UPDATED
RISK ASSESSMENT

THE PREVENTION AND CONTROL OF LEGIONNAIRES' DISEASE

FOR

WESSEX RF & CA

AT

Launceston ACF
Launceston College
Dunheved Road
Launceston
Cornwall
PL15 9JE

Prepared by	:	Stephen Cross MWMSoc
Check by	:	L. Blakemore
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1. EXECUTIVE SUMMARY

This document is intended to identify the risk of developing legionnaire's disease from the building water system. The Health and Safety Executive Approved Code of Practice recommends Risk Assessments should be reviewed on a regular basis and in accordance with the current ACOP recommendations.

The Health and Safety commission issued an Approved Code of Practice for "Prevention of Legionellosis (including legionnaires' disease)" which came into effect on 15th January 1992, requiring a risk assessment to be undertaken. Guidance notes were issued by the Health and Safety Executive in the form of HS(G)70 and on the 8th January 2001 the Approved Code of Practice L8 came into force and BS8580:2019 . This risk assessment is structured around the requirements of these documents, ACOPL8 revised and HSG274 Parts 1, 2 and 3 and The Water Regulations Guide.

Legionellosis is the term used for infections caused by legionella pneumphila and other bacteria from the family Legionellaceae. Legionnaire's Disease is a pneumonia that principally effects those who are susceptible due to age, illness, immunosuppression, smoking etc. and may be fatal. Legionellae can also cause less serious illnesses that are not fatal or permanently debilitating but which can affect all people. Infection is attributed to inhaling legionellae, either those water droplets which are small enough to penetrate deeply into the lung, or in droplet nuclei (particles left when water has evaporated). Legionellae are widespread in natural sources of water. They may enter man-made systems or water services, where they can multiply under certain conditions, and if there is a means of creating the transmitting water droplets, people in the vicinity may be at risk. Between 200-400 cases of legionellosis are reported in England and Wales every year.

For a risk to be present a chain of events has to occur:

* System infection
* Legionellae proliferation enhanced by system conditions
* Aerosol formation
* Inhalation of aerosol by susceptible individual

Since aerosol formation and inhalation is difficult to avoid the onus falls on the operator to prevent system infection and to eliminate conditions in which legionellae thrive. The aim is to reduce the risk to an acceptable level by controlling the conditions necessary for proliferation of the bacterium. As a general rule, in practice this means: Keeping the hot water storage temperature at greater than 60^0C, maintaining cold water temperatures at less than 20^0C, keeping water systems clean and in good condition and controlling contamination of the water systems. It is, however, understood that some small systems, particularly when instantaneous water heaters are being used as a hot water source, may not be able to achieve these parameters and further recommendations will be given as required.

In order to achieve this aim, a detailed legionellosis risk assessment has been carried out, the results of which are used to produce recommendations for the control of the bacterium.

Full details of the required actions are enclosed.

2. SUMMARY OF RECOMMENDATIONS and RISK RATING

This section includes a summary of our recommendations together with a priority rating for Legionellae Risk. This site is entirely mains fed, there are no water storage tanks. Chlorination would only be required in the future if adverse water samples were recorded during a routine monitor, alterations were made to the plumbing system or undefined circumstances contaminated the water supply. This assessment supersedes all previous.

The overall legionella risk on this site is low and in order to ensure the risk is kept as low as reasonably practicable we would advise that the guidelines precautions advised in Sections 3 & 4 as well as recommendations below are adhered to as far as possible. Although all precautions may be taken the system may still carry an inherent risk due to the complexity of the given system.

Our recommendations and risk rating at the date of this Risk Assessment are as follows:

	SYSTEM TYPES		***RISK RATING***
	COLD WATER STORAGE TANKS:		
01	None on site		
	Actioned date:	Company/initials:	
	HOT WATER CALORIFIERS:		
01	None on site		
	Actioned date:	Company/initials:	
	SHOWERS AND SPRAY OUTLETS:		
01	None on site		
	Actioned date:	Company/initials:	
	POINT OF USE WATER HEATERS:		
01	Water heaters >15ltr capacity should be set to store produce water at >60°C at outlets within 1 running minute unless fitted with a thermostatic mixer valve		High
	Actioned date:	Company/initials:	
	GENERAL:		
01	It is strongly advised that systems are flushed with fresh mains water for a minimum of 2 minutes and purged to waste if they have been left dormant for a period of time and this procedure is recorded in the site log book.		High
	Actioned date:	Company/initials:	

Priority Ratings – Levels of Risk

High : Risk should be rectified as a matter of priority
Medium : Consider improvement when possible
Low : Low risk but requires attention

OVERALL SYSTEM RISK STATUS

The **Overall System Risk Status** is assessed as a function of the **Likelihood Rating** and **Consequence Rating**, as detailed in the Risk Matrix below.

