



Australian Government

UEPOPS135 Shut down a heat recovery steam generator unit

Release: 1

UEPOPS135 Shut down a heat recovery steam generator unit

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 involves the skills and knowledge required to shut down an in-service heat recovery steam generator (HRSG) unit.

HRSGs are heat exchangers that retrieve heat from hot gas streams which is then supplied to steam turbines to generate additional electric power. Shutting down an HRSG unit, with or without supplementary firing, to a boxed-up condition will require the hot and cold gas outlet dampers to be closed and the steam water drum to be pressurised at a normal working level prior to a hot or warm restart, or to be in a depressurised state in preparation for a short or long outage.

Competency in this unit requires the ability to plan and prepare shutdown, operate plant during shutdown, test and analyse steam turbine system faults, and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator

Power generation plant operators are trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

UEPOPS101 Operate and monitor HRSG hot gas control system

UEPOPS134 Shut down a gas turbine

Competency Field

Operations

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 and prepare work

- 1.1** Work health and safety (WHS)/occupational health and safety (OHS) regulations, legislative requirements, codes of practice, manufacturers' recommendations and specifications, environmental requirements and workplace procedures are identified, applied and monitored
- 1.2** Work requirements are identified from relevant personnel and documentation in accordance with workplace procedures
- 1.3** Preoperational checks are carried out on HRSG plant in accordance with manufacturers' recommendations and specifications, and workplace procedures

2 Operate HRSG plant during shutdown

- 2.1** Supplementary firing system is placed in and out of service in accordance with manufacturers' recommendations and specifications, and workplace procedures
- 2.2** Gas turbine exhaust gas flow and power output are adjusted to achieve required steam temperature, pressure and flow conditions in accordance with workplace procedures
- 2.3** Feedwater flows are adjusted to achieve required steam conditions and demand in accordance with workplace procedures
- 2.4** HRSG drains and vents are operated to depressurise and drain steam and/or water space and heat exchange elements in accordance with manufacturers' recommendations and specifications, and workplace procedures
- 2.5** HRSG plant is maintained in required out-of-service condition in accordance with manufacturers' recommendations and specifications, and workplace procedures
- 2.6** Boiler water quality is maintained within required parameters to prevent corrosion of drums, headers and heat exchange elements in accordance with workplace procedures
- 2.7** HRSG plant is operated within limits of design in

		accordance with workplace procedures
	2.8	HRSG plant is monitored in accordance with workplace procedures to detect deviations from required operating conditions
	2.9	Corrective action is taken to rectify HRSG plant abnormalities in accordance with manufacturers' recommendations and specifications, and workplace procedures
3 Test HRSG plant operation during shutdown	3.1	Tests are performed in accordance with workplace procedures
	3.2	Power generation system and HRSG plant are observed for operational response in accordance with workplace procedures
	3.3	HRSG plant is returned to required operational status upon completion of testing in accordance with workplace procedures
4 Analyse system faults	4.1	Causes of abnormal HRSG plant operating conditions are identified by analysing technical and operational information in accordance with workplace procedures
	4.2	HRSG plant integrity and personnel safety are maintained through consultation with relevant personnel and technical and operational documentation in accordance with workplace procedures
	4.3	Relevant personnel are notified when defects are detected in accordance with workplace procedures
5 Complete documentation	5.1	HRSG plant problems, movements and status are reported in accordance with workplace procedures
	5.2	Documentation is updated 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.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS434 Shut down a heat recovery steam generator unit.

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for UEPOPS135 Shut down a heat recovery steam generator unit

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least two separate occasions and include:

- applying work health and safety (WHS)/occupational health and safety (OHS) legislation, including:
 - emergency procedures
 - risk control measures
 - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying heat recovery steam generator (HRSG) plant status
- interpreting manuals
- implementing regulations, legislative requirements, codes of practice, manufacturers' recommendations and specifications, and environmental requirements
- organising resources
- planning for HRSG plant shutdown
- preparing and operating HRSG plant and equipment
- responding to abnormal HRSG plant operating conditions
- shutting down HRSG plant operations
- testing HRSG plant operation using diagnostic and data analysis techniques and tools to determine faults
- using temperature and pressure reducing techniques and principles
- working with permit to work system.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and include knowledge of:

- arrangements of power production plant
- control of steam temperature and pressure throughout full range of HRSG operation up to and including maximum continuous rating

- depressurisation and cooling
- HRSG gas path and water and steam circuits
- HRSG system components and the interaction of these components with other power generation plant and equipment
- manuals
- operation techniques for HRSG plant and equipment
- permit to work system
- regulations, legislative requirements, codes of practice, manufacturers' recommendations and specifications, and environmental requirements
- WHS/OHS requirements, including:
 - emergency procedures
 - risk control measures
 - safe working practices
- workplace documentation
- workplace policies and procedures.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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