

LCA STANDARD FOR THE DELIVERY OF LEGIONELLA RISK ASSESSMENT SERVICES

A) WHAT DOES THIS STANDARD COVER

1 This service standard is for LCA Members involved in identifying, assessing and reporting on the risk associated with Legionella in all types of water systems. Whilst the LCA Member is required to comply with this standard, the exact scope of the individual Legionella risk assessment will vary from site to site and should be a matter of contractual agreement between the LCA Member and the service user.

2 Legionella risk assessment category is divided into the following four sub-categories:

- a.** Hot and Cold Water Systems Legionella risk assessment
- b.** Evaporative Cooling Systems Legionella risk assessment
- c.** Process and Other Systems Legionella risk assessment
- d.** Legionella risk assessment of hot and cold water systems within a healthcare setting - the specialist water systems are covered under Process and Other Systems

3 This standard includes the:

- a.** Survey, assessment of Legionella risk and reporting
- b.** Survey and drafting of schematic diagrams and asset registers, where included in the scope (optional) **NB** this option is also covered by the Independent Consultancy standard where the work is to be completed without risk assessment

4 This standard excludes:

- a.** Sampling and laboratory analysis (covered under the Legionella Sampling and Testing standard)
- b.** Other risks (other pathogens, chemical risk, general Health and Safety risks, Water Regulations compliance, etc.) – while an assessor may need to be aware of these elements to complete a Legionella risk assessment; they do not form a part of this standard
- c.** Provision of written schemes of control
- d.** Auditing
- e.** Design and delivery of record systems
- f.** Competence assessment
- g.** Producing specifications for tenders

B) COMPETENCE OF STAFF (INCLUDING SUB-CONTRACTORS)

5 The LCA Member must ensure that their personnel involved in all aspects of Legionella risk identification, assessment and review are competent to carry out their specific tasks by reason of their training, knowledge, skill, and experience. There are several stages involved in delivering a satisfactory Legionella risk assessment service:

- a.** Obtaining the required information to design the risk assessment programme (The Surveyor)
- b.** Designing and costing the risk assessment programme and defining the scope of service (The Designer)
- c.** Planning and initiation of the programme (The Planner)
- d.** Carrying out the risk assessment including, monitoring and inspection tasks (The Technician)
- e.** Reporting and communicating the findings, significance of results and recommendations (The Reporter)
- f.** Ensuring the service has been delivered according to the LCA Member's company procedures (The Auditor)

6 The level of knowledge and skill required to carry out a suitable and sufficient Legionella risk assessment will vary significantly with the complexity of the water systems being assessed and risk profile of the population that may be affected e.g. there is a vast difference between the requirements associated with a simple office block water system and a large and complex hospital water system or an industrial cooling process.

7 The competence of the assessor is of paramount importance and should be matched to the complexity of the system and the risks being assessed. The differentiation of four classes of risk assessment in Appendix 1 reflects the general complexity but there will always be systems that fall outside these classifications. If the assessor is not competent then the assessment

is unlikely to be suitable or sufficient. In each case, they should be able to demonstrate that they have sufficient experience, specialist knowledge and understanding of:

- a. The type of water system(s) and associated equipment to be assessed
- b. The factors affecting the colonisation by and growth of Legionella
- c. The evaluation and assessment of risk from Legionella and the adequacy of controls in place
- d. The procedures necessary to complete surveys, measurements and sampling
- e. The corrective actions that can be applied to reduce or eliminate the risk
- f. The relevant control measures that can be applied, e.g. water treatment, temperature control, thermal and chemical disinfection, cleaning, inspections, monitoring, etc.
- g. The relevant monitoring techniques to assess the performance of the control measures, e.g. temperature and biocide monitoring, sampling for microbiological testing
- h. The suitability of records required to demonstrate compliance

8 Risk assessors should be aware of their limitations and not work beyond their competence. They should be able to seek more competent help where unexpected complexities arise. Where a risk assessor is unable to complete a risk assessment or gain access to additional competent help, they must either decline to complete the risk assessment or include a statement to the effect that the assessment is not complete and detail its limitations.

9 LCA Members may use a prepared template or proforma for their risk assessment survey and report preparation and this constitutes a valuable aide memoire. Care should be taken that the template format does not prevent significant non-standard findings from being reported. An important aspect of the competence of a Legionella risk assessor is the ability to be able to go beyond any prepared template where the template does not fit the situation.

10 See Appendix 1 for further guidance on the specialist requirements of a competent assessor for different types of water systems.

11 The LCA Member must not knowingly carry out risk assessments on water systems where their personnel lack the assessed competence to do so.

C) SERVICE DELIVERY

12 The LCA Member should have clear processes and documented procedures which cover:

- a. Agreeing the scope of the assessment and services to be provided in detail, including any exclusions
- b. Preparatory arrangements
- c. Carrying out the risk assessment
- d. Reporting
- e. Risk assessment reviews and reassessment (if requested by the service user)

Section 1. Agreeing the scope of the assessment service to be provided

13 When making an offer to undertake Legionella risk assessment services, the LCA Member must agree key aspects of the scope of works with the client beforehand and detail these in the proposal document or quotation. These need to include:

- a. Which premises and/or buildings are to be covered by the assessment
- b. Which water systems are to be assessed and any that are knowingly excluded
- c. Whether the assessor will have access to previous risk assessments
- d. What the requirements will be regarding schematic diagrams and asset registers (refer to appendix 2) i.e.
 - i. Whether the client will provide pre-existing schematic diagrams and asset registers to assist the assessor and whether their review is to form part of the assessment and the extent of that review
 - ii. Whether the assessor is to produce schematic diagrams as part of the assessment and their format
 - iii. Whether the assessor is to produce asset registers as part of the assessment and their format

Information Box 1: Written Schemes of Control

Risk assessment does not involve the preparation of the written scheme of control, but it does provide information that is critical to its preparation in the form of identification of risk systems, condition reports, risk evaluation, recommended corrective actions and control measures.

- e. What the requirements will be regarding the written scheme of control i.e.
 - i. Whether the client will provide pre-existing written scheme of control and records for the assessor to review as part of the assessment
 - ii. Whether the agreed scope of work includes provision of additional input into the production or changes to a written scheme of control over and above the production of the risk assessment.
- f. Any restriction on taking photographs for inclusion in the final report
- g. The format in which the final assessment is to be presented e.g. electronic format, hard copy, number of copies, etc.
- h. To whom the final assessment is to be sent
- i. What arrangements need to be in place to provide access and assistance that may be required from a competent escort who is familiar with the site and water systems to be assessed
- j. What are the specific site safety and/or other requirements, e.g. induction training, permit to work, working at height, etc.
- k. Contacts to whom any issues of immediate concern should be reported
- l. Define what happens after the report is issued; e.g. how any queries or other matters arising from the final report are to be addressed, presentation of the report and/or responding to subsequent communications and any additional implications how to assess areas of repetition such as identical business units or flats – an agreement on what proportion will be surveyed
- m. How to record any unavoidable omissions; the effect any such omissions might have on the assessment; whether the required information can be obtained by other means and; what provision should be made to provide access on a subsequent occasion and any additional implications
- n. Where reported information, such as records of previous inspections, is to be included, how this should be identified and used in the assessment of risk; e.g. calorifier or cooling tower internal inspection reports
- o. Is an executive summary to be included and its extent defined; e.g. individual executive summaries and/or overall executive summary for multisite projects?

14 If the client accepts the LCA Member's proposals, there then needs to be a record of a formal agreement between both parties defining the above points. This may take the form of a signed agreement, a purchase order or emailed acceptance referencing the LCA Member's detailed quotation or proposal which defines these points.

Section 2. Preparatory Arrangements

- 15** The LCA Member's procedures should include the following preparatory arrangements:
- a. The LCA Member must ensure that the personnel assigned to carry out the assessment and associated tasks are competent to do so (based on the expected type and inherent complexity of the water systems and the likely risk profile of the exposed population)
 - b. Provision of equipment required to carry out the assessment survey
 - c. Complete a documented pre-work task risk assessment prior to work on site
 - d. Produce a method statement or procedure for carrying out the risk assessment

Section 3. Carrying out the assessment

16 The LCA Member must ensure that (subject to scope) all required systems are identified and included in the risk assessment process.

Note 1 - If an existing risk assessment report is available, it can be a valuable resource for the risk assessor in carrying out a reassessment. Appraisal of the current risk assessment can give the assessor valuable information about the water systems being assessed and the attitude of the management on site however the appraisal of the validity of the existing risk assessment cannot be performed adequately without a site survey.

