



Australian Government

AHCIRG341 Operate and maintain irrigation pumping systems

Release: 1

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Modification History

Release	Comments
Release 1	This version released with AHC Agriculture, Horticulture and Conservation and Land Management Training Package Version 4.0.

Application

This unit of competency describes the skills and knowledge required to prepare, start up, operate, monitor and shut down an irrigation pumping system and maintain pumps and pumping equipment.

The unit applies to individuals who operate and maintain irrigation pumping equipment under broad direction and take responsibility for their own work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Unit Sector

Irrigation (IRG)

Elements and Performance Criteria

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. Prepare to maintain pumps	1.1 Obtain and interpret work requirements for the satisfactory completion of operations 1.2 Select and use required materials, tools, equipment and machinery and check for safe operation 1.3 Confirm activity to be undertaken, including identifying potential hazards and risks and implementing safe working practices to manage risks 1.4 Select, fit, use and maintain safety and personal protective

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<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	equipment applicable to the task 1.5 Identify and arrange support required for the safe completion of the servicing and maintenance tasks 1.6 Carry out isolation and lock-out of all equipment necessary for the safe execution of tasks
2. Carry out pump maintenance	2.1 Inspect pumps and report any faults 2.2 Troubleshoot pump system and rectify cause of faults 2.3 Adjust and set pressure switches and air tanks to suit pump performance and site conditions 2.4 Service and maintain pumps according to operation and maintenance manual 2.5 Dispose of waste according to environmental procedures 2.6 Maintain servicing and maintenance records according to servicing and maintenance recording procedures
3. Prepare the pumping system	3.1 Check operation and function of pump and driver 3.2 Conduct pumping system pre-start-up checks according to operation and maintenance manual 3.3 Ensure pumping system valves are correctly sequenced and filters are clear before commencing pumping operations, and safety requirements are met
4. Start up and shutdown pumping system	4.1 Operate ancillary equipment using safe practices 4.2 Start up and shut down pump according to operation and maintenance manual 4.3 Implement emergency shutdown procedures when required
5. Operate and monitor pumping and ancillary systems	5.1 Check and maintain flanges, gaskets and seals within operational tolerances to avoid environmental damage 5.2 Monitor pump pressures and flows for conformance 5.3 Use amperage testing equipment to monitor and identify variations in pumping systems and equipment operating conditions 5.4 Monitor pumping systems, equipment and component performance for signs of excessive wear or reduction of performance 5.5 Check operational valves and valve assemblies for leaks 5.6 Check and clean filter systems periodically and remove any

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	potential blockages or impurities entering the pumping system or equipment which may cause cavitation or malfunction during operation 5.7 Inspect and sample lubrication oil to ensure operating levels are correct and to determine if any contamination has taken place which may affect the operational capacity of the pumping system and equipment 5.8 Take appropriate action resulting from checks and monitoring
6. Shut down the pumping system	6.1 Shut down injection equipment and pump according to operation and maintenance manual 6.2 Clean pumping equipment 6.3 Collect, treat and dispose of or recycle waste generated by both the pumping process and cleaning procedures

Foundation Skills

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.

Skill	Description
Reading	Interpret textual information from a range of sources to identify relevant and key information about workplace operations
Numeracy skills	Calculate oil, lubricant and coolant levels
Navigate the world of work	Recognise and follow workplace requirements, including safety requirements, associated with own role and area of responsibility

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
AHCIRG341	AHCIRG310	Performance criteria clarified	Equivalent unit

Code and title current version	Code and title previous version	Comments	Equivalence status
Operate and maintain irrigation pumping systems	Operate and maintain irrigation pumping systems	Foundation skills added Assessment requirements updated	

Links

Companion Volumes, including Implementation Guides, are available at VETNet: -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72>

Assessment Requirements for AHCIRG341 Operate and maintain irrigation pumping systems

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Performance Evidence

An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit. There must be evidence that the individual has operated and maintained irrigation pumping equipment on at least two occasions and has:

- selected tools and equipment appropriate to the scope of works
- applied workplace health and safety requirements
- carried out the following operation and maintenance tasks:
 - inspected and cleaned pumps
 - adjusted pump settings
 - primed a pump
 - checked and cleared or replaced filters
 - replaced worn components, including pump seals, liners and impellers
 - tensioned fasteners and y-belts
 - monitored pressures and flows
 - used amperage testing equipment
 - replaced belts
 - set valves and checked for wear and leakages
 - cleared blockages
 - checked and topped-up fluids, including coolants, lubricants and hydraulic oils
 - checked oil quality and levels
 - lubricated pumps
- performed start up and shutdown procedures
- maintained clean work area and equipment.

Knowledge Evidence

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:

- workplace requirements applicable to health and safety in the workplace for operating and maintaining irrigation pumping systems
- advantages and disadvantages of each pump type
- pump performance and fault finding
- pumps and their application in irrigation, such as centrifugal, vertical turbine, submersible and propeller
- pumps that are suitable as booster and floating pumps
- automatic pump switches, including:
 - timers,
 - pressure switches,
 - irrigation controllers, and
 - flow switches
- properties of water including pressure and flow rates
- irrigation pump system operation and maintenance manual
- reading pump gauges and controls
- amperage testing equipment
- service and maintenance requirements of pumps
- basic principles of hydraulics flow versus pressure
- discharge and flow rates
- impellers, rotors and stators
- pump components and their principles of operation
- valves and their uses.

Assessment Conditions

Assessment of skills must take place under the following conditions:

- physical conditions:
 - a workplace setting or an environment that accurately represents workplace conditions
- resources, equipment and materials:
 - irrigation pump system operation and maintenance manual
 - irrigation pump system equipment
 - irrigation pump system oil, lubricant, coolant and cleaning agents
 - amperage testing equipment
 - personal protective equipment applicable to operating and maintaining irrigation pumping systems
- specifications:
 - work instructions and workplace procedures applicable to operating and maintaining irrigation pumping systems
 - workplace requirements applicable to health and safety in the workplace and operating and maintaining irrigation pumping systems
 - irrigation pump system tools and equipment and procedures
 - servicing and maintenance recording procedures

- environmental procedures for collection, treatment, disposal or recycling of waste
- timeframes:
 - according to job requirements.

Assessors of this unit must satisfy the requirements of assessors in applicable vocational education and training, legislation, frameworks and/or standards.

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