

Science and Technology Facilities Council

Control of *Legionella* Bacteria and other Water Borne Pathogens

Safety Code No 38

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REVISIONS

1.0	Initial Issue	September 2010
1.1	Update training providers	September 2011
1.2	Minor update to 4.1.1	December 2011
1.3	Addition of Appendix 8	October 2012
1.4	Document Retention Policy added	August 2014
1.5	Legislation references updated, Water Safety Group (ToR) Added, ISIS Cooling Towers and Evaporative Condensers (R11 and R80) Safety Code added	April 2016
1.6	Revision to Hydrop guidance documents for cooling towers and separately all other *Legionella* hazards	June 2017
1.7	Rationalization of appendices 1, 2 & 8	October 2018
1.8	Added Appendix for DL Closed loop systems	July 2019
1.9	Updated Appendix for ISIS cooling towers	February 2020
1.10	Update to training Appendix	August 2022
1.11	Updated Appendix 2 added	February 2023
1.12	Revision and Update by HYDROP E.C.S. in line with current guidance	February 2024
1.13	Reformatting and Update Following STFC RAL WSG comments	January 2025
1.14	Revision and Reformatting following discussion with SHE team and HYDROP E.C.S.	January 2026
1.15	Revision and Reformatting following discussion with SHE team and HYDROP E.C.S.	February 2026
1.16	Minor alterations following feedback from RAL Estates team	October 2026

Acknowledgement

This Safety Code and its associated books and appendices have been developed as a joint approach between UKRI Science and Technology Facilities Council and HYDROP E.C.S. The contents of this document are the sole property of UKRI Science and Technology Facilities Council and HYDROP E.C.S. The contents of this document cannot be replicated or shared without the express permission of both parties.

CONTROL OF *LEGIONELLA* BACTERIA AND OTHER WATER BORNE PATHOGENS

1. Introduction

Legionnaires' Disease or Legionellosis is the term used for infections caused by *Legionella pneumophila* and other related bacteria. *Legionella* bacteria are only dangerous in respirable form and generally only to susceptible individuals where inhalation of the bacteria in aerosols or water droplets (typically <5μm) may cause severe, and potentially fatal forms of pneumonia in those individuals.

Legionella bacteria are widespread and found naturally in many aquatic environments, where they feed on algae and organic matter in sludge, sediment and silt. They tolerate a range of temperatures, although below 20°C and above 50°C they are dormant and above 60°C they will not survive. In the laboratory, they grow in stagnant nutrient rich water in the temperature range 20°C to 45°C, and optimally at 37°C (body temperature).

When *Legionella* bacteria enter man-made water systems they may proliferate under favourable conditions. These conditions may be present in old or badly maintained water systems with rust, scale or biofilm build up. If water droplets are then created and dispersed into the atmosphere people in the vicinity may be at risk of inhaling the bacteria. To eliminate or reduce the risk, control measures must be in place to prevent the growth of the organism in the water system, and to minimise the generation of water droplets and aerosols.

Legionnaires' Disease is a reportable disease under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations, 2013.

The control of *Legionella* and other water borne pathogens is covered in a range of legislation, guidance documents and standards. A detailed reference list is covered in Section 5 below.

2. Purpose

STFC places great importance on the health, safety and welfare of its staff, contractors, tenants and visitors, requiring ALL partners to play their part in helping it discharge its legal obligations, as far as reasonably practical.

This Code, and its supporting Books, is intended to set out management standards for *Legionella* control and for maintaining water quality from an Estates maintenance, capital development and organisational perspective. Collectively they describe the procedures required to reduce the risk from *Legionella* bacteria and the legal responsibilities of building owners and operators in this respect.

However, due to infrastructural variations across STFC's three principal sites, operational complexities within its departments and their interface with site services, and the use of specialist equipment, departments also have a pivotal role to play in managing water hygiene. These documents provide a robust, consistent framework for maintaining high standards in water hygiene generally and to manage the risk of Legionellosis to a standard that meets the requirements of relevant legislation.

It is anticipated that the requirements established in this code will be fully complied with by staff, tenants, users, project managers, contractors, whether appointed by Estates or Departments and in whatever capacity, with or without contractual agreements.

HSE's Approved Code of Practice (ACoP) Legionnaires Disease - The Control of *Legionella* bacteria in Water Systems, referred to as L8, offers specific guidance for STFC to achieve compliance with all relevant legislation and for managing the risks posed by poor water quality, particularly where *Legionella* bacteria may be present.

