

Procedure for the Inspection of Cooling Towers

1. Scope

- 1.1. This procedure is intended to assist those competent to complete routine proactive inspections of water systems incorporating evaporative cooling systems in a consistent and proportionate manner.
- 1.2. The procedure is intended to be read in conjunction with the general inspection protocol and with any relevant health and safety information. The guidance assumes that all those applying it will have received some training in inspection techniques for legionella and that they are familiar with the requirements of the ACOP L8.
- 1.3. The procedure is intended to inform the Enforcement response taken as result of an inspection or investigation of water systems utilising evaporative cooling and to introduce an inspection checklist into this process. It therefore provides guidance on the application of the principles in our Enforcement Policy and the decision framework in the Enforcement Management Model (EMM).
- 1.4. The procedure and guidance is also intended to be used as a training resource in conjunction with other procedures for training the Department's enforcement officers in inspection / investigation technique and processes.

2. Policy

- 2.1. Routine inspections of cooling towers and evaporative condensers are carried out by the health and safety team in accordance with the health & safety rating scheme. This forms part of the annual Health & Safety Team Service Plan.
- 2.2. Inspections will be carried out as close to the scheduled date of inspection as possible and should aim to be within 2 weeks of that date wherever practicable.
- 2.3. The main aim of the legionella inspection or investigation process is to identify strengths and weaknesses in the management and operation of relevant water systems where legionella is a risk and to form appropriate and consistent enforcement responses.
- 2.4. With regard to specific competence, officers new to the team and those unfamiliar with the important aspects of cooling system operation will be provided with a period of vocational training (shadowing more experienced colleagues) and will be expected to complete the City and Guilds training Certificate in Operation of Evaporative Cooling Systems prior to commencing unaccompanied inspections.
- 2.5. This procedure should be read in conjunction with the enforcement guidance given in the HSE document *OC 255/9 Legionellosis: routine inspection of water systems incorporating cooling towers and evaporative condensers*.
- 2.6. The Approved Code of Practice and Guidance document *Legionnaires' disease – The control of legionella bacteria in water systems (L8)* contains details on control measures and how they are put in place and monitored. Under EMM, L8 is a Defined Standard and will be

used accordingly to inform any perceived risk gap. The ACOP and Guidance are regarded as the accepted level of good practice (within ALARP compliance policy)

2.7. L8 does not cover all the areas we would consider as 'best practice'. There are a number of organisations such as BSRIA and the Water Management Society who produce information on legionella. Such national standards also have the status of Established Standard in EMM and will be used as such.

2.8. Sampling is not undertaken routinely as part of the inspection process. Sampling may occur during a legionella investigation and officers will be expected to follow the guidance and procedure as set out in the Environment Agency document *The determination of Legionella bacteria in waters and other environmental samples (2005)* which is available online.

3. Procedure

3.1. The Northgate M3 system will be used by the team manager and/or Operations Support Team to identify upcoming inspections.

3.2. New inspection worksheets under the task code of HS02 will be created for each cooling tower that is due for inspection.

3.3. The team manager will allocate each worksheet to a case officer which may include themselves.

3.4. The case officer must first check the M3 property records and green cooling file for any relevant history. This will likely also yield contact details for the premises. The check must include the current scanned copy of the notification form which will be on the Actions tab in the M3 property sheet.

3.5. A prior appointment must be made so that the requisite people are available with sufficient time to discuss issues with the officer. The format of the inspection should be explained at the time the inspection appointment is made and should confirm the two part process listed below and that the tower(s) will need to be switched off and left to settle for examination.

NB. It is normal practice to meet with the Responsible Person (or Appointed Person) during the inspection process in addition to site engineers and water treatment contractors.

3.6. The inspection for legionella is in two parts as with most programmed inspections.

- a. The first part is an examination of the procedures the site has to identify, control and manage legionella risk and an examination of the available records that verify the procedures.
- b. The second part is an examination of the physical conditions and this is intended to further inform the evaluation of the level of control and the confidence the officer has in the management of the site.

NB. No physical examination should take place until the procedures have been checked and verified and the water flow across the tower has been switched off and the water left to settle to the point where aerosols are unlikely i.e. in practice where there is little or no water dripping within the system; this should occur within 15-30 minutes in the majority of systems. The management should be able to confirm.

