

Monash University Procedure

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| Procedure Title | Cooling Tower Management Procedure |
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| Scope | This document applies to all cooling tower systems located on all properties owned by Monash University. It applies to all systems regardless of whether the property is occupied by Monash University or by a tenant. |
| Purpose | Monash University is committed to providing staff, students, contractors and visitors with a healthy and safe environment for work and study. To ensure a healthy and safe environment at Monash, and compliance with the requirements of the Public Health and Well Being Act 2008, a risk management program for the implementation and ongoing management of cooling tower systems has been implemented. |
| PROCEDURE STATEMENT | |

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1. Abbreviations

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|------|-------------------------------------|
| OH&S | Monash Occupational Health & Safety |
| OHS | Occupational health and safety |

2. Registration of Cooling Tower Systems

2.1. New Cooling Tower System Registration

All cooling tower systems must be registered with the Department of Health. An application to register any new cooling tower system must be lodged before the system is tested and commissioned. Application forms are available from:

<http://www.health.vic.gov.au/environment/legionella/registration.htm>

Forms should be lodged with (and information is available from):

- Registration & Licensing Team
- Victorian Department of Health
- PH: 1800 248 898, Fax: 1300 769 748
- Email: legionella@health.vic.gov.au

2.2. Renewal of registration for existing cooling tower system

Cooling tower system registrations are for a period of 1, 2 or 3 years. Records must be kept of the expiry dates for each cooling tower system and applications for renewal lodged with the Department of Health (on the above contact details) before the expiry of the previous application. Renewal forms are available from and should be lodged with:

<http://www.health.vic.gov.au/environment/legionella/registration.htm>

A copy of the official renewal of registration granted for each cooling tower system must be filed in the university's TRIM filing system and a copy forwarded to the Maintenance Planner – Mechanical Services.

Responsibility

Relevant campus Manager, Maintenance Operations or Property and Venues Services Branch representative

Availability

Official renewal of registration form - TRIM

2.3. Change to cooling tower system registration

The relevant campus Manager, Maintenance Operations or Property and Venues Services Branch representative must notify the Department of Health (on the above contact details) within 30 days of:

- A change in the ownership of the land on which a cooling tower system is located;
- A change in mailing address or contact details for the official contact for a cooling tower system;
- A change in the numbers of cooling towers in a cooling tower system; and
- The relocation of the cooling tower system on land

Change to cooling tower system registration forms are available from and should be lodged with:

<http://www.health.vic.gov.au/environment/legionella/registration.htm>

A copy of any official change to cooling tower system registration granted for any cooling tower system must be filed in the university's TRIM filing system and a copy forwarded to the Maintenance Planner – Mechanical Services.

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Availability

Official change to registration form - TRIM

2.4. Decommissioning of a cooling tower system

The Department of Health must be notified (on the above contact details) within 30 days of the decommissioning of any cooling tower system.

Decommissioning of a cooling tower system registration forms are available from and should be lodged with: <http://www.health.vic.gov.au/environment/legionella/registration.htm>

A copy of the official decommissioning of cooling tower system form must be filed in the university's TRIM filing system and a copy forwarded to the Maintenance Planner – Mechanical Services.

Responsibility

Relevant campus Manager, Maintenance Operations or Property and Venues Services Branch representative

Availability

Official decommissioning form - TRIM

3. Cooling Tower System Risk Management Plan

3.1. Developing a Risk Management Plan

A risk management plan must be developed for every cooling tower system on Monash University property. The plan should be developed after completing the risk assessment and grading of the tower (see step 3 above) and must be completed within 12 months of the first registration of the cooling tower system. A risk management plan must continue to exist at all times the cooling tower system is in operation.

A risk management plan should contain a number of basic components, namely:

- Site and contact details;
- Assessment of each of the critical risks;
- Summary of the overall risk classification;
- Details of the system collected during the risk assessment process; and
- Attachments or reference to other documents such as operational plans, shut-down procedures etc.

