



Australian Government

Assessment Requirements for PMAOPS405 Operate complex control systems

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to PMAOPS405A Operate complex control systems

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 and respond to panel messages and alarms
- obtain and interpret data from the control system to minimise variation and maximise performance
- identify early warning signs of equipment/processes needing attention or with potential problems
- select and apply procedures for planned and unplanned start-up/shutdown
- identify hazards and risks and apply risk control procedures
- communicate and negotiate effectively with all stakeholders
- isolate the causes of problems and distinguish between causes of problems/alarm/fault indications, including:
 - instrument failure/malfunction
 - electrical failure/malfunction
 - mechanical failure/malfunction
 - equipment design deficiencies
 - product parameters (temperature, flows, pressure and levels)
 - process control system malfunction
 - power/utility failures
 - software problems
 - multitasking.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- advanced control features
- interactions between control loops
- interactions between plant units within the entire plant
- the architecture and location of the process/production equipment
- specific plant process operations
- interactions between plant items/processes
- product specifications and tolerances, systems operating parameters and system integrity limits

- process control philosophies and strategies
- emergency shutdown (ESD) procedures
- relevant science of the process (e.g. physics, chemistry and biochemistry) to the level of identifying and manipulating factors controlling process rate and product properties, and identifying and resolving potential problems
- basic science of upstream and downstream processes
- interactions between plant area and other value stream members
- impact of external factors (e.g. variations in weather and feed)
- complex process drawings (e.g. piping and instrumentation diagram (P&ID), process flow diagram (PFD), and cause and effect
- basis of control for the plant
- instrumentation and control systems, including feed forward, feed-back and open control
- instrumentation and control system components (e.g. relevant primary sensing devices, final control elements and transducers/transmitters)
- control loops (including proportional integral derivative (PID) control, set points, controlled variable and indicated variable)
- interaction between multiple control loops (including cascade control)
- impacts of changing controller settings and the limits within which changes can be made
- effective communication techniques
- organisation procedures
- uninterrupt power supply (UPS) and its applications and use
- duty of care obligations
- hierarchy of control
- hazards that may arise in the job/work environment, and:
 - their possible causes
 - potential consequences
 - appropriate risk controls.

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:
 - should occur over a range of situations which include typical disruptions to normal, smooth operations
 - will typically include a supervisor/third-party report focusing on consistent performance and problem recognition and solving. A supervisor/third-party report must be prepared by someone who has a direct, relevant, current relationship with the person being assessed and who is in a position to form a judgement on workplace performance relevant to the unit of competency
 - must include the use of industrial type complex control system, controlling a real or simulated process requiring demonstration of operation and responding to problems
 - may use industry-based simulation for all of the unit particularly where safety, lack of opportunity or significant cost is an issue.

- Assessment should occur in operational workplace situations. Where this is not possible, or where personal safety or environmental damage are limiting factors, 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.
- Assessment in a simulated environment should use evidence collected from one or more of:
 - walk-throughs
 - pilot plant operation
 - demonstration of skills
 - industry-based case studies/scenarios
 - ‘what ifs’.
- 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 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.

Links

Companion Volume implementation guides are found in VETNet -

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