



Australian Government

PMASUP444 Plan plant preparation and isolation

Release: 1

PMASUP444 Plan plant preparation and isolation

Modification History

Release 1. Supersedes and is equivalent to PMASUP444A Plan plant preparation and isolation

Application

This unit of competency covers the skills and knowledge required to plan and prepare for isolation of plant and its return to service. This unit of competency applies after the work scope has been agreed, but before the isolation and preparation commences.

Isolation is a process for ensuring no energy or material can enter the isolated area. Typically the isolation will occur so that the plant can be prepared for subsequent work, such as maintenance.

This unit of competency applies to senior technicians, operator/maintainers, maintenance planners, authorised permit issuers, and those in similar roles who are required to apply in-depth knowledge of process and plant in order to confirm the work to be done; plan the isolation and de-isolation strategies, preparations and sequencing; obtain authorities; liaise with stakeholders and complete documentation. The technician will have detailed operational and process knowledge but is not required to demonstrate 'hands on' operation of equipment as part of this competency. This competency may form part of their regular work role or could be a full-time role on secondment for a major shutdown.

This unit of competency applies to hazardous plant, such as a major hazard facility. However, with appropriate contextualisation it can be applied 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.

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|---|--|---|
| 1 | Confirm scope of work | <ul style="list-style-type: none">1.1 Examine identified work scope (e.g. what, where, who, when, why, duration and frequency)1.2 Confirm purpose of identified work1.3 Identify plant and equipment involved1.4 Negotiate any conflicts/inconsistencies with relevant stakeholders1.5 Identify possible need for temporary lifting of any isolations |
| 2 | Develop isolation philosophy for work | <ul style="list-style-type: none">2.1 Apply relevant isolation philosophy/strategy, including type of/hierarchy of isolation and lock out/tag out2.2 Determine implications of isolation2.3 Identify physical limits of affected plant and equipment2.4 Check suitability and effectiveness of existing isolation procedures2.5 Assess possible boundaries for isolations2.6 Seek local knowledge for similar isolations and preparations2.7 Identify available/permissible preparation strategies, including purging fluids and techniques2.8 Draft strategies for isolation and preparation2.9 Communicate, as appropriate, with stakeholders2.10 Negotiate isolation and preparation conflicts2.11 Prepare isolation philosophy for work |
| 3 | Manage hazards | <ul style="list-style-type: none">3.1 Identify existing hazards of plant, process and materials3.2 Identify hazards associated with performing the isolations and preparation3.3 Identify hazards associated with purging/flushing/venting materials |

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|---|--|--|
| | 3.4 | Draft strategies for controlling any releases |
| | 3.5 | Estimate required preparation durations taking into account factors, such as starting conditions, safe rates of change (pressure, temperature), volumes and pressures required |
| | 3.6 | Make recommendations for improvement in accordance with procedures |
| | 3.7 | Liaise with technical experts as required |
| | 3.8 | Specify types of isolations and locations of isolations required |
| | 3.9 | Specify controls to bring hazards to ‘as low as reasonably practicable’ (ALARP) |
| 4 | Plan required isolation and preparation | |
| | 4.1 | Determine required sequencing of all steps |
| | 4.2 | Develop isolation procedure |
| | 4.3 | Develop preparation procedure |
| | 4.4 | Develop decontamination procedures |
| | 4.5 | Develop required procedures for plant supplementary systems |
| | 4.6 | Verify procedures against relevant drawings and the plant |
| | 4.7 | Identify and schedule required pre-work |
| | 4.8 | Determine competencies required to complete planned isolations and preparation |
| | 4.9 | Plan required de-isolation and preparation for return to service |
| | 4.10 | Discuss proposed plans with relevant stakeholders |
| | 4.11 | Complete required documentation |
| 5 | Obtain authority to execute plan | |
| | 5.1 | Obtain approval to implement the isolation and preparation plan |

- 5.2 Obtain approval to implement the de-isolation and preparation for return to service plan
- 5.3 Acquire hardware and resources for isolation and de-isolation and preparation for work and return to service

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:

- Government of Western Australia, Department of Commerce, Guidance note – Isolation of plant, 2010 (or similar state regulation)
- National Offshore Petroleum Safety Authority (NOPSA) requirements, where relevant
- Major Hazard Facility (MHF) Licence to operate, where relevant
- 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

Hazards	Hazards include one or more of the following: • electricity • gas (flammable, toxic and anoxic) • gases and liquids under pressure • structural hazards • structural collapse • equipment failures • industrial (machinery, equipment and product) • equipment or product mass • 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, noise, 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
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
Determining competencies required	Determining competencies required for isolation and preparation includes consideration of the need for skilled/qualified/licensed personnel in the areas of the following: • electrical (normal)

- electrical high voltage and hazardous area
- electrical isolation/de-isolation
- radiation
- heights
- mobile plant
- plumbing
- mechanical fitting
- permit preparation

Isolation procedures

Isolation procedures include one or more of the following:

- isolation processes
- isolation list
- multiple isolations
- temporary lifting of isolations, when and if required
- interlocks
- and will include consideration of:
 - isolation alternatives
 - conflicts of isolation

Verifying procedures

Verifying procedures include one or more of the following:

- checking existing documents which have been used are accurate, current and complete
- checking planned isolation points do exist, are accessible, and are suitable for the isolation planned
- having a history of providing the isolation desired

Relevant drawings

Relevant drawings include one or more of the following:

- piping and instrumentation diagrams (P&IDs)
- process flow diagrams (PFDs)
- process flow sheets (PFSs)
- process engineering flow sheets (PEFs)

Required pre-work

Required pre-work includes one or more of the following:

- scaffolding
- building up/depletion of inventories/work in progress (WIP)
- obtaining of supplies
- identification tags
- lock out kits

Required documentation

Required documentation includes one or more of the following:

- drawings
- procedures
- marking up existing documents
- punch lists
- vendor documents/engineering specifications
- documentation required by the site work control system (e.g. permits)

Documents will conform to the site requirements and document control systems, and will be paper-based, electronic or in another approved form.

Authority to execute

Authority to execute includes both the authorisation to proceed and the timing of that execution. Authority will be obtained through the channels required by the organisation/facility.

The level of authority required will vary for different types of work, different types of isolation and different plants/facilities.

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMASUP444A Plan plant preparation and isolation

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 PMASUP444 Plan plant preparation and isolation

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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:

- plan, prepare and develop plant preparation and isolation philosophy/activities for a particular activity
- arrange resources as required
- communicate effectively with stakeholders, including manufacturers, engineering personnel, designers, contractors and maintenance and other company personnel
- identify hazards and risks and apply risk control procedures
- complete written/electronic documentation.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- all items on a schematic of the system and functions of each
- principles of operation of items of equipment in the system
- process parameters and limits, (e.g. temperature, pressure, flow and pH) and plant integrity limits
- typical requirements for preparation to ensure that plant and equipment is in a safe and appropriate condition for the required work, including:
 - draining
 - purging
 - inerting
 - decontaminating
 - cleaning
 - 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
- implications of isolation in both the area of the work and upstream and downstream, including:

- upstream and downstream process implications
- ability to prepare plant once isolated
- integrity of plant once isolated and prepared
- methods for controlling releases to the environment, including:
 - preventing any release
 - containing any release
 - recovery and reuse or disposal of any release.
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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.
- Simulation may be used for part only of this unit.
- 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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