



Australian Government

FBPGRA4001 Control power and automation for milling processes

Release: 1

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Modification History

Release	Comments
Release 1	This version released with FBP Food, Beverage and Pharmaceutical Training Package version 1.0.

Application

This unit of competency describes the skills and knowledge required to match milling requirements to available services and equipment.

The unit applies to millers who are required to set and control milling equipment in industrial flour mills, including semolina mills and mills without purifiers. It includes development of strategies for effective use of power and automation, and directing programmed and other maintenance in order to ensure that milling performance is maintained.

All work must be carried out to comply with workplace procedures, in accordance with State/Territory work health and safety legislation that apply to the workplace.

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

Pre-requisite Unit

Nil

Unit Sector

Grain processing (GRA)

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. Establish range of utilities and services used by mill	1.1 Identify distributed services used in mill 1.2 Ensure schematics showing location and distribution of services are available and understood by key personnel

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.3 Categorise services as critical to mill operation or ancillary according to workplace procedures 1.4 Develop contingency strategies in the event of utilities and services requiring maintenance or repair
2. Review mill electric power system for start-up and power demand management	2.1 Identify mains supply terminal, input voltage and electricity supplier 2.2 Identify mill transformers and distribution to sub-mains 2.3 Identify back-up generation and supply system, including automatic and manual operation conditions 2.4 Identify location of mill equipment and areas supplied by each sub-main and switchboard 2.5 Recognise key features and requirements of installed electrical safety systems, including lock off and isolation switches 2.6 Obtain maximum demand and diversity factor (power factor correction) and identify implications for mill operations 2.7 Establish motor control and start-up procedures according to manufacturer, engineer and supply authority procedures
3. Establish scope of hydrocarbon fuel use by mill	3.1 Identify capacity and fuel use of any on-site boilers 3.2 Locate emergency generators and their fuel source 3.3 Identify other fuel-powered equipment and processes 3.4 Locate location of fuel reservoirs/tanks and review against mill strategy for the prevention of dust explosions
4. Establish type and location of mill controls	4.1 Identify mill operations and equipment controlled automatically 4.2 Identify mill operations and equipment controlled through central process control stations/terminals 4.3 Identify mill operations and equipment controlled manually 4.4 Determine back-up strategies for mill control in the event of failure of control equipment
5. Control pneumatic conveying system	5.1 Determine processes where negative or positive pressure is required 5.2 Monitor air speed and volume requirements for conveying tasks 5.3 Select air speed and volume appropriate for exhausts 5.4 Balance negative pressure systems according to mill operation

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	procedures 5.5 Monitor for abnormal increases in blow-line pressure 5.6 Determine cleaning intervals for dust collectors
6. Control wheat damping and conditioning	6.1 Monitor adequacy of water supply according to mill operation procedures 6.2 Determine if feed forward or feedback system is used 6.3 Supervise moisture testing of wheat according to workplace procedures 6.4 Set damping system controls for desired moisture level taking into account feed rate and lying-in time
7. Establish strategies and practices for efficient use of power and automation	7.1 Maximise throughput to mill capacity where possible 7.2 Ensure manufacturer maintenance and lubrication schedules are followed 7.3 Ensure standard operating procedures (SOPs) for controls and workstations are developed and up to date

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.

Skill	Description
Numeracy	- Identify maximum power demand for mill - Identify typical range of power demand for mill, taking into account scope of equipment and average production requirements
Navigate the world of work	- Challenge and develop own management style and innovative practices - Monitor adherence to legal and regulatory standards and responsibilities for self and others - Consider own role in terms of contribution to broader goals of the work environment, and adapt and renegotiate role and responsibilities when this has the potential to increase effectiveness

Skill	Description
Interact with others	• Use appropriate language and communication skills to facilitate discussions • Provide information about innovative practices, processes and products • Clarify the purpose and possible actions to be taken as a result of work-related communications
Get the work done	• Identify current innovative practice and organisational trends • Use a computer, keyboard and software to collect and file research data • Source, collect and organise a range of data about performance against targets • Identify maintenance requirements and develop schedules

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
FBPGRA4001 Control power and automation for milling processes	FDFGR4001A Control power and automation for milling processes	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volumes, including Implementation Guides, are available at VETNet: -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=78b15323-cd38-483e-aad7-1159b570a5c4>

Assessment Requirements for FBPGRA4001 Control power and automation for milling processes

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Performance Evidence

An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit.

There must be evidence that, on at least one occasion, the individual has:

- interpreted schematics and identified range of utilities used by mill
- determined importance of services to mill operations
- identified key features and requirements of installed electrical safety systems
- matched milling requirements to available services and equipment, including electricity, gas and other fuels, steam generation, hydraulics and pneumatics
- used computerised and other control equipment to achieve desired milling outcomes
- determined fuel sources and power demand patterns for mill operations
- assessed fuel supply capacity
- determined control equipment and control options for mill
- established risk management and contingency strategies for mill power and automation
- integrated equipment maintenance and lubrication strategies with production requirements
- interpreted manuals, other technical information, diagrams and drawings
- applied safe work practices and identified work health and safety hazards and controls.

Knowledge Evidence

An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:

- types of electric motors and their advantages and disadvantages
- function and operational requirements of power system components, including:
 - mains supply terminal
 - mill transformers
 - back-up generation and supply system
 - electrical safety systems
 - motor control and motor protection strategies

- demand and diversity factors
- fuel sources for mill uses, including:
 - on-site boilers
 - emergency generators
 - fuel powered equipment
- mechanical power transmission types and principles, including:
 - direct drives
 - belt drives
 - chain drives
 - gears
- factors influencing the velocity of particles in free air and in positive and negative air streams
- strategy for the prevention of dust explosions
- design principles used in exhaust systems for fans, ductwork and dust collectors
- advantages and disadvantages of axial flow, propeller and centrifugal fans
- advantages and disadvantages of forward, backward and radial bladed rotors
- types of mill controls and back-up strategies
- purpose and function of instrumentation, including:
 - proximity switches
 - position sensors
 - transducers
 - tachometers
 - flow meters
 - weighers
 - load cells
 - bin level indicators
 - pressure switches
 - programmable logic controllers (PLCs), system control and data acquisition (SCADA) systems, and other programmable instrumentation and systems
- mill equipment and its location and function
- maximum power demand for mill
- typical range of power demand for mill, taking into account scope of equipment and average production requirements.

Assessment Conditions

Assessment of skills must take place under the following conditions:

- physical conditions:
 - a workplace or an environment that accurately represents workplace conditions
- resources, equipment and materials:
 - personal protective equipment relevant to flour milling operations

- sampling schedules and test procedures and equipment
- specifications:
 - work procedures, including advice on safe work practices, food safety, quality and environmental requirements
 - equipment manuals including operating parameters
 - specifications, control points and processing parameters
 - documentation and recording requirements and procedures.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

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