



Australian Government

Department of Education, Employment and Workplace Relations

MSATCM507A Monitor primary steel making process

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This unit covers the knowledge and skills needed to monitor and control the operation of a Basic Oxygen Steelmaking (BOS) furnace
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Application of the Unit

Application of the unit	In a typical scenario, a technician will utilise a SCADA system to monitor the processing of melting steel scrap, charging of molten iron and associated materials within the Basic Oxygen Steelmaking (BOS) furnace and on completion transfer to a ladle, ensuring that quantities, temperatures and all procedures are used in accordance with parameters provided and standard operating procedures
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units	MSATCM304A	<i>Interpret basic binary phase diagrams</i>
	MSATCM406A	<i>Apply basic chemistry principles to metallurgy</i>
	MSATCM501A	<i>Calculate and predict chemical outcomes in metallurgical situations</i>

Employability Skills Information

Employability Skills	This unit contains employability skills.
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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. Access/interrogate SCADA system	1.1.Find all relevant screens and information within SCADA system 1.2.Interpret and acknowledge messages 1.3.Input and output information as required
2. Make required changes.	2.1.Adjust production/process in response to SCADA information in accordance with procedures 2.2.Apply metallurgical principles to determine and prioritise required actions in accordance with standard operating procedures 2.3.Record adjustments and variations to specifications/schedules and report to appropriate personnel 2.4.All events outside of parameters or standard operating procedures is immediately referred to appropriate personnel for remedial action

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- carry out all work according to OH&S practices
- read, interpret and follow information on work specifications, standard operating procedures and work instructions and other reference material
- maintain accurate records
- meet specifications for furnace output
- communicate within the workplace

Required knowledge:

Competency includes sufficient knowledge of:

- plant layout of the BOS furnace, identification of the processing units
- process sequence of operations
- scrap charging ; hot metal composition and charging; oxygen lancing
- slag formation, effect of slag / metal; gas emulsion; effect of stirring with inert gas
- chemistry and thermo dynamics of process including sequence of impurity element removal
- influence of lance height, slagging practice- single / double number of reblows, additions of coolant
- conditions for specification to end points of carbon and temperature - importance of elements C, SI, MN, P, S; residual elements, oxygen content; temperature; type of steel
- conditions for final specification from end points - control of oxygen content, alloy additions and alloy recoveries, tapping of vessel, slag removal, selection of alloys. argon bubbling and temperature control of ladles
- ladle transfer
- metallurgical analysis in steelmaking
- importance of composition of steel properties
- effects of C, SI, MN, P, S and alloys NI, CR, MO, NB, TI, V, PB
- effects of residual elements- CU, SN, AL, AS
- effects of gases in steels- N2, O2, H2

Evidence Guide

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

A person who demonstrates competency in this unit must be able to monitor primary steel making processes. Critical aspects for assessment and evidence are required to demonstrate competency in this unit.

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

It is essential that competence is demonstrated in the ability to:

- use OH&S practices
- explain the general principles of steelmaking
- monitor the operation of a BOS furnace under direction and consistently achieve required furnace output specification

Relationship to other units

This unit may be assessed concurrently with other relevant units.

Assessment method and context

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the elements, performance criteria, skills and knowledge. A holistic approach should be taken to the assessment.

Assessors should gather sufficient, fair, valid, reliable, authentic and current evidence from a range of sources. Sources of evidence may include direct observation, reports from supervisors, peers and colleagues, project work, samples, organisation records and questioning. Assessment should not require language, literacy or numeracy skills beyond those required for the unit.

The assessee will have access to all techniques, procedures, information, resources and aids which would normally be available in the workplace.

The method of assessment should be discussed and agreed with the assessee prior to the commencement of assessment.

Resource implications

This section should be read in conjunction with the

EVIDENCE GUIDE

range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Range Statement

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.

Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used.
SCADA system	System Control and Data Acquisition is a general term applied to a number of systems which automatically collect critical process data, perform required mathematical manipulations on it and then make control decisions and/or give required information to personnel for action. In the continuous manufacturing sector, the SCADA system may be integrated into other sophisticated computer control systems such as DCS (Distributed control system). Organisations may simply refer to their SCADA as the DCS or other similar term (such as the proprietary name of the computer system) SCADA systems may provide information from outside of the process, such as stock/material levels in a location. This information may all be accessed by the SCADA system and the employee using it in order to make production rate and other control decisions (either automatically or human assisted) about their own process.

Unit Sector(s)

Unit Sector	Metallurgy
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Competency field

Competency Field

Co-requisite units

Co-requisite Units		