- 3.7. An inspection summary front sheet and checklist form is provided (the front sheet of which is attached at Appendix 3) and should be fully completed as part of the inspection. A printable copy of the complete form is available within the Inspection Checklist directory.
- 3.8. General guidance on the cooling tower inspection process is provided in Appendix 2.
- 3.9. The officer is expected to undertake an assessment of the management procedures and paperwork in place in addition to a physical inspection of the system. The officer will need to talk to those who may have responsibilities for aspects of the control regime.
- 3.10. The checklist questions should be used as prompts to help the officer test the duty holder's knowledge of the system(s) under inspection and the knowledge of those others with a role to play in their management.
- 3.11. Officers are advised to take photographic evidence of the general site conditions and of any problems found and a copy be placed on file for future reference. Officers are also requested to obtain copies of documents where possible as per the checklist to include a summary of the system controls, the system schematic and the roles & responsibilities.
- 3.12. Where the notification for the tower is found to be out of date, including details of the responsible company/person, then an updated form must be requested. A copy of the blank form is available on the City of London website.
- 3.13. Other relevant health and safety issues are also included within the inspection process such as COSHH and Manual Handling and the controls for these priority topics should be assessed at the same time as the legionella risks.
- 3.14. A negative answer to any of the questions on the checklist normally indicates that site arrangements may need to be reviewed or improved.
- 3.15. The checklist is not a risk assessment and the officer will need to use experience and judgement to evaluate the overall level of compliance in specific areas so that at the conclusion of the inspection they are able to decide on an appropriate enforcement response.
- 3.16. Upon completion of the inspection a report must be produced and sent to the responsible person for the premises or other appropriate contact within one week. A copy of the report must be saved on M3 against the worksheet and using the codes as below.
- 3.17. Formal enforcement action will be determined following use of the Enforcement Management Model and may include use of Improvement Notices or Prohibition Notices. Guidance on the service of these in relation to cooling towers is provided in Appendix 2.
- 3.18. Revisits to premises will be required where remedial actions of a physical nature must be confirmed by the officer as having been completed e.g. repairs to a leaking tower or the

cessation of drift. Other matters of compliance may be confirmed by correspondence although it will be at the officers discretion as to which method of confirming compliance is used.

3.19. The M3 worksheet must be completed using the following codes as necessary:

- 600 Officer Actions
- 012 Revisit
- 609 Verbal Advice Given
- 203A Written Legal Requirements
- 203B Written Recommendations/Advice

Relevant email communication and photos should be attached to the M3 worksheet. Received letters should also be scanned and attached. The original copy may be placed on file.

3.20. Where the premises details have altered, the M3 property must be updated to reflect the changes.

3.21. The case officer will complete the inspection by rating the premises on M3 using the HELA risk rating system to determine the appropriate inspection interval. Specific guidance on completing inspection ratings relating to cooling towers and legionella is provided in Appendix 4.

New Notifications

3.22. New notifications of cooling towers will be received by either case officers or the Operational Support Team (OST). All notifications received by officers should be forwarded to the OST.

3.23. The OST will scan the notification and place a copy on M3 against the relevant property worksheet within the Action tab. Where the notification is of a brand new tower then a new premises will be created with the phrase 'Cooling Tower' listed as the Trader Name.

3.24. The OST will inform the Health & Safety team manager of the new notification when received and will also create and post a receipt to the notifier.

3.25. Where a new premises is created then an inspection worksheet must also be created and be made available for allocation to an officer by the team manager.

Decommissioning / Removal of Cooling Towers from Premises

3.26. When informed of a cooling tower being decommissioned, the case officer must update M3. This will involve editing the Trader Name to 'Decommissioned Cooling Tower' and altering the main use under the Commercial tab of the property worksheet to COOLD.

3.27. A tower will be considered as decommissioned if it has been drained down and shut off permanently. It will not be applied to towers used on a seasonal basis.

3.28. The officer must allocate themselves a non-routine special visit for one year hence of the notification. This is accessed on M3 via the Health and Safety module for the property. The officer may need to de-allocate the existing health & safety inspection worksheet prior to allocating a new one. The special visit is a reminder to the officer to check the status of the cooling tower and must be kept in place whilst the tower remains on site and decommissioned.

3.29. If informed or discovered that the cooling tower is being brought back into use then a full health & safety inspection must be allocated as per the start of this procedure.

3.30. Where cooling towers are removed from site and are no longer present then the officer must, after seeking reassurance that the information is accurate, close the premises off on M3. This will also effectively remove the notification from the public register.

4. Roles

4.1. **Line Managers** should:

- a. Manage the work of their officers to achieve the objectives set in the health & safety service plan
- b. Support and guide their officers as necessary

4.2. **Authorised officers** should:

- a. Apply their knowledge and skills to promote compliance of legal requirements by duty holders and to influence them to improve their management of health & safety.

5. Responsibilities

5.1. **Line managers** are responsible for:

- a. Ensuring that HSE's strategic plans are reflected in our service plan
- b. Nominating and assigning competent authorised officers
- c. Ensuring officers meet the specific competence requirements
- d. Ensuring that competent officers carry out interventions
- e. Ensuring that intervention programmes are met in timely fashion

5.2. **Authorised officers** are responsible for:

- a. Ensuring any site inspections are planned, carried out, and reported effectively
- b. Following the appropriate inspection protocols and guidance
- c. Following the appropriate enforcement decision making procedure where they identify a requirement for more formal enforcement action
- d. Meeting performance standards allotted to them within the procedure or discussing with line management to agree revised performance standards when necessary.

