



Australian Government

UEPOPL003 Licence to operate a reciprocating steam engine

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the UEP Electricity Supply Industry - Generation Sector Training Package Release 2.0.

Application

This unit specifies the outcomes required to operate a reciprocating steam engine for licensing purposes, which includes the operation of steam equipment where the steam acts upon a piston under pressure.

Reciprocating steam engine means equipment that is driven by steam acting on a piston causing the piston to move and includes and expanding (steam) reciprocating engine.

High-risk work (HRW) is classed as the operation of a reciprocating steam engine where the diameter of any piston exceeds 250 millimetres.

This unit requires the operator to plan the work, carry out pre-operational safety checks, start the reciprocating steam engine, monitor the reciprocating steam engine operation, carry out shutdown of reciprocating steam engine for operational and maintenance purposes.

A person performing this work is required to hold a reciprocating steam engine operation HRW licence.

Licensing/Regulatory information

This unit is based on the licensing requirements of Part 4.5 of the Model Work Health and Safety (WHS) Regulations, HRW and meets Commonwealth, state and territory HRW licensing requirements.

Any alteration to this unit would result in a unit that would not be acceptable to WHS/occupational health and safety (OHS) regulators for the purpose of licensing.

Pre-requisite Unit

There are no prerequisite units

Competency Field

Licensing

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 Plan work

- 1.1 Types of operations to be conducted for a reciprocating steam engine are assessed and prepared
- 1.2 WHS/OHS regulations, legislative requirements, codes of practice, manufacturers' recommendations and specifications, and environmental requirements, and workplace procedures are identified, applied and monitored
- 1.3 Personal protective equipment (PPE) is selected for use in accordance with workplace procedures
- 1.4 Hazards and potential hazards in work area are identified and assessed for risk and controls recommendations are in accordance with workplace procedures
- 1.5 Pre-operational safety checks of reciprocating steam engine and equipment are conducted in accordance with workplace procedures
- 1.6 Maintenance requirements and equipment faults are identified and reported in accordance with workplace procedures
- 1.7 Communication methods are identified according to workplace procedures

2 Start reciprocating steam engine

- 2.1 Controls are implemented for hazards in work area in accordance with industry standards and workplace procedures
- 2.2 Start-up checks are performed and the reciprocating steam engine is brought on line safely in accordance with workplace procedures
- 2.3 Maintenance requirements are identified and reported in accordance with workplace procedures

3 Monitor reciprocating steam engine operation

- 3.1 Reciprocating steam engine is monitored, including undertaking operational checks, in accordance with workplace procedures

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|---|------------|--|
| | 3.2 | Operating log is maintained clearly and accurately in accordance with workplace procedures |
| | 3.3 | Information regarding reciprocating steam engine, its status and operation is communicated clearly in accordance with workplace procedures |
| 4 Shut down reciprocating steam engine | 4.1 | Engine is shut down, including shutdown checks and shut down checks for maintenance in accordance with workplace procedures |
| | 4.2 | Reciprocating steam engine is isolated in accordance with workplace procedures |
| | 4.3 | Maintenance requirements are identified, recorded and reported in accordance with workplace procedures |

Foundation Skills

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

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEP Electricity Supply Industry - Generation Sector Training Package Companion Volume Implementation Guide.

relevant standards may include

but not be limited to:

- codes of practice
- legislation
- Australian Standards
- manufacturers' recommendations and specifications

communicated and communication may include

but are be limited to:

- verbal
- written
- telephone
- two-way radio
- log records
- computer record systems

emergencies may include

but not be limited to:

- fire
- bomb threat
- terrorism
- personal accidents
- chemical spills
- major steam leaks
- major water leaks
- flooding
- natural disasters

equipment may include

but not be limited to:

- engine and auxiliary plant
- engine lubrication and power or control oil systems
- hydraulic oil system
- pump
- compressed air system
- steam supply system
- cylinder exhaust system
- computers with equipment control functions
- supervisory, alarm, protection and control equipment
- relevant maintenance equipment

including equipment for:

- lock out for protecting operators and co-workers from accidental injury
- emergency shutdown stopping
- extinguishing fires
- organisational first aid requirements
- evacuation

equipment faults may include

but not be limited to:

- abnormal operating conditions
- loss of a major auxiliary
- excessively high engine and engine valves heating rates or differentials
- high engine bearing temperatures or vibration
- high pressure heater malfunctions
- mechanical or electrical faults or failure
- failed field devices
- engine protection

hazards may include

but not be limited to:

- chemical hazards
- thermal hazards
- manual handling hazards
- guarding of machinery requirements
- illumination of work area
- rubbish and combustibles in area
- leakage of steam
- leakage of oil
- obstructions in work area
- fire
- noise
- vibration
- water
- working at heights

operational checks may include

but not be limited to:

- supply and quality of steam and line pressure
- exhaust system
- safety devices
- speed governor
- vibration level
- lubrication system
- operation and function of valves and fittings
- cylinder drainage system
- operation of control and/or safety devices

personal protective equipment (PPE) may include

but not be limited to:

- prescribed under, regulation, codes of practice and workplace policies and practices

preoperational safety checks may include

but not be limited to:

- supply steam system
- position and operation of engine valves
- lubrication system
- cylinder drainage system
- exhaust system
- auxiliary equipment
- safety devices
- over speed shutdown
- pressure relief devices
- speed governor

procedures may include

but not be limited to:

- manufacturers' recommendations and specifications
- industry operating procedures
- workplace procedures (e.g. work instructions, operating procedures and checklists)

operation of steam equipment may include

- where the steam acts upon a piston under pressure and action of the steam forces the piston to move
- the definition includes all expanding (steam) reciprocating engines, with any piston diameter of greater than 250 millimetres

recorded may include

but not be limited to:

- operations and maintenance of reciprocating steam engine equipment
- difficulties or issues
- environmental issues
- recommendations for future work
- results
- hazards
- incidents or injuries
- dangerous occurrences or equipment
- malfunctions using logbooks
- proformas
- production reports
- maintenance records

shutdown checks may include

but not be limited to:

- steam supply
- cooling process
- load on engine
- cylinder drains
- auxiliary equipment

shutdown checks for maintenance may include

but not be limited to:

- checks of cooling down process
- isolation of steam
- isolation from any common connection
- opening of all access points required for inspection

start-up checks may include

but not be limited to:

- heat input
- steam supply system
- steam traps and steam line purge systems operation
- engine warmed up
- lubrication system
- drainage system
- operation and position of engine valves and fittings
- operation of auxiliary equipment
- freedom of rotation of engine
- warm up of reticulation system
- reticulation line pressure

testing may include

but not be limited to:

- loss of a major auxiliary controls
- response checks
- standby plant cut-in tests
- valves operating checks
- on load engine valve and emergency governor operation test
- performance tests
- valve operation tests
- alarm and protection tests.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPL002 Licence to operate a reciprocating steam engine.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8>