



Australian Government

PMAOPS315 Operate and troubleshoot process control systems

Release: 1

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Modification History

Release 1. Unit code and title changed. Application and Performance Criteria changed. Range of Conditions removed. Assessment Requirements changed. Supersedes and is equivalent to PMAOPS305 Operate process control systems.

Application

This unit describes the skills and knowledge required to operate a centralised control panel, such as distributed control system (DCS) type controls, to control and monitor multiple vessels, plant items and/or products. It is typically located on-site but off-plant in a control room, but may also be off-site. It may use a range of control algorithms and multiple control loops and include other local controllers that are integral to its operation.

This unit applies to autonomous operators who have overall responsibility for the operation of all units of equipment covered by the control system/portion of the control system they operate. They would take a leading role in liaising and cooperating with other members of the team, including 'outside operators'. However, this unit does not preclude the situation where the panel operator may also undertake 'outside' functions.

No licensing or certification requirements exist at the time of publication. Relevant legislation, industry standards and codes of practice within Australia must be applied.

Pre-requisite Unit

Nil

Competency Field

Operations

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Operate process control system according to procedures	1.1 Receive and give shift handover 1.2 Communicate with personnel to identify and coordinate work requirements 1.3 Identify, control and report hazards 1.4 Check for recent work undertaken on plant units being controlled and address outstanding and incomplete work

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<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.5 Check operational status of process control system
2. Use operator interface	2.1 Use human interface devices (HIDs) to access control system 2.2 Monitor the process using the operator interfaces 2.3 Select controller modes 2.4 Acknowledge messages and alarms
3. Access control information	3.1 Obtain current and historical data and information from the control system by applying systems knowledge 3.2 Identify the status of individual pieces of equipment from the control panel and use information to identify potential faults 3.3 Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics 3.4 Record process variations and irregularities to procedures
4. Control process variations and monitor operations	4.1 Use historical data to assist in the identification of abnormal situations 4.2 Process available information to identify potential faults 4.3 Undertake required set point and output changes to meet plant and process requirements 4.4 Optimise plant operating conditions in accordance with guidelines 4.5 Adjust production in response to test results and control panel information 4.6 Monitor key process and environmental variables and take action 4.7 Adjust controller settings in accordance with procedures 4.8 Use fine-tuning software according to operating procedures 4.9 Coordinate with upstream and downstream units 4.10 Record adjustments and variations to specifications and schedules
5. Identify and respond to abnormal situations during operation	5.1 Monitor process control system frequently and critically throughout shift using own senses, and measured and indicated data 5.2 Monitor field data and instrumentation to ensure that product remains on specification 5.3 Identify impacts of changes upstream and downstream 5.4 Identify actual and developing situations that may require action

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	5.5 Take action to remedy abnormal situations according to operating procedures 5.6 Complete required documents outlining abnormal situation management and corrective action taken
6. Shut down and prepare process control system for maintenance	6.1 Prepare process control system to be shut down according to operating procedures 6.2 Complete pre-shutdown checks according to operating procedures 6.3 Shut down process control system according to operating procedures 6.4 Identify, control and report shutdown hazards 6.5 Monitor shutdown and identify abnormal situations that may require action 6.6 Take action to remedy abnormal situations according to operating procedures 6.7 Shut down and changeover duty and standby equipment according to operating procedures 6.8 Isolate process control system from energy sources
7. Prepare and start up process control system	7.1 De-isolate and prepare process control system to be returned to standby or service 7.2 Complete pre-start checks according to operating procedures 7.3 Start up process control system according to operating procedures 7.4 Identify, control and report startup hazards 7.5 Monitor startup and identify abnormal situations that may require action 7.6 Take action to remedy abnormal situations according to operating procedures

Foundation Skills

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

- Learning skills to follow instructions, monitor process and select appropriate procedure.
- Reading skills to follow written procedures and documentation.
- Writing skills to complete workplace documentation.

- Oral communication skills to liaise and coordinate with team members and outside operators.
- Numeracy skills to monitor field data, instrumentation and process parameters.
- Technology skills to operate control panel, interfaces and software.

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

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMAOPS305 Operate process control systems.

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 PMAOPS315 Operate and troubleshoot process control systems

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit:

- at least 2 times, each in a separate work context.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- process control systems, including:
 - the function and location of the equipment
 - operating parameters and integrity limits
 - impact of external factors, including variations in weather and feed
 - emergency shutdown procedures
 - control system architecture
 - basis of control for the plant/s
 - types of instrumentation and control systems, including feedforward, feedback and open control
 - types of instrumentation and control system components and their role, including primary sensing devices, final control elements and transducers and transmitters
 - how control loops and their components, including proportional integral derivative (PID) control, set points, controlled variable and indicated variable, operate to control the process, and their limitations
 - interaction between multiple control loops, including cascade control
 - impacts of changing controller settings and the limits within which changes can be made
 - uninterruptable power supplies (UPS) and its applications and use
- organisational processes and procedures, including:
 - interactions between plant items and processes
 - specific plant process operations
 - process drawings, such as piping and instrumentation diagram (P&ID) and process flow diagrams (PFD)
 - process control philosophies and strategies

- physics and chemistry to the level of being able to provide an overview of the science of the process control system
- basic science of upstream and downstream processes
- principles of cause and effect
- product specifications and tolerances
- process control system abnormal situations and required action including but not limited to:
 - instrument failure and malfunction
 - electrical failure and malfunction
 - mechanical failure and malfunction
 - equipment design deficiencies
 - product parameters (temperature, flows, pressure and levels)
 - process control system malfunction
 - power and utility failures
 - variation in feed rate; quality or loss of feed
 - unstable control of pressure, temperature, level and/or flows
 - unstable and suboptimal operation
 - control equipment failure
 - process plant trips
 - change in atmospheric conditions (rain, temperature, wind and lightning)
 - emergency situations
- process control system hazards:
 - possible causes
 - potential consequences
 - appropriate risk controls
 - reporting and escalation procedures.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - plant, process control system, interface
 - operating procedures
- abnormal situations must be relevant to process control systems.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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