17 The risk assessment process must include, where applicable and relevant to the assessment of risk:

- a.** Review of any previous risk assessments
- b.** Review of existing schematic diagrams and asset registers (if available) and comment/recommendation on their accuracy and suitability for understanding Legionella risk
- c.** Preparation of new schematic diagrams and /or asset registers (where required by the agreed scope)
- d.** Inspection and assessment of the condition of system water and accessible equipment and an assessment of the contribution to risk made by the design, construction and operation of the system (condition surveys)
- e.** It may be useful to include an appraisal of condition surveys from site records, but this should be clearly identified, and any limitations taken into account in the assessment of risk
- f.** Where it is not possible to inspect all parts of the system and it is not possible to determine the system condition from other evidence, it may be necessary to postpone the assessment and return at a later date when access can be arranged
- g.** Assessment of the inherent risk presented by the system before any controls are applied (worst case)
- h.** Assessment of the residual risk presented by the system when the controls in place are applied (current level of risk)
- i.** Assessment of any risk gap between residual risk and ALARP (as low as reasonably practicable) risk

18 If there is no written scheme of control in place, a high priority in the risk assessment recommendations must be that one needs to be produced, unless the LCA Member considers that there is no reasonably foreseeable risk, in which case they must document that this is their assessment.

19 Where a written scheme of control is in place, the risk assessor should check the written scheme of control and report on its adequacy. The written scheme of control should include:

- a.** Purpose and scope of the written scheme of control
- b.** Reference to identified risks
- c.** Notification of any cooling towers or evaporative condensers
- d.** Management structure
 - i.* dutyholder
 - ii.* responsible person(s) and communication pathways
 - iii.* Training records of personnel involved in the scheme of control
 - iv.* Allocation of all responsibilities i.e. to the dutyholder, responsible person(s), site staff and third parties such as water treatment providers and other subcontractors
- e.** Schematic diagram
- f.** Description of the correct operation of the plant and any controls to be implemented to minimise risk - these must address the identified risk
- g.** Start-up and shut-down procedures, and plant rotation and flushing requirements for little-used outlets
- h.** Details of any plant or equipment brought onto site by third parties
- i.** Method statements and task risk assessments including those for storage, handling, use and disposal of any chemical used both on the treatment of the system and the testing of the system water
- j.** Schedule of monitoring, other operational checks, inspections and calibrations that are to be completed on the

systems, along with the required frequency of the tests and the control limits

- k.** Planned appropriate corrective actions (Planned appropriate corrective actions in a written scheme of control are pre-planned actions to respond to foreseeable situations that may arise. Any anticipated result should have a planned response detailed in the written scheme – e.g. low HWS temperature, check calorifier and retest in one hour, low bromine, check/adjust brominator and retest in one hour, etc.)
 - i.* Dosing system and/or control system failure
 - ii.* Failure of control measures
 - iii.* Very high microbial activity as estimated by dipslides, TVC counts or repeat positive water analyses for *Legionella* spp.
- l.** Incident plans which cover, where appropriate:
 - i.* An outbreak of legionellosis at the site
 - ii.* An outbreak of legionellosis close to the site

20 Where a scheme of control is in place, the records of this should be reviewed for:

- a.** The effectiveness of the control measures
- b.** The maintenance history of the systems

Information Box 2: Proportionality in Risk Assessment and Written Schemes of Control

The above list of requirements for a written scheme are dependent on the complexity of the system and the level of risk present. It may be proportionate to expect detailed written procedures for start-up and shut down in a hospital hot and cold water system or a cooling tower. It would not be proportionate to expect the same level of written detail in a domestic house with a simple hot and cold water system only and normal susceptibility of occupants.

The risk assessor must make an assessment of the suitability of the written scheme and whether it is proportional to the risk identified.

- c.** History of past issues, such as water temperature in *Legionella* growth range, positive *Legionella* results, high dipslides, etc. For actions taken after adverse results have been found in the past, the following should be considered:
 - i.* Were the correct actions taken and the correct communication chain invoked?
 - ii.* Were the actions taken within a timely fashion?
 - iii.* Were the results rechecked (after the action) to confirm conditions were back under control?
 - iv.* If the actions did not result in better control, was an escalation procedure invoked to ensure conditions were eventually controlled? If not, is there an escalation procedure in place?
 - v.* Were there lessons learned or a new procedure put in place to prevent recurrence?
- d.** Monitoring and inspection records for the systems and significant deviations from acceptable operating conditions

21 The LCA Member must also assess management responsibilities to include:

- a.** The dutyholder, the responsible person and any deputies are clearly identified in the written scheme of control
- b.** Where applicable (healthcare or other settings where a WSG is in place), there is an appropriately comprised multi-disciplinary water safety group
- c.** The roles of all responsible parties (e.g. consultants, facilities management companies and water treatment companies) are clearly defined and contact details for these persons and parties are readily available
- d.** Lines of communication and the reporting structure are clearly stated in the written scheme of control
- e.** The responsibility for tasks to be undertaken by each individual or party are outlined clearly with the necessary frequency of the tasks
- f.** The ability of management to maintain control of the risk of *Legionella*

22 The LCA Member needs to review the available training records of those personnel with an involvement in the written scheme of control and comment on their relevance and validity. In addition to the formal training records, the LCA Member should assess the level of competence of the staff by studying the site records.

Information Box 3: Competence of Individuals Involved in Legionella Control

Legionella risk assessment does not usually involve directly assessing the competence of individuals involved in Legionella control. An assessment of their competence however must be made based on the available evidence. The assessor may look at actions taken after adverse results have been found in the past to ensure that suitable corrective actions were taken in a timely manner.

Completed service reports or logbook entries with the correct advice and non-conformances properly identified supports the competence of the individual involved. The assessor must have sufficient competence in testing, analysis and management themselves to be able to assess the competence of others from their work.

Training and competence assessment records can be checked to verify that staff have been deemed competent to undertake the written scheme of control tasks.

The assessor might be concerned that the training and checks on competence for individuals are inadequate, in which case they should make recommendations to improve the procedure for confirming competence.

Section 4. Reporting

Information Box 4: Urgent Reporting of Matters of Immediate Concern

If the LCA Member identifies an imminent danger of exposure to Legionella, e.g. failure of a biocide dosing system or a previously unidentified water system, or one which falls outside the scope of their brief, they must report this immediately to the agreed emergency contact, and not keep this for the final written report. Information which relates to non-Legionella risks may be identified and reported as a matter of immediate concern, as a duty of care, but these other risks should not dilute the assessment of Legionella risk in the risk assessment report.

23 Risk assessment reports should be concise without unnecessary repetition and/or the inclusion of unnecessary information. Examples of inappropriate content include large extracts of guidance, such as ACoP L8 and HSG274 or information which relates to risk systems other than those that are the subject of the assessment. Risks other than those associated with Legionella may be identified, but detailed discussion should be elsewhere.

Information Box 5: Purpose of Legionella Risk Assessment Reporting

The risk assessment is the process and the written report is the record of that process. The principal purpose of the risk assessment report is to communicate clearly to the dutyholder the risks identified and assessed in an efficient and effective manner. It should be sufficiently detailed to allow dutyholders an appropriate understanding of the key issues and actions required to control risks from exposure to Legionella.