6. Procedure overview

6.1. A process flow chart and accompanying notes provide the framework for this procedure and they are in the attached Appendix 1.

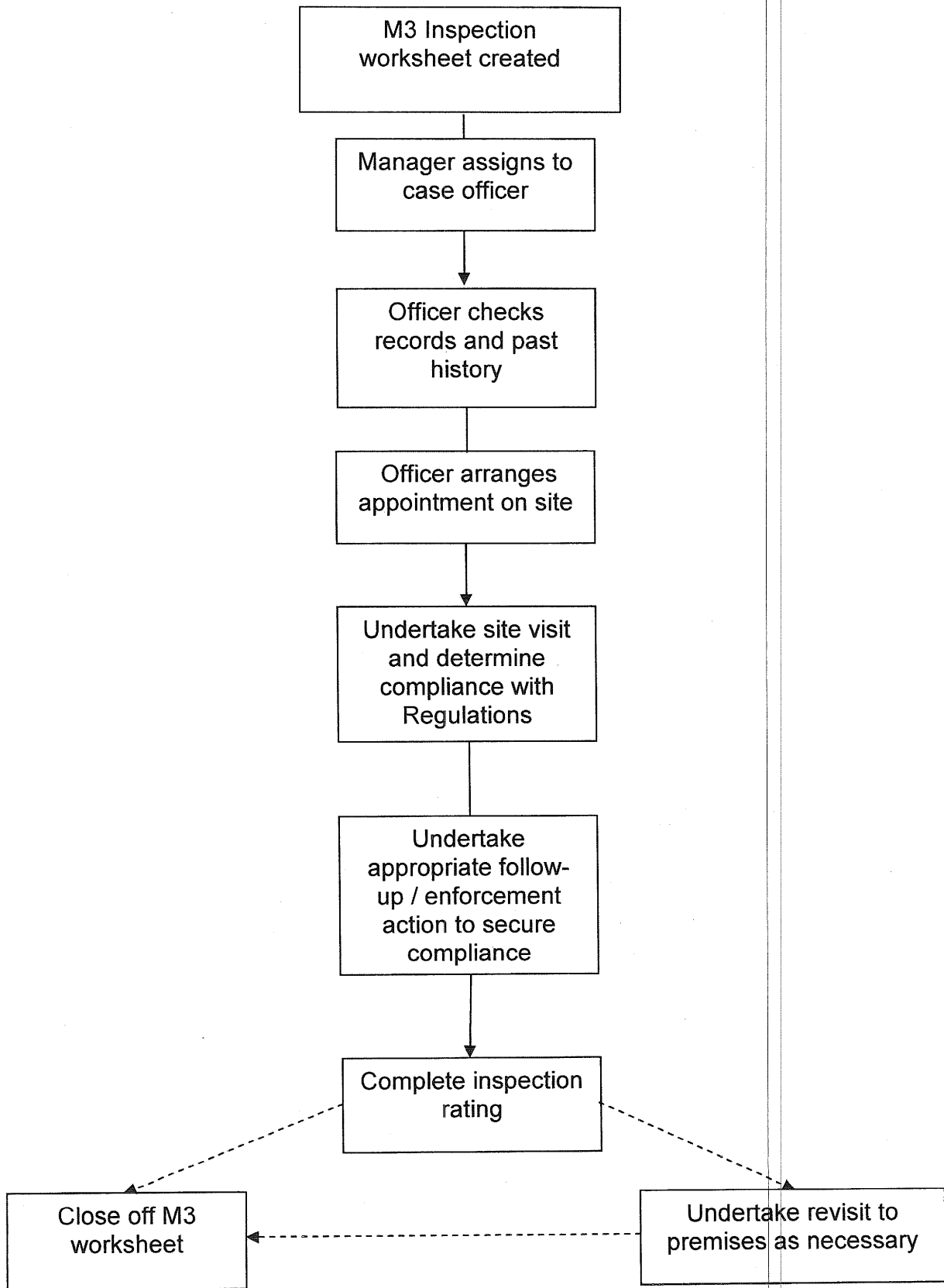
7. Monitoring

7.1. Line managers should ensure, via the agreed monitoring procedures that those involved in operating inspections carry out their responsibilities in line with the standards and timescales required.

7.2. Sufficient documented checks will be made to satisfy themselves, and to prove to any subsequent audits, that the procedure is being operated correctly.

Appendix 1

Cooling Tower Inspection Procedure – Process Flowchart



Appendix 2

1. Guidance

- 1.1. There are a variety of cooling tower types and treatment methods found within the City and enforcement officers completing proactive inspections of water systems must be familiar with these and the main differences between them as this will effect the evaluation of control schemes for legionella.
- 1.2. General levels of competency and authorisation (to be able to initiate certain enforcement actions) are laid out in the Authorisation of Officers procedure.
- 1.3. Much can be learnt from talking to the operational staff and inspecting the towers and comparing this information with that contained in written records, risk assessments, the written scheme of control, the associated logbooks and the various accepted standards. This guidance attempts to provide a framework for completing this process.

