



Australian Government

Department of Education, Employment and Workplace Relations

RIIPSM305A Operate converters

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers the operation of converters in the metalliferous mining industry. It includes planning and preparing for converter operations, starting up converters, monitoring and controlling the process, maintaining plant availability, and shutting down the converter. Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Relevant information must be sourced prior to application of the unit.

Application of the Unit

This unit is appropriate for those working in an operational role at worksites within:
Metalliferous mining

Licensing/Regulatory Information

Refer to Unit Descriptor.

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for converter operation	1.1. Access, interpret and apply compliance documentation relevant to the work activity 1.2. Receive, interpret and clarify shift changeover details 1.3. Establish and maintain communications with other personnel using approved communication methods 1.4. Select personal protective equipment appropriate for work activities 1.5. Check and test control and monitoring systems for correct operation 1.6. Select appropriate type of auxiliary equipment for work activities and check for availability 1.7. Carry out computer systems and equipment pre-start checks to ensure equipment is ready for operation 1.8. Identify, address and report potential risks and hazards 1.9. Identify, address and report environmental issues 1.10. Follow emergency procedures to ensure safety of personnel and plant 1.11. Ensure approved dust suppression and extraction methods are in place 1.12. Ensure work area is adequately ventilated
2. Start-up converter	2.1. Perform pre-start checks 2.2. Carry out start-ups from standby and after maintenance according to established operating procedures 2.3. Carry out first charge to established procedures to protect personnel and plant 2.4. Stabilise the system within operating parameters
3. Monitor and control the process	3.1. Complete routine checks, logs and paperwork 3.2. Recognise and respond to signs of potential and actual problems 3.3. Monitor condition of metal and take action

	to maintain production schedule and quality 3.4. Monitor availability of feeds and take action to maintain production schedule and quality 3.5. Monitor and maintain blast air flow to converter at optimum level 3.6. Monitor and maintain converter oxygen at optimum level 3.7. Monitor cooling medium flow to converter to maintain safe converter temperatures 3.8. Maintain metal and gas temperatures at safe levels 3.9. Control and monitor converter movement 3.10. Monitor and control rate and amount of additives to molten metal 3.11. Respond to warning alarms and lights and take action to rectify 3.12. Control and monitor metal and slag blow process and pouring 3.13. Complete log sheets
4. Maintain plant availability	4.1. Monitor plant throughout shift 4.2. Use measured/indicated data and sight e to identify issues likely to impact on plant availability 4.3. Predict impact of change in one unit/area on other plant unit/areas and communicate to relevant people 4.4. Test trips and alarms 4.5. Inspect converter plant and rectify and/or report faults 4.6. Maintain furnace temperature during non-operating periods 4.7. Operate Tuyere punching 4.8. Prepare plant for maintenance as required
5. Shutdown converter	5.1. Determine type of shutdown required and give warning 5.2. Shutdown furnace in required sequence according to established procedures 5.3. Leave plant in a condition ready to restart

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Specific skills are required to achieve the Performance Criteria of this unit, particularly for its application in the various circumstances in which this unit may be used. This includes the ability to carry out the following, as required to operate converters:

- apply legislative, organisation and site requirements and procedures for operating converters
- troubleshoot
- apply precautions necessary for safe working
- use protective clothing and equipment
- apply operating procedures
- report faults
- recognise limits of authority
- apply team working practices
- communicate information
- use hand and power tools

Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly for its application in the various circumstances in which this unit may be used. This includes knowledge of the following, as required to operate converters:

- principles of converter operation
- first charge procedures
- conversion process
- converter configuration, components and operation
- auxiliary equipment type, purpose operation
- air, water and oxygen systems and purpose
- personal protective equipment
- additives
- metal and slag blow purpose and method
- combustion principles
- trouble shooting of converter problems
- safe working

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following: • knowledge of the requirements, procedures and instructions for operating converters • implementation of requirements, procedures and techniques for the safe, effective and efficient completion of converter operations • working with others to undertake and complete the converter operations in a way that meets all of the required outcomes • consistent timely completion of converter operations that safely, effectively and efficiently meets the required outcomes
Context of and specific resources for assessment	• This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • Assessment of this competency requires typical resources normally used in a resources and infrastructure sector environment. Selection and use of resources for particular worksites may differ due to the site circumstances. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job. • Customisation of assessment and delivery environment to sensitively accommodate

	cultural diversity. • Aboriginal people and other people from a non English speaking background may have second language issues. • Where applicable, physical resources should include equipment modified for people with disabilities. Access must be provided to appropriate learning and/or assessment support when required.
Method of assessment	This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods: • written and/or oral assessment of the candidate's required knowledge • observed, documented and/or first hand testimonial evidence of the candidate's: • implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes • consistent achievement of required outcomes • first hand testimonial evidence of the candidate's: • working with others to undertake and complete the converter operations
Guidance information for assessment	Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.

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. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant compliance documentation may include:	• legislative, organisational and site requirements and procedures • manufacturer's guidelines and specifications • Australian standards • Employment and workplace relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
Legislation may include Acts and regulations dealing with:	• mining safety and health • mine inspection • OHS • explosives
Communications may include:	• radio • telephone • PA system • charging sirens • alarms • clear calls
Personal protective equipment may include:	• helmet • safety footwear • hearing protection • gloves • eye/face protection • respiratory protection • heat resistant clothing
Auxiliary equipment may include:	• belts • compressors • distribution control systems • gantry cranes and attachments and other mobile equipment • hand and power tools • hoses (water and air) • pump systems • conveyors

	• cranes
Pre-start checks may include:	• computer systems and equipment • availability of equipment • detection of unusual conditions • job requirements • personnel availability • walk through plant • communications • feed supply
Hazards may include:	• cranes • molten metal • hot materials • noise • air pollution • sharp objects • moving machinery • heights • falling objects • gases • automatic equipment start-up
Site environmental issues may include:	• drainage • dust (dump) • emissions • flora and fauna • hazardous chemicals • noise • recycling • run-off • spills • waste management and disposal • water quality
Start-ups may include:	• air systems • cameras and monitors • checking interlocks • checking distribution control system (DCS) • display instruments, lights and gauges • isolations • lighting • suppression systems • valves • visual and audio warning devices and lights

Maintenance may include:	• minor adjustments to operational plant • cleaning plant, equipment and work area • installation/removal of devices to allow safe maintenance
First charge procedures refers to	• the initial start-up of new and refurbished vessels
Converter problems can include:	• uncontrolled emissions (gas or metal) • electrical/mechanical failures • standard of product received • additives not up to standard
Cooling media may include:	• water • air
Type of shutdown may include:	• hot shutdown for scheduled on-line maintenance • cool shutdown to minimise temperature for refurbishment
Burners may be:	• diesel • natural gas

Unit Sector(s)

Smelting

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.