The **Consequence Rating** is a measure of the inherent risk associated with the assessed system.

The **Likelihood Rating** is a measure of the efficacy of control procedures put in place, as detailed in ACoP L8, to control that inherent risk.

The Overall System Risk Status will be reduced by implementing the recommendations as detailed in 'Section 2 Summary of Recommendations' above.

		Likelihood		
		LOW	**MEDIUM**	**HIGH**
Consequence	**LOW**	Low	Low	Medium
	MEDIUM	Low	Medium	High
	HIGH	Medium	High	High

Documentation:

A log book containing a copy of this risk assessment and records of all water hygiene works should be kept on site and available for inspection at any time. The log book should contain details of Lines of communication and responsibility and Log Book Documentation (see 6 & 7) fully updated

Recommended Programme of Works

1. All works recommended above should be carried out as soon as possible.
2. The Guidelines in Sections 3 & 4 should be adhered to.
3. The programme of monitoring that is now in place should be carried on to ensure future cleanliness of the systems (to include chlorinations if necessary) and to comply with current legislation
4. ACOP L8 Guidance (Revised) and HSG274 parts 1, 2and 3 gives the following guidance for Risk Assessment review times.

    a. Arrange to review the assessment regularly and specifically whenever there is a reason to suspect it is no longer valid.
    b. When a change occurs in relation to the system.
    c. New information about risks or control measures becomes available.
    d. Results of checks indicate that control measure are no longer effective.
    e. There are changes to key personnel.
    f. A case of Legionnaires' disease has been associated with the system.

    However, where none of the above are applicable, an update at a 2year period would seem to be acceptable.

3 – WATER MANAGEMENT PROGRAMME

Recommended frequencies for risk systems as stated in ACOP L8 and HSG274 for Launceston ACF
Records of all checks should be recorded in site log book.

WEEKLY

1. Little used outlets – flush through and purge to drain, or purge to drain immediately before use without release of aerosols

MONTHLY

1. Check cold water temperature is below 20°C after running the water for two minutes at the sentinel taps.
2. Monitor temperatures from flow and return at calorifiers – outgoing water should be at least 60 degrees C and return at least 50 °C.
3. Hot water temperature should be at least 50°C within a minute of running the water at sentinel taps.
4. Where thermostatic valves are fitted hot water source should be stored or set at a minimum of 60°C to control the legionella bacteria and the mixed water at tap outlets should not exceed 43°C (Health and Safety to prevent possibility of scalding).
5. Some instantaneous water heaters are not designed to produce acceptable temperatures after running taps for one minute, in this case, the temperature should be taken very quickly after the tap is opened to ensure as high a temperature as possible is recorded. For some heaters which are not designed to produce higher temperatures a temperature of 45°C has to be acceptable.

QUARTERLY

1. All shower heads and hoses should be dismantled, cleaned, de-scaled and disinfected or more frequently if site conditions dictate.

ANNUALLY

1. Take samples from hot water calorifiers and note condition of drain down water. (An approved contractor should carry this out).
2. Mixer valves should be serviced annually (D08 and BS1415 Standard)

NB Checks made to hot and cold water temperatures should be made on a rotational basis.
All finding should be noted in a site log book

NNB: All systems should be run following a shut down period of 72 hours or more.

WATER SAMPLING

1. Microbiological monitoring of hot and cold water systems that are well maintained (using dipslides or TVC's) is not normally necessary since the source is drinking water. However, there is the potential for micro-organisms to proliferate in various parts of hot and cold water systems – if this happens it may manifest itself in taste and odour problems. Microbiological investigation should then be implemented.

Monitoring for legionella should be carried out:

1. When biocides are to be used to treat the system and distribution temperatures are reduced from those recommended – initially samples should be undertaken on a monthly basis which may then be reviewed when confidence in the efficacy of the biocide regime has been established.
2. In systems where control levels are not consistently achieved **
3. When an outbreak is suspected or identified **
4. In establishments with high risk occupants **

** Frequency of testing would depend on individual circumstances

4. GENERAL PRECAUTIONS AND ACTIONS

The list below indicates the essential practical maintenance/management actions for which the head of site is responsible for ensuring.

