



Australian Government

UEPOPS141 Start up a heat recovery steam generator unit

Release: 1

UEPOPS141 Start up 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 start up a heat recovery steam generator (HRSG) for service.

HRSG are recovery heat exchangers that retrieve the heat from hot gas streams which are then supplied to steam turbines to generate additional electric power. Placing an HRSG in-service will require the entry of a heating medium and the control of water within the steam and water drum. It includes monitoring the flow and quality of feedwater, steam pressure and temperature increases and metal temperatures within HRSG design limits so that the HRSG is supplying a constant flow of steam at the required temperature and pressure.

Competency in this unit requires the ability to plan and prepare start-up, operate HRSG plant during start-up, test and analyse HRSG 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

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential Performance criteria describe the performance needed to

outcomes.

demonstrate achievement of the element.

1 Plan and prepare HRSG start-up 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 plant in accordance with manufacturers' recommendations and specifications, and workplace procedures

2 Conduct HRSG start- up

- 2.1** Preoperational conditions of the HRSG and gas turbine are established in accordance with workplace procedures
- 2.2** Minimum operation of gas turbine is established and supported in accordance with manufacturers' recommendations and specifications, and workplace procedures
- 2.3** Monitoring of HRSG drum level, feedwater flow, steam and metal temperature rates of rise, steam pressure rate of rise and control of steam flow and drainage is carried out in accordance with manufacturers' recommendations and specifications, and workplace procedures
- 2.4** Exhaust temperature, flow to HRSG and gas turbine power output are adjusted to achieve required steam conditions and demand in accordance workplace procedures
- 2.5** HRSG plant is operated within limits of design in accordance with workplace procedures
- 2.6** HRSG plant is monitored to detect deviations from required operating conditions in accordance with workplace procedures
- 2.7** Corrective action is taken to rectify HRSG abnormalities in accordance with manufacturers' recommendations and specifications, and workplace procedures

3 Test HRSG plant operation

- 3.1** Tests are performed in accordance with workplace procedures

- 3.2 HRSG plant is observed for correct 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 HRSG 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 UEPOPS432 Start up 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 UEPOPS141 Start up 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) legislated requirements, including:
 - emergency procedures
 - risk control measures
 - safe working practices
- communicating with personnel
- identifying heat recovery steam generator (HRSG) plant status
- implementing regulations, legislative requirements, codes of practice, manufacturers' recommendations and specifications, and environmental requirements
- interpreting manuals
- monitoring and operating HRSG plant and equipment
- organising resources
- planning and preparing HRSG plant and equipment for start and run-up operations
- recognising and responding to abnormal HRSG plant operating conditions
- starting, running-up and operating HRSG and associated plant and equipment
- testing HRSG plant operation using diagnostic and data analysis techniques and tools to determine faults
- using recording procedures to complete documentation
- utilising temperature and pressure raising techniques
- 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 heat transfer and rate of temperature rise during HRSG start-up
- HRSG plant and equipment, location and operating parameters

- manuals
- operational testing of HRSG plant
- permit to work system
- regulations, legislative requirements, codes of practice, manufacturers' recommendations and specifications, and environmental requirements
- techniques HRSG plant and equipment operation
- temperature and pressure raising requirements
- WHS/OHS requirements, including:
 - emergency procedures
 - risk control measures
 - safe working practices and principles
- workplace policies and procedures
- workplace documentation.

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.

Links

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