The ACoP, L8, allows the Principal Duty Holder to obtain assistance from a 'Competent Person' in the implementation of legislative requirements, and STFC has engaged the services of a company specialising in water treatment and *Legionella* management. The Competent Person in this context is currently Hydrop E.C.S. With their assistance and expertise this Code and its supporting Books establishes standards and arrangements for water hygiene management and *Legionella* control across STFC premises.

Broad requirements of L8 for controlling *Legionella* bacteria in STFC's water systems are to:

(i) identify sources of risk and undertake formal *Legionella* risk assessments with suitable and sufficient documentation of findings, including schematics which describe the water system,

(ii) develop a risk minimisation programme, a prioritised action plan and a mechanism for escalating remedial work where risk assessment and monitoring data indicate an emerging risk,

(iii) implement and manage the programme with ongoing review and reassessment of the *Legionella* exposure risk,

(iv) develop formal procedures for inspection, monitoring, maintenance and disinfection of water systems at appropriate intervals,

(v) train staff to a suitable standard according to their role,

(vi) maintain suitable records detailing water systems and the necessary control measures to be implemented in all premises within STFC's control,

(vii) prepare an emergency response plan.

3. Scope

3.1 Existing Water Systems

This code applies to the design, commissioning, operation and maintenance of all water systems, where there is the potential for *Legionella* bacteria to grow and be dispersed as a respirable aerosol, whether systems are owned or managed by the STFC or brought onto STFC sites by facility users, tenants or contractors.

This includes, but is not limited to, the following domestic or non-domestic systems:

- Air Scrubbers
- Adiabatic cooling systems
- Car washes
- Cooling systems for scientific equipment
- Cooling towers
- Domestic or emergency showers or eye wash stations

- Expansion vessels Fire-fighting systems such as water mist or drench sprinkler systems hoses and reels (where installed) and wet risers
- Fixed and mobile air conditioning, ventilation systems and humidifiers
- Hot water calorifiers (primary heating coils, electric immersion heaters or otherwise)
- Hot and cold-water systems, both domestic and industrial
- Machine tool coolant systems, e.g. lathes
- Specialist, or bespoke, scientific equipment
- Water storage tanks
- Water features or fountains, including drinking fountains
- Ultrasonic baths and washing facilities
- Pressure washers.

Further examples are provided in the subsequent books to this Code.

3.2 New works and alterations to piped services

Plant and water systems must be designed and installed to be safe and without risks to health including risks associated with colonisation and growth of *Legionella* bacteria within the water system. Water systems must be designed and installed to comply with:

- Construction (Design and Management) Regulations 2015
- Building Regulations for systems provided with water from the public supply (Building (Scotland) Regulations 2004
- BS EN 806 (parts 1-5) Specifications for installations within buildings conveying water for human consumption
- BS 8558:2015 - Guide to the design installation and testing of services supplying water for domestic use within buildings.
- Water Supply (Water Quality) Regulations 2000 (Scotland only)

New water systems must be fully commissioned to verify their performance to design specifications.

A risk assessment must be undertaken **at each stage of a project from design stage onwards to ensure suitability of the water systems prior to handover and occupation.** A new water system will require, as a minimum, a full flushing regime and disinfection to ensure that clean, potable water is available at every outlet before the area or building is handed over for occupation and ongoing maintenance.

Where buildings are temporarily taken out of use, or mothballed, the water system must continue to be managed to ensure that microbial growth, including potential proliferation of *Legionella* bacteria is controlled. If the building later comes back into use the water system should be fully recommissioned (i.e. flushed, cleaned and disinfected) as though the system is new. Further details for the requirements for all projects are found within Book 3.

3.3 Document Directory

The supporting Books to this Code provide a framework for departments to follow in accordance with legislative requirements and good practice. **Not all books are relevant to all departments**, and the following table is intended to provide a guide on applicability by department. Each book contains information and instructions for specific subject areas.