24 The LCA Member must ensure that, subject to the agreed scope and where relevant, the assessment report contains the following:

- a.** Assessment Details
 - i.* An executive summary (for simple systems this may not be required) *
 - ii.* The scope of the assessment, including clear identification of buildings, systems assessed and their use
 - iii.* The identification of which systems can present a risk from Legionella and those which cannot
 - iv.* Analysis and evaluation of risk for each system including an explanation of how the risk rating is derived (care should be taken not to provide false reassurance with an overall risk for a building or site where individual system risks differ)

- v. Consideration of elimination or substitution of the risk
 - vi. Identification of key personnel, both staff and contractors, and an assessment of their competence based on the training and operational records available
 - vii. Schematic diagrams (if they have been produced); or reference to them (if they have been reviewed); or recommendation that they be produced or updated, as appropriate. *
 - viii. Asset registers (if they have been produced); or reference to them (if they have been reviewed); or recommendation that they be produced or updated, as appropriate. *
 - ix. The results of condition surveys including operating parameters, temperatures, system inspections and asset registers and if third party information is to be used it should be clearly identified in the assessment.
 - x. The review of the existing written scheme of control (if there is one) *
 - xi. An assessment of the potential for Legionella to grow and the effectiveness of the control measures
 - xii. Any limitations of the assessment
 - xiii. Any matters or areas of evident concern identified which fall outside the scope of the assessment
 - xiv. Details of the competence of the assessor
 - xv. Details of the person involved in QA reviewing the assessment report (if different)
 - xvi. Details of any sources of reference and guidance utilised, e.g., bibliography *
- b. Recommendations**
- i. Prioritised recommendations for corrective actions to eliminate or reduce the risk
 - ii. If the existing written scheme of control and control measures are inadequate then the report should give recommendations for site and system specific control measures (monitoring, inspection and treatment, etc.) including identification of sentinel outlets and/or other sample and inspection points i.e. the recommendation must not simply duplicate HSE guidance verbatim or include the guidance tables. For example; the frequency of flushing expansion vessels must be specified, as this should be determined by this risk assessment document.
 - iii. Short term control measures to be applied until completion of corrective actions
 - iv. Longer term control measures to be applied following completion of corrective actions
 - v. Recommended precautions to be taken when testing, maintaining or operating low risk systems, such as fire systems, heating and chilled water systems, etc. *
 - vi. The recommended review date and guidance regarding the circumstances under which a reassessment will be required (see section 5 for more detail on review and reassessment)

25 **NB** Not all risk assessment reports will require every item, e.g. individually occupied residential premises with low risk water systems (e.g. Tenanted flat) may not require items marked*.

26 Special requirements for healthcare premises: the report should include a statement that it is a Legionella risk assessment and not a water system risk assessment as required by HTM04-01 and include an explanation of the additional requirements of HTM04-01.

Note 2 – recommendations should be site and system specific and not simply reproduced from HSG274 guidance.

Section 5. Risk Assessment Reviews and Reassessment

Information Box 6: Legionella Risk Assessment Reviews

Risk assessment records should be live documents and reviewed by the dutyholder as soon as there is any reason to question their validity (L8 paras 32 and 47). Reviewing a risk assessment or reassessing the risk is a definite action or event with the objective of keeping the risk assessment up to date. It is the dutyholder's responsibility to identify the requirement to carry out a review, and if necessary, a reassessment as detailed in D) below.

27 The LCA Member, if contracted to do so by the client, should have procedures to review the existing risk assessment, determine whether it is still valid and to decide if a reassessment is required and its extent.

Section 6. Verification and Quality Control

28 The LCA Member must have procedures and records to ensure that:

- a. The survey, risk assessment and reporting has been completed to the scope agreed
- b. Appropriate recommendations have been made to achieve ALARP risk
- c. Significant non-conformances are recorded and tracked to conclusion where the LCA Member has an ongoing relationship with the client

29 A representative proportion of output must be reviewed to ensure compliance with the above and records kept of the review.

D) WHAT YOU NEED TO TELL YOUR CUSTOMER

30 There are several key responsibilities that the dutyholder has a legal duty to address. These are listed below:

- a. The dutyholder must ensure there is a Legionella risk assessment record that includes all systems where water is stored or used in any premises controlled by the dutyholder (COSHH Regs). This risk assessment should be regularly reviewed to ensure it is valid and reassessed when required. (See L8 paras 32 and 47).
- b. Any invitation to potential service providers to quote/tender for Legionella risk assessment services should have a clear scope of work defined by the dutyholder or their representative.
- c. Make reasonable enquiries of the service provider regarding proof of competence of individuals involved in carrying out the Legionella risk assessment e.g. provision by the service provider of: training records, competence evaluations, examples of previous work, etc. (See LCA Buyers Guide 702.17 06-17)
- d. Schematic diagrams and asset registers should be available in order to inform and help the risk assessor (See L8 paras 38 and 40). Pipework engineering drawings may be too detailed to allow simple communication of Legionella risk but schematic diagrams must show detail relevant to Legionella control.
- e. The findings of the risk assessment including the required corrective actions and the control measures should be implemented. The output from the scheme of control should be recorded and used in any subsequent review of risk.
- f. A written scheme of control should be produced and maintained and the output from this should be recorded and used in any subsequent review of risk.
- g. Regular reviews of the effectiveness of Legionella control activities should be carried out to verify the written scheme of control remains adequate.
- h. The dutyholder should have change management procedures and/or regular review procedures should be in place to determine if the existing risk assessment remains valid, suitable and sufficient. If it is not, then a reassessment of the risk is required.

Note 3 - It is likely that the risk assessor or other service providers can play a valuable role in these processes and an outside perspective can be invaluable.

Information Box 7: Additional Requirements for Health Care Premises

Healthcare Premises are covered not only by L8 but also HTM04-01: Safe water in Healthcare premises which requires the dutyholder to establish a Water Safety Group (WSG) and produce a water safety plan (WSP). This includes but goes considerably beyond the Legionella risk assessment.

In this case the dutyholder has broader responsibilities to ensure that all members of the WSG are competent. Further information defining Healthcare premises can be obtained at:

www.cqc.org.uk/sites/default/files/20151230_100001_Scope_of_registration_guidance_updated_March_2015_01.pdf

Appendix 1 – Competence Requirements for Risk Assessors for Different System Types

31 The principle of proportional management of legionellosis risk is founded on effective risk assessment. Any shortcoming in this process is likely to have an impact throughout subsequent risk management. Complex systems and especially those with a highly susceptible population, such as healthcare, require assessors with the highest levels of competence.

32 Those involved in risk assessment need a suitable and sufficient understanding of Legionella and legionellosis, appropriate control measures and regulatory requirements. They need a good, practical understanding of the principles of risk assessment and require an appropriate understanding of design and operation of the type of water systems to be assessed and the implications for the risk from Legionella.

Hot and cold water systems (non-healthcare)	
Types of system (including but not limited to)	Specialist Requirements
<ul style="list-style-type: none"> • Individually occupied residential premises with low risk water systems (e.g. Tenanted flat) • Multi occupancy dwellings (e.g. Flats with part common water systems) • Hotels, leisure centres, universities, schools, military barracks • Commercial buildings with larger but relatively simple water systems (e.g. Office block) • Industrial premises (e.g. Unique hot and cold water systems developed to meet specific demand) 	<p>Assessors should have knowledge, experience and/or training in:</p> <ul style="list-style-type: none"> • Types of systems, their components, their operation and likely risk factors e.g. <ul style="list-style-type: none"> - Small mains fed systems - Gravity fed cold water systems - Pressurised systems - Recirculating hot water systems • Water heater types, their operation and likely risk factors • Disinfection and cleaning techniques • Water regulatory requirements for the setting of the assessment
Evaporative cooling systems	
Types of system (including but not limited to)	Specialist Requirements
<ul style="list-style-type: none"> • Cooling towers • Evaporative condensers • Dry/wet cooling systems including adiabatic coolers • Plume abatement cooling towers • Humidifiers 	<p>Assessors should have knowledge, experience and/or training in:</p> <ul style="list-style-type: none"> • Cooling system design and operation • Cooling water treatment theory and practice • Water testing, monitoring and interpretation • System condition appraisal • Pack inspection techniques • Cleaning and disinfection techniques
Other Risk Systems	
Types of system (including but not limited to)	Specialist Requirements
<ul style="list-style-type: none"> • Swimming pools • Spa and hydrotherapy pools • Vehicle wash systems • Misting systems • Leisure and ornamental water features • Engineering and machining systems • Paint prep systems • Fume scrubbers • Fire and deluge systems • Hose pipe and sprinkler systems, water bowsers • Pressure washers • Dentistry equipment • Emergency showers • Rainwater harvesting/grey water • Wet dust collectors • Water jet cutters • Tunnel washer systems 	<p>Risk assessments of these systems may require the assessor to use a first principles approach. Assessors should therefore have a level of competence appropriate to the type of system being assessed including:</p> <ul style="list-style-type: none"> • Water chemistry, treatment and testing • Applicable inspection and condition appraisal techniques • Cleaning methodologies, etc. <p>Since there is such a wide variety of other systems, it can be highly beneficial to the assessor to have the availability of someone (usually an employee of the service user) with intimate working knowledge of the system being assessed.</p>

Hot and Cold Water Systems in Healthcare

Types of system (including but not limited to)	Specialist Requirements
<p>These include hot and cold water systems within healthcare premises.</p>	<p>Assessors must have an understanding of the elevated susceptibility of users to Legionella bacteria and the enhanced precautions advocated in guidance specifically for healthcare premises.</p> <p>Assessors should have an awareness of other potential waterborne infection risks to which users might be particularly susceptible in healthcare and how these risks interact with Legionella risk. These other infection risks are generally not included in the Legionella risk assessment but may have implications for the recommendations of the Legionella risk assessment i.e. they should not conflict.</p> <p>An Assessor involved in Healthcare should also understand:</p> <ul style="list-style-type: none"> • The requirements of the relevant managerial and technical aspects of HTM 00 and HTM 04-01 as a minimum; • The elevated susceptibility of patients in certain areas of the hospital (not all patients are of a high susceptibility); • The application of, and often reliance on water treatment in hospital water systems and its relevance to end use of the water; • The complex arrangements including the interaction between estates, clinical departments, infection control, sterile services and health and safety departments; • The restrictions on surveys that exist in areas such as augmented care wards and operating theatres; • Large and complex domestic water systems, including the principles of HWS recirculating systems in HSG274 part 2. • Hydrotherapy and Birthing Pools.

