



Australian Government

PMASUP341 Monitor and maintain instrument and control systems

Release: 1

PMASUP341 Monitor and maintain instrument and control systems

Modification History

Release 1. Supersedes and is equivalent to PMASUP341B Monitor and maintain instrument and control systems

Application

This unit of competency covers the skills and knowledge required to monitor and maintain instrument/electrical systems used for process measurement and control of a process.

This unit of competency applies to process technicians and those in similar roles who are required to test, repair, recommission instrumentation and control systems in the facility; issue permits to allow work to be undertaken; verify equipment operation; calibrate instrumentation; troubleshoot problems; and prepare reports related to the equipment/systems.

This unit of competency applies to any control system/instrumentation forming part of a control system, including those for compressor systems, prime movers, valve systems and systems measuring/controlling flow, pressure or temperature. Control systems can be pneumatic, electrical/electronic, electro-pneumatic, computer-based, and so on.

This unit of competency applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

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

Pre-requisite Unit

MSMPER300 Issue work permits

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.

- 1 **Monitor equipment operation**
 - 1.1 Monitor equipment operation according to instrument/electrical equipment operating principles and parameters
 - 1.2 Access and interpret relevant technical drawings and schematics to determine system faults
 - 1.3 Issue permit to work to allow work to be undertaken
 - 1.4 Verify equipment operation/performance through test procedures to ensure correct operation and to confirm identified problems from other sources
 - 1.5 Correct operational variations through calibration and adjustment
 - 1.6 Document operational variations

- 2 **Test/repair equipment**
 - 2.1 Verify equipment is operating correctly and document test results
 - 2.2 Apply appropriate troubleshooting techniques to determine the cause of operational faults
 - 2.3 Rectify operational faults through the application of relevant maintenance procedures
 - 2.4 Isolate, remove and dispose of faulty equipment, and install new equipment
 - 2.5 Verify the performance of newly installed equipment to ensure it meets required operational parameters and conditions
 - 2.6 Record all repairs/installations to provide historical records of the condition of system equipment

- 3 **Recommission systems and equipment**
 - 3.1 Recommission repaired/installed equipment to online operation in the correct sequence at the required operational parameters
 - 3.2 Monitor or activate systems to ensure they are operating both safely and effectively
 - 3.3 Close out permit to work and restore site/system to

normal operation

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| 4 | Compile and analyse reports | 4.1 | Collect information concerning deviations/repaired equipment and put into accepted reporting format |
| | | 4.2 | Compile reports ensuring they provide an accurate and ongoing record of deviations in pipeline processes and a current record of pipeline and equipment trends |
| | | 4.3 | Utilise information or reports for short and long-term deviation control planning |

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
- 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.

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

Instrument and control systems

This unit of competency includes all such items of equipment and unit operations which form part of the instrument and control systems for plant units, such as:

- compressor systems and equipment – instrumentation and control systems include one or more of the following:
 - compressors, monitoring systems, power supply systems, pumps, pumping systems and equipment, pressure vessels/filtration equipment, coolers, scrubbers, expanders, anti-surge systems, safety systems and compressor control systems
- prime movers, such as turbine engines, reciprocating engines, electric motors – instrumentation and control systems include one or more of:
 - fuel and carburettion systems, ignition systems, lubrication systems, induction and exhaust systems, governing systems, power supply systems, safety and shutdown systems
- flow systems – instrumentation and control systems include one or more of the following:
 - piping systems, metering equipment, flow control equipment, pressure and temperature transmitters and transducers, telemetry equipment, programmable logic controllers (PLCs), flow computers, electro-pneumatic process control equipment and their associated online analytical instrumentation, such as gas chromatographs, moisture

- analysers, gas sampling and gas analysis equipment and pig
- valve systems – instrumentation and control systems include one or more of the following:
 - non-control valves, control and shut off valves, non-return or check valves and pressure relief valves, manual hand operated actuator, gas/hydraulic actuator and pneumatic valves

Instrument/electrical systems

Instrument/electrical systems include one or more of the following:

- process analysing systems, eg gas analysis
- emergency shutdown systems (ESD)
- fire systems
- pressure and temperature control systems
- metering systems (e.g. orifice, turbine and positive displacement)
- telemetry and supervisory control and data acquisition (SCADA) systems
- communications systems
- solar systems
- utility systems

Types of faults

Types of faults include one or more of the following:

- material leaks
- electrical problems
- compressor or pump failure
- out of current inspection status
- gauge failure or hose rupture/leaks
- instruments out of calibration
- non-flow of material
- instruments and equipment requiring cleaning

Test equipment

Test equipment will be selected as required from one or more of the following:

- dead weight tester
- transmission unit
- ice point tester
- decade box
- multimeter
- resistance temperature device (RTD) calibrator

- chart recorders
- data logging equipment

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMASUP341B Monitor and maintain instrument and control systems

Links

Companion Volume implementation guides are found in VETNet -

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