

## Modification history

Release	Comments
Release 2	This version released with PPM Pulp and Paper Manufacturing Training Package Version 2.0.
Release 1	This version released with PPM Pulp and Paper Manufacturing Training Package Version 1.0.

PPMEPG440	Troubleshoot and rectify power generation system
<b>Application</b>	<p>This unit of competency describes the skills and knowledge required to identify, diagnose and rectify power quality and distribution faults and report operational data relevant to power generation systems in the pulp or paper industry.</p> <p>This unit applies to senior operators and production specialists who troubleshoot and rectify power generation systems, in a pulp and paper manufacturing facility. This typically involves working in a facility with complex integrated equipment and continuous operations.</p> <p>No licensing, legislative or certification requirements apply to this unit at the time of publication. Where the turbine equipment falls under the category for which a High Risk Work Licence is required, this unit should not be used and the appropriate unit should be sought.</p>
<b>Prerequisite Unit</b>	Nil
<b>Unit Sector</b>	Pulp and Paper Manufacturing (PPM)

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Identify and diagnose causes of faults	1.1 Identify faults according to workplace health and safety and environmental procedures, safe working requirements, productivity requirements, standard operating procedures (SOP), risks and hazard identification and housekeeping requirements 1.2 Interpret abnormal plant conditions and system alarms to determine type and location of fault 1.3 Identify faults through physical inspections of plant, equipment and processes 1.4 Identify and locate the cause and source of fault and take appropriate actions 1.5 Access and refer to relevant historical data to confirm fault diagnosis 1.6 Communicate diagnosis to relevant personnel according to organisational procedures/SOP 1.7 Select, fit, use and maintain personal protective equipment according to job requirements and task to be undertaken
2. Rectify faults	2.1. Rectify faults according to workplace health and safety and environmental procedures, safe working requirements, and SOP 2.2. Implement shutdown and isolation procedures, according to SOPs or manufacturer's specifications/operating procedures 2.3. Repair or replace faulty equipment 2.4. Adjust process and equipment to restore normal operations 2.5. Verify restoration to normal operations and communicate to relevant personnel
3. Record and report operational data	3.1. Document variations from required production output and systems operation faults 3.2. Record troubleshooting process and corrective action 3.3. Communicate relevant information to appropriate personnel in accordance with operational requirements



<b>Foundation Skills</b>	
<i>This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.</i>	
<b>Skill</b>	<b>Description</b>
Reading	<ul style="list-style-type: none"> <li>Interpret documentation, procedure manuals and test results</li> </ul>
Writing	<ul style="list-style-type: none"> <li>Record and report test results and rectifications accurately and legibly using correct technical vocabulary</li> </ul>
Numeracy	<ul style="list-style-type: none"> <li>Estimate and calculate using measuring equipment relevant to power generation systems and to aid troubleshooting</li> <li>Interpret instruments, gauges and data recording equipment</li> </ul>
Navigate the world of work	<ul style="list-style-type: none"> <li>Use electronic and other control systems to control equipment and processes for power generation systems</li> <li>Access, navigate and enter computer based information</li> </ul>
Get the work done	<ul style="list-style-type: none"> <li>Maintain situational awareness in the work area</li> <li>Analyse and use sensory information to adjust process and to maintain and co-ordinate safety, quality and productivity</li> </ul>

<b>Unit Mapping Information</b>			
<b>Code and title current version</b>	<b>Code and title previous version</b>	<b>Comments</b>	<b>Equivalence status</b>
PPMEPG440 Troubleshoot and rectify power generation system Release 2	PPMEPG440 Troubleshoot and rectify power generation system Release 1	Performance criteria added, minor changes to knowledge evidence, minor change to licensing statement	Equivalent unit

<b>Links</b>	Companion Volumes, including Implementation Guides, are available at VETNet: <a href="https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=12998f8d-d0ac-40bc-a69e-72a600d4fd93">https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=12998f8d-d0ac-40bc-a69e-72a600d4fd93</a>
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<b>TITLE</b>	<b>Assessment requirements for PPMEPG440 Troubleshoot and rectify power generation system</b>
<b>Performance Evidence</b>	
<p>An individual demonstrating competency must satisfy all of the elements and performance criteria of this unit. There must be evidence that the individual has:</p> <ul style="list-style-type: none"> <li>• identified, diagnosed and rectified faults in plant, equipment and processes relevant to power generation systems at least twice in line with required enterprise intervals</li> <li>• selected and used appropriate troubleshooting methods for power generation systems</li> <li>• read and interpreted documentation, procedures and reports relevant to troubleshooting and power generation systems</li> <li>• communicated effectively and worked safely with others, in the work area when troubleshooting and rectifying power generation systems.</li> </ul>	

<b>Knowledge Evidence</b>	
<p>An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:</p> <ul style="list-style-type: none"> <li>• organisational procedures relevant to workplace health and safety with particular emphasis on:             <ul style="list-style-type: none"> <li>• use of personal protective equipment (PPE)</li> <li>• equipment lock out and isolation procedures</li> <li>• handling chemicals and hazardous substances, including spill and disposal guidelines</li> <li>• plant clearance requirements</li> <li>• emergency procedures and responses</li> <li>• job safety analysis documentation and processes</li> <li>• plant permit systems and processes</li> <li>• high risk load shifting licensing requirements where relevant</li> <li>• major hazard facility requirements where relevant</li> </ul> </li> <li>• troubleshooting methods applicable to the operation power generation systems</li> <li>• documentation and procedures relevant to troubleshooting and rectifying power generation systems in the pulp and paper industry including:             <ul style="list-style-type: none"> <li>• standard operating procedures (SOP)</li> <li>• productivity requirements</li> <li>• quality procedures</li> <li>• environmental sustainability requirements/practices</li> <li>• machinery and plant manufacturing operating manuals</li> <li>• enterprise policies and procedures</li> <li>• operational logs and reports</li> <li>• maintenance logs</li> <li>• safety data sheets</li> <li>• process and instrument diagrams</li> </ul> </li> <li>• power generation systems, processes and associated services sufficient to troubleshoot including:             <ul style="list-style-type: none"> <li>• plant layout</li> <li>• theory of operation</li> <li>• causes and effects of adjustments made to power generation system and processes</li> </ul> </li> <li>• relationships between power generation system and associated services</li> <li>• sampling and testing for plant and system operations, and process steam supply monitoring – purpose, standards and procedures as per site agreements</li> <li>• types, causes and effects of power distribution systems and power generation plant shutdowns</li> <li>• effect of steam quality on turbine operation</li> <li>• operational tolerances of the turbine system and the effect of operating outside these tolerances</li> <li>• AC/DC generation principles</li> <li>• output control and regulation principles</li> <li>• power factor characteristics, effects and correction techniques</li> <li>• electrical isolation procedures</li> <li>• principles of operation of transformers and circuit protection systems</li> <li>• electronic and other control systems, operation and application to make appropriate adjustments that control power generation systems.</li> </ul>	

<b>Assessment Conditions</b>	
<p>Assessment of skills must take place under the following conditions:</p> <ul style="list-style-type: none"><li>• physical conditions:<ul style="list-style-type: none"><li>• a workplace or a productive environment that accurately reflects performance in a workplace</li></ul></li><li>• resources, equipment and materials:<ul style="list-style-type: none"><li>• access to the full range of equipment involved in integrated continuous manufacturing of power generation systems in a pulp or paper manufacturing facility, including chemical products and systems</li><li>• electronic control systems which includes digital control system, touch screens or robotics</li><li>• maintenance tools and equipment and consumables for power generation systems</li><li>• PPE suitable for troubleshooting power generation systems</li></ul></li><li>• specifications:<ul style="list-style-type: none"><li>• sample workplace documentation, procedures and reports including SOP, quality procedures, environmental sustainability requirements/practices, plant manufacturing operating manuals, enterprise policies and procedures, plant isolation documentation, safe work documentation including plant clearance, job safety analysis, permit systems</li><li>• local power authority regulations for starting up power generation systems</li><li>• details of production requirements to plan power generation levels</li><li>• template operating log for recording troubleshooting processes and power generation performance</li><li>• relevant personnel for the purposes of communicating information</li><li>• organisational workplace health and safety and SOP for power generation system.</li></ul></li></ul> <p>Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.</p>	

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