Appendix 2 – Schematic Diagrams for Legionella Risk Assessment

33 Schematic diagrams are accurate but simplified illustrations of the configuration of water systems, which include all key components and omit anything which is not relevant. They are not formal technical drawings and are intended to be easy to read without specialised training or experience. Determining what is relevant and what is not relevant is an important skill in drafting schematic diagrams and communicating the risk from Legionella.

34 They must clearly indicate where assumptions have been made or where uncertainty exists. A schematic diagram that shows the incorrect pipework or system relationships can result in failure to adequately identify suitable control strategies and actions and therefore increase the risk from Legionella.

35 All risk systems (e.g. evaporative cooling, hot and cold water, process, etc.) must have a schematic diagram and this should include, where present in the system:

- a.** Source of makeup water
- b.** Piping routes and relationships including risers, branches and the extent of water return pipework and connections
- c.** Cooling towers, evaporative condensers, heat exchangers and chillers
- d.** Storage and header tanks
- e.** Calorifiers and water heaters
- f.** Water softeners and other pre-treatment plant
- g.** Water treatment equipment
- h.** Pumps
- i.** Strainers
- j.** TMVs
- k.** All outlets
- l.** Deadlegs
- m.** Dead ends
- n.** Any other detail relevant to the communication of risk

36 Whilst it is not a requirement of a risk assessment to produce either schematic diagrams or asset registers, the absence of an adequate schematic diagram, in particular, can limit the accuracy of the assessment – particularly in complex or substantially modified water systems. The LCA Member should explain this to the client in advance of the assessment. For extremely complex systems or high-risk areas it may be impossible to complete a risk assessment without schematic diagrams or asset registers. The risk assessor should also consider the schematic diagram as part of the communication of risk - detailed pipework scale drawings may not be as effective in communication as a simplified drawing that retains the essential detail.

37 In the absence of an up-to-date schematic diagram the risk assessor may judge that for a simple water system in a small building there is sufficient information to complete and issue a risk assessment, and full reasons for this decision should be given in the assessment. The risk assessor may produce diagrams during the site survey in order to assist in understanding the system and explaining the findings of the assessment. These may not meet the requirements of L8 para 40 and the written scheme of control, where full system schematic diagrams are needed.

38 For larger buildings and systems and settings of elevated susceptibilities full schematic drawings will always be needed to produce a suitable and sufficient risk assessment.

39 The schematic diagram should contain sufficient detail to communicate the risk and enable implementation of the written scheme of control, e.g. it is essential to include all recirculating loops on schematic diagrams when the recommendations for the written scheme of control include monitoring of these areas. Identification of sentinel points, sample points from sample plan, TMVs etc. can be useful in communicating the risk and in implementation of a written scheme of control.

FOR AND ON BEHALF OF THE LEGIONELLA CONTROL ASSOCIATION

LCA STANDARD FOR THE DELIVERY OF WATER TREATMENT SERVICES

A) WHAT DOES THIS STANDARD COVER?

1 This service standard is for those involved in the development and application of a water treatment programme in all types of water systems, whether by chemical or non-chemical means where something is being added, conditioned or changed in the system water, to control Legionella. This is divided into the following three sub-categories:

- a.** Hot and Cold Water Services Water Treatment
 - i.* Private water supply treatment where Legionella is being controlled
 - ii.* Treatment of down water services with potable biocides, water conditioners or physical methods in building services
- b.** Evaporative Cooling Systems Water Treatment
- c.** Other Risk Systems Water Treatment
 - i.* Industrial process water systems including papermills, factories, metal working fluids, air scrubbers, etc.
 - ii.* Spa pool water treatment
 - iii.* Any other water system where Legionella control activity is undertaken by water treatment

2 This standard includes the:

- a.** Design of the water treatment programme
- b.** Use of water treatment equipment within a water treatment programme
- c.** Supply of water treatment chemicals or other consumables
- d.** On-site analytical and monitoring of the water treatment programme, when carried out as part of that programme
- e.** Associated corrective action
- f.** Reporting and record keeping

3 This standard excludes:

- a.** Laboratory analysis (covered under the Legionella Sampling and Testing standard)
- b.** Temperature control (covered under the Hot and Cold Water Monitoring and Inspection standard)
- c.** Cleaning and disinfection (covered under the Cleaning and Disinfection standard)
- d.** Monitoring of biocide and/or chemical treatment residual in hot and cold water systems as a stand-alone service, when applied by others (covered under the Hot and Cold Water Monitoring and Inspection standard)
- e.** Provision of water treatment dosing and control equipment (covered under the Plant and Equipment standard)

Information Box 1: Water Treatment Technologies

It is not the role of the LCA or this standard to prescribe particular techniques or technologies for the control of Legionella bacteria in a risk system; however, whatever method is employed, the overall water treatment programme should be capable of delivering the desired outcomes, such as: scale, microbial, corrosion, fouling control, etc. These outcomes may be dependent on the nature of the water, the system being treated, the client's expectations and performance specification, if any.

B) COMPETENCE OF STAFF (INCLUDING SUB-CONTRACTORS)

4 There are six main areas of competence necessary in the delivery of these services:

- a.** Obtaining the required information to design the service (The Surveyor)
- b.** Designing and costing the water treatment programme including selection of products and defining the scope of service (The Designer)
- c.** Planning and initiation of the programme (The Planner)
- d.** Carrying out the water treatment, analysis, monitoring and inspection tasks and interpreting the results (The Technician)
- e.** Reporting and communicating the findings and recommendations (The Reporter)

- f. Ensuring the service has been delivered to the LCA Member's company procedures (The Auditor)

5 These six job aspects require different knowledge, skills and experience to be competent and will vary with the water system type.

6 The LCA Member should identify the skills required for the relevant task, provide appropriate training and assess the competence of the operative to carry their assigned tasks.

C) SERVICE DELIVERY

7 The LCA Member should have documented procedures for the design, execution and management of the required water treatment programme as detailed under sections 1-6 below.

Section 1: Information Gathering / System Survey

8 Before agreeing a scope of works with the service user it is essential to gather sufficient information to appropriately plan the work. Development of a scope of work may be a multistage process with caveats and stages in development. A survey, discussion or review of a specification may be appropriate to gather information, e.g. on a structured survey form or aide memoire.

9 The survey / information gathering should include, as appropriate:

- a. Make-up water analysis
- b. Water system mechanical details
- c. Water system operational details
- d. Environmental restrictions
- e. Review of the fitness for purpose of any existing water treatment equipment
- f. Review of the current Legionella risk assessment and management processes (if any)
- g. Any other information relevant to the design of an appropriate water treatment programme

10 See Appendix 1 for further detail on the above points.

Section 2: Water Treatment Programme Design

11 The LCA Member should have a documented procedure to ensure the correct products are selected to achieve the desired outcomes e.g. use of product selection guides. Such guides should identify control parameters and highlight any product limitations which may affect the performance of the programme. Water treatment products must be compatible when dosed in the same system, e.g. oxidising biocides should not be dosed with readily oxidizable biocides or inhibitors.

