



Australian Government

Department of Education, Employment and Workplace Relations

RTE3605A Troubleshoot irrigation systems

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This competency standard covers the process of troubleshooting faults and blockages in irrigation systems. It requires the ability to read and apply system specifications, technical manuals and supply/spare parts inventories, operate, maintain and repair irrigation systems, and record and report maintenance activities. Troubleshooting faults and blockages in irrigation systems requires knowledge of characteristics and operation of replaceable components of irrigation systems, system malfunctions and their likely causes, isolation procedures and OHS and environmental guidelines.

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Locate and identify faulty components and blockages	1.1 Irrigation system and component function is determined by reference to system specifications and technical manuals.
	1.2 Monitoring and maintenance records are checked and reviewed.
	1.3 Operational tests are carried out in accordance with system specifications, technical manuals and OHS requirements.
	1.4 Faulty components and blockages are identified and documented according to enterprise policy and procedures.
2 Shut down/isolate component	2.1 Shut down sequence and isolation procedures are applied as required according to system specifications and technical manuals.
	2.2 Safe shut down or isolation is verified.
	2.3 Safety/security lock off devices and signage is installed according to enterprise policy and procedures.
3 Replace faulty components and clear blockages	3.1 Access to faulty components and blockages is arranged.
	3.2 Faulty components are removed from the system, according to system specifications and technical manuals, and repaired or disposed of in an environmentally responsible way.
	3.3 Replaceable components are selected from manufacturers catalogues and procured using enterprise procedures.
	3.4 Replacement components are installed to meet system specifications according to technical manuals.
	3.5 Replace faulty components and clear blockages are carried out without unnecessary damage to

- surrounding site and structures.
- 3.6 Blockages are cleared or blocked sections are replaced according to enterprise, environmental and OHS procedures.
- 4 Return system to normal operating status
- 4.1 Isolated or shut down components are returned to service.
- 4.2 Operational tests are carried out according to system specifications, technical manuals and OHS requirements.
- 4.3 System is returned to normal operational set up.
- 4.4 Repair activities are reported and recorded according to enterprise policy and procedures

Required Skills and Knowledge

Not applicable.

Evidence Guide

What evidence is required to demonstrate competence for this standard as a whole?

Competence in troubleshooting faulty components and blockages in irrigation systems requires evidence that a person can locate, isolate and replace faulty components and blockages and return the system to normal operating status.

The skills and knowledge required to troubleshooting faulty components and blockages in irrigation systems must be **transferable** to a different work environment. For example, this could include different systems, components, enterprise procedures and access difficulties.

What specific knowledge is needed to achieve the performance criteria?

Knowledge and understanding are essential to apply this standard in the workplace, to transfer the skills to other contexts, and to deal with unplanned events. The knowledge requirements for this competency standard are listed below:

identification, characteristics and operation of replaceable components of irrigation systems

system malfunctions and their likely causes

environmental impacts of irrigation, using water from any ground or underground source

purchasing procedures

isolation procedures

enterprise policies and procedures

irrigation OHS and environmental guidelines.

What specific skills are needed to achieve the performance criteria?

To achieve the performance criteria, appropriate literacy and numeracy levels as well as some complementary skills are required. These include the ability to:

- read and apply system specifications, technical manuals and supply/spare parts inventories
- record and report maintenance activities
- identify adverse environmental impacts of irrigation activities and appropriate remedial action
- operate, maintain and repair irrigation systems
- implement and follow relevant enterprise OHS and environmental policies and procedures.

What processes should be applied to this competency standard?

There are a number of processes that are learnt throughout work and life, which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this competency standard. Following each question a number in brackets indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process and 3 = perform, administer and design the process.

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| 1. How can communication of ideas and information (2) be applied? | Order replaceable components from suppliers. |
| 2. How can information be collected, analysed and organised (2) ? | Collecting and assessing system performance data. |
| 3. How are activities planned and organised (2) ? | Organising shut down and repair activities. |
| 4. How can team work (2) be applied? | Checking and reviewing monitoring and maintenance records completed by others. |
| 5. How can the use of mathematical ideas and techniques (2) be applied? | Interpreting system performance data and purchasing parts within budget. |
| 6. How can problem-solving skills (2) be applied? | Identifying and replacing faulty components. |
| 7. How can the use of technology (2) be applied? | Using computerised irrigation systems. |

Are there other competency standards that could be assessed with this one?

This competency standard **could** be assessed on its own or in combination with other competencies relevant to the job function.

There is essential information about **assessing this competency standard for consistent performance and where and how it may be assessed**, in the Assessment Guidelines for this Training Package. All users of these competency standards must have **access** to the **Assessment Guidelines**. Further advice may also be sought from the relevant **sector booklet**.

Range Statement

Range of Variables

The Range of Variables explains the contexts within which the performance and knowledge requirements of this standard may be assessed. The scope of variables chosen in training and assessment requirements may depend on the work situations available

What **irrigation systems** might be relevant to this standard?

These may be pressurised irrigation systems such as micro-irrigation, spray irrigation or gravity fed irrigation systems.

Micro-irrigation systems include mains pressure, low pressure, below or above ground, sprays systems, drip emitter trickle, t-tape, mini-sprinklers, capillary, ebb and flow, and flood systems.

Spray irrigation systems include travelling irrigators (soft hose, hard hose boom type) centre pivot, linear move, powered side roll hand shift permanent (installed), and bike shift/easy shift.

Gravity fed irrigation systems include border check, contour irrigation, furrow irrigation, hillside flooding and basin irrigation.

Border check systems may be either permanent or temporary earth, plastic or concrete devices for insertion in a drain for reticulating water, contour banks used to collect and distribute water along the perimeter of an irrigation plot, contour banks within a plot to collect/distribute water or larger scale systems to stop water exiting one area to another.

Irrigation systems may range from manual operation and monitoring to fully automated with computer control and monitoring.

What faulty **components** or system parts might need to be replaced?

These may vary according to brand and supplier and may include, but not be limited to, injectors, pumps, tensiometers, probe tubes, flow meter, pressure gauge, controllers, solenoid valves, wiring, quick coupling valves (QCV), computer and/or other scheduling devices, pipes, jets, micro

jets, laterals, sprinklers, emitters, integrated dripline "thin wall", seals, outlets and gears.

What **operational tests** of the system may be conducted?

These may include pressures, flow rates, sprinkler performance, calculation of co-efficient of uniformity and distribution uniformity.

What might be the **OHS requirements** for maintenance activities?

Requirements may include systems and procedures for safe manual handling, outdoor work (including protection from solar radiation, dust and noise), selection, use and maintenance of relevant personal protective clothing and equipment, selection, care and safe use of hand tools and safe systems for the prevention of electrical injury.

What may be involved in gaining **access** to faulty components or blockages?

Gaining access may require specific approvals from property owners/managers and may involve excavation work.

How might faulty components be **disposed** of?

Disposal of faulty components must occur in an environmentally responsible way. For example, metal and plastic components may be recycled, returned to the manufacturer, or disposed of in accordance with enterprise procedures.

For more information on contexts, environment and variables for training and assessment, refer to the Sector Booklet.

Unit Sector(s)

Not applicable.