



Australian Government

Department of Education, Employment and Workplace Relations

PMAOPS280B Interpret process plant schematics

Revision Number: 1

PMAOPS280B Interpret process plant schematics

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the interpretation of process plant schematics for a range of operations uses. It includes a wide range of schematics.
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Application of the Unit

Application of the unit	In a typical scenario, an operator needs to undertake an activity on the plant, or related to the plant and uses a schematic as an aid in interpreting the plant and/or the plant systems or as an aid to explaining the plant/plant systems to another person (who may be another operator, technical specialist, member of management, maintenance worker or contractor). The operator would: • find relevant information from the schematic • mark up a schematic for their own use or the use of another person • sketch a schematic, using relevant symbols, as part of an explanation to another person or as an <i>aide memoir</i> for themselves This competency covers all general and common symbols and also includes those specific to the relevant plant which is the operator's area of responsibility. It includes those conventions which are applied by their place of work.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
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.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- interpretation of symbols and other drawing elements
- communication
- problem solving

Required knowledge

Competence includes an understanding of process plant schematics and their application to the actual plant and process. In particular it includes a knowledge of:

- symbols used on schematics by that organisation
- schematic conventions, eg with particular reference to crossing and branching lines
- indications of equipment/pipe specifications
- indications of process conditions/limits
- cause and effect interpretation as relevant

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to apply schematics to plant/process based situations. Consistent performance should be demonstrated. In particular look to see that: - critical process/plant features can be identified from a schematic - main process features can be described using a schematic.
Context of and specific resources for assessment	Assessment will require access to a plant over an extended period of time, or a suitable method of gathering evidence of ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Items	Items on schematic/in plant includes: - all major plant items such as: - vessels, - columns, - reactors - heat exchangers - minor plant items
Context	Schematics have various names and includes: - P&IDs (piping and instrumentation diagrams) - PFDs (process flow diagrams) - PEFs (Process Engineering Flow) - cause and effect diagrams/matrix Unless qualified in the unit, 'schematic' means a formally drawn, authorized schematic and may be hard copy or electronic.
Symbols	Symbols and conventions used in the schematics for the relevant plant area should be used. They may be Australian Standards symbols, the organisation's standard symbols or some other standard system:
Minor equipment	Minor equipment includes that equipment commonly described by size and type and includes: - pumps - valves - strainers - filters

RANGE STATEMENT	
	instrumentation (local and remote) It typically would not include items such as vessels, columns, reactors or heat exchangers which would be major plant items.
Plant preparation	Plant preparation entails all that activity which may be required to render the plant safe for non-operational work (which is typically maintenance but may be other work) and includes: - 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	Key conditions includes: - normal range of process conditions such as - level - pressure - flow - temperature - alarm conditions/values - trip, ESD values
Work lists	Work lists may include: - punch list - tag numbers - spade/blind lists - similar lists
Manual schematic	Manual schematic may include: - a hand drawn sketch of the part of the process of interest - a mark up of a formally drawn schematic

RANGE STATEMENT	
	Schematics may be hard copy or electronic.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State 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.

Unit Sector(s)

Unit sector	Operational/technical
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		