1. Operate hot water systems at or above the approved minimum temperature. Storage should be at 60°C. Outlet (tap) temperatures should be 50°C (unless fitted with a temperature reduction mixer). Instantaneous heaters should be able to produce a temperature of at least 45 degrees C. Terminal fittings or communal showers in buildings used by young children/ the very old and those with sensory loss should be supplied with water through thermostatic mixing valves so that the temperature of the water discharged at the outlets does not exceed 43 degrees C.

2. Maintain cold systems at or below the approved maximum water temperature. It is acceptable for the temperature to be 2°C greater than the incoming mains water temperature. However, this should not exceed 25°C.

3. Infrequently used outlets should be removed and any dead legs capped off at the main circulation. Where showers are required and retained they are to be run at least once per week or if possible daily. Shower heads should be cleaned and disinfected in accordance with L8 at least on a quarterly basis.

4. Avoid stagnation of water in pipework. Ensure that all outlets are run on a regular basis. If a basin or other outlet is no longer used it should preferably be removed and pipework taken out to avoid 'dead legs'.

5. Avoid the creation of unnecessary aerosols of water.

6. Ensure that the system is cleaned and disinfected if you become aware of any activity or occurrence, which you believe, may jeopardise water hygiene.

7. Maintain records of temperature checks – regular temperature checks should be taken from selected tap outlets after one running minute. A standard glass thermometer held under the water flow is all that is needed. Once a temperature has levelled off it should be read and recorded. The results recorded on a simple temperature record table. When temperatures consistently fail to comply with the approved ranges your water hygiene company should be contacted for further guidance and advice.

8. When the site is unused for more than 72 hours it is advisable to run hot and cold tap outlets on entry to the building to ensure stagnant water is removed from the pipework before use. **

9. After plumbing (i.e. new water heater or pipework alterations etc.) have been carried out, the site should be chlorinated to ACOPL8 standard - it may be necessary to fit an injection point to enable this process.

10. All outside bib taps should be fitted with non-return valves to prevent back flow.

11. Buildings with mixtures of lead, copper and iron pipework should be considered for refit in the long-term budget

12. Dedicated drinking water tap should be clearly labelled.

13. Intermittently Used Buildings:

** *On entry to a building after period of closure one senior nominated person should ensure the following before any personnel are allowed to use the water systems.*

a. The furthest tap from the mains entry point should be turned on and flushed – this will ensure that any water lying dormant within the building or trapped in the feed pipe from the mains supply is thoroughly flushed and allowing the cold water to attain towns water temperatures at outlets. Approximately 2-3minutes constant running of a mains tap if the building is close to the towns water stop tap, or 10 minutes if over 100yds should be sufficient.

b. Instantaneous water heaters are not designed to store hot water at 60 degrees as the guidelines suggest but we would recommend that the heaters are turned on and allowed at least 5 minutes for the temperature to rise to over 45 degrees C before use.

14. Positive Legionella Results

14.1 Positive Legionella results from a water system are reported to the client's responsible person by the fastest means available. This is usually a telephone call or email which will be confirmed by emailing the laboratory's analysis report and setting down in writing the initial corrective measures that we and/or our client should be undertaking.

14.2 The corrective measures advised will depend on individual circumstances and will be based on the guidance notes form HSE's ACOP HSG274 Parts 1,2,3 and will be instigated as quickly as possible after receiving an order from client.

5. GENERAL SITE INFORMATION

CLIENT : Wessex RF & CA
Site : Launceston ACF
Date : July 2021

Building Description and type of use	Single storey green wooden hut		
Approx Nos of occupants and overall age group	25 people aged 12 years+		
Normal operational hours of this building	2 nights per week 18:00-21:00		
On site contact name at date of RAs	Gary White		
Size and location of incoming mains stop taps	**Location**	**Size**	**Clearly labelled**
	Under kitchen sink	15mm	Yes
Are there specific site security requirements		NO	
1. Is induction required		NO	
2. Are access permits required		NO	
3. Are permits to work required		NO	
4. Is there a Site procedure for reporting emergencies		NO	

SCOPE OF RISK ASSESSMENT

1. Cold-water storage tank/s and all associated downstream services.
2. Hot water services.
3. Cold mains supply
4. **Samples for Legionella analysis do not normally need to be taken as part of a risk assessment however should our assessor decide that sampling will assist in determining the risk – sample/s will be taken in accordance with BS7592**

These listed water systems will only be assessed for risk of Legionellosis and not for any other factor.
The extent of the Risk Assessment is reliant on information supplied from site at time of survey and on observable conditions.
Whilst every effort has been made to ensure the accuracy of the content of this document, Aquastat will accept no responsibility for any omissions.

