



Australian Government

PMAOPS226A Monitor and operate flare systems

Release 1

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Modification History

New unit - Release 1

Unit Descriptor

This unit of competency covers the skills and knowledge needed to monitor flare systems. It also includes solving problems with flare systems and equipment.

Application of the Unit

This unit applies to an operator who monitors flare systems as part of their duties. The flare system includes all items from the safety relief device through to the flare inclusive. It includes:

- elevated flares
- ground flares
- high level vents (with no flame).

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.

Licensing/Regulatory Information

Not applicable.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

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|---|------------------------------------|-----|---|
| 1 | Monitor flare system | 1.1 | Identify and control flare system hazards |
| | | 1.2 | Visually inspect flare system components for compliance to requirements |
| | | 1.3 | Take relevant readings |
| | | 1.4 | Take required actions |
| | | 1.5 | Complete logs as required |
| 2 | Shut down flare system as required | 2.1 | Obtain required authorisations for a flare shutdown |
| | | 2.2 | Identify and control flare shutdown hazards |
| | | 2.3 | Prepare for flare shutdown according to procedures |
| | | 2.4 | Shut down according to procedures |
| 3 | Start up flare system as required | 3.1 | Check all required work has been completed |
| | | 3.2 | Identify and control flare start-up hazards |
| | | 3.3 | Prepare for flare start-up according to procedures |
| | | 3.4 | Start up flare system according to procedures |

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|---|-----------------------------|-----|--|
| 4 | Solve flare system problems | 4.1 | Respond to abnormal conditions |
| | | 4.2 | Identify other problems in flare system |
| | | 4.3 | Take appropriate action to remedy flare problems |
| | | 4.4 | Communicate relevant information |
| | | 4.5 | Complete required documentation |

Required Skills and Knowledge

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

Required skills

Required skills include:

- observing
- recognising conditions which indicate a problem
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret/complete workplace documents and technical information

Required knowledge

Required knowledge of flare system principles and typical problems to a level needed to monitor and operate flare systems, includes:

- organisation's procedures
- duty of care obligations
- hierarchy of control
- communication protocols, e.g. radio, phone, computer, paper and permissions/authorities
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- knock on/escalation potential
- process materials likely to be flared and the conditions which will lead to flaring
- function and troubleshooting for flare system
- relevant environmental requirements
- types of flare system equipment and their principles of operation and start-up/shutdown, and reasons for the different types
- flare system hazards
- inert gas purging and flame out potential
- relevant alarms, causes and responses
- significance of the exclusion zone
- how the flare system is integrated into the operation of the plant
- flare system purging requirements and methods
- indicators and consequences of poor combustion (as relevant)
- operations in abnormal conditions

- environmental licence exceedance reporting
- use of logs and routine reading
- trip/emergency system actions
- pilot/flare ignition systems

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.

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

Critical aspects for assessment and evidence include:

- monitoring flare systems
- shutting down/starting up flare systems
- recognising and solving flare system problems.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to a plant over a period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue, an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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. 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.

Context

This competency includes all flare system components from the safety relief valve to the flare inclusive. It may include but is not limited to:

- elevated flare
- ground flare
- vents (sometimes called 'cold flare')

Flare system components

Flare system components may include but are not limited to:

- safety relief devices
- headers (warm/cold, high pressure/low pressure (HP/LP) and wet/dry)
- knock out drum
- flare tip (single point, multipoint and enclosed)
- stack seals
- pilot system
- blowers
- steam systems
- monitoring instrumentation
- recovery systems
- drains
- pumps
- pilot fuel/emergency fuel systems
- purge systems
- interlocks and other safety systems
- ignition systems
- liquid burners/systems, as relevant

Hazards

Flare system hazards may include but are not limited to:

- access and exclusion zone
- heat
- blow backs
- leaks/loss of containment (LOC)
- ineffective isolations
- inadequate ventilation
- air ingress
- liquid carryover
- high liquid levels in knock out pots/separation vessels
- contraction and expansion (cold vapours)
- dislodgement of burning coke
- noise
- cryogenic temperatures
- radiation
- liquid hammer

Visual inspection

Visual inspection may include but is not limited to:

- pilot flame condition
- burn pattern
- ice on header lines
- vessel levels

- damage or deterioration
- smoke density

Required actions

Required actions arising from an inspection may include but are not limited to:

- checking and adjusting pilot fuel/air ratio
- ensuring complete combustion
- finding and rectifying sources of liquid in header line
- draining/pumping out pots
- making a maintenance request
- environmental reporting

Prepare for shutdown

Prepare for shutdown may include but is not limited to:

- notification to other relevant plants/units of planned shutdown
- bringing standby flare on line
- isolation of system at appropriate points
- purging of systems
- shutting down relevant components

Prepare for start-up

Preparing for start-up may include but is not limited to:

- notification to other relevant plants/units of planned start-up
- checking integrity of components
- valves correctly lined up
- deisolating of system
- purging of system
- pilot fuel system ready

Abnormal conditions

Abnormal conditions may include but are not limited to:

- weather
- loss of pilot fuel
- loss of utilities
- flame out
- high flare system back pressure
- cross connection between dissimilar systems

Flare system problems

Flare system problems may include but are not limited to:

- iced lines
- high levels in pots/vessels

- smoke from flare
- flame out
- lack of header purge flow
- flash back
- inconsistent header composition
- blockage
- cold feed to warm header

Procedures

Procedures may be written, verbal, computer-based or in some other form. They may include but are not limited to:

- all work instructions
- standard operating procedures
- checklists
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic based
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to resolve to designated person

Health, safety and environment

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed

(HSE)

through state/territory or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)**Competency field**

Unit sector Operational/technical

Custom Content Section

Not applicable.