2. Programme Management

- 2.1. There must be a person nominated (in writing) as responsible for the water system. If there is no nominated person then further action is required particularly if weaknesses are identified in the overall management of the system. You will need to impress on the occupier this requirement but make your own judgement on the level of enforcement needed (alongside other aspects of the management of health and safety at the premises). An improvement notice is likely to be necessary where there are other demonstrable problems with management of the control systems
- 2.2. Identify the chain of responsibility for the cooling tower and complete the relevant part of the inspection form. This sounds easy but in some company's responsibility can be vague or divided e.g. through contractors (and contracts), if this is the case explore the issues, improvements maybe required at managerial level; responsibilities need to be defined and communicated (understood by all).
- 2.3. Examine any procedures that are in place between the main duty holder and their staff and/or contractors and explore their application and use. Problems have occurred in the City where a duty holder has a main contractor who then sub-contracts elements of his work e.g. water treatment, sometimes mechanical and electrical work too. There needs to be effective communication between the parties. The LCA Code of Conduct has details on what should be included in liaison between their members and clients.

3. Risk Assessment

- 3.1. The aim of the risk assessment process is to identify for the duty holders the main strengths and weaknesses of the control systems they have and to make recommendations where improvements are required e.g. in the management structure, the operational procedures and the success of the water treatment and so as to reduce any risk gap between their position and established good practice. Good practice has the meaning given in HSE Policy on assessing compliance with the law in individual case and the application of good practice.
- 3.2. It should be noted what precautions are required to protect persons against exposure to the legionella bacteria. The COSHH Regulations set out a hierarchy of measures to eliminate or reduce risks so far as is reasonably practicable. The first matter which should be considered is substitution of the system for a lower risk device such as closed chillers or air blast cooling where this is reasonably practicable. If this cannot be done, the necessary measures for control are more than just a chemical treatment of the water. They consist of a whole range of measures including design, operation, maintenance, monitoring and management and must include the provision of drift eliminators.

3.3. Your aim is to establish how effective this process is in identifying and addressing the important issues. The important questions here: Is the assessment used as a basis for subsequent action and if so how (is it used to identify, design or implement appropriate risk control measures). You must emphasise the importance of conducting the assessment in such a way that it is an integral part of management systems for the site; such integration is critical to the long term success of any such system. Your role is not to carry out a surrogate assessment but to make a best estimate of the duty holders situation based on the evidence in hand.

3.4. If no assessment has been done then further action must be taken as it is unlikely that control will be effective but to serve notice you need to be able to identify significant risks which the duty holders have failed to effectively control. An Improvement Notice or exceptionally a Prohibition Notice could be served to perform a risk assessment depending on the risk gap identified. The later served to reduce the risk in the short term and the former to secure compliance in the longer term. The assessment is made between what you find when this is compared with good practice, the defined standard (L8) and then any established or interpretive standard(s).

3.5. The information in the inspection form should help prompt you to ask the right questions and establish the extent of compliance.

4. Written scheme, system description and safe operation

4.1. There should be an operation manual for the tower, if so is it easily available, if not further action maybe required. The manual should state the normal operating parameters for the tower(s) and the corrective action needed when limits are exceeded.

4.2. Check the logbook for the tower and compare with the required action (in the written scheme). Take remedial action if there are wide discrepancies.

4.3. Check the maintenance manual and log. Note if pipework and valves are identified and labelled.

4.4. There should be a simple description of the water treatment equipment and system so it is clear what is in place and how it is intended to operate. It is worthwhile taking a copy of this for our records (if not already available).

4.5. There should be a simple summary of the written scheme so it is clear (to the responsible person) what is expected to happen, when and who takes the requisite action. There is no one standard system but various guides have been produced e.g. WMS Society, NHS Estates (both now dated) and BSRIA. Water treatment consultants have also produced their own schemes (based on standard packages). Best practice will be reviewed periodically and the location of documents that help inform this process clearly stated so officers, new and experienced can gain access to these simply and efficiently.

4.6. Further guidance on various elements of a written scheme is produced in the following sections on system schematics, water treatment, cleaning and chlorination and monitoring and records. The appropriate sections of the inspection form should be completed.

5. System schematic

5.1. A schematic drawing should be available for all the risk systems with as much detail as possible on interconnected systems, e.g. all mains cold water, tank cold water and hot water systems.

