Australian Government

PMAOPS210B Operate particulates handling equipment

Release 2

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

PMAOPS210B Operate particulates handling equipment

Modification History

Release 2 – Minor clarifications and editorial corrections.

Unit Descriptor

This competency covers the operation of the range of equipment used to store and convey particulate solids. This competency is typically performed by many operators in a solids handling plant and is often a starting point for operators to learn the operation of the plant as a whole. It covers items of equipment such as mechanical conveyor systems (including feeders), and/or pneumatic conveyor systems and storage equipment such as hoppers and silos or stockpiles.

Application of the Unit

In this competency the operator would control the conveyor systems transporting particulates into or out of storage (e.g. silos, stockpiles). This means setting up, starting and stopping mechanical or pneumatic conveyor systems and their feeder systems (if any) to convey the materials from one point to another (e.g. between storage units, from storage to packing area). During the process the operator would monitor the operations and take appropriate action to keep particulates moving correctly. This could include removing blockages and preventing rat holing or bridging in hoppers/silos.

This also requires the operator to recognise indications of potential problems with the equipment and to take appropriate and timely remedial action. The operator would carry out minor maintenance according to procedures, or report maintenance requirements outside the operator's level of ability.

The operator would also manage the particulates storage facilities. This includes:

- transferring stock into, out of or between storage units
- making effective use of the available storage capacity
- monitoring the quality, quantity and location of stock
- supplying customers (internal or external) with the correct quality and quantity of stock
- identifying and controlling hazards related to particulates handling equipment and surrounding areas.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Should this be a complex storage facility see PMAOPS309B Operate particulates handling_storage equipment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

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.

Elements and Performance Criteria

1	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
2	Operate mechanical conveyors and/or feeders as required	2.1	Identify the type of conveyor/feeder
		2.2	Start up and shut down conveyor/feeder according to the conveyor type and duty
		2.3	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		2.4	Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends
3	Operate pneumatic/vacuum conveyor as required	3.1	Identify the type of conveyor
		3.2	Start up and shut down conveyor according to conveyor type and duty
		3.3	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate.
		3.4	Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends.

4	Operate fan/blower if appropriate	4.1 Identify type of fan/blower
		4.2 Start up and shut down fan/blower according to its type and duty
		4.3 Monitor critical variables, such as amps, temperature or vibration, and recognise trends/patterns which indicate a potential or actual problem with the fan/blower
		4.4 Take appropriate action
5	Transfer particulates	5.1 Check source, destination and route of planned transfer
		5.2 Check quality, quantity and location of stored particulates
		5.3 Transfer particulates into, out of and between storage units as required
		5.4 Supply customers with correct quality and quantity in a timely manner
6	Isolate and de-isolate plant	6.1 Isolate plant
		6.2 Make safe for required work
		6.3 Check plant is ready to be returned to service
		6.4 Prepare plant for return to service

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving
- ability to distinguish between:
- grades and specifications of materials
- types and causes of conveyor or storage problems to a level that allows problems to be isolated to an item of equipment

Required knowledge

A comprehensive understanding of the equipment and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of particulate properties, such as:

- particle size and shape - reactivity, solubility, colour, health and safety
- angle of repose - storage and transport
- angle of slide - transport
- explosivity - static electricity
- dusts - hazards, good practice.

Also knowledge of:

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit
- process parameters and limits (e.g. temperature, pressure, flow, pH and amps)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling flow
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems

- types and causes of problems within operator's scope of skill level and responsibility
- density and bulk density
- good operating practices
- methods of resolving problems
- HAZCHEM symbols and codes

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating 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	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with: • *MSAPMSUP210A Process and record information*. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • *MSAPMOHS200A Work safely*.
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

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. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs if the candidate, accessibility of the item, and local industry and regional contexts.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Equipment	This competency unit includes items of equipment, such as: mechanical conveyors/feeders (including belt, vibrating, screw and flight; and feeders, such as screw, star, slide, volumetric and weight) pneumatic conveyors, including aspects, such as dense phase, disperse phase, pressure and vacuum storage (e.g. silos and hoppers, purging hoppers, and stockpiles) bulk tankers, transportable containers and intermediate storage
Problems	Typical problems include:

- damage to particulates
- contamination of stored stock
- rat holing and bridging in silos
- routing issues, and so on

Start up shut down as required

Start up shut down as required includes:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold or empty
- all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)

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 (e.g. Responsible Care) and government regulations.

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE 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)

Operational/technical

Competency field

Not applicable

Co-requisite units

Not applicable