12 Water treatment programme design should include (where appropriate):

- a. Selection of products or control techniques
- b. Consideration of suitability of existing pre-treatment and dosing and control equipment for the proposed treatment programme
- c. Design of the monitoring and testing programme:
 - i. Chemical test selection
 - ii. Identification of suitable sampling points
 - iii. Microbial monitoring regime
 - iv. Test methods
 - v. Definition of all control limits and desired outcomes
 - vi. Testing frequency / service schedule
- d. Disinfection and cleaning regime (the delivery of cleaning and disinfection is covered under the LCA Cleaning and Disinfection standard)

Section 3: Agreeing the Scope of Work with the Service User

- 13** This must include the following:
- a.** The premises and/or buildings to be included
 - b.** The identification of the water systems to be treated
 - c.** Treatment techniques to be used to deliver the desired outcomes
 - d.** Products and services to be supplied
 - e.** Monitoring, analysis and inspection programme
 - f.** Identify those tasks in the water treatment programme to be covered by the LCA Member and those which should be provided by the service user
 - g.** Agreement of lines of communication and reporting
 - h.** Reporting format and delivery method
 - i.** Access arrangements and times

Section 4: Preparation

14 LCA Members must ensure that the programme is correctly set up, the role and expectations of both parties is understood and, where appropriate, the service user is given the necessary instruction in the aspects of the programme which they are to implement. It should include (as appropriate):

- a.** Documented allocation of responsibilities between the LCA Member and the service user
- b.** Agreement over lines of communication and reporting
- c.** Initial instruction for the service user and identification of training needs
- d.** Agreement over success criteria for the programme

15 Prior to site attendance:

- a.** Ensure LCA Member staff/sub-contractor has the appropriate assessed competence/capability to carry out the task
- b.** Provide appropriate resources to your staff including:
 - i.* Task risk assessment
 - ii.* Suitable method statement/work instruction
 - iii.* Emergency procedures (e.g. first aid, accident reporting, incident reporting, chemical handling/safety and environmental protection, etc.)
 - iv.* PPE/RPE and other safety/access equipment that may be required by the site rules or task risk assessment/method statement
 - v.* Suitable monitoring, testing and inspection equipment
 - vi.* Job reporting system (e.g. a paper or electronic record of the work when completed)

Section 5: Carrying out the Work

16 Immediately prior to commencing each service visit, the operatives must:

- a.** Complete a pre-work task risk assessment or review and, if necessary, amend the preliminary task risk assessment
- b.** Check PPE/RPE and equipment required by pre-work task risk assessment
- c.** Check method statement/work instruction is valid
- d.** Ensure monitoring, testing and inspection equipment is suitably calibrated and reagents are in date. See LCA Guidance on Calibration of Water Testing Equipment document (405.21 04-21).

- 17 During the service visit, the operatives must:
- a. Carry out LCA Member allocated tasks
 - b. Complete a detailed report of work outcomes. A copy is to be created for both the site records and the LCA Member's own offsite records. This report may be in duplicate paper or shared electronic format
 - c. Bring to the attention of the client any non-conformance with the programme control limits and give recommended corrective actions
 - d. Bring to the attention of the client any other areas of concern identified which impact on Legionella risk

Section 6: Verification and Quality Control

- 18 The LCA Member must have procedures and records in place to ensure that:
- a. All scheduled service visits have been completed (missed visit control)
 - b. Required monitoring, analysis and inspection tasks have been completed
 - c. The correct control limits have been employed
 - d. Results have been interpreted correctly
 - e. Appropriate corrective actions have been discussed with the agreed contacts
 - f. Significant non-conformances are recorded and tracked to conclusion
- 19 A representative proportion of output must be monitored to ensure compliance with the above.

D) WHAT YOU NEED TO TELL YOUR CUSTOMER

- 20 It is the responsibility of the dutyholder/responsible person to:
- a. Have a Legionella risk assessment, written scheme of control and schematic diagrams in place, which includes a programme of treatment, monitoring and inspection and to make them available to the LCA Member
 - b. Provide sufficient information to enable the LCA Member to design an appropriate treatment programme - it is not adequate to request the provision of water treatment services "in accordance with L8"
 - c. Make systems available and ensure safe access for treatment, monitoring and inspection
 - d. Ensure that tasks they are responsible for are completed and documented in the agreed record system
 - e. Participate in the agreed review process
 - f. Provide notification and any necessary instruction on known risks and safety requirements in the areas the LCA Member will be working e.g. access to the site asbestos register

Appendix 1 – Information Required for Survey of Different System Types

21 The LCA Member should have a defined process for gathering the required information to design an appropriate treatment programme for the relevant system type, e.g., a survey procedure and structured survey form.

22 The survey/information gathering may include, as appropriate:

Type of system	Survey Requirements <u>May Include:</u>
Hot and cold water systems	<ul style="list-style-type: none"> • Mechanical and operational aspects of the system, e.g.; <ul style="list-style-type: none"> a) Calorifiers b) Cold water storage tanks c) System water volume d) Recirculation details e) Sentinel outlets f) Make-up source g) System metallurgy h) Water consumption i) Etc. • Chemical properties of the water to be treated, e.g.; <ul style="list-style-type: none"> a) pH b) Conductivity/TDS c) Hardness d) Chloride e) Sodium f) Temperature g) Alkalinity h) Etc. • Environmental restrictions with respect to water treatment • Location and suitability of dosing and control equipment and review of the fitness for purpose of any existing treatment equipment • Safe handling of chemicals, delivery, storage and application methods • Other restrictions on the application of water treatment such as use of water for Dialysis, Neonates, etc.

Type of system	Survey Requirements <u>May Include:</u>
Evaporative cooling system	<ul style="list-style-type: none"> • Mechanical and operational aspects of the system, e.g. <ul style="list-style-type: none"> a) Manufacturer b) Volume of system c) Recirculation rates d) Evaporation rates e) Make-up source f) System half-life g) Critical heat exchangers h) System metallurgy i) Water consumption j) Water and heat exchanger temperatures k) Etc. • Chemical and microbiological properties of both the make-up source and system water <ul style="list-style-type: none"> a) pH b) Conductivity c) Alkalinity d) Sulphate e) Chloride f) Total Hardness g) Calcium Hardness h) Magnesium Hardness i) Iron j) Zinc k) Manganese l) Total Phosphate m) Ortho Phosphate • Environmental restrictions with respect to chemical treatments, blowdown, etc. • Review of historical maintenance records • Review of historical system data in relation to risk management, e.g., current treatment, logbooks, legionella test certificates • Cleaning and disinfection records, and also system operation, e.g., failures due to corrosion, scale deposition, process contamination, etc. • Location and suitability of pre-treatment plant, dosing and control equipment and review of the fitness for purpose of any existing treatment equipment • Safe handling of chemicals, delivery, storage and application methods

Type of system	Survey Requirements <u>May Include:</u>
Other risk systems	<ul style="list-style-type: none"> • Mechanical and operational aspects of the system, e.g. <ul style="list-style-type: none"> a) Manufacturer b) Volume of system c) Recirculation rates d) Make-up source e) System half-life f) Critical heat exchangers g) System metallurgy h) Process information i.e., will there be any compatibility issues with the treatment proposed i) Water consumption j) Water and heat exchanger temperatures k) Etc. • Relevant chemical and microbiological properties of both the make-up source and system water • Environmental restrictions with respect to chemical treatments, blowdown, etc. • Review of historical maintenance records • Review of historical system data in relation to risk management, e.g., current treatment, logbooks, Legionella analytical test certificate • Cleaning and disinfection records, and also system operation, e.g., failures due to corrosion, scale deposition, process contamination, etc. • Location and suitability of pre-treatment plant, dosing and control equipment and review of the fitness for purpose of any existing treatment equipment • Safe handling of chemicals, delivery, storage and application methods

FOR AND ON BEHALF OF THE LEGIONELLA CONTROL ASSOCIATION

LCA STANDARD FOR THE DELIVERY OF HOT AND COLD WATER MONITORING AND INSPECTION SERVICES

A) WHAT DOES THIS STANDARD COVER?

