



Australian Government

RIIARO409 Optimise automated in-loading and out-loading operations

Release: 1

RIIARO409 Optimise automated in-loading and out-loading 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 in-loading and out-loading operations to meet performance targets relating to quality, efficiency, and safety. It includes optimising the operation of automated in-loading and out-loading control systems and responding to abnormal situations.

The unit applies to those who oversee in-loading and out-loading operations at locations remote from the control centre. They control in-loading and out-loading equipment, such as car dumpers, apron feeders, conveyors, stackers, reclaimers, screening units, surge bins, sample stations and ship-loaders.

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 automated in-loading control system	1.1 Confirm incoming train circuits against car dumpers, conveyors and stockpiles designated in scheduling plan 1.2 Confirm train loadout information with upstream systems and take action as required by the load characteristics in accordance with organisational protocols 1.3 Monitor availability and operational status of in-loading fixed plant as required by plan of the day

ELEMENT	PERFORMANCE CRITERIA
	1.4 Optimise product throughput and stockpiling required by plan of the day by troubleshooting in-loading equipment faults and flow problems
2. Optimise automated out-loading control system	2.1 Confirm availability of stockpiles and reclaimers to meet customer product requirements as scheduled in plan of the day and manage stockyard based on equipment availability 2.2 Prepare ship-loading plan within control system in accordance with hatch order and tonnage per hatch calculated by ship surveyor 2.3 Monitor ship-loading sequence and quantities against ship-loading plan and confirm completion of each cycle with on-site personnel following designated protocols 2.4 Monitor automated sampling data to confirm product quality is as required by plan of the day and escalate if outside required parameters
3. Respond to abnormal situations	3.1 Interact with rail team to solve rail or port interface problems according to organisational protocols 3.2 Determine and implement best option from those available to maintain production if stockyard equipment becomes unavailable 3.3 Identify and troubleshoot stockpile issues based on sampling data that is inconsistent with required product quality and escalate as required in line with escalation protocols 3.4 Prioritise active alarms to determine order in which actions are taken to resolve faults and maintain a steady flow of product 3.5 Refer issues that disrupt ship-loading schedule to scheduling team and recommend solutions in line with organisational protocols according to the situation, and implement amended requirements 3.6 Maintain running log of resolved faults and items requiring attention and update delay accounting and trend databases

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
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SKILL	DESCRIPTION
Numeracy	• Interprets and uses a range of mathematical information and sampling data relating to automated in-loading and out-loading operations • Uses ship-loading hatch plans to confirm correct sequence and quantities of operations

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 RIIARO409 Optimise automated in-loading and out-loading 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 in-loading and out-loading operations, or aspects thereof, on at least 2 occasions.

During the above, the candidate must:

- troubleshoot in-loading equipment faults and flow problems
- prepare ship-loading plan within control system
- monitor ship-loading sequence and quantities against ship-loading hatch plan.

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:

- control system requirements, including:
 - system architecture, operating parameters and integrity limits
 - human-machine interface (HMI)
 - programmable logic controllers (PLCs)
 - proportional integral derivative controllers (PIDs)
 - sequences
 - modes of operation
 - advanced control features
 - decision rights
 - when to intervene
- legislation, standards and guidelines relating to:
 - transport, handling and export of bulk materials, including or equivalent to:

- Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code), IMO 1997 with guidance on: suitability of ships, procedures between ships and shore organisations, cargo transfer, ballast handling
- rail safe working rules and procedures and radio protocols
- maritime safety
- ports legislation and policies
- environmental requirements, including:
 - • dust and noise management
 - transportable moisture limit
 - flow moisture point for cargoes prone to liquefaction
- environmental reporting
- in-loading requirements, including:
 - rail safety system – train holding devices
 - direct locomotive control (DLC)
 - end of train monitoring
 - monitoring partially dumped wagons
 - stockpile management based on product type and stockpile status
 - functions, characteristics, technical capability, safety devices and limitations of equipment in the in-loading circuit, including:
 - car dumpers
 - apron feeders
 - conveyors
 - stackers
- out-loading requirements, including:
 - pre-loading requirements in BLU Code, including:
 - master (or the ship's captain) and the terminal representative (known as the Surveyor), who must agree on a plan that ensures permissible forces are balanced on the ship during loading
 - plan, which must include the quantity of ore and sequence of hatches, taking into consideration the rate of loading, the number of pours and the de-ballasting capability of the ship
 - lodgement of plan and any subsequent revisions with the port of loading and a copy retained on board the ship throughout the voyage
 - role of controller in loading vessels safely in relation to:
 - de-ballasting
 - listing
 - over-loaded hatches
 - trim
 - weather conditions
 - direct loading
 - stockyard management, including implications from incorrectly stacked stockpiles

- functions, characteristics, technical capability, safety devices and limitations of stockyard equipment, including:
 - reclaimers
 - conveyors
 - apron feeders
 - screening units
 - fines surge bins
 - sample stations
 - ship-loaders
- product quality in relation to:
 - grade
 - blend
 - size distribution
 - moisture content
 - implications for customers if sampling data is outside the plan.

Assessment Conditions

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

- include access to:
 - personal protective equipment
 - automated in-loading and out-loading 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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