Whilst there is no prescribed format for a risk management plan the Department of Health provides a template which can be used, or modified to use, in the development of a risk management plan. A copy of this template, together with guidelines on how to complete a risk management plan for cooling tower systems, is available at: <http://www.health.vic.gov.au/environment/legionella/risk-plans.htm>

The risk management plan must address five critical risks namely:

- Stagnant water, including lack of water recirculation in a cooling tower system and the presence of dead-end pipework and other fittings in the cooling tower system;
- Nutrient growth, including the presence of biofilm, algae and protozoa in a cooling tower system, water temperature within a range that will support rapid growth of microorganisms in a cooling tower system and the exposure of the water of a cooling tower system to direct sunlight;
- Poor water quality, including the presence of solids
- Deficiencies in a cooling tower system, including deficiencies in the physical design, condition and maintenance of the system;

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- The location of, and access to, a cooling tower system or cooling tower system, including the potential for environmental contamination of the system and the potential for exposure of people to the aerosols of the system

The plan must also address any matters raised in a report from any person engaged by the owner of the land or the owner of the cooling tower system which refers to control measures being inadequate or requiring improvement.

Set out the steps to be taken to ensure compliance with the maintenance, service and testing requirements described in the Public Health and Wellbeing Regulations 2009 of a cooling tower system. For example, the plan will need to describe how you will respond to an adverse microbiological test result e.g. detection of Legionella or a high HCC result.

Risk Management plans must be reviewed annually, and a copy of the latest plan forwarded to the Maintenance Planner – Mechanical Services.

Occupational Health and Safety may undertake periodic audits of cooling tower system risk management plans.

Responsibility

Relevant campus Manager, Maintenance Operations or Property and Venues Services Branch representative.

3.2. Availability Of Risk Management Plan

The risk management plan, once completed, must be made available to an authorised officer of the Department of Health on request. The current plan should be kept in a readily accessible place on each campus, with a copy placed on the Facilities and Services intranet and in TRIM.

Responsibility

Relevant campus Manager, Maintenance Operations or Property and Venues Services Branch representative.

Availability

Risk management plan:

- One copy in readily accessible place on relevant campus
- On Facilities and Services intranet
- In TRIM

3.3. Audit of Risk Management Plan

The risk management plan should be reviewed annually by an independent auditor as part of the annual independent audit of cooling tower system management (see step 7 below)

Responsibility

Maintenance Planner – Mechanical Services

4. Maintenance and testing of cooling tower systems

4.1. Responsibilities of owners of cooling tower systems

The Public Health & Wellbeing Regulations 2009 require the person who owns, manages or controls a cooling tower system:

4.1.1. To ensure that the water in the system is continuously treated with:

- One or more biocides to effectively control the growth of microorganisms including Legionella;
- Chemical or other agents to minimise scale formation, corrosion and fouling;

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- A biocidal dispersant.
 - A chlorine-compatible biocidal dispersant is added to the recirculating water of the cooling tower system;
 - The system is then disinfected, cleaned and re-disinfected –
 - Immediately prior to initial startup following commissioning, or any shut down period of greater than one month; and
 - At regular intervals as specified in the maintenance regime developed as part of the risk assessment relevant to each specific cooling tower system
- 4.1.2. To ensure that the system is serviced at regular intervals (as specified in the maintenance regime developed as part of the risk assessment relevant to each specific cooling tower system);
- 4.1.3. To ensure that a water sample is taken from the cooling tower system at regular intervals (as specified in the maintenance regime developed as part of the risk assessment relevant to each specific cooling tower system) and sent to a laboratory for an HCC count;
- 4.1.4. To ensure that a water sample is taken from the cooling tower system at regular intervals (as specified in the maintenance regime developed as part of the risk assessment relevant to each specific cooling tower system) and sent to a laboratory for a Legionella test

Responsibility

Relevant campus Manager, Maintenance Operations or Property and Venues Services Branch representative.

4.2. Servicing of cooling tower systems

Each cooling tower system must be serviced at regular intervals in accordance with the risk management plan associated with that cooling tower system.

Responsibility

Relevant campus Manager, Maintenance Operations or Property and Venues Services Branch representative.

4.3. Testing of cooling tower systems for heterotrophic colony count (HCC)

- 4.3.1. For all sites heterotrophic colony count (HCC) must be performed as specified in the maintenance regime developed as part of the risk assessment relevant to each specific cooling tower system. An independent (NATA accredited) company must carry out the tests.
- 4.3.2. Copies of all HCC for all cooling tower systems on all campuses should be forwarded to the Occupational Health and Safety Unit (OHS) as soon as the results are received, for inclusion on the OHS website. They should also be filed in TRIM.
- 4.3.3. If the HCC is less than or equal to 200,000 CFU/mL no further action is required.
- 4.3.4. If the reading is higher than this level within 24 hours of receiving the laboratory report:
- the system must be manually treated with biocide by the service contractor;
 - the water treatment program, tower operation and maintenance program must be reviewed and any faults corrected by the service contractor; and
 - between 2 and 7 days after disinfection, retest for HCC must be performed.
- 4.3.5. If this second reading is less than or equal to 200,000 CFU/mL no further action is required.
- 4.3.6. If the reading is higher than this level the service contractor should:

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- disinfect the system within 24 hours; and
 - resample the water again in 2 to 7 days.
- 4.3.7. If a third consecutive elevated HCC reading is received OHS must be notified immediately (see Part 6 – Reporting on Cooling tower system Testing) Occupational Health and Safety will take responsibility for notifying the Department of Health and communicating the results to the university community.
- 4.3.8. The Divisional Director Facilities and Services, the Manager Maintenance and Minor Works Branch and the Maintenance Planner – Mechanical Services must be notified immediately that any third consecutive elevated HCC reading is received.

Responsibility

Relevant campus Manager, Maintenance Operations or Property and Venues Services Branch representative.

Availability

HCC readings report – TRIM
Certificate of analysis - TRIM

4.4. Testing of cooling tower systems for legionella

- 4.4.1. For all sites Legionella testing must be performed as specified in the maintenance regime developed as part of the risk assessment relevant to each specific cooling tower system. An independent (NATA accredited) company must carry out the tests.
- 4.4.2. Copies of the test results for all cooling tower systems on all campuses are to be forwarded to the Occupational Health and Safety Unit (OHS) as soon as received for inclusion on their website. They should also be filed in TRIM.
- 4.4.3. If no Legionella is detected, no further action is required.
- 4.4.4. If Legionella is detected within 24 hours of receiving the laboratory report the service contractor should:
- disinfect the system;
 - the water treatment program, tower operation and maintenance program must be reviewed and any faults corrected; and
 - between 2 and 7 days later the service contractor should retest for Legionella.
- 4.4.5. If no Legionella is detected in this second reading, no further action is required. If Legionella is again detected the service contractor should:
- disinfect, clean and re-disinfect the system within 24 hours; and
 - resample the water again in 2 to 7 days.
- 4.4.6. If a third consecutive Legionella reading is received OHS must be notified immediately (see Part 6 – Reporting on Cooling tower system Testing) Occupational Health and Safety will take responsibility for notifying the Department of Health and communicating the results to the university community.
- 4.4.7. The Divisional Director Facilities and Services, the Manager Maintenance and Minor Works Branch and the Maintenance Planner – Mechanical Services must be notified immediately that any third consecutive Legionella reading is received.

Responsibility

Relevant campus Manager, Maintenance Operations or Property and Venues Services Branch representative.

Availability

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Legionella readings report – TRIM
Certificate of analysis - TRIM

5. Records

| Record: | Location: | Time: | Responsibility |
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| New cooling tower system registration | TRIM | 7 years | Monash representative responsible for the installation and commissioning of the cooling tower system concerned Property and Venues Services representative (including paperwork provided by tenant) |
| Renewal of cooling tower system registration | TRIM | 7 years | Relevant campus Manager, Maintenance Operations Property and Venues Services representative (including paperwork provided by tenant) |
| Change to cooling tower system registration | TRIM | 7 years | Relevant campus Manager, Maintenance Operations Property and Venues Services representative (including paperwork provided by tenant) |
| Decommissioning of cooling tower system | TRIM | 7 years | Monash representative responsible for the decommissioning of the cooling tower system concerned Property and Venues Services representative (including paperwork provided by tenant) |
| Cooling tower system risk assessment | TRIM | 7 years | Relevant campus Manager, Maintenance Operations Property and Venues Services representative (including paperwork provided by tenant) |
| Cooling tower system Risk Management Plan | Readily accessible place on each campus | 7 years | Relevant campus Manager, Maintenance Operations |
| | Facilities and Services intranet & TRIM | 7 years | Property and Venues Services representative (including paperwork provided by tenant) |
| Cooling tower system testing results and certificates of analysis | TRIM | 7 years | Relevant campus Manager, Maintenance Operations or nominee Property and Venues Services representative (including paperwork provided by tenant) |
| Annual independent audit of cooling tower systems | TRIM | 7 years | Maintenance Planner – Mechanical Services Property and Venues Services representative (including paperwork provided by tenant) |
| Condition audit of | Maintenance and Minor | 7 years | Maintenance Planner – Mechanical Services |

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| Record: | Location: | Time: | Responsibility |
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| cooling tower systems | Works Planners' database | | Property and Venues Services representative (including paperwork provided by tenant) |

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| Responsibility for implementation | <p>A comprehensive list of OHS responsibilities is provided in the document OHS Roles, Committees and Responsibilities Procedure. A summary of the specific responsibilities relevant to Cooling tower management is provided below:</p> <p>Facilities and Services: Responsibility for the active management of all cooling tower systems rests with the university's Facilities and Services Division, including responsibility for legal compliance with legislation relating to cooling tower systems, which is managed by the division's Occupational Health and Safety Unit.</p> <p>The Maintenance Planner: Mechanical Services will work with relevant campus Manager, Maintenance Operations, Property and Venues Branch representatives and Occupational Health and Safety to ensure the registration, risk management, maintenance, testing and auditing of cooling tower systems is carried out in compliance with this procedure and with relevant government requirements.</p> <p>Manager, Maintenance Operations: On a day-to-day basis the relevant campus Manager, Maintenance Operations will oversee registration renewals, changes and decommissioning, risk assessments, risk management plans, maintenance and testing of systems and record keeping, and will provide reports to the Maintenance Planner – Mechanical Services on these matters and on auditing of systems.</p> <p>Property and Venues Services Branch: For cooling tower systems on Monash University property (or part thereof) that is leased to a third party, Property and Venues Services Branch will take responsibility for the day-to-day management, in accordance with these procedures, of registrations, renewals, changes and decommissioning, risk assessments, risk management plans, maintenance and testing of systems and record keeping, and will report through to the Maintenance Planner – Mechanical Services on these matters and on auditing of systems. In some instances Property and Venues Services Branch may choose to delegate this day-to-day management to the tenant, in which case this will be clearly stated in the lease agreement and Property and Venues Services Branch will take responsibility for obtaining from the tenant all paperwork relevant to the registration, risk assessment and plans, maintenance and testing reports and audit reports. In addition, the Property and Venues Services representative will ensure the tenant has provided the university with a statutory declaration, which states that all services have been completed and signed by the Company Director or a person in charge. The Property and Venues Services Branch representative will ensure these are filed in the university TRIM system on a monthly basis. Property and Venues Services Branch will also notify the Maintenance Planner – Mechanical Services if and when any new lease is finalised, amended and/or terminated which includes cooling towers in the property.</p> |
| Status | Revised |

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| Approval Body | | |
| Definitions | <p>A comprehensive list of definitions is provided in the Definitions tool. Definitions specific to this procedure are provided below.</p> <p>Cooling Tower System: Feat removal device that recirculates water and includes a fan used to transfer process waste heat to the atmosphere.</p> <p>Independent Auditor: An auditor certified by the Department of Health to undertake an annual cooling tower system audits.</p> <p>Maintenance Planner – Mechanical Services: A person appointed by the university to that role to facilitate cooling tower management.</p> <p>Monash University Property: Land owned or leased by Monash University at the university’s Australian campuses, residences and off-campus facilities.</p> <p>Nata Accredited: National Association of Testing Authorities accreditation which provides independent assurance of technical competence through a proven network of best practice industry experts for customers who require confidence in the delivery of their products and services.</p> <p>Property And Venues Services Branch Representative: A person appointed by the Manager Property and Venues Services Branch.</p> <p>Relevant Campus Manager, Maintenance Operations: The person appointed by the university to the role of Manager Maintenance Operations Clayton, Manager Maintenance Operations Caulfield/ Parkville, Manager Maintenance Operations Berwick/ Peninsula or Manager Facilities and Services Gippsland.</p> <p>Risk Management Plan: Cooling tower system Risk Management Plan.</p> <p>Tenant: A person or entity leasing property owned wholly or partly by Monash University.</p> | |
| Legislation Mandating Compliance | | |
| Related Policies | | |
| Related Documents | • | |
| Document History | | |
| Version | Date of Issue | Changes made to document |
| | | 1. |
| 5 | November 2016 | <ol style="list-style-type: none"> 1. Added compliance section and removed references to the standards from the Purpose. 2. Restructure the document to place the emphasis on areas producing their own local after-hours process. 3. Clarified that a risk assessment must be done for after-hours work. 4. Removed definition for “working or studying alone”. 5. Removed reference to “risk factor” as this term is no longer using in the |

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| | | <p>risk management program.</p> <ol style="list-style-type: none">6. Reduced the amount of superfluous information.7. Updated hyperlinks. |
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