- 1** This service standard is for those providing services in the control of Legionella bacteria growth within hot and cold water systems and the associated control and monitoring measures that need to be put in place such as:
- a.** Design and application of monitoring and inspection services for hot and cold water including temperature, disinfectant residual, water quality monitoring, sampling (for water quality), inspection and condition assessment, etc.
 - b.** Monitoring of water temperature
 - c.** Monitoring of online treatment residual in hot and cold water
 - d.** Monitoring of hot water circulation in principal and subordinate loops
 - e.** Flushing and purging of little used outlets, dead legs, calorifier drains, expansion vessels, etc.
 - f.** Inspection of tanks and calorifiers
 - g.** Inspection of insulation
 - h.** Inspection and temperature testing of TMVs
- 2** This standard excludes:
- a.** Offline chemical or thermal disinfection and/or cleaning (covered under the LCA Service Standard for Cleaning and Disinfection)
 - b.** Application of chemicals for continuous water treatment (covered under the LCA Service Standard for Water Treatment services)
 - c.** Mechanical servicing

B) COMPETENCE OF STAFF (INCLUDING SUB-CONTRACTORS)

- 3** There are six main areas of competence necessary in the delivery of these services:
- a.** Obtaining the required information to design the monitoring and inspection programme (The Surveyor)
 - b.** Designing and costing the monitoring and inspection programme and defining the scope of service (The Designer)
 - c.** Planning and initiation of the programme (The Planner)
 - d.** Carrying out the monitoring and inspection tasks and interpreting results (The Technician)
 - e.** Reporting and communicating the findings, significance of results and recommendations (The Reporter)
 - f.** Ensuring the service has been delivered according to the LCA Member's company procedures (The Auditor)
- 4** These different job aspects require different knowledge, skills and experience to be competent. The LCA Member should identify the skills required for the relevant task and provide appropriate training and assess the competence of the operative to carry out their assigned tasks.

C) SERVICE DELIVERY

- 5** To enable you to deliver hot and cold water monitoring and inspection services in an appropriate and safe manner you must have in place documented procedures to manage the following:

Section 1: Survey/Information Gathering

- 6** Before agreeing a scope of works it is essential to gather sufficient information to appropriately plan the work. A survey, discussion or review of a specification may be appropriate to gather information.
- 7** Obtain the necessary information, for example:
- a.** Copies of system schematic diagrams to identify location of components
 - b.** Existing Legionella risk assessment and written scheme of control (or access to same)
 - c.** Monitoring and inspection points
 - d.** Relevant site-specific requirements, for example:
 - i.** Preliminary task risk assessment

- ii. Safe access to complete the work
- iii. Induction procedures
- iv. Access permits and permits to work
- v. Reporting any emergencies during the work
- vi. Security and safety restrictions
- vii. Requirement to avoid cross contamination of services from the monitoring activity

Section 2: Design of the Monitoring and Control Programme

8 In some cases an existing written scheme of control may be in place which should include a programme of monitoring and control. This programme must be reviewed for suitability and amended if required.

9 If there is no suitable written scheme of control in place, then based on the information gathered in section 1, an appropriate scheme of monitoring and control must be designed to address identified risks.

10 The guidance on design of a suitable monitoring regime detailed in HSG274 part 2 and for healthcare premises, in HTM 04-01 must be considered.

11 Where the work is routine, you should have standard method statements/procedures for the monitoring and inspection tasks within the programme.

Section 3: Agreeing the Scope of Work

12 This must include:

- a. The premises and/or buildings to be included
- b. The identification of the water systems
- c. Identification of monitoring and inspection points
- d. Frequency of monitoring and inspection
- e. Identify those tasks covered by the LCA Member and those which should be provided by the service user to follow the guidance in HSG274 part 2 and (for healthcare premises), in HTM 04-01 on monitoring and inspection of hot and cold water services
- f. Agreement of lines of communication and reporting
- g. Reporting format and delivery method
- h. Access arrangements and times

Section 4: Preparation

13 Prior to attending site you must:

- a. Ensure the staff/subcontractor has the appropriate assessed competence/capability to carry out the task
- b. Provide appropriate resources to your staff including, where appropriate:
 - i. Appropriate method statement/work instruction
 - ii. Task risk assessment
 - iii. Emergency procedures (e.g. first aid, accident reporting, incident reporting, chemical handling/safety procedures, etc.)
 - iv. Emergency equipment, required PPE/RPE and other safety/access equipment
 - v. Calibrated monitoring and inspection equipment (keep testing records for audit)
 - vi. Job reporting system (e.g. a paper or electronic record of the work when completed)

Section 5: Carrying out the Work

- 14** Immediately prior to commencing work the operatives must:
- a.** Complete a pre-work task risk assessment or review and, if necessary, amend the preliminary task risk assessment
 - b.** Check PPE/RPE and equipment required by pre-work task risk assessment
 - c.** Check method statement/work instruction is valid
- 15** During the work the operatives should:
- a.** Carry out LCA Member allocated tasks detailed in the method statement including required tests, observations, etc.
 - b.** Complete report of work outcomes e.g. test results, observations, condition reports, non-conformances, etc. for the site records and a copy to be maintained by the LCA Member including all details
 - c.** Bring to the attention of the client any non-conformance or other areas of concern identified

Section 6. Verification and Quality Control

- 16** The LCA Member must have procedures and records in place to ensure that:
- a.** All required visits are done to schedule (missed visit control)
 - b.** Required monitoring and inspection tasks are completed
 - c.** The correct control limits are employed
 - d.** Results are interpreted correctly
 - e.** Appropriate corrective actions are advised to the agreed contacts
 - f.** Significant non-conformances are recorded and tracked to conclusion
- 17** A representative proportion of output must be monitored to ensure compliance with the above.

D) WHAT YOU NEED TO TELL YOUR CUSTOMER

- 18** It is the responsibility of the dutyholder/responsible person to:
- a.** Have a risk assessment and written scheme of control in place, which includes a programme of monitoring and inspection and to make this available to the service provider.
 - b.** Make systems available for monitoring and inspection to enable the service provider to plan and execute the service.
 - c.** Ensure safe access for monitoring and inspection is provided.
 - d.** Ensure that tasks allocated to them are completed.
 - e.** Adhere to the agreement regarding definition of scope and any responsibility implied.

FOR AND ON BEHALF OF THE LEGIONELLA CONTROL ASSOCIATION

LCA STANDARD FOR THE DELIVERY OF CLEANING AND DISINFECTION SERVICES

A) WHAT DOES THIS STANDARD COVER?

- 1 This service standard is for those providing services in the cleaning and disinfection (chemical or thermal) of any water system either as part of a specific Legionella control strategy or where the water system has become contaminated.
- 2 This standard is broken down into three sub-categories of:
 - a. Hot and Cold Water Systems
 - b. Evaporative Cooling Systems
 - c. Process and Other Risk Systems
- 3 This standard includes the:
 - a. Cleaning of a water system or component part
 - b. Disinfection of a water system or component part
- 4 This standard excludes:
 - a. Post disinfection sampling (covered under the Legionella Sampling and Testing standard)
 - b. Continuous application of disinfectant (covered under the Water Treatment standard)

B) COMPETENCE OF STAFF (INCLUDING SUB-CONTRACTORS)

- 5 For each type of system there are six main areas of competence in the delivery of these services:
 - a. Obtaining the required information to design the cleaning and disinfection programme (The Surveyor)
 - b. Designing and costing the programme including selection of products, processes and defining the scope of service (The Designer)
 - c. Planning and initiation of the programme (The Planner)
 - d. Carrying out the cleaning and disinfection process including required analysis, monitoring and inspection, etc. (The Technician)
 - e. Reporting and communicating the outcomes, findings and recommendations (The Reporter)
 - f. Ensuring the service has been delivered according to the LCA Member's company procedures (The Auditor)
- 6 Different types of system require staff to have different knowledge, skills and experience to be competent. The LCA Member should identify the skills required for the relevant task and system, provide appropriate training and assess the competence of the operative to carry out their assigned tasks.

C) SERVICE DELIVERY

- 7 To enable you to deliver cleaning and disinfection services in an appropriate and safe manner you must have in place procedures to cover and manage the following:

Section 1: Survey/Information Gathering

- 8 Before agreeing a scope of works it is essential to gather enough information to appropriately plan the work. A survey, discussion or review of a specification may be appropriate to gather information.
- 9 Obtain the necessary information, for example:
 - a. A current system condition appraisal
 - b. Waste disposal options/requirements
 - c. Restrictions imposed by equipment manufacturers that may impact the disinfection technique
 - d. Location and isolation points for dosing, control or sensitive equipment where applicable
 - e. Copies of system schematic diagrams to identify deadlegs, redundant pipe-work or equipment, outlets, etc.
 - f. Relevant site-specific requirements, for example:
 - i. Preliminary task risk assessment
 - ii. Safe access to complete the work

- iii. Induction procedures
- iv. Access permits and permits to work
- v. Reporting any emergencies during the work
- vi. Security and safety restrictions
- vii. Is discharge consent required?

Note 1 - Guidance on condition assessment is detailed in HSG274, HSG282, etc.