- 5.2. Drawings should be prepared so that a person not familiar with a particular risk system can readily determine pipework and equipment interconnections.
- 5.3. The responsible person should ensure that schematics are being kept up to date and any alterations to systems incorporated without delay.
- 5.4. Changes which alter legionella risk, such as the addition or removal of plant or system modifications, will require a review of the written risk assessment and preventive scheme and this should be documented.
- 5.5. The schematics should have the features identified in the inspection form:
- a. All pumps, strainers, main valves, drains, control sensors, chemical dosing points, water softeners, float valves, overflows, warning pipes, open vents, showers, etc. to be shown, using standardised symbols.
 - b. Diagrammatic representations should be positioned on the drawing so that the true vertical relationship between components is indicated, e.g. gravity fed outlets below the tanks which feed them.
 - c. The extent of dead legs and blind ends should be indicated, although identical floors or repeated components need not be drawn in detail.
 - d. Where pipe routes and equipment cannot be traced or accessed a note to this effect to be made, with interpreted details shown as broken lines.
 - e. All important components should be annotated, using recognised abbreviations.
 - f. The direction of flow should be indicated by an arrow.
- 5.6. Where a risk assessment does not contain a schematic plan or, has one which is plainly inadequate, you should ensure that the duty holders comply with the requirement to provide one.
- 5.7. In some circumstances it may be appropriate to issue an IN on this aspect alone, on the basis that the risk assessment is not 'suitable and sufficient', for example, in situations where there is a particularly complex system (this will mainly relate to hot and cold water systems and larger open circuit cooling water systems) or one which has been subject to much alteration since its original installation. If there is no risk assessment in the first place and an IN is issued for this purpose, then, if absent, the requirement for a schematic plan should always be listed in the schedule.

6. Water treatment

- 6.1. It should be clear from the log book and written scheme what water treatment methods are in place. See comments above on recording the arrangements.
- 6.2. Where arrangements do not meet the standards specified in L8 enforcement action will be appropriate.

NB. The City of London has encouraged the provision of softened water in systems that are prone to scaling and especially in closed circuit cooling towers where scale once formed is difficult to remove and tube bundles impossible to replace cost effectively.

NB. The City of London has encouraged the provision of alternating biocides, even where bromine is utilised as the primary biocide. This is in an attempt to ensure that effective control is more likely to be

maintained should the primary biocide system fail (in which case the bromine is likely to disappear quickly from the system). Dosing systems have now become more efficient and where an assessment can demonstrate that the use of a single oxidising biocide is sufficient this is acceptable but only where the assessment process is sufficiently robust on this point. Note that some 2^o biocides have a bio-dispersant effect i.e. whilst they provide a kill in their own right they also help increase the effectiveness of the 1^o oxidising biocide by making micro-organisms more likely to come into contact with the 1^o biocide.

NB. The City of London has encouraged investment in the control and automation of dosing and dose monitoring. Manual dosing is to be seen as a last resort where for example automated systems fail. Long term manual dosing is problematic as it exposes operatives to increased health risk contrary to COSHH principles, it is difficult to maintain stable and appropriate chemical levels and it is more prone to human behaviour problems.

6.3. It should be clear from the monitoring arrangements and accompanying records and your own physical checks how successful the treatment regime is. See comments below.

7. Clean and chlorination

7.1. Cleaning must take place at appropriate intervals, normally every 6 months, unless there are particular problems with the site when it could be more frequent.

NB. The City of London seeks to ensure that cleaning methods are thorough and that pack removal (in open circuit systems) is completed at least every 12 months and that there are appropriate access arrangements that encourage this. The HSE has produced further guidance on cleaning which allows for the risk assessment process to be applied to tower cleaning via the use of alternative methods such as endoscopy. It remains City policy to encourage annual pack removal.

7.2. Cleaning must be completed properly and supervised appropriately to ensure it is carried out. Your physical checks, discussions and examination of the site records should try to elicit if there are particular problems with cleaning at the premises you are inspecting.

7.3. If there are design and access constraints that preclude standard cleaning methods then there must be appropriate alternatives that ensure the system remains clean in situ, e.g. side stream filtration.

NB. Problems can centre on the time available to complete work, the design of the tower and access to and space available for stripping components down. For this reason you should explore the actual methods that will be used.

7.4. Pre and post chlorination should be completed and levels recorded in accordance with L8 recommendations.

8. Monitoring and records

8.1. Inspect the recent records in the log book to see how controlled or variable the results have been (and if they have been properly recorded). Look too at the results of the weekly checks and compare these with the monthly checks (they should be similar for the same tests). If results vary widely from month to month investigate and determine if any corrective action has been highlighted and implemented.

8.2. Check to see how exceptions outside the control limits are recorded, note if this is something that often occurs and note any underlying reasons for exceptions. Note if appropriate action has been taken and recorded.

8.3. Discuss sampling procedures and highlight the recommendation in the Environment Agency publication- The determination of legionella bacteria in waters and other environmental samples (2005) - Part 1 Rationale of surveying and sampling.

9. Physical condition and design

9.1. Examine the building to determine; the location of the tower(s) the access route to them; the proximity of the towers to any air intakes.

9.2. Any difficulty in reaching the tower or parts is likely to lower the probability that checks etc are done.

9.3. Note if there is a flow meter in the water supply to the tower. This is desirable to measure the water make up rates and can also be used to provide proportional dosing for corrosion inhibitor.

9.4. Cooling towers should be identified by number for ease of maintenance and other work. Similarly the volume of the water system(s) also needs to be known to assist with calculations for dosing (non-oxidising biocides and chlorine during cleans and disinfections particularly).