6. LINES OF COMMUNICATION AND RESPONSIBILITY

At this site the following key contacts have been identified.

	NAME	ADDRESS	TEL NOS
Duty holder: *Individual with the legal responsibility to ensure that health and safety is managed effectively*			
	Kelvin Walker	Wessex RF & CA Mount House Mount Street Taunton TA1 3QE	01823 254571 wx-estatess@rfca.mod.uk
Nominated on site responsible person: *Individual appointed with and who has accepted responsibility under the authority of the duty holder for ensuring that for the control of Legionella all those assigned to carry out tasks are competent to do so.*			
	Gary White	Bodmin ACF HQ	07787 558356
Deputy on site responsible person: *In a large undertaking there may be more than one responsible person*			
Deputy on site responsible person			
Water Supply Company	South West Water	Peninsula House Rydon Lane Exeter EX2 7HR	01392 446688
Mechanical contractor or Maintenance company	Wessex RF & CA	Mount House Mount Street Taunton TA1 3QE	01823 250105
Electrical contractor or maintenance company	Wessex RF & CA	Mount House Mount Street Taunton TA1 3QE	01823 250105
Water Treatment Company for this assessment	Aquastat	Unit N – The Old Parlour Purn House Farm, Bleadon Weston-Super-Mare North Somerset BS24 0QE	Tel: 01934 811264 Email - enquiries@aquastat.co.uk
	1st Company contact	Gary Ford General Manager	As above or email gary.ford@aquastat.co.uk
	2nd Company contact	Louise Blakemore	As above or email louise.blakemore@aquastat.co.uk
Nearest Medical Assistance	Derriford Hospital	Derriford Road Crownhill Plymouth PL6 8DH	0845 155 8155

NB: If any of the above are not available at the time of inspection it may represent a gap in management procedures which could lead to a risk of infection through mis-communication.

NNB: Any changes in the above structure must be recorded as soon as they take effect and all parties must be notified.

7. LOG BOOK DOCUMENTATION/RECORD KEEPING

PREMISES : Launceston ACF

Is there a water hygiene log book on site	YES	
If yes - please confirm the following:		
Where is the log book located?	Bodmin ACF HQ	
Name and position of person responsible for log book?	Gary White	
Has this person received the appropriate training in Legionella Control?	Unknown	
Does the log book contain a copy of the existing Legionella Risk Assessment?	YES	
Does the log book contain written scheme for Legionella control?	YES	
Are there any non-conformances outstanding from previous Risk Assessments		NO
Are monthly temperature checks being taken and regularly recorded?	YES	
Is there an attendance log sheet in the book?		NO
If applicable are showers being dismantled, cleaned and disinfected on a regular basis?		Not applicable
Are tanks and calorifiers being monitored on a 6monthly basis?		Not applicable
If applicable are little used outlets being flushed regularly?	YES	
If applicable are mixer valves being serviced on an annual basis?		Not applicable
If no log book on site please advise the following:		
Is the log book held at a different location?	YES	
If yes - please give name of responsible person and full address and telephone number	Bodmin ACF HQ We understand copies of all related works are held centrally at Wessex RF & CA HQ in Taunton.	
Is there an asset register on site?	YES	
Are Safety Data Sheets held for chemicals associated with Legionella control?		Not seen

If there is no log book on site, or held at a different location this represents a non-compliance with the Approved Code of Practice

If the log book is held at a different premises it is the duty of the responsible person to ensure the above checks are carried out and fully recorded.

8. SCHEDULE OF DEAD LEGS – LITTLE USED OUTLETS/EQUIPMENT

Site : Launceston ACF

LOCATIONS	ACTION
None located	If there are areas deemed to facilitate little used outlets, these should be included in the weekly flushing regime and recorded in the log book

Due to the complexity and concealed nature of most systems it is impossible to guarantee that all pipework passing underground or through floors, walls and ceilings has been traced and it is possible that certain system dead-ends or dead legs may not have been identified. It is, therefore, recommended that bacterial monitoring on a regular basis is carried out to ensure that if dead legs are present, their impact is known and understood.