Section 2: Design and Selection of Techniques

- 10** Based on the information gathered above, an appropriate technique should be designed or selected to safely and effectively carry out the work.
- 11** Where the work is routine, you should have standard method statements from which an appropriate selection should be made. Where the work is non-routine, a process must be designed from first principles of cleaning and disinfection.
- 12** The following should be considered in your method (where applicable):
- a. The known or anticipated condition of the system to be cleaned
 - b. What debris, deposits, contaminants, etc. need to be cleaned and how i.e. cleaning techniques

Information Box 1: Cleaning

Effective disinfection of water systems requires them to be physically as clean as is practicable. Identification of system contaminants and design/selection of an effective process is critical. Disinfection without cleaning is only suitable where inspection shows the system to already be physically clean.

- c. Is a pre-work disinfection required?
- d. Selection of disinfection process (chemical or thermal) and/or cleaning agent to be used
- e. Concentration or temperature and contact time required
- f. Effect of pH on selected disinfectant

Information Box 2: Effect of pH

Chlorine based disinfectants are affected by the pH of the water and guidance in HSG274 and PD 855468 should be considered. The speed of disinfection and potential effectiveness of chlorine base disinfectants is subject to a pH dependent equilibrium. Whilst this may be compensated for by maintaining a significant excess of disinfectant, where the system water pH is greater than 8.0 and significant contamination or chlorine demand is anticipated it may be appropriate to introduce additional measures such as increasing the contact time or changing to a less pH sensitive disinfectant.

- g. Residual disinfectant level required after contact time (sufficient disinfectant should be added to ensure that the required disinfectant level is maintained throughout the disinfection period, which may require, as appropriate, either starting at higher levels and allowing for losses or boosting the disinfectant level as the process proceeds. Excessive reduction in residual disinfectant level may indicate higher levels of system contamination.)
- h. Neutralisation and flushing requirements

Information Box 3: Shock Disinfection with Water Systems in Normal Use

Disinfectants are likely to break down and liberate biofilm to the water system outlets if it is present and this may include legionella. Therefore hot and cold water systems should not be in use during shock disinfection even if the disinfectant used is considered safe for human consumption/contact.

- i. Is it necessary to isolate any equipment during the process?
- j. Effluent and waste disposal arrangements
- k. PPE/RPE and other special precautions required

13 In addition to the points above, consideration of site specific requirements, etc. should be made during the preparation stage. All methodology should consider the guidance in HSG274.

Section 3: Agreeing the Scope of Work

14 There must be clear agreement in place detailing the scope of the work to be carried out. Specifically:

- a. The premises and/or buildings involved
- b. The identification of the systems to be cleaned and disinfected
- c. Service users' and/or others' responsibilities, e.g., safe access, removal of pack, tenting, etc.
- d. Who is responsible for the removal and lawful disposal of wastes, e.g., effluent, scale, sludge, redundant parts, components, consumables, etc.?
- e. The time required and available to carry out the task

15 Acceptance/acknowledgement is required from the service user of the scope e.g. purchase order or go-ahead from the client.

Section 4: Preparation

16 Prior to attending site you must:

- a. Ensure the staff/sub-contractor has the appropriate assessed competence/capability to carry out the task
- b. Provide appropriate resources to your staff including, where appropriate:
 - i. Appropriate method statement/work instruction
 - ii. Task risk assessment
 - iii. Emergency procedures (e.g. first aid, accident reporting, incident reporting, chemical handling/safety procedures, etc.)
 - iv. Emergency equipment, required PPE/RPE and other safety/access equipment
 - v. Cleaning equipment and chemicals
 - vi. Test equipment
 - vii. Job reporting system (e.g. a paper or electronic record of the work when completed)

Section 5: Carrying out the Work and Reporting

17 Immediately prior to commencing work the operatives should:

- a. Complete a pre-work risk assessment or review and, if necessary, amend the preliminary task risk assessment
- b. Check PPE/RPE and equipment
- c. Check method statement/work instruction is applicable

- 18** During the work the operatives should:
- a.** Carry out tasks in the method statement
 - b.** Make required tests, observations, etc. and record results
 - c.** After the process, the remaining disinfectant should be neutralised and then flushed from the system if necessary or if a thermal disinfection the temperature of the system should be reduced and flushed to outlets to reduce risk of scalding

Information Box 4: Contact Time

Contact time for disinfectants must be observed and residual levels measured to ensure the required level was achieved for the required contact time. Dosing a disinfectant and assuming a contact time without verification is not acceptable practice for LCA Members.

- d.** Complete report of work outcomes e.g. test results, observations, condition reports, non-conformances, etc.
- 19** Following the completion of the work a report or certificate must be issued which should include the following:
- a.** Start and finish times including the contact time for the disinfectant or thermal contact time
 - b.** The disinfectant levels or temperature achieved at the start, during, and at the end of the contact time
 - c.** Any other relevant detail such as pH, drop in disinfectant residual, etc.

Section 6: Verification and Quality Control

- 20** The LCA Member must have procedures and records in place to ensure that, where applicable:
- a.** All required visits are done to schedule (missed visit control when on contract)
 - b.** Required clean and disinfection tasks are completed
 - c.** The correct control limits are employed
 - d.** Results are understood and interpreted correctly
 - e.** Appropriate corrective actions are advised to the agreed contacts
 - f.** Significant non-conformances are recorded and tracked to conclusion

- 21** A representative proportion of output must be monitored to ensure compliance with the above.

D) WHAT YOU NEED TO TELL YOUR CUSTOMER

- 22** It is the responsibility of the dutyholder/responsible person to:
- a.** Maintain the entire system, and the water in it, in a clean condition and to facilitate inspection to determine if the system is clean or not
 - b.** Make systems available for cleaning and disinfection if required with adequate notice to enable the LCA Member to plan and execute the service
 - c.** Ensure safe access for inspection and cleaning is provided
 - d.** Adhere to the agreement regarding definition of scope and any responsibility implied
 - e.** Ensure any necessary discharge consent is in place for effluent generated during the clean and disinfection process

FOR AND ON BEHALF OF THE LEGIONELLA CONTROL ASSOCIATION

LCA STANDARD FOR THE DELIVERY OF PLANT AND EQUIPMENT SERVICES

A) WHAT DOES THIS STANDARD COVER?

- 1** This service standard is for those providing services in the design, manufacture, supply, installation, refurbishment, modification, servicing, commissioning, etc., of any plant and/or equipment associated with the control of Legionella bacteria in water systems. This includes modification and refurbishment of water systems that could impact on Legionella control.
- 2** This standard does not apply to equipment supplied from a retail or trade outlet where the member has no further input to its use.
- 3** There are specific requirements on designers, manufactures, importers, suppliers and installers detailed in ACoP L8 paragraphs 75-86.
- 4** This standard is solely for items of plant or equipment that could impact Legionella control, either directly or indirectly, and covers the following aspects:
 - a.** Design and or selection
 - b.** Manufacture
 - c.** Supply of plant, equipment, spares etc.
 - d.** Installation of plant, equipment, spares etc.
 - e.** Commissioning of plant, equipment etc.
 - f.** Refurbishment of plant, equipment etc.
 - g.** Modification of plant, equipment etc.
 - h.** Servicing of plant, equipment, provision of spares etc.
- 5** This standard excludes:
 - a.** Use of plant or equipment
 - b.** Any testing of plant or equipment where no changes are made e.g. TMV failsafe testing, checking softener water quality, calibration of dosing and control equipment, etc.

B) COMPETENCE OF STAFF (INCLUDING SUB-CONTRACTORS)

- 6** There are six main areas of competence in the delivery of these services:
 - a.** Obtaining the required information to design the service (The Surveyor)
 - b.** Designing, costing and defining the scope of the service (The Designer)
 - c.** Planning and initiating the work. This could include indemnification of suppliers, procurement of parts, operation and maintenance manuals, identification of training needs & special equipment, etc. (The Planner)
 - d.** Carrying out installation, commissioning, servicing, maintenance, refurbishment, replacement, etc. (The Technician)
 - e.** Reporting and communicating results, outcomes and providing required documents and future recommendations (The Reporter)
 - f.** Ensuring the service has been delivered according to the LCA Member's company procedures (The Auditor)
- 7** These areas of competence require staff to have different knowledge, skills and experience to be competent and will vary with the service to be provided (please refer to item 4 above). The LCA Member should identify the skills required for the relevant task and system, provide appropriate training and assess the competence of the operative to carry out their assigned tasks.