Their relevance to specific departments is shown below:

Book Number	Document Title	Targeted Departments				
		Estates Operations	Estates Projects	SHE	ISIS	All other depts.
Book 0	**Introduction** *Application and Scope, Policy, Strategy and Management Structure* https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC38-Book-0.pdf	✓	✓	✓	✓	✓
Book 1	**General Considerations** *Primary risk management processes and microbiological control measures* https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC38-Book-1.pdf	✓	✓	✓	✓	✓
Book 2	**Water Safety Operations** *Estates led processes and procedures for inspection, monitoring, maintenance and surveillance of water systems and equipment* https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC38-Book-2.pdf	✓		✓	✓	
Book 3	**Capital Procedures** *Design, Installation and Commissioning of all new-builds and refurbished areas* https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC38-Book-3.pdf		✓	✓	✓	
Book 4	**Contingency Measures** *Contingency measures for a breach of control parameters, bacterial contamination management and Outbreak Plan* https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC38-Book-4.pdf	✓	✓	✓	✓	
Book 5	**Associated Processes, Specifications, Certificates and Permits** *Standard Operating Procedures, Certificates and Permits referenced in Books 1, 2, 3 and 4*	✓	✓	✓	✓	✓

	https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC38-Book-5.pdf					
Book 6	**Appendices** *Includes all departmental specific processes and procedures.* https://www.she.stfc.ac.uk/wp-content/uploads/2026/10/SC38-Book-6.pdf	✓	✓	✓	✓	✓

4. Duty Holders, Roles and Responsibilities

4.1 STFC Executive Chair

STFC's Executive Chair (EC) is the Principal Duty Holder for STFC and is accountable for ensuring that suitable safety management arrangements are established and working effectively across STFC, in compliance with all relevant Health, Safety and Environmental (SHE) legislation. This includes the arrangements for the control of *Legionella* bacteria and other potential waterborne pathogens, as set out in this Code.

4.2 Chief Operating Officer

Under the management arrangements, The Executive Chair can delegate this responsibility to the Chief Operating Officer (COO) and, in collaboration with the Heads of STFC sites, the Head of SHE, the Director of Estates and Departmental Directors, the COO oversees the implementation of the requirements set out in this Code. The Chief Operating Officer is the Primary Duty Holder for all STFC managed sites.

4.3 Heads of STFC sites

Heads of Site are responsible to the EC and COO for oversight of safety management arrangements at site level. Each Head will chair SHE management meetings, discussing matters related to site safety and safety risk management. The Chair will receive an annual report from the site Water Safety Group whose membership comprises representatives from each department. Issues of concern can be escalated to the COO and / or the EC at any time.

4.4 Director of Estates

The Director of STFC Estates (Estates Duty Holder): Is responsible for appointing a competent *Legionella* Responsible Person to be responsible for the domestic water services and estates owned water assets. Responsible for appointment of AE/external auditor and the ongoing maintenance and monitoring of the domestic water infrastructure across the relevant sites. The relevant responsibilities for the Director of Estates are:

4.4.1 ensure that one or more suitably trained and experienced *Legionella* Responsible Persons (LRPs), and deputies, are appointed in writing, trained to the appropriate level and provided with the resources to manage *Legionella* hazards within Estates defined areas of responsibility. The names of such appointments must be recorded in the SHE Directory.

4.4.2 ensure that all Estates Project Managers (external and internal) are fully briefed on the requirements of this Code regarding water systems in new builds or refurbishments, and especially for water system specification, installation, commissioning and handover to Estates.

4.4.3 ensure, alongside other departmental Directors, that site Water Safety Groups are established at RAL and DL to advise and keep *Legionella* and water hygiene management arrangements under review on each site.

However, in the case of ROE, a Water Safety Group is not considered necessary for the size of site, but a verbal report must be made to the Site SHE Committee by Estates and the machine shop supervisor on the outcome of their *Legionella* control measures and water hygiene management arrangements. This may be reviewed at next renewal of contract

4.5 Directors of Departments

Ultimate responsibility for operational health and safety lies with Department Directors and this includes management of potential *Legionella* risks, alongside those associated with departmental activities. In the case of *Legionella,* risk may be associated with specialist equipment, or the risk may be introduced during their work activities or local projects that impinge on piped services and water systems.

Department Directors shall:

4.5.1 ensure that one or more knowledgeable members of staff are appointed as members of the site-specific Water Safety Group (WSG) to act as the departmental *Legionella* representative(s). Appointments should include a lead, and a deputy, to provide resilience. Department *Legionella* Leads must be provided with the resources to manage *Legionella* and water hygiene risks within their defined areas of responsibility and appointees should be recorded in the SHE Directory.

4.5.2 ensure that *Legionella* Leads undertake appropriate training to fulfil their role effectively.

4.5.3 ensure that a register of any departmental water system or equipment which may pose *Legionella* risk is compiled and kept up to date, and that *Legionella* risk assessment is undertaken.

4.5.4 ensure that the Estates maintenance and operational team is notified of any plans to connect new equipment to Estates water infrastructure that may pose a *Legionella* risk. This must be reported through the Estates RP and Water Safety Group. Connection to existing infrastructure will only be permitted following receipt of written confirmation from the Estates RP. Responsible for appointing a competent LRP to be responsible for the scientific and technical departmental owned water assets, and ensuring that no departmental staff adapt, install or connect to estates owned water assets or domestic water services without the prior approval from the site-based Estates LRP. Responsible for the appointment of AE/External Auditor where needed for specific science and technical assets such as ISIS cooling towers.

4.5.5 attend site specific Water Safety Group meetings in those cases where there are ongoing concerns related to *Legionella* management or poor water hygiene and recurrent elevated sample results.

4.6 Departmental *Legionella* Leads / Water Safety Group (WSG) Members shall:

4.6.1 ensure that effective arrangements are implemented for the assessment and management of the *Legionella* risks within their area of responsibility,

4.6.2 maintain a register of departmental water systems or equipment that may pose a *Legionella* risk.

4.6.3 **as appropriate**, ensure one or more suitably qualified and experienced persons or *Legionella* management contractors are appointed for water systems treatment and maintenance to undertake the duties detailed in this code on their behalf. Where contractors are employed they shall be registered with the Legionella Control Association and where mechanical works are to be conducted on water systems the relevant contractors must be Water Safe Registered www.watersafe.org.uk

Where appointed, the competence and performance of those undertaking these activities should be reviewed regularly and documented.

4.6.4 **as appropriate,** ensure that a documented register of all water systems, including cooling towers and evaporative condensers, is established, maintained and regularly reviewed.

4.6.5 **as appropriate,** ensure all existing or new cooling towers or evaporative condensers are registered with the local environmental health authority, in writing with details of their type and location. A copy of the notification should be retained. Where cooling towers or evaporative condensers are made redundant, decommissioned or demolished, they should inform the local environmental health authority, in writing, retaining a copy of the notification.

4.6.6 ensure that documented risk assessments are conducted for systems detailed in the department's water systems register and within their area of responsibility. Risk assessments should determine whether potential for exposure is reasonably foreseeable and detail the control measures necessary to prevent or minimise risk.

Legionella risk assessments should be reviewed every 2 years, or whenever significant changes or modifications to water systems occur, or in the light of results from *Legionella* monitoring programmes. All *Legionella* risk assessments are to be conducted in line with the requirements of BS850-1 2019.

4.6.7 ensure that documented "Written Schemes", based on risk assessments are created to outline controls for preventing, reducing, controlling and monitoring *Legionella* hazards. The scheme should describe the correct operation of the water system and persons responsible for carrying out actions, including:

a. an accurate schematic diagram of the system, updated whenever there is a significant change
b. system commissioning, shutdown and re-commissioning procedures and precautions
c. system checks and frequencies to determine the effectiveness of *Legionella* controls and warning of system malfunction
d. maintenance requirements and frequencies, and
e. remedial actions in the event of system malfunction or *Legionella* outbreak.

4.6.8 ensure that all records relating to the management of *Legionella* are retained for at least 5 years, including but not limited to test results, inspection records, maintenance records, contractor training records etc.

4.6.9 ensure that the design of new water systems, or equipment containing water, considers the hazards arising from *Legionella* in order that the risks are eliminated or minimised.

4.6.10 as appropriate supervise the contracts for water system treatment and maintenance of cooling towers, and hot and cold-water systems.

4.6.11 immediately report any instances of increased risk (e.g. high bacterial or other pathogen counts) or Legionella outbreak to the SHE Group, see STFC SHE code 5 Reporting and Investigation of SHE Incidents.

4.6.12 ensure that Site Water Safety Groups are established and operated as per their Terms of Reference (ToR). Terms of Reference are detailed in Book 6.

4.6.13 ensure that no adaptions, isolations or alterations are made to the existing site infrastructure without the written permission and approval of the estates RP.

4.6.14 attend the site-based water safety group. To ensure they maintain a list of all departmental owned water assets. Ensure there is a suitable and sufficient water risk assessment and written scheme for each departmentally owned asset.

4.7 Departmental Staff shall

4.7.1 not adapt, install or connect to estates owned water assets or domestic water services without the prior approval from the site-based Estates LRP.

4.7.2. ensure Estates staff are provided with the necessary access to undertake statutory compliance activities, such as sampling and flushing, which must take precedence over non-statutory laboratory operations

4.8 Estate's Compliance Team shall:

4.8.1 ensure that any discovery of newly installed water equipment, or systems, or modifications to them, **which have not been approved** is reported on Evotix.

4.8.2 liaise with departments for access to all areas for the purposes of sampling water outlets or implementing flushing regimes to manage *Legionella* risks in piped services or water equipment / systems.

4.8.3 inform SHE group of any recurrent high bacterial counts from sampling regimes which indicate a loss of control **and** ensure this is also reported on Evotix.

4.9 Project Managers shall:

4.9.1 inform and seek the advice of the Estate's RP and Water Safety Group in advance of work on or modifications to existing water equipment / systems or their design: or any new water equipment / systems and their design and installation, that may pose the risk of Legionella incubation. See Book 3.

All projects and capital works must be conducted in accordance with the relevant sections of this Code.

See also SHE Code 15 Contractor Management, and SHE Code 19 Work on buildings premises, services and infrastructure. STFC staff working in such areas should be trained, and evidence of training and competence sought from contractors.

4.9.2 provide a summary of proposed and approved work on or modifications to existing water equipment / systems or their design to the Chair of the WSG for information.

4.9.3 report all incidents or near misses related to the management and control of Legionella, see STFC SHE code 5 Reporting and Investigation of SHE Incidents. Report all actual or suspected cases of Legionnaires' disease in staff or others working on STFC sites immediately to the STFC SHE Group.

4.10 SHE Group shall:

4.10.1 report all instances or Legionnaires' Disease to local environmental health authorities, and the HSE under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), 2013. (Public Health etc. (Scotland) Act 2008, via the local NHS Health Protection Team)

4.10.2 ensure that an audit of the implementation of this SHE code is undertaken, as appropriate by the appointed Legionella management contractor, at least every 5 years, see STFC SHE Code 30 - SHE Auditing and Inspection. This shall be in addition to any local audit/inspection programmes undertaken against relevant guidelines and approved codes of practice more frequently.

4.10.3 nominate a SHE Adviser to be a member of each site-specific Water Safety Group.

5 References

i. The Water Regulations Advisory Scheme's (WRAS) 'Water Regulations Guide', and any other requirements of the local water undertaker.

ii. Water Supply (Water fittings) Regulations 1999.

iii. Water Supply (Water Quality) Regulations 2000.

iv. Water Supply Water fittings (Scotland) Byelaws 2014.

v. HSE Legionnaires' disease, The Control of L*egionella* Bacteria in Water Systems. Approved Code of Practice and guidance on Regulations: L8 (Fourth edition) Published 2013.

vi. HSE Legionnaires' disease: Technical Guidance Part 1: The Control of *Legionella* Bacteria in Evaporative Cooling Systems: HSG274, 2024.

vii. HSE Legionnaires' disease Technical Guidance Part 2: The Control of *Legionella* Bacteria in Hot and Cold-Water Systems: HSG274, 2024.

viii. HSE Legionnaires' disease: Technical Guidance Part 3: The Control of *Legionella* Bacteria in other Risk Systems: HSG274, 2024.

ix. BS 1710 - 1984 - Specification for identification of pipeline services.

x. BS 8558:2015 provides complimentary guidance to BS EN 806. It is a guide to the design, installation, testing, operation and maintenance of services supplying water for domestic use within buildings and their curtilages.

xi. BS EN 806-5:2012 Specification for installations inside buildings conveying water for human consumption - Operation and maintenance.

xii. BS EN 806-1:2000 Specifications for installations inside buildings conveying water for human consumption - General.

xiii. BS EN 806-2:2005 Specifications for installations inside buildings conveying water for human consumption - Design.

xiv. BS EN 806-3:2006 Specifications for installations inside buildings conveying water for human consumption - Pipe sizing - simplified method.

xv. BS EN 806-4:2010 Specifications for installations inside buildings conveying water for human consumption - Installation.

xvi. BS 8551-2015 Provision and management of temporary water supplies and distribution networks.

xvii. BSI PD 855468-2015 Guide to the flushing and disinfection of services supplying water.

xviii. BS 8558-2015 Guide to the design, installation, testing and maintenance of services

xix. BS EN ISO 5667-1 2006 Water Quality – Sampling.

xx. BS 8554 2015 - Code of practice for the sampling and monitoring of hot and cold-water services in buildings.

xxi. BS7592:2022 – Sampling for *Legionella* bacteria in water systems – Code of Practice.

xxii. BS 8580-1:2019 – Water Quality – Risk assessments for *Legionella* Control – Code of Practice.