



Australian Government

PMAOPS313 Operate and troubleshoot furnaces to induce reaction

Release: 1

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Modification History

Release 1. Unit code and title changed. Application and Performance Criteria changed. Range of Conditions removed. Assessment Requirements changed. Supersedes and is equivalent to PMAOPS303 Operate furnaces to induce reaction.

Application

This unit describes the skills and knowledge required to operate a furnace for the primary purpose of causing, inducing or facilitating a chemical reaction such as cracking, smelting or other very high temperature processes. The furnace will typically be directly fired or may use the feed as the fuel.

This unit applies to autonomous operators who are required to demonstrate a significant understanding of the process and the equipment operation in a plant with local control, or in liaison with the control-room operator in a plant with a centralised control panel. It includes operation of component plant items.

This unit applies to an individual working alone or as part of a team or group, and working in liaison with other shift team members and the control-room operator, as appropriate.

No licensing or certification requirements exist at the time of publication. Relevant legislation, industry standards and codes of practice within Australia must be applied.

Pre-requisite Unit

Nil

Competency Field

Operations

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. Operate furnace system according to procedures	1.1 Receive and give shift handover 1.2 Communicate with personnel to identify and coordinate work requirements 1.3 Identify, control and report hazards 1.4 Check for recent work undertaken on furnace system and address

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	outstanding and incomplete work 1.5 Check operational status of furnace system 1.6 Perform routine checks and complete logs and paperwork, taking appropriate action on unexpected readings 1.7 Adjust furnace system according to agreed operational parameters
2. Identify and respond to abnormal situations during operation	2.1 Monitor furnace system frequently and critically throughout shift using own senses, and measured and indicated data 2.2 Monitor field data and instrumentation to ensure that product remains on specification 2.3 Identify impacts of changes upstream and downstream 2.4 Identify actual and developing situations that may require action 2.5 Take action to remedy abnormal situations according to operating procedures 2.6 Complete required documents outlining abnormal situation management and corrective action taken
3. Shut down and prepare furnace system for maintenance	3.1 Prepare furnace system to be shut down according to operating procedures 3.2 Complete pre-shutdown checks according to operating procedures 3.3 Shut down furnace system according to operating procedures 3.4 Identify, control and report shutdown hazards 3.5 Monitor shutdown and identify abnormal situations that may require action 3.6 Take action to remedy abnormal situations according to operating procedures 3.7 Shut down and changeover duty and standby equipment according to operating procedures 3.8 Isolate furnace system from energy sources
4. Prepare and start up furnace system	4.1 De-isolate and prepare furnace system to be returned to standby or service 4.2 Complete pre-start checks according to operating procedures 4.3 Start up furnace system according to operating procedures 4.4 Identify, control and report startup hazards

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	4.5 Monitor startup and identify abnormal situations which may require action 4.6 Take action to remedy abnormal situations according to operating procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

- Learning skills to follow instructions, monitor process and select appropriate procedure.
- Reading skills to follow written procedures and documentation.
- Writing skills to complete workplace documentation.
- Oral communication skills to liaise and coordinate with team members and the control-room operator.
- Numeracy skills to monitor field data, instrumentation and process parameters.

Other foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMAOPS303 Operate furnaces to induce reaction.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875>

Assessment Requirements for PMAOPS313 Operate and troubleshoot furnaces to induce reaction

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit:

- at least 2 times, each in a separate work context.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- all items on a schematic of the furnace system, including:
 - type of furnace, the component plant items and their functions
 - principles of operation of plant and equipment, including combustion principles, draft, burner design, excess air/flue CO/CO₂, and flame patterns/ impingement
 - methods of changing production rate and process variables
 - impact of external factors (including variations in weather)
 - interactions between plant items and processes
 - operating parameters and integrity limits, and product specifications and tolerances, including temperature, pressure, flow and pH
 - procedures for starting, stopping, operating, controlling and isolating system
- physics and chemistry to the level of being able to provide an overview of the science of the furnace system process
- furnace system abnormal situations and required actions, including but not limited to:
 - soot blowing
 - control of draft, fuel and air
 - variations in catalyst activity (where appropriate)
 - control of temperature and cracking/product rate/quality
 - variations in feed rates
 - variations in quality
- hierarchy of control
- furnace system hazards:
 - possible causes
 - potential consequences
 - appropriate risk controls

- reporting and escalation procedures.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
- furnace system
- operating procedures
- abnormal situations must be relevant to furnace systems.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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