



Australian Government

PMAOPS280 Interpret process plant schematics

Release: 1

PMAOPS280 Interpret process plant schematics

Modification History

Release 1. Supersedes and is equivalent to PMAOPS280B Interpret process plant schematics

Application

This unit of competency covers the skills and knowledge required to interpret process plant schematics for a range of operations uses.

This unit of competency applies to operators who are required to find specific information from a schematic, mark up a schematic for their own or someone else's use, and sketch a schematic using relevant symbols as part of an explanation to another person or as an aide memoir for themselves.

This unit of competency applies to a wide range of schematics and covers all general and common symbols. It also includes those specific to the plant which is the operator's area of responsibility and any conventions which are applied by the organisation.

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

Pre-requisite Unit

Nil

Competency Field

Operations

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

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

1	Relate schematic to plant	1.1	Match items on schematic with items in plant
		1.2	Determine relevant pipe and flange schedules
		1.3	Identify sizes and types of minor equipment
		1.4	Locate relevant instrument tapping points and control points
		1.5	Identify direction of flow on schematic and in plant

2	Identify points required to prepare plant	2.1	Locate isolation and blanking points for any item of the relevant schematic
		2.2	Identify drain/vent/purge points for any item on the relevant schematic
		2.3	Identify trip system elements
		2.4	Use schematic to check/develop work lists
3	Describe the process with a schematic	3.1	Use a schematic as the basis of a description of the process
		3.2	Describe the process using a manual schematic
		3.3	Walk through process identifying all plant items in process order
		3.4	Identify key conditions/variables from a relevant schematic

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
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- 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.

Items

Items on schematic/in plant include the following:

- all major plant items, such as:
 - vessels
 - columns
 - reactors
 - heat exchangers
- minor plant items, such as:
 - pumps
 - valves
 - strainers
 - filters
 - instrumentation (local and remote)

Schematics

Schematics are formally drawn, authorised diagrams and are hard copy or electronic.

Schematics have various names, including:

- piping and instrumentation diagram (P&ID)
- process flow diagram (PFD)
- process engineering flow (PEF)
- cause and effect diagrams/matrix

Manual schematic includes one or more of the following:

- a hand drawn sketch of the part of the process of interest
- a mark up of a formally drawn schematic

Symbols

Symbols and conventions used in the schematics for the relevant plant area should be used, and include one or more of the following:

- Australian Standards symbols

- the organisation's standard symbols
- some other standard system

Points required to prepare plant

Points required to prepare plant include three or more of the following:

- isolations
- blank/spade/spectacle blind, breakout spool locations
- draining
- purging
- blanketing
- venting
- ventilating
- locating plant, equipment and services - above ground
- locating below ground (or otherwise obscured) pipeline and services

Key conditions/variables

Key conditions/variables include one or more of the following:

- normal range of process conditions, such as:
 - level
 - pressure
 - flow
 - temperature
- alarm conditions/values
- trip and emergency shutdown (ESD) values

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMAOPS280B Interpret process plant schematics

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 PMAOPS280 Interpret process plant schematics

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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:

- interpret symbols and other drawing elements and explain their relationship to the plant and process
- identify critical processes and plant items from a schematic
- draw or mark up a schematic and use it to describe main process features and plant items.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- standard/common symbols used on schematics
- schematic conventions (e.g. with particular reference to crossing and branching lines)
- symbols and conventions used by the organisation, if different from common usage
- indications of equipment/pipe specifications
- indications of process conditions/limits.

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 occur in operational workplace situations. Where this is not possible or practical, assessment must occur in 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 (provided a record is kept) 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.
- 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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