



Australian Government

UEPOPS434 Shut down a heat recovery steam generator unit

Release: 1

UEPOPS434 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 Generation Training Package.

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 shut down, operate plant during shut down, test and analyse steam turbine system faults and completing documentation.

Individuals will, in general, work under supervision, in a power generation facility as an operator

Power generation plant operators are typically 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.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS333 Operate and monitor HRSG hot gas control system

UEPOPS408 Shut down a gas turbine

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Plan and prepare work

2 Operate HRSG plant during shut down

PERFORMANCE CRITERIA

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

- 1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and workplace procedures
- 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 workplace procedures and site requirements
- 2.1** Supplementary firing system is placed in and out of service, in accordance with workplace procedures and manufacturers' recommendations
- 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, in accordance with workplace procedures and manufacturers' recommendations to depressurise and drain steam and/or water space and heat exchange elements
- 2.5** HRSG plant is maintained in required out of service condition, in accordance with workplace procedures and manufacturers' recommendations
- 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 its' design, in accordance with workplace procedures

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| | 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 workplace procedures |
| 3 Test HRSG plant operation during shut down | 3.1 | Tests are performed, in accordance with workplace procedures |
| | 3.2 | Power generation system and HRSG plant are observed for correct operational response, in accordance with workplace procedures |
| | 3.3 | Corrective action is taken, in accordance with workplace procedures, when response does not meet documentation, HRSG plant integrity or personnel safety requirements |
| | 3.4 | 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, in accordance with workplace procedures, by analysing technical and operational information |
| | 4.2 | Corrective action is taken, in accordance with workplace procedures |
| | 4.3 | HRSG plant integrity and personnel safety is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and technical and operational documentation |
| | 4.4 | Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected |
| 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 Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS434B 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 UEPOPS434 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 Generation Training Package.

Performance Evidence

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

- 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 HRSG plant status
- organising resources
- planning for HRSG plant shut down
- preparing and operating Heat Recovery Steam Generator (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, performance criteria and range of conditions and includes knowledge of:

- control of steam temperature and pressure throughout full range of heat recovery steam generation operation up to and including maximum continuous rating
- depressurisation and cooling
- heat recovery steam generator gas path and water and steam circuits
- HRSG system components and the interaction of these components with other power

- generation plant and equipment
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- operation techniques for HRSG plant and equipment
- permit to work system
- typical arrangements of power production plant
- Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) including:
 - emergency procedures
 - risk control measures
 - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

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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.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

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 currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

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