9.5. Note if the tower is nearing the end of its useful life, if so additional precautions may be necessary.

9.6. Note the timing settings on the biocide pumps. Alternating non-oxidising biocides will typically be added at 3 day intervals, i.e. a 6 day cycle for each biocide. It is best to add biocide at times of low load and to switch off blow down arrangements (a.k.a. bleed lock) automatically during the time, typically 2-4 hours that has been planned for the biocide kill.

9.7. Note if the electrical conductivity probe is accessible and easily removed for recalibration.

9.8. Ascertain if there are by pass loops or standby pumps within the water circuit (the schematic should show these). If present the operating cycle needs to bring them into regular service to purge stagnant water (minimum weekly).

9.9. Complete the relevant section of the site inspection form.

10. Enforcement Guidelines (Legionella)

10.1. The enforcement approach must be informed by our Enforcement Policy, principles of compliance and ALARP and the principles within the EMM. Separate guidance and a procedure note are available on compliance ALARP and on the completion of the EMM.

10.2. The Notification of Cooling Tower and Evaporative Condenser Regulations (NCTEC), the HSW Act, and in particular COSHH, may all be used for HS enforcement in relation to evaporative cooling systems and legionella risk.

10.3. Experience has shown that enforcement letters and details regarding other enforcement action should be directed as a matter of course to senior management within the duty holders company to ensure that action is effected expediently or more negatively that the controlling mind of the company has had the opportunity to take action (i.e. that cannot pursue a suggestion that the Building Manager (or whomever did not pass on information).

10.4. The risk gap analysis needs to be applied carefully for legionella risks as for health risks. HSE have produced an Operational Circular (OC130/5) that deals with general guidance on application of EMM to health risks. NB. Biological agents in Hazard Group 2 are considered to pose a significant

health risk not a serious health risk. Legionella is not mentioned specifically in this guidance. Large numbers of people maybe affected and it would be appropriate to consider Table 5.2 in EMM.

10.5. The appropriate benchmark standard for legionella is L8. When considering the initial enforcement expectation this standard is a Defined. Both notices and prosecutions could be appropriate, if the precautionary measures are manifestly below the expected standard but as already mentioned you must evaluate the quality of evidence you already have, or will need to obtain, to support enforcement action and ensure you have what is required before action is taken.

10.6. Depending on circumstances the following actions may be appropriate:

- a. Failure to notify under the NCTEC Regulations - improvement notice (IN).
- b. The absence of or an inadequate assessment along with no or poor water treatment programme and no evidence of cleaning and disinfection procedures or poor physical conditions- Serious risk of infection arising possible- PN and/or prosecution.
- c. No or inadequate assessment under COSHH - IN. The requirement for a system schematic plan and responsible person should be listed in the schedule, where these do not exist.
- d. No appointed responsible person, but risk assessment otherwise adequate - letter.
- e. No system schematic plan, but risk assessment otherwise adequate - generally a letter, but for complex systems an IN may be appropriate.
- f. Failure to provide safe access – IN or PN
- g. Excessive organic contamination and/or presence of excessive scale in the pond – PN or require immediate shock dosing, followed up by thorough cleaning and disinfection **or** immediate cleaning and disinfection.
- h. Absence of, or clearly defective, drift eliminator – IN or PN
- i. A clearly identified risk from the presence of organic contamination **and** absence of, or clearly defective, drift eliminator - PN and/or prosecution.

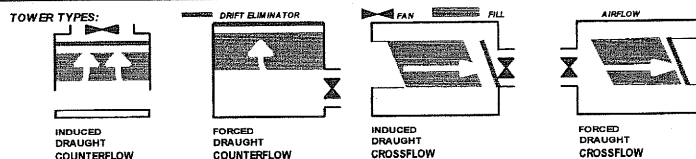
10.7. Even if occupiers comply with notices issued according to the above guidelines, over a longer term, cumulative evidence may emerge of consistent failure to manage the system. Consideration of prosecution should then be given even if infringements at any one particular time are not the most serious. The enforcement response here is likely to turn on a management review of the duty holder and strategic factors.

Water treatment companies

10.8. Enforcement action should be considered against water treatment companies where they are either clearly lacking in competence, negligent or have issued misleading documentation which indicates that a system is properly controlled under COSHH, when it manifestly is not. The HSE have produced an OC on water treatment companies http://www.hse.gov.uk/foi/internalops/fod/oc/200-299/255_14.pdf which you should be familiar with.

