performance criteria
 - multiple smaller projects which together provide sufficient evidence of the requirements of all the elements and performance criteria.
- A third-party report, or similar, may be needed to testify to the work done by the individual, particularly when the project has been done as part of a project team.
- Assessment should use a real project in an operational workplace. Where this is not possible or practical, assessment must occur using a sufficiently rigorous simulated environment reflecting realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept).
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition, the assessor or anyone acting in subject matter expert role in assessment must demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they must assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
 - relevant VET or other qualification/Statement of Attainment
 - appropriate workplace experience undertaking the type of work being assessed under routine and non-routine conditions
 - appropriate workplace experience supervising/evaluating the type of work being assessed under routine and non-routine conditions

- Currency can be demonstrated through one or more of:
 - being currently employed undertaking the type of work being assessed
 - being employed by the organisation undertaking the type of work being assessed and having maintained currency in accordance with that organisation's policies and procedures
 - having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment
 - conducting on-the-job training/assessments of the type of work being assessed
 - being an active member of a relevant professional body and participating in activities relevant to the assessment of this type of work

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