

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 duty holder/responsible person to:
- a.** Maintain the water 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 the systems available for the agreed work, with safe access, and adequate notice to ourselves to schedule and execute the agreed work.
 - c.** Provide us with any information on known risks and safety requirements in the areas we will be working, and advise of any known deadlegs, redundant pipework and the location of schematic diagrams.
 - d.** Ensure any preparatory work you are responsible for is completed prior to commencing cleaning and disinfection work.
 - e.** Ensure any necessary trade effluent discharge consent is in place for effluent generated from the cleaning and disinfection process.

Appendix 1 – Appropriateness of Measurement Methods

- 23** Analytical measurements must be taken and recorded at various stages during and after a disinfection process to ensure the required levels were achieved for the required contact time and residual disinfectant was neutralised/flushed prior to putting the system back on line. This measurement must have a suitable degree of accuracy and precision to be meaningful in the context of the disinfection.
- 24** Effective disinfection, protection of the system from material damage and safety of users following disinfection depend on these levels.
- 25** Key points for selection of the analytical method:
- a.** The analytical method must be appropriate for the range of measurement
 - b.** The measurement precision must be appropriate for the target result
 - c.** The test measurement needs to be accurate enough for the control required
- 26** It is not always practicable to achieve a precise target disinfectant level, so it is prudent for method statements to indicate both a minimum and upper target limit to be achieved.
- 27** The LCA expects Members to take care to avoid gross overdosing and take suitably precise measurements of disinfectant levels at sentinel test points to ensure they reach at least at the minimum target value **and** ideally that the upper target limit has not been exceeded. The LCA also expects that Members use suitable methods to check the disinfectant is at safe levels after the disinfection process is complete.
- 28** For high level disinfection several test methods may be needed:
- a.** A precise high range method to establish that sufficient disinfectant has been achieved at key test points (titration, photometer, high range comparator, etc.)
 - b.** A simple high range method to confirm presence/absence at outlets after levels have been measured at sentinel points (test strip, test paper, etc.)
 - c.** A low range method to confirm the disinfectant has been removed or reduced to safe levels on completion of work after neutralisation/flushing (DPD1, low range test strip, etc.)
- 29** Readings reported must be the actual reading and not simply the level specified in the method statement. The record should reflect the method used. In this example the same level of disinfectant might be measured using different methods and recorded as below:
- a.** Test strip reading 30-100mg/l
 - b.** Comparator reading 50-75mg/l
 - c.** Titration reading 50-55mg/l
 - d.** Photometer 51.2mg/l
- 30** Using a test strip to measure disinfectant and recording 50mg/l would not be acceptable.
- 31** Any pH testing equipment must be of suitable precision to differentiate between levels that might require action. i.e. where a method statement for disinfection using chlorine is based on PD855468, pH >7.6 is where contact time should be extended in hot and cold water systems. The measurement method employed must be able to differentiate between pH 7.6 and a pH of 7.7. This would normally require the use of a pH meter, photometer, or some other suitable equipment. Simple pH test strips may not have a suitable level of precision.

FOR AND ON BEHALF OF THE LEGIONELLA CONTROL ASSOCIATION