9. FIRE HOSES

Fire hoses were not located on this site

10 WATER SOFTENER

Water Softener/s was/were not located on site

11. CALORIFIER REPORT

Site : Launceston ACF
Cal : There are no cals on site
Date : July 2021

Location of cal	
Construction	
Size of cal	
Horizontal/vertical	
Storage/non-storage	
Main heat source	
Supplementary heating	
Insulation type	
Is there an open vent	
What size is access hatch	
Is there a drain valve – if yes give size	
Does drain valve work	
Condition of water from drain valve	
Size and materials cold feed pipe	
Is cold feed valved	
Fed from mains, tank or softened	
Pressure gauge reading	
Temp from main gauge on hot water flow	
Temp from gauge on sec return flow	
Safety valve size	
Is system circulated by sec return (yes/no)	Single/duplex
Is calorifier circulated	
Anti-stratification Pump (yes/no)	
Has pump got a time clock	
If yes – how many hours is it set in any 24	
Isolating valves on flow/return	
Is calorifier labelled	
Is pipe work coded/labelled	
Power supply voltage/distance	
How far to adequate drain	
Periods of availability for working	
Access limit Height x width	
Temperature from nearest hot outlet	

Comments/Recommendations:

12. SHOWERS

Site : Launceston ACF
Date : July 2021

SHOWERS/SPRAY HEADS

Location	Nos of showers	Dismantled/ cleaned and disinfected YES/NO	Overall condition	Any repairs replacements
None on site				

13. WATER HEATERS AND RANDOM TEMPERATURE CHECKS

EXPANSION VESSEL INFO

Location	Make/model and capacity of each heater	Mains or tank fed	Full clean possible	Temp degrees C	Is there a pressure vessel – Yes/No	If yes – make model and size and whether fitted horizontally or vertically
01 - Gents	Hyco 25ltr	Mains	No	52	Yes	5ltr Vertical

Random temperatures were taken from the following locations:

Location	Hot/cold or CWM/MIXER TAP or MIXER VALVE	Temp degrees ºC	Satisfactory Yes/No	Comments
Kitchen	Hot	51	Yes	
Kitchen	CWM	16	Yes	
Ladies	Hot	52	Yes	
Ladies	CWM	16	Yes	

Comments/Recommendations:

1. Due to the water heater's volume it must store at ≥60˚c

For information purposes:

A. All cold water should be stored at less than 20 degrees C.
B. All hot water should be set to produce at least 45 degrees C at outlets after one running minute.
C. Temperatures between 20 degrees C at 45 degrees C produce ideal breeding ground for bacteria and should be avoided at all times.

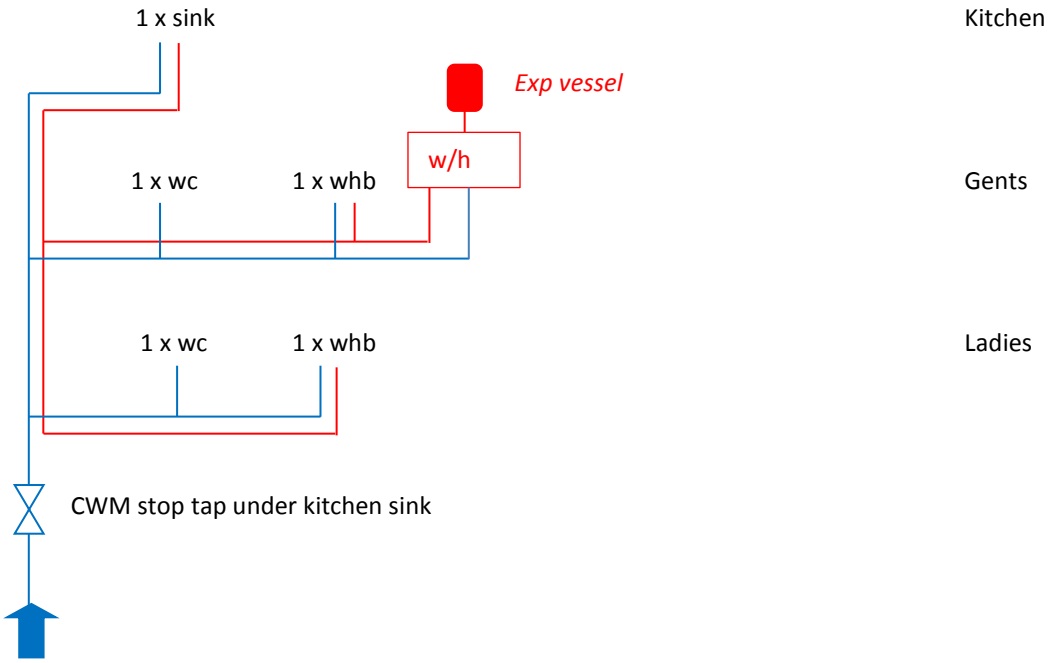
14. WATER OUTLETS: SITE: Launceston ACF July 2021

