



Australian Government

RIIARO408 Optimise automated wet processing plant operations

Release: 1

RIIARO408 Optimise automated wet processing plant operations

Modification History

Release 1	This version first released with RII Resources and Infrastructure Industry Training Package Version 9.0. Newly created unit.
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Application

This unit describes the skills and knowledge required to optimise the performance of automated wet plant operations to meet performance targets relating to quality, efficiency and safety. It includes optimising the performance of wet processing plant control systems, monitoring processes and outcomes from wet processing plant, and responding to abnormal situations

The unit applies to those who oversee automated wet plant operations at locations remote from the control centre. They control fixed plant, such as primary, secondary, and tertiary crushers; conveyors; reclaimers; scrubbers; stackers; screening and de-sanding units; pumps; cyclones, up-current, rougher and scavenger spiral classifiers; vacuum filter belts; and residue thickeners.

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

Unit Sector

Coal mining

Metalliferous mining

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element
1. Optimise performance of wet processing plant control systems	1.1 Confirm availability and operational status of wet processing and beneficiating plant components required to meet the plan of the day 1.2 Optimise product throughput required by the plan of the day by troubleshooting flow problems peculiar to wet plant processing 1.3 Identify and address factors preventing optimal performance

ELEMENT	PERFORMANCE CRITERIA
	of plant and make adjustments in accordance with organisational protocols 1.4 Interpret trends and control system data to take proactive action to adjust production, control variations and avoid unplanned downtime 1.5 Identify possible impact on upstream and downstream processes and communicate with the site regarding information and solutions before making changes to maintain optimal performance of wet processing plant
2. Monitor processes and outcomes from wet processing plant	2.1 Monitor status of individual wet processing plant components to optimise interfaces between multiple control loops within plant operations 2.2 Monitor production of concentrate, middlings and tailings in the wet processing circuits of the plant in accordance with equipment capability and limitations 2.3 Monitor quality and quantity of product to assure continuing supply that meets planning priorities 2.4 Monitor and address environmental factors relating to wet processing, safety, progress against targets and any constraints that may potentially impact process outcomes 2.5 Monitor sampling data on product quality and production rates to assure continuing supply that meets planning priorities 2.6 Undertake modelling and management of stockpiles to enable customers' needs to be met for required product as scheduled in plan of the day
3. Respond to abnormal situations	3.1 Use plan of the day, trend data and alarms to prioritise and resolve faults in accordance with organisational procedures 3.2 Confirm the integrity of data from plant detection systems and request site personnel to investigate when required 3.3 Use real time and/or trend data to adjust or compensate for actual or potential adverse situations within designated scope of responsibility 3.4 Respond to changed conditions in designated area/s of control in line with organisational protocols and follow escalation protocols according to the situation 3.5 Update delay accounting and trend databases and maintain a running log of resolved faults and items requiring attention

Foundation Skills

This section describes those language, literacy, numeracy, and employment skills that are essential to performance but not explicit in the performance criteria.

SKILL	DESCRIPTION
Numeracy	• Interprets and uses a range of mathematical information relating to sampling and trend data associated with automated wet processing plant operations • Represents mathematical information and data when undertaking modelling and updating trend databases

Unit Mapping Information

No equivalent unit. Newly created unit.

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272>

Assessment Requirements for RIIARO408 Optimise automated wet processing plant operations

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- optimise automated wet plant processing operations, or aspects thereof, on at least 2 occasions.

During the above, the candidate must:

- interpret plans and targets
- identify environmental factors relating to wet processing plant operations
- troubleshoot flow problems
- prioritise and resolve faults and maintain a log of resolved faults and items requiring attention
- update delay accounting and trend databases.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- fundamentals of control systems in an automated wet processing plant environment, including those relating to:
 - organisational protocols, daily plans and targets
 - factors that impact quality and productivity
 - instruments and warnings
 - isolation
 - inhibitors
 - interlocks
 - sampling
 - downtime accounting
 - trending/data analysis

- key components of process control, including:
 - system architecture, operating parameters and integrity limits
 - human-machine interface (HMI)
 - programmable logic controllers (PLCs) and proportional integral derivative controllers (PIDs) controlling circuits for:
 - scrubbing, screening and de-sanding
 - wet beneficiation of undersized material
 - tailings area (pumps, thickeners)
 - sequences
 - modes of operation
 - advanced control features
 - decision rights
 - when to intervene
- functions, characteristics, technical capability, limitations, safety devices, and representation on Supervisory Control and Data Acquisition (SCADA) system of wet processing plant components, including:
 - primary and secondary crushers/sizers
 - conveyors
 - stackers, including radial stackers, slewing stackers
 - scrubbers
 - wet screening units
 - tertiary crushers
 - dry screening units
 - pumps
 - de-slime cyclone classifiers
 - up-current classifiers
 - rougher and scavenger spiral concentration units
 - tailings residue thickeners
 - vacuum filter belts for de-watering
 - automated sampling laboratories
 - bucket wheel and drum reclaimers, bridge reclaimers
 - flotation
- key elements of stockpile management, including:
 - reclaiming
 - blending
 - tanking
 - bulking
 - slumping stockpiles for wet material
 - stockpile limits
 - managing contamination

- restrictions
- environmental factors that impact wet processing plant outcomes, including:
 - slurry
 - liquefaction of fine-grained products in transport due to high moisture content
 - transportable moisture level (TML) requirements
 - tailings dam management
- safety requirements that impact wet processing plant outcomes, including:
 - environmental controls, including those relating to dust and water
 - conditions relating to licence to operate
 - functional safety requirements
 - personal protective equipment
 - functional safety requirements, including those for interacting with site personnel on isolations procedures relevant to own role
- protocols for recognising and responding to abnormal situations, including:
 - instrument, mechanical, electrical failures or malfunctions
 - control system malfunction
 - utility disruption: power, communications, water
 - trending/ early warning signs
 - delays
 - unplanned requirements, including maintenance.

Assessment Conditions

Mandatory conditions for assessment of this unit are stipulated below. The assessment must:

- include access to:
 - personal protective equipment
 - automated wet processing plant control system/s
 - communications technology
- be conducted in a safe environment; and,
- be assessed in the context of this sector's work environment; and,
- be assessed in compliance with legislative and regulatory requirements and using policies, procedures and processes directly related to the industry sector for which the unit is being assessed; and,
- confirm consistent performance can be applied in a range of relevant workplace circumstances.

Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated work environment* provided it is realistic and sufficiently rigorous to cover all aspects of this sector's workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.

Assessor requirements

Assessors must be able to clearly demonstrate current and relevant industry knowledge and experience to satisfy the mandatory regulatory standards as set out in the Standards for Registered Training Organisations 2015/Australian Quality Training Framework mandatory requirements for assessors current at the time of assessment and any relevant licensing and certification requirements.

This includes:

- the minimum years of current** work experience after competency has been obtained as specified below in an industry sector relevant to the outcomes of the unit.

It is also acceptable for the appropriately qualified assessor to work with an industry expert to conduct assessment together and for the industry expert to be involved in the assessment judgement. The industry expert must have current industry skills directly relevant to the training and assessment being provided. This means the industry subject matter expert must demonstrate skills and knowledge from the minimum years of current work experience after competency has been obtained as specified below, including time spent in roles related to the unit being assessed:

Industry sector/Unit sector	AQF indicator level	Required assessor or industry subject matter expert experience
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Infrastructure***	1	1 year
	2	2 years
Drilling, Coal Mining, Extractive (Quarrying), Metalliferous Mining and Civil Infrastructure***	3-6	3 years
Units coded 'RIIARO' (Autonomous and Remote Operations)	Given that this is an emerging industry area, assessors are required to demonstrate vocational competencies at least to the level being assessed, and current industry skills directly relevant to the assessment being provided.	
Other sectors	Where this unit is being assessed outside of the resources and infrastructure sectors assessor and/or industry subject matter expert experience should be in line with industry standards for the sector in which it is being assessed and where no industry standard is specified should comply with any relevant regulation.	

*Guidance on simulated environments has been stipulated in the Companion Volume Implementation Guide located on VETNet.

****Assessors can demonstrate current work experience through employment within industry in a role relevant to the outcomes of the unit; or, for external assessors this can be demonstrated through exposure to industry by conducting a minimum number of site assessments as determined by the relevant industry sector, across various locations.**

*****Excluding units coded 'RIIARO' (Autonomous and Remote Operations).**

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