Appendix 3

Inspection (Work Sheet) Reference: WK/20.....		Risk Category (LAC 67)	Officer:	Date:
Building Name:		Address:		
Tel No: Emergency (24Hr) No:		Postcode:		
Responsible Person: Name:		Position:		
Tel No's:		Company:		
Contacts: (Specify: FM, Managing Agent, M&E, Water Treatment, Auditor, Risk Assessor). Name:		Position:		
Tel No's:		Company: <i>Leg. Control Assoc. member Y / N / n/a</i>		
Contacts: Name:		Position:		
Tel No's:		Company: <i>Leg. Control Assoc. member Y / N / n/a</i>		
Contacts: Name:		Position:		
Tel No's:		Company: <i>Leg. Control Assoc. member Y / N / n/a</i>		
<u>Inspection summary:</u>				
Enforcement response: Prosecution/ Notice/ Letter				
<u>System Summary:</u>				
Number of towers: Age: Location:				
Tower Type**: Open Circuit/ with heat exchanger/Closed Circuit/ (True) Evaporative Condenser *Circle type and indicate configuration using the diagrams below.				
Sampling Location(s):				
Period(s) Operation*: <u>Continuous</u> ; 7 day. <u>Timed</u> ; Working week/Week Days. <u>Seasonal</u> ; * Delete as appropriate <u>Intermittent</u> ; <u>Standby</u> Comments:				
Treatment:	Bromine/ Bio-dispersant/ Non-oxidising biocide/ ClO ₂ / Ozone/ UV			
Dosing:	<u>Automatic</u> : (Feedback)/ (Proportional)/ (Timed)/ <u>Manual</u> :			
Bleed Control:	Conductivity/ Proportional/ Continuous/ Timer/ Manual			
Softened water:	Yes/ No/ Blended			
Hot Water System: Gravity or Pressurised: with/without recirculation/ Other (e.g. heat pump)				



Appendix 4

City of London Cooling Tower Inspection HELA Rating System

1. Scope

1.1. This guidance is designed to be used by case officers completing cooling tower inspections and to enable the new HELA risk rating system to be used to complete a meaningful cooling tower risk rating, i.e. as an inspection tool for prioritising our inspection program for cooling towers. It also helps avoid the need for a more specialist cooling tower rating system on M3.

1.2. The guidance should be used in conjunction (or by those familiar) with the general guidance on HELA risk rating. This guidance changes (fundamentally) for the inspection year 2010-11 to reflect LAC 67/2 (Rev1 -2 February 2010).

2. Guidance

2.1. The new rating guidance contains four factors that are now to be rated separately not cumulatively. These factors are:

- a. Confidence in management;
- b. Health performance;
- c. Safety performance and;
- d. Welfare standards.

2.2. The following summary and tables mirror the advice given in the general rating LAC and our own guidance but make it more pertinent to cooling tower work. The sections are separated according to the new general rating guidance. Other rating information e.g. from the Topic Inspections remains from the last edition and is included to help in the scoring assessment.

2.3. *The following are some of the important indicators you might need to consider in your rating assessment, but remember the rating is designed only to give an overall assessment so the premise can be programmed for future inspection and allocated an appropriate HELA risk band. It is not designed as an enforcement tool beyond establishing a consistent scoring system. The level of detail you need to consider in your enforcement assessment will be higher but never the less the following information could assist you in both processes*

3. Confidence in Management

3.1. As for the Topic Inspections the benchmark or risk control indicator should be a management that is both enthusiastic and competent. The duty holder should have identified the main risks and, for each one, knows the relevant standards and ensures they are implemented.

4. Safety Performance:

4.1. This is a new criterion but essentially it combines Safety Hazard and Risk from the old rating system. Risk assessments; the identification of maintenance activities etc involving known risks and/or risks in pertinent Priority Programs should be the work activities you consider in your assessment of safety performance.

4.2. Safety performance areas likely to require assessment include:

- a. The identification and systems in place to control maintenance activities and related risks inc. Falls from height, Slips and trips and confined space working

- b. Access to work areas particularly the tops of the towers (for cleaning and routine checks and maintenance)
- c. Lone working (an issue for many maintenance personnel especially in larger premises or on 'unmanned' sites).
- d. The active monitoring of contractors (a perennial feature of our work)
- e. Systems of work for dealing with significant problems (emergencies)
- f. Training in the requisite risk control measures

5. Health Performance:

5.1. As with Safety Performance this is a new criterion. It also now largely includes the old public risk category (as the principal activity is the management/control of legionella proliferation, a health risk).

5.2. Risk assessments and quality of risk control measures to rate in your assessment include:

- a. Control measures that minimise the creation and dissemination of breathable droplets e.g. drift control measures, proximity to air conditioning inlet
- b. Water quality- Kept within accepted control limits with records of recent tests up to date.
- c. Other controls that minimise proliferation and that meet current good practice; e.g. for Temperature, stagnation and time; operating parameters, design issues, balance pipes, flat CT bases

5.3. Also consider:

- a. Workers and work in close proximity to the tower(s) and the possible increased risk from aerosol inhalation
- b. The proximity of vulnerable groups

6. Welfare

6.1. As per standard risk rating scores

7. Frequency of Inspection

A = 1 year

B1 = 18 month

B2 = 2 years

C = 3 years.

