



**Australian Government**

# **MSAPMWJ201A Use high pressure water jetting equipment**

**Release 2**

# MSAPMWJ201A Use high pressure water jetting equipment

## Modification History

Release 2: ISC upgrade to incorporate changes to Australian Standard.

## Unit Descriptor

This unit of competency covers the use of high pressure water jetting equipment under the supervision of a competent operator. The job may be to clean, prepare, abrade, cut or demolish concrete, steel or other plant, equipment, vessels or infrastructure. This work is undertaken in compliance with *AS/NZS 4233.1: 2013 High Pressure Water Jetting Systems Part 1. Safe Operation and Maintenance*, or its authorised replacement and *Safe Work Australia Guide for Managing Risks from High Pressure Water Jetting December 2013*, its state equivalent (where one exists) or the authorised replacement.

## Application of the Unit

In a typical scenario, two or more operators (at least one of whom will be a competent operator) working as a team will operate a high pressure water jetting system. AS/NZS 4233.1:2013 defines this work as work with:

- (a) *High pressure water jetting systems pressurised by positive displacement pumps with an output capability greater than 800 bar litres per minute.*
- (b) *High pressure water jetting operations carried out at pressures above 800 bar litres per minute and includes jetting operations involving the use of additives and abrasives.*
- (c) *Water jetting operations below 800 bar litres per minute where there is a foreseeable risk of injury to operators.*

It further defines:

*High pressure water jetting systems with an output capability greater than 800 bar litres per minute and less than 5600 bar litres per minute are identified as Class A and systems with an output capability in excess of 5600 bar litres per minute are identified as Class B.*

The competent operator is defined by *MSAPMWJ301A Operate a high pressure water jetting system*.

Competence may also be required in a range of other units of competency in order to be allowed to operate on site under supervision. Work will be undertaken on a worksite which may be a client's site or a site belonging to the organisation.

AS/NZS 4233.1:2013 states that 'Verification of competency or refresher training on high pressure water jetting operations shall be carried out and documented at appropriate intervals not exceeding two years to ensure the continued competency of operators'.

## Licensing/Regulatory Information

Not applicable.

## Pre-Requisites

Not applicable

## Employability Skills Information

This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

## Elements and Performance Criteria

- |   |                              |     |  |
|---|------------------------------|-----|--|
| 1 | Prepare for work             | 1.1 | Obtain required job details as part of a team          |
|   |                              | 1.2 | Complete site access and work control requirements     |
|   |                              | 1.3 | Identify site hazards and required hazard controls     |
|   |                              | 1.4 | Prepare required equipment under supervision           |
|   |                              | 1.5 | Participate in toolbox meeting or similar, as required |
|   |                              | 1.6 | Complete required pre-work paperwork                   |
| 2 | Complete on-site preparation | 2.1 | Arrive at site ready for job                           |
|   |                              | 2.2 | Liaise with job owner, as appropriate                  |
|   |                              | 2.3 | Obtain required permits/work authorities, as directed  |
|   |                              | 2.4 | Follow job pack as directed                            |
|   |                              | 2.5 | Check available water                                  |
|   |                              | 2.6 | Check waste disposal                                   |
|   |                              | 2.7 | Recognise and control job and site-specific hazards    |

- |   |   |  |
|---|---|--|
| 3 | Set up job under supervision                              | 3.1 Prepare worksite   |
|   |   | 3.2 Set up water jetting equipment                                 |
|   |   | 3.3 Liaise with other work groups, as appropriate                  |
|   |   | 3.4 Establish appropriate means of communication between operators |
|   |   | 3.5 Ensure hazard controls are operational and adequate            |
|   |   | 3.6 Check and use required personal protective equipment           |
|   |   | 3.7 Test emergency shut-off  |
| 4 | Undertake water jetting job in accordance with procedures | 4.1 Start up high pressure water jetting system                    |
|   |   | 4.2 Communicate as appropriate                                     |
|   |   | 4.3 Operate equipment to proceed with job, as specified            |
|   |   | 4.4 Monitor job conditions   |
|   |   | 4.5 Monitor job and equipment, as directed                         |
|   |   | 4.6 Maintain required line of sight                                |
|   |   | 4.7 Monitor hazards and activate emergency stop, as required       |
|   |   | 4.8 Recognise faults and take appropriate action                   |
|   |   | 4.9 Complete required paperwork                                    |
| 5 | Complete job  | 5.1 Shut down equipment  |
|   |   | 5.2 Clean job site and equipment                                   |
|   |   | 5.3 Service and inspect equipment under supervision, as required   |
|   |   | 5.4 Store equipment, as required                                   |
|   |   | 5.5 Restock running spares and consumables, as directed            |
|   |   | 5.6 Report any issues or incidents, as required                    |
|   |   | 5.7 Participate in debrief   |
|   |   | 5.8 Complete required paperwork                                    |

## Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

### Required skills

Required skills include:

- recognising conditions which will lead to out of specification product or unsafe situation
- implementing the enterprise's procedures in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation of equipment clearly and effectively
- maintaining appropriate levels of environmental controls and quality assurance
- reading and interpreting safety data sheets(SDS)
- recognising equipment problems and taking action to prevent equipment failure
- reading and numeracy to interpret workplace documents, instrumentation and technical information

### Required knowledge

Required knowledge includes:

- hazards associated with the process, plant and equipment where water jetting is to be carried out
- high pressure water jetting hazards
- injuries resulting from high pressure water jets and appropriate responses
- application of the hierarchy of control in controlling the hazards
- relevant safety signs and symbols
- fundamentals of hydraulics
- basic understanding of reaction force and its determination
- relevant communication systems including hand signals
- basic principles of heat stress, fatigue, hydration, physiology, biomechanics as applied to water jetting
- basic principles of how high pressure water jetting nozzles/jets work
- basic understanding of diesel engine systems
- basic principles (only) of pressure and flow relationships

## Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>	<p>It is essential that use of equipment is understood and that the importance of critical properties, settings and readings is known. Competence must be demonstrated in the operation of equipment to the level required for this unit of competency.</p> <p>Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective actions.</p> <p>Holistic assessment of this unit of competency with other related units is preferred.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> <li>• hazards are identified and controlled</li> <li>• job is completed efficiently and to required standards</li> <li>• quality is monitored</li> <li>• required measurements/observations are continually made</li> <li>• all health, safety and environment (HSE) requirements are followed</li> <li>• problems are anticipated and appropriate action is taken (i.e. problem fixed or reported).</li> <li>• The assessor should be able to demonstrate competence in water jetting operations and have adequate industry experience (with three to five years being a guideline) in water jetting.</li> </ul>
<p><b>Context of and specific resources for assessment</b></p>	<p>Assessment will require access to operating equipment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operations.</p> <p>Simulation or case studies/scenarios may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include 'walk-throughs' of the relevant competency components. A bank of scenarios/case studies/what ifs and questions will be required to probe the reasoning behind observable actions.</p>
<p><b>Guidance information for assessment</b></p>	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

## Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<b>Procedures</b>	<p>All operations are performed in accordance with standard procedures. Procedures may be written, verbal, computer-based or in some other form, and may include:</p> <ul style="list-style-type: none"> <li>• all work instructions</li> <li>• standard operating procedures (SOPs)</li> <li>• Australian standards</li> <li>• Guidance Notes</li> <li>• formulas/recipes</li> <li>• batch sheets</li> <li>• temporary instructions</li> <li>• any similar instructions provided for the smooth running of the plant</li> <li>• good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations</li> </ul>
<b>Site access requirements</b>	<p>Site access requirements may include:</p> <ul style="list-style-type: none"> <li>• site induction</li> <li>• other site/client requirements</li> </ul>
<b>Work control requirements</b>	<p>Work control requirements may include:</p> <ul style="list-style-type: none"> <li>• client/site requirements, such as permits or other authorities to enter site, commence and continue work</li> </ul>
<b>Prepare equipment</b>	<p>Preparation of required equipment may include:</p> <ul style="list-style-type: none"> <li>• selecting (e.g. from store) equipment needed for the job, under direction</li> <li>• checking equipment is in appropriate condition for the job, under supervision</li> <li>• checking equipment is within inspection date</li> <li>• loading equipment onto truck or similar, as directed</li> <li>• filling fuel and ensuring adequate supply of other consumables, as directed</li> </ul>

<b>Equipment</b>	<p>Equipment may include:</p> <ul style="list-style-type: none"> <li>• pump</li> <li>• pump motor/driver</li> <li>• hoses</li> <li>• guns, lances and nozzles</li> <li>• personal protective equipment</li> <li>• other equipment, plant, tools and hazard control devices required for the job</li> </ul>
<b>Job owner</b>	<p>Job owner may include:</p> <ul style="list-style-type: none"> <li>• client or their representative</li> <li>• site manager or their representative</li> <li>• production manager or their representative</li> <li>• maintenance manager or their representative</li> <li>• other person with prime responsibility for the plant/plant area which is the subject of the water jetting</li> </ul>
<b>Job paperwork</b>	<p>Job paperwork may be electronic, hard copy or other format and may include:</p> <ul style="list-style-type: none"> <li>• tool storeroom records</li> <li>• equipment loaded records</li> <li>• maintenance/inspection records/checklists</li> <li>• tag out/reports for failed equipment</li> <li>• hazard controls</li> <li>• work packs</li> </ul>
<b>Personal protective equipment</b>	<p>Personal protective equipment may include:</p> <ul style="list-style-type: none"> <li>• personal protective equipment as specified in: <ul style="list-style-type: none"> <li>• Section 4 AS/NZS 4233.1: 2013 <i>High Pressure Water Jetting Systems Part 1. Safe Operation and Maintenance, or its authorised replacement</i></li> <li>• Section 5 <i>Safe Work Australia Guide for Managing Risks from High Pressure Water Jetting December 2013</i>, or its authorized replacement</li> </ul> </li> <li>• medical alert card as specified in Section 9.5 of AS/NZS 4233.1: 2013 <i>High Pressure Water Jetting Systems Part 1. Safe Operation and Maintenance, or its authorised replacement</i></li> <li>• other equipment as required</li> </ul>
<b>Liaise with job owner</b>	<p>Liaise with job owner may include:</p> <ul style="list-style-type: none"> <li>• confirming job owner needs and standards</li> <li>• confirming job and job site</li> <li>• checking job owner is satisfied with completed job</li> </ul>



	<ul style="list-style-type: none"> <li>confirming compliance with site requirements</li> <li>other job owner communications</li> </ul>
<b>Job pack</b>	<p>Job pack may include:</p> <ul style="list-style-type: none"> <li>permits/clearances</li> <li>safe work method statements</li> <li>job safety and environment analysis (JSEA) or other hazard analysis and control information</li> <li>Safety Data Sheets (SDS)</li> </ul>
<b>Water</b>	<p>Water is to be checked for appropriate:</p> <ul style="list-style-type: none"> <li>amount (volume and pressure)</li> <li>quality/properties</li> <li>availability</li> </ul>
<b>Waste disposal</b>	<p>Waste disposal checks ensure that waste generated will be disposed of in an environmentally appropriate manner and in accordance with site requirements. Waste may include:</p> <ul style="list-style-type: none"> <li>contaminated water</li> <li>material removed by water jetting</li> <li>fuel or similar waste</li> <li>other wastes</li> </ul>
<b>Worksite preparation</b>	<p>Worksite preparation may include:</p> <ul style="list-style-type: none"> <li>establishing exclusion zone (e.g. with barricades or tape)</li> <li>fixing signage</li> <li>ensuring safe footing for personnel</li> <li>participating in/verifying isolations</li> </ul>
<b>Prepare water jetting equipment</b>	<p>Preparing water jetting equipment may include:</p> <ul style="list-style-type: none"> <li>interpreting equipment markings</li> <li>assembling equipment</li> <li>checking electrical earth</li> <li>flushing equipment</li> <li>visual inspection of hoses</li> </ul>
<b>Communication</b>	<p>Communication may include:</p> <ul style="list-style-type: none"> <li>hand signals</li> <li>radio head phones</li> <li>other appropriate means</li> </ul>
<b>Hazards</b>	<p>Hazards may include:</p> <ul style="list-style-type: none"> <li>high pressure hazards</li> <li>site/process hazards</li> <li>hazards arising from materials in job site, including</li> </ul>

	<p>materials being removed by water jetting</p> <ul style="list-style-type: none"> <li>• hose set-up and hose runs</li> </ul>
<b>Hazard controls</b>	<p>Hazard controls may include:</p> <ul style="list-style-type: none"> <li>• appropriate controls for all hazards identified</li> <li>• controls identified in the relevant permits to work</li> <li>• controls required by <i>AS/NZS 4233.1: 2013 High Pressure Water Jetting Systems Part 1. Safe Operation and Maintenance, or its authorised replacement</i></li> <li>• other appropriate controls</li> </ul>
<b>Job conditions</b>	<p>Job conditions may include:</p> <ul style="list-style-type: none"> <li>• total work hours (for day/from base)</li> <li>• rest/rotation periods</li> <li>• weather</li> <li>• heat stress symptoms</li> <li>• site conditions</li> </ul>
<b>Monitor job and equipment</b>	<p>Monitoring job and equipment includes monitoring as directed:</p> <ul style="list-style-type: none"> <li>• the pump</li> <li>• system efficiency</li> <li>• product quality</li> <li>• mechanical equipment</li> </ul>
<b>Appropriate action</b>	<p>Appropriate action includes:</p> <ul style="list-style-type: none"> <li>• recognising actual and potential problems</li> <li>• determining problems needing action</li> <li>• determining possible fault causes</li> <li>• rectifying problem using appropriate solution within area of responsibility</li> <li>• following through items initiated until final resolution has occurred</li> <li>• reporting problems outside area of responsibility to designated person</li> </ul>
<b>Solutions</b>	<p>Solutions may include:</p> <ul style="list-style-type: none"> <li>• activating emergency switch</li> <li>• stopping work until situation resolved</li> <li>• raising alarm</li> <li>• responding to injury</li> </ul>
<b>Health, safety and environment (HSE)</b>	<p>All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through federal or state/territory legislation, and these must not be compromised at any time. Where there is an apparent conflict between</p>

	Performance Criteria and HSE requirements, the HSE requirements take precedence
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**Unit Sector(s)**

Surface finishing

**Competency field**

Not applicable

**Co-requisite units**

Not applicable