C) SERVICE DELIVERY

- 8** To enable you to deliver plant and equipment services in an appropriate and safe manner you must have in place procedures to manage the following:

Section 1: Survey/Information Gathering

9 Information gathering by survey or other means, to obtain sufficient information to design and/or select, modify or service the appropriate plant, equipment or water system.

Section 2: Design/Selection of Equipment or Service

- 10** The LCA Member must ensure, where appropriate, that:
- a.** Systems are designed to reduce or eliminate Legionella risk where possible
 - b.** Systems are designed and installed to comply with relevant codes and guidance and state clearly what these are
 - c.** Systems are designed to facilitate inspection and maintenance
 - d.** Systems are so designed and constructed so that they will be safe and without risks to health
 - e.** The design considers all mechanical, operational, chemical and management aspects of any existing or proposed control programmes which are relevant

Section 3: Agreeing the Scope of Work

11 Detailed clarification is required of the scope of the services to be supplied and their objectives and outcomes. This includes, where applicable:

- a.** The project objectives
- b.** The premises and/or buildings to be included
- c.** The identification of the systems to be included or impacted
- d.** The scope of supply
- e.** Responsibility for waste disposal including any trade effluent or trade waste created by the work
- f.** Information and instructions on safe use of the installation are to be supplied
- g.** Access arrangements and timescales
- h.** An agreement between both parties defining the scope of the supply and referencing the agreed level of detail in, and format of, for example, drawings, asset registers, operation and maintenance manuals etc.

12 Where the Plumbing Notification Laws apply, in your proposal you should inform your customer of their responsibilities to notify their water undertaker. Where the installation will create an ongoing liquid waste you should inform your customer of their responsibilities for trade effluent consent.

Section 4: Preparation

- 13** Prior to attending site you must:
- a.** Ensure the staff/sub-contractor has the appropriate assessed competence/capability to carry out the task
 - b.** Provide suitable resources to your staff including, where appropriate:
 - i.* Appropriate method statement/work instruction
 - ii.* Task risk assessment
 - iii.* Emergency procedures (e.g. first aid, accident reporting, incident reporting, chemical handling/safety procedures, etc.)
 - iv.* Emergency equipment, required PPE/RPE and other safety/access equipment
 - v.* Calibrated monitoring and inspection equipment (keep testing records for audit)
 - vi.* Job reporting system (e.g. a paper or electronic record of the work when completed)

Section 5: Carrying out the Work

- 14** Immediately prior to commencing work the operatives should:
- a.** Complete a pre-work risk assessment or review and, if necessary, amend the preliminary task risk assessment
 - b.** Check PPE/RPE and equipment
 - c.** Check method statement/work instruction is valid
- 15** During the work the operatives should:
- a.** Carry out tasks in the method statement
 - b.** Complete report of work outcomes e.g. commissioning or test results, maintenance records, etc.

Section 6: Handover/Completion

- 16** The following may be required on completion:
- a.** Adequate information for the user about the risks and measures necessary to ensure that the plant and equipment, and (as appropriate) the water systems in which they are installed, will be safe and without risks to health
 - b.** Provision of drawings, asset registers, operation and maintenance manuals etc.
 - c.** Demonstration and instruction for the client
 - d.** Sign off by the customer on completion of the project

Section 7: Verification and Quality Control

- 17** The LCA Member must have procedures and records in place to ensure that, where applicable:
- a.** All required visits are done to schedule (missed visit control when part of an ongoing contract)
 - b.** Required plant and equipment tasks are completed
 - c.** Appropriate corrective actions are advised to the agreed contacts
 - d.** Significant non-conformances are recorded and tracked to conclusion
- 18** A representative proportion of output must be monitored to ensure compliance with the above.

D) WHAT YOU NEED TO TELL YOUR CUSTOMER

- 19** It is the responsibility of the dutyholder/responsible person to:
- a.** Consider that changes to the water system may alter the Legionella risk such that a reassessment of risk is required
 - b.** Ensure that any equipment as described above is designed, installed and commissioned correctly
 - c.** Make the appropriate notification under the requirements of the Plumbing Notification Laws
 - d.** Apply for a trade effluent discharge consent where appropriate
 - e.** Update the written scheme of control, if required

FOR AND ON BEHALF OF THE LEGIONELLA CONTROL ASSOCIATION

LCA STANDARD FOR THE DELIVERY OF TRAINING SERVICES

A) WHAT DOES THIS STANDARD COVER?

1 This service standard is for those offering formal training to their customers in aspects of Legionella awareness and/or control, as either:

- a. Standard courses, or
- b. Courses designed and developed for the service user addressing a specific training need

2 This standard does not cover:

- a. Internal staff training
- b. Product demonstration and instruction
- c. Informal guidance and support
- d. Competence assessment
- e. Presentations at outside events e.g. conferences

B) COMPETENCE OF STAFF (INCLUDING SUB-CONTRACTORS)

3 There are a number of stages involved in delivering training:

- a. Obtaining the required information to design or select the training to be provided (The Surveyor)
- b. Designing and costing the programme and defining the scope of training (The Designer)
- c. Planning and initiation of the programme (The Planner)
- d. Carrying out the training (The Technician). Staff engaged to deliver training should:
 - i. Have suitable knowledge and experience in the subject
 - ii. Remain up to date with current practice
 - iii. Be able to present information in an appropriate format
 - iv. Be highly motivated and able to engage an audience
 - v. Be a good communicator
- e. Reporting and communicating the outcomes (The Reporter)
- f. Ensuring the service has been delivered according to the LCA Member's company procedures (The Auditor)

4 These stages require staff to have different knowledge, skills and experience to be competent. The LCA Member should identify the skills required for the relevant task and provide appropriate training and assess the competence of the operative to carry out their assigned tasks.

C) SERVICE DELIVERY

5 To enable you to deliver training services in an appropriate and safe manner you must have procedures to cover and manage the following:

Section 1: Training Requirements

6 You should establish the training need and formally agree the course content and objectives with your customer to meet that need. This should include whether the course is to deliver theoretical or practical knowledge or a combination of both.

7 The content of the training course must be communicated to your customer and the course title referenced on the certificate or record of training issued.

Section 2: Training Courses

8 The delivered training must:

- a. Be held in an appropriate venue

- b.** Be carried out in group sizes appropriate to the subject and method to ensure proper candidate participation
- c.** Be delivered in an appropriate way to achieve the objective, for example by:
 - i.* Presentation
 - ii.* Practical elements (where applicable)
 - iii.* Student participation
- d.** Include a suitable marked assessment (if required) at the end of programme
- e.** On completion of the training each delegate should be issued with a certificate indicating the:
 - i.* Level achieved in assessment (if applicable) **NB some courses may be pass/fail with no certificate issued for fail**
 - ii.* Course title
 - iii.* Date of course
 - iv.* Name of training organisation and any other relevant information

9 Course content for standard or bespoke courses should be reviewed, assessed and updated regularly to ensure it remains current.

10 In addition to these, for practical or field based training the points below must be considered:

- a.** For training to include a measure of knowledge, understanding and practical skill the students should be observed and assessed carrying out tasks which present a variety of scenarios and the participants should demonstrate that they are:
 - i.* Able to follow instructions
 - ii.* Able to work by themselves and carry out required tasks
 - iii.* Able to work safely in respect of their own safety and the safety of others
 - iv.* Able to account for their actions in a clear unambiguous written record

Note - Training courses will deliver knowledge and measure understanding but cannot confirm the level of competence. Competence can only be assessed by observation, questioning, etc., 'on the job' at appropriate intervals and is the responsibility of the employer.

Section 3: Ongoing Quality Assurance Process

11 The LCA Member must have procedures and records in place to ensure that:

- a.** The training has been completed to the scope agreed
- b.** Assessment has been completed to the agreed scope

12 A representative proportion of output must be monitored to ensure compliance with the above.

D) WHAT YOU NEED TO TELL YOUR CUSTOMER

13 It is the responsibility of your customer:

- a.** To assess the training needs and requirements of their own staff (possibly in conjunction with relevant LCA Member(s))
- b.** To complete regular reviews of own staff training records (possibly in conjunction with relevant LCA Member(s))
- c.** To complete regular competence assessments for specific tasks and identify further training requirements and format, e.g., theory, practical, etc.
- d.** To determine if the content of any training offered meets the requirements.

FOR AND ON BEHALF OF THE LEGIONELLA CONTROL ASSOCIATION