Confidence in management <i>Typical follow up</i> →	Compliance in all areas that matter: best practice 100. <i>Letter</i>	Broad compliance in areas that matter <i>Letter</i>	Some compliance in areas that matter <i>Letter or Enforcement Letter</i>	Limited compliance in areas that matter <i>Enforcement Letter and Improvement Notice</i>	No real compliance in areas that matter <i>Enforcement Notice</i>	No compliance <i>Probable Prohibition Notice or Prosecution</i>
Summary Benchmark: ↓ Management enthusiastic and competent. The duty holders have identified the main risks and for each one know the relevant standards and ensure they are implemented	Extremely-Confident Full compliance	Very-Confident Broad compliance	Reasonably Confident Some compliance	A little confident A little compliance	Almost no confidence Almost no compliance	No Confidence No real compliance
<ul style="list-style-type: none"> <input type="checkbox"/> A comprehensive written scheme and a positive drive for the highest standards <input type="checkbox"/> A clear management structure fully implementing the scheme <input type="checkbox"/> Full participation of all employees <input type="checkbox"/> Excellence is sought at all levels <input type="checkbox"/> Rigorous plans, assessments and performance standards <input type="checkbox"/> Regular and thorough reviews and audits 	<ul style="list-style-type: none"> <input type="checkbox"/> The organisation is determined to be better than average and has a good written scheme <input type="checkbox"/> The management structure is well defined and the scheme usually successfully implemented <input type="checkbox"/> Formal arrangements secure a high degree of involvement <input type="checkbox"/> Most staff are trained and competent 	<ul style="list-style-type: none"> <input type="checkbox"/> The firm desires to comply with the law <input type="checkbox"/> The management structure is mostly defined and achieves a just-adequate implementation of the scheme <input type="checkbox"/> Efforts are made to secure the participation etc. of all employees <input type="checkbox"/> There are partial arrangements to secure information flows but often not fully adhered to <input type="checkbox"/> Some elements of planning, assignments and significant performance developed 	<ul style="list-style-type: none"> <input type="checkbox"/> The written scheme is incomplete with limited commitment to make it work <input type="checkbox"/> A recognisable management structure; A largely defensive approach in involving employees <input type="checkbox"/> Information flows tend to be ad hoc, spasmodic and untimely <input type="checkbox"/> Limited training and instruction programmes <input type="checkbox"/> Inadequate understanding of how plans, assessments and standards should be used 	<ul style="list-style-type: none"> <input type="checkbox"/> Written scheme absent or very limited application; grudging compliance <input type="checkbox"/> Disorganised management structure; reluctant implementation of improvements <input type="checkbox"/> Little interest in the views of employees <input type="checkbox"/> Information flows are disorganised and rarely on time <input type="checkbox"/> Incompetence is accepted and only minimal training provided <input type="checkbox"/> Mediocre attempts at planning and almost no assessment or performance standards <input type="checkbox"/> Inspection/investigation systems are poor and superficial <input type="checkbox"/> Little understanding of how to review performance or put lessons into practice 	<ul style="list-style-type: none"> <input type="checkbox"/> Written scheme is absent or so limited as to be useless; deliberate non-compliance <input type="checkbox"/> Unrecognised management structure and those practices operated are without concern for "policy" or "quality" <input type="checkbox"/> No concern for employees' opinions <input type="checkbox"/> Information flows are minimal <input type="checkbox"/> Staff are untrained and ignorant of health & safety <input type="checkbox"/> Plans, assessment and performance standards are non-existent <input type="checkbox"/> Performance not reviewed and lessons never learned 	

Safety Performance	High standards	Good standards	One or more minor shortcomings	Standards variable but lower than the benchmark	Standards generally unsatisfactory	Standards unacceptable
Safety Risk (old HELA rating score)	Negligible	Low	Medium Low	Medium High	High	
Standard general safety conditions	Good	Reasonable	Poor			Very Poor
<i>Typical follow up</i> →	Compliance in all areas that matter; best practice too. <i>Letter</i>	Broad compliance in areas that matter <i>Letter</i>	Some compliance in areas that matter <i>Letter or Enforcement Letter</i>	Limited compliance in areas that matter <i>Enforcement Letter and Improvement Notice</i>	No real compliance in areas that matter <i>Enforcement Notice</i>	No compliance <i>Probable Prohibition Notice or Prosecution</i>
Summary Benchmark ↓	<i>Letter</i>	<i>Letter</i>	<i>Enforcement Letter</i>	<i>Enforcement Notice</i>	<i>Enforcement Notice</i>	<i>Probable Prohibition Notice or Prosecution</i>
Identification of activities involving maintenance inc. falls from height, confined space working	<input type="checkbox"/> Effective risk assessment, well documented safe systems of work <input type="checkbox"/> Good supervision and monitoring of written scheme	<input type="checkbox"/> Risk assessment done; adequate safe systems of work. <input type="checkbox"/> Adequate supervision of written scheme	<input type="checkbox"/> Risk assessment some adequate safe systems but evidence of unsafe systