



## WHS-08 Legionella Health Risk Management

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Document Control	
<b>Territory Generation document number:</b>	WHS-08
<b>BDOC No:</b>	BDOC2013/101
<b>Document release date:</b>	02/08/2011
<b>Review period:</b>	3 Years
<b>Next review date:</b>	Sept 2017
<b>Document Owner:</b>	WHS Specialist
<b>Document Sponsor:</b>	Chief Executive Officer

**Document History**

<b>Version No:</b>	<b>Date Released</b>	<b>Change</b>	<b>Remarks</b>
1.0	02/08/2012	n/a	Procedure approved and released
2.0	15/01/2013	Update References	Migration to BDOC in TRIM
3.0	09/09/2014	Whole of document	Document review, removed PWC reference, convert to TGen Doc.

**1 Purpose**

The purpose of this procedure is to provide information on the management of the Legionnaire's disease health risk that may arise from working on or near power station cooling tower water systems.

**2 Scope**

The information set out in this procedure applies to cooling tower water systems associated with:

- (a) Condensing systems of steam-driven turbines driving electricity generators and
- (b) Main power station auxiliary plant, such as turbine plant heat exchangers.

Therefore this procedure will apply to all personnel, contractors and visitors working on or in proximity to the following Generation plant:

- Channel Island - Open cycle cooling tower system
- Channel Island - Evaporative wet air coolers Sets 1, 2 & 3
- Ron Goodin Power Station - Evaporative wet air coolers x 5 located in cable basement
- Ron Goodin Power Station - Open cycle cooling systems Sets 1 - 5
- Weddell Power Station - Evaporative wet air coolers Sets 1 & 2.

**3 Roles and responsibilities**

Role / Title	Responsibility
<b>Chief Executive Officer</b>	Shall ensure that : <ul style="list-style-type: none"> <li>• All personnel are aware of requirements of this procedure and its management in sites under Territory Generation control.</li> <li>• Initiates procedure review as required.</li> </ul>
<b>All Managers/Site Coordinators</b>	Shall ensure that: <ul style="list-style-type: none"> <li>• This procedure is put in place at all Territory Generation controlled power stations sites.</li> <li>• Personnel are advised and trained as necessary in the procedure to be followed.</li> <li>• Contractors are informed of and follow the procedure, where applicable.</li> <li>• Contribute to procedure reviews</li> </ul>
<b>Project Officers/Contract Managers</b>	Shall ensure that: <ul style="list-style-type: none"> <li>• Contractors under their control are informed of and follow the procedure, where applicable.</li> <li>• Contribute to procedure reviews</li> </ul>
<b>All Personnel</b>	Shall ensure that: <ul style="list-style-type: none"> <li>• This procedure is followed personally and by contractors/visitors under their control, where applicable</li> <li>• Contribute to procedure reviews</li> </ul>
<b>Document Owner</b>	<ul style="list-style-type: none"> <li>• The position responsible for the preparation,</li> </ul>

	review and accuracy of this document.
<b>Document Sponsor</b>	<ul style="list-style-type: none"> <li>The position responsible for the approval and use of this document</li> </ul>

#### 4 Definitions

<b>Legionnaires Disease</b>	A potentially fatal illness characterized by pneumonia and caused by infection with <i>Legionella</i> bacteria species, commonly <i>Legionella pneumophila</i> . The incubation period of the disease is from 2 – 10 days, and the attack rate is low.
<b>Cooling tower</b>	Means a device for lowering the temperature of water by evaporative cooling in which atmospheric air is in contact with falling water, thereby exchanging heat.
<b>Cooling tower water system</b>	Means a heat exchange system comprising a heat rejection plant and interconnecting water recirculating pipe work and associated pumps, valves and controls.
<b>Transmission</b>	Means direct exposure to mists or airborne droplets containing <i>Legionella</i> bacteria. Commonly such mists occur from cooling towers and warm water systems.
<b>Symptoms</b>	Symptoms of Legionnaires disease which include an abrupt onset of high fever, non-productive cough, chills, headache and muscle pain.
<b>Risk of infection</b>	Means the combination of the amount of <i>Legionella</i> bacteria the person is exposed to and the resistance of the individual to the bacteria.
<b>High risk groups</b>	Means illnesses, conditions or medical treatments that weaken the body's immune system, diabetes, chronic lung, heart or kidney disease and aged persons.
<b>Cfu</b>	Means colony forming units.
<b>Bio-films</b>	Means a layer of micro organisms contained in a matrix that may form a layer of slime on surfaces in contact with water.
<b>Shall</b>	Means a mandatory requirement
<b>Should</b>	Means an advisory requirement

## 5 References

- AS 3666.3:2000 *Air handling and water systems of buildings – Microbial control Part 3: Performance based maintenance of cooling water systems*
- AS 5059: 2006 *Power station cooling tower water treatment systems – management of legionnaires disease health risk*
- Australian Government (Comcare) Fact Sheet: *Legionnaires Disease* [www.comcare.gov.au](http://www.comcare.gov.au)

## 6 Records

- Water quality testing results are to be saved in TRIM
- Positive Legionella test results to be recorded in the GRACE system.

## 7 Legionella bacteria health risk precautionary measures

There is a lack of information on the infective dose that is needed to cause Legionnaires disease in humans.

Any persons who believe themselves to be in a high risk health group (see definitions) are to communicate this information to their immediate supervisor. Persons identified as being in a high risk health group are not to work on or in proximity to cooling towers and evaporative cooling systems unless they have been given a medical clearance.

In order to minimise the risk of exposure to *Legionella* bacteria that may arise from working on or near cooling tower water systems; the following general precautions shall be taken:

### 7.1 Regular water treatment by automated dosing systems

Automated dosing shall be undertaken as recommended by water treatment specialist advice.

### 7.2 Routine water quality testing

A representative sample of water from cooling tower water systems shall be tested for *Legionella* bacteria once a month.

### 7.3 Additional water treatment (slug dosing)

A slug dosing regime shall be initiated by Operations personnel under the following circumstances:

- Receipt of positive *Legionella* bacteria test results (> 10 cfu/ml).
- In the event of planned work in high risk areas such as water blasting screens, condenser water boxes; as a precautionary measure.
- In the event of high risk work activities such as handling cooling tower sludge and bio-films.

NOTE: Additional water treatment regimes will be determined by contracted water treatment technical experts.

### 7.4 General restricted access

Exposure to water debris or spray from cooling tower water systems must be limited at all times.

Therefore:

- Access to cooling towers water systems shall be generally restricted except for those persons with a need to access the area for maintenance purposes, water testing and plant monitoring or routine inspections.

### 7.5 Hazard management

A Job Safety Environmental Analysis (JSEA) is to be completed for all essential work activities being conducted when working on or near cooling tower water systems.

### 7.6 Minimum Personal Protective Equipment (PPE) requirements:

In the event of a positive Legionella bacteria test result all personnel accessing cooling tower water systems for maintenance purposes, water testing and plant monitoring or routine inspections shall:

- Wear a P2 mask as minimum PPE.
- Assess the need for additional PPE based on work activities.

### 7.7 Additional PPE requirements for high risk activities

In the event of the need to conduct high risk activities such as:

- Working on or near water blasting screens and/or condenser water boxes.
- Handling cooling tower sludge and bio-films.
- Conducting essential work on or near cooling tower water systems when *Legionella* bacteria > 10 cfu/ml has been detected.
- Conducting water treatment slug dosing when *Legionella* bacteria > 10 cfu/ml has been detected.

The following additional PPE requirements shall be worn:

- Full length protective clothing
- Boots
- Impervious gloves
- Goggles
- Full or ½ face respirator that combines a high efficiency particulate air filter of at least P2 class (for filtering aerosols) and a chemical cartridge filter of type B Aus or B1 (for filtering disinfection chemicals).

## 8 Legionella bacteria levels and health risk

AS 3666.3 sets out the following responses to *Legionella* bacteria levels:

<10 cfu/ml (Not detected)	Maintain existing procedures
< 1000 cfu/ml (Detected)	Investigate, review and take remedial action
> 1000 cfu/ml (Detected)	Investigate, review and take remedial action

**NOTE:** The above *Legionella* warning levels are given for guidance only.

- At all times water treatment and maintenance procedures aim to achieve zero (<10cfu/ml) levels of *Legionella* bacteria.
- Testing is undertaken to determine the efficacy of these procedures, **NOT** to detect health risk.
- Testing and detection methods for *Legionella* bacteria can take up to 10 days.

- The incubation period for Legionnaires disease is from 2 – 10 days.
- While tests of cooling tower and other water sources may not indicate the presence of *Legionella* bacteria, it should be remembered that there will be some time lapse between water sampling and the availability of associated test results. During this time it is possible that personnel may have been exposed to *Legionella* bacteria. Therefore to minimise the risk of exposure, precautionary measures shall be taken as listed in Section 7
- There are currently no screening tests for the early detection of Legionnaires disease; however it can be diagnosed through a series of pathology tests.
- All persons experiencing flu type symptoms must inform their Medical Practitioner of the possibility of *Legionella* bacteria exposure; so that the Medical Practitioner can review all symptoms and determine if pathology testing is required to establish a diagnosis.

## 9 Actions in the event of a positive Legionella test result

In the event of a positive test result > 10 cfu/ml (*Legionella* bacteria detected):

- Access to cooling tower water system areas will be further restricted with areas to be cordoned off by Operations where possible and warning signs displayed.
- All work activities in these areas which are deemed non-essential shall be placed on hold.
- All essential work activities shall be conducted using PPE for high risk activities as indicated in section 7(g).
- The additional precautions above shall remain in place until re-test results are received indicating levels <10 cfu/ml (*Legionella* bacteria not detected).
- *Legionella* bacteria re-testing shall occur following slug dosing.

In the event of a positive Legionella test result > 10 cfu/ml (Legionella detected):

- Access to cooling tower water system areas will be further restricted with areas to be cordoned off by Operations where possible and warning signs displayed.
- All work activities in these areas which are deemed non-essential shall be placed on hold.
- All essential work activities shall be conducted using PPE for high risk activities as indicated in section 6.g).
- The additional precautions above shall remain in place until re-test results are received indicating levels <10 cfu/ml (Legionella not detected).
- Legionella bacteria re-testing shall occur following slug dosing.

## 10 Communication of water quality test results

Results of routine water quality tests will be made available to all work area supervisors who will be required to communicate this information to their personnel and display monthly test results on site safety boards.

In the event of a positive Legionella bacteria test result (> 10 cfu/ml):

- The incident is to be logged into the GRACE system as a hazard.

- The site Production Manager or delegate is to email all of site indicating a positive Legionella reading; specifying the area and precautionary actions to be taken. This information is to be communicated to all persons on site.
- Re-test results shall be communicated to all personnel by relevant work area managers/supervisors and displayed on site safety boards.