

**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.

PPMWAS340	Troubleshoot and rectify water systems
<b>Application</b>	<p>This unit of competency describes the skills and knowledge required to identify, diagnose, rectify and report faults in water systems, in the pulp and paper industry.</p> <p>The unit applies to senior operators and production specialists who manage troubleshoot and rectify water systems, in a pulp or 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.</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 analyse causes of faults	1.1 Check work plan and carry out according to productivity requirements, environmental sustainability procedures, workplace health and safety and standard operating procedures, risks and hazards identification, and housekeeping requirements 1.2 Check availability of materials and supplies 1.3 Use alarms and visual checks on water systems to determine fault type. 1.4 Interpret sampling and testing results to identify deviations from specifications 1.5 Use an appropriate analysis to identify and locate cause and source of problem 1.6 Access relevant sources of information to assist analysis 1.7 Select, fit, use and maintain personal protective equipment according to job requirements and task to be undertaken
2. Rectify plant and equipment faults	2.1 Shutdown equipment and implement isolation procedures, prior to fault rectification 2.2 Identify, repair or replace faulty equipment 2.3 Adjust process and carry out operator level maintenance 2.4 Return plant and equipment to normal operations 2.5 Verify restoration to normal operations and communicate to relevant personnel
3. Rectify water quality faults	3.1 Identify quality faults or variations by observation, systematic sampling and testing 3.2 Take samples for tests to detect quality faults 3.3 Interpret test results and make operational adjustments, according to organisational procedures 3.4 Rectify faults or recommend further action 3.5 Action out-of-specification water
4. Record and report operational data	4.1 Document variations from specifications and performance variations, according to organisational procedures 4.2 Record causes of deviation and corrective action undertaken 4.3 Communicate relevant information to appropriate personnel

<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>Read and interpret documentation, procedure manuals and test results relevant to water systems</li> </ul>
Writing	<ul style="list-style-type: none"> <li>Record accurately and legibly, fault rectifications, using correct technical vocabulary</li> <li>Access, navigate and enter computer based information</li> </ul>
Oral communication	<ul style="list-style-type: none"> <li>Use appropriate spoken communication strategies with work colleagues and other personnel, on site to assist with analysis and resolution of operational problems and to manage troubleshooting and maintenance</li> </ul>
Numeracy	<ul style="list-style-type: none"> <li>Interpret instruments, gauges and data recording equipment</li> </ul>
Navigate the word of work	<ul style="list-style-type: none"> <li>Use electronic and other control systems to control equipment and processes</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 to maintain and co-ordinate safety, quality and output</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>
PPMWAS340 Troubleshoot and rectify water systems Release 2	PPMWAS340 Troubleshoot and rectify water systems Release 1	Performance criteria added, minor changes to knowledge evidence	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 PPMWAS340 Troubleshoot and rectify water systems</b>
<b>Performance Evidence</b>	
<p>An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit. There must be evidence that the individual has:</p> <ul style="list-style-type: none"> <li>• carried out troubleshooting and rectification activities for water systems, at least twice, in line with required enterprise intervals</li> <li>• selected and used appropriate troubleshooting methods to correct water system, water quality and equipment faults</li> <li>• responded to the causes and impacts of unplanned shutdowns and processes and taking corrective action</li> <li>• implemented isolation and access procedures prior to fault rectification</li> <li>• maintained a clean and hazard free work area and following safety chemical handling procedures</li> <li>• reported on operational and rectification data</li> <li>• used safety accessories, including protective and high visibility, safety clothing and electronic communication equipment when working with water systems</li> <li>• communicated effectively, through written and verbal means, the corrective actions undertaken.</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 that can be applied across problem faults in water systems</li> <li>• documentation and procedures relevant to water systems, in the pulp and paper industry and including: <ul style="list-style-type: none"> <li>• standard operating procedures (SOP), housekeeping and risk and hazard identification</li> <li>• productivity requirements and quality procedures</li> <li>• environmental sustainability requirements and practices</li> <li>• machinery and plant manufacturing operating manuals</li> <li>• enterprise policies and procedures</li> <li>• manufacturer's specifications and maintenance documentation</li> <li>• safety data sheets</li> <li>• process and instrument diagrams</li> <li>• operator's log and job sheets and maintenance logs</li> <li>• incidents reports</li> </ul> </li> <li>• impact of different types of water sources including raw, mains or recycled water on water systems</li> <li>• use of sampling and testing checks including consistency, pH, conductivity, flocculation, colour, suspended solids, caustic strength, alkalinity, impurities, brine, bacteria, colour and acid strength</li> <li>• key features of water systems, processes and associated services sufficient to troubleshoot including plant layout, theory of operation, causes and effects of adjustments made to water system and processes and relationships between water system, processes and associated services</li> <li>• implications of the use of water types including fresh water, treated water, de-mineralised water, softened water, filtrate-clarified water, potable water, dilution water (filtrate) ex-vacuum system waste water (effluent), white water (ex-machine) and cloudy water, on water systems</li> <li>• how to identify and respond to hazards and risks of water systems including: <ul style="list-style-type: none"> <li>• confined space</li> <li>• hazardous chemicals and materials</li> <li>• biological hazards and environmental hazards</li> </ul> </li> </ul>	

<b>Knowledge Evidence</b>
<ul style="list-style-type: none"> <li>• heat, height and slippery surfaces</li> <li>• pressures, fumes and electrical equipment</li> <li>• compressed air, nip points and flooding</li> <li>• key features of maintenance systems including operator level maintenance as per site agreements, operator maintenance schedules, maintenance suppliers and pro-active maintenance strategies including Total Productive Maintenance and Reliability Centred Maintenance</li> <li>• use of electronic and other control systems, operation and application to make appropriate adjustments that control the water system</li> <li>• materials and supplies including chemicals and filtering mediums</li> <li>• water systems including de-alkalinisation plant, de-mineralisation plant, water softening plant, chemical treatment plant, reverse osmosis plant, clarifier plant, chillers, water storage systems, filtration systems, cooling towers, condensers, and potable water plant.</li> <li>• equipment including flow control and metering devices, pumping systems, electronic and digital monitoring and metering, valving systems, pipes, fittings, chemical testing and analysis equipment, chemical dosing equipment, tanks and chests, communication equipment, aeration ponds, chemical handling equipment, hand and power tools, pest control equipment, load shifting equipment, computer systems, electronic screens and alarms, process control systems, fully automated, semi-automated, manually operated plant and equipment appropriate to water processes and 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 troubleshooting equipment involved in maintaining integrated continuous operation of water systems in a pulp or paper manufacturing facility</li> <li>• PPE required for operating water systems</li> </ul> </li> <li>• specifications: <ul style="list-style-type: none"> <li>• sample workplace documentation, procedures and reports including SOPs, quality procedures, environmental sustainability requirements or practices, plant manufacturing operating manuals, enterprise policies and procedures, oil or chemical spills and disposal guidelines, plant isolation documentation, safe work documentation.</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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