LOCATION	WC	SLUICE	URINAL	SLAB	SINK	WHB	SHOWER	BATH	OTHER	MAINS TAP	TANK TAP	HOT TAP	HOT WATER SOURCE
Kitchen					1					1		1	*From water heater 01*
Gents	1 M					1				1		1	*Water heater 01*
Ladies	1 M					1				1		1	*From water heater 01*

** M- Mains fed outlet

15. LINE DRAWINGS OF WATER SYSTEMS **SITE: Launceston ACF** **July 2021**

NB: Due to the complexity of the pipe work at this site it is not possible to ensure the total accuracy of these line drawings. They may require revision.



16. PHOTOGRAPHIC EVIDENCE **SITE: Launceston ACF** **July 2021**

Sign

Building

16. PHOTOGRAPHIC EVIDENCE **SITE: Launceston ACF** **July 2021**

Water heater

CWM stop tap

16. PHOTOGRAPHIC EVIDENCE **SITE: Launceston ACF** **July 2021**

CWM stop tap sign

17. Water Treatment & Hygiene Experience and Training Details

All personnel undertaking water treatment and hygiene works must only be carrying out their duties if they are suitably qualified, trained and competent to do so. Details of the assessor for this risk assessment are recorded below:

Persons name:	Stephen Cross MWMSoc
Job description:	Legionella risk assessor & technician
Company:	Aquastat
Experience:	9 years employment as water hygiene technician and risk assessor
External Qualifications:	Confined Space *(ESS Safeforce)* May 2012
	Emergency First Aid and CPR *(ESS Safeforce)* May 2012
	Working at Heights *(ESS Safeforce)* May 2012
	Water Management Society and City & Guilds accredited Risk Assessment of Water Systems *(Merit)* Nov 2015

Certification for all of the above are held at Aquastat offices.

18. Legislation and Codes of Practice

The following are identified as the key Codes of Practice and Legislation applying to water systems and water quality.

The Health and Safety at Work Act 1974:

Management of The Health & Safety at Work Etc. Act Regulations 1999

The control of Legionella bacteria in water systems: Approved Code of Practice and Guidance (L8) Revised and HSG274 parts 1, 2 and 3

BS8580: Water Quality – Risk assessments for Legionella control – Code of Practice

BS7592: Sampling for Legionella bacteria in water systems – Code of Practice

COSHH: **Control of substances hazardous to Health**

SI1992 No. 224: The notification of cooling towers and evaporative condensers Regulation 1992

BACS. Code of Practice: The control of Legionella by the safe and effective operation of cooling systems. (British Association of chemical specialities).

T.M.13: Minimising the risk of Legionnaire's Disease - 2013 (Chartered Institute of Building Service Engineers).

BS8558:2015 : Design, Installation, Testing and Maintenance of Services Replaces BS6700 supplying water for domestic use within buildings and their cartilage's.

BS1710: Pipe work identification.

WRC Approvals: Filtering and Registration Scheme and Installation Practices.

Water Supply : Water Regulations Guide ISBN 0-9539708-0-9

The Control of Legionellae in Health Care Premises: A Code of Practice. (DHSS) – HTM04

SUMMARY OF THE APPROVED CODE OF PRACTICE L8 (revised) and HSG274 Parts 1, 2 and 3 FOR THE PREVENTION OR CONTROL OF LEGIONELLOSIS

Any water system operating with temperatures of greater than 20C and which may release a spray or aerosol presents a reasonably foreseeable risk of Legionellosis. Experience shows that the following are the key systems, which required attention.

- **Systems incorporating cooling towers or evaporative condenser.**
- **Hot water services**
- **Humidifiers and air washers.**
- **Spa baths and pools.**
- **Hot and cold water services in premises where the occupants are particularly susceptible.**

For premises covered by the Health and Safety at Work Act 1974, the HSC's Approved Code of Practice requires the following:

- **A risk assessment undertaken by a competent person to identify the risk of Legionellosis and any necessary and reasonably practicable precautionary measures required.**

- **A management plan identifying steps to be taken to minimise the risk. The plan should also identify the responsible persons, the lines of communication and the training and competence requirements for employees and sub-contractors.**

- **Implementation of the plan including training.**

- **Record keeping to track remedial activities and to monitor performance.**

- **The owner should ensure that the management system performance is audited and subject to management review to keep it relevant.**

The following list provides an indication of the requirement of the ACOP, which is enforced by the Health and Safety Executive or the Environmental Health Department of the local authority, depending on your premises type. Failure to comply is not in itself an offence, but failure to comply may be taken by a court as proof that the person has contravened the legal requirements.

* **Risk Assessments**
* **Management plan and procedure development**
* **Training of personnel**
* **Remedial action such as**
  - cleaning and disinfection
  - Tank refurbishment
  - Regular water treatment (chemical/plant)
* **Provision of log books**
* **Regular monitoring and system maintenance including sampling analysis, chemical cleaning and disinfection.**

Doc: AWRA2 -Appendice B

THE CONTROL OF LEGIONELLOSIS L8 SUMMARY FOR HOT & COLD WATER SERVICES

L8 (Revised) and HSG274 Parts 1, 2 and 3 applies to all premises covered by the Health and Safety at Work Act 1974, where foreseeable risk of Legionellosis is present i.e. most commercial premises with a hot and cold water system

The prime focus of this document is to avoid conditions that permit Legionellae to proliferate and to avoid the creation of sprays or aerosols or where this is impracticable to minimise the release of droplets.

The conditions that promote legionellae proliferation are:

- **Temperatures in the range of 20 - 45 C**
- **Presence of sediment, sludge, scale or organic matter which act as nutrients.**
- **Some unapproved water fittings may harbour legionella and act as a nutrient.**
- **High microbial levels may act as nutrients and as a host for legionellae.**
- **Biofilms and slimes may harbour and protect Legionellae from biocides. These are often caused by stagnant or low flow conditions.**

The main areas of concern for hot and cold water services are shown in Table (1) along with some possible precautionary measures. A risk assessment should be carried out on each site and a management plan developed to minimise the risk. The management plan and its execution should be completely documented as detailed in Table (2).

TABLE 1 - TYPICAL RISKS IN HOT AND COLD WATER SERVICES

ITEM	POSSIBLE PROBLEM	OPTIONS & PRECAUTIONARY MEASURES
Storage Tank	Stagnation Temperature>20C Sludge and Scale build up Corrosion deposit build up Ingress of nutrients	Location of inlet and outlet Ensure tanks not too large or numerous Insulation, or low level chlorination Clean and disinfect on regular basis Refurbishment/Butyl lining Tight fitting covers and insect mesh on overflow
Softeners & Filters	Deposit build up Microbiological build up Fitting harbouring legionella	Backwash regularly Disinfect 6 monthly or as monitoring requires Use approved fittings only
Calorifiers	Stratification (temp<60C) Intermittent use Scale build up	Pumped circulation or regular thermal Disinfection Thermal disinfection Pre-treat water or descale as required
Dead legs (e.g. taps, showers and other appliances)	Fittings harbouring legionella Stagnation	Use approved fittings only Chlorination and flush through Thermal disinfection and flush through Keep pipe runs short
All pipework and systems	Sludge, Scale, Debris build up	Clean and disinfect on a regular basis Regular microbiological monitoring (e.g. Dip-slide 4 - 6 per annum Legionella sampling annually

RECORDS FOR HOT AND COLD-WATER SERVICE

A log book with the following contents is recommended:-

- **Identification of those responsible and lines of communication.**
- **Description and plan of the system.**
- **Risk Assessment.**
- **Operation of the system.**
- **Procedures for inspection and checking of the system.**
- **Management plan of remedial activities and records of progress.**
- **Records of:**
  - **Water temperatures**
  - **Record of operation, maintenance and checking**
  - **Inspection record and subsequent action.**
  - **Cleaning and disinfection record**

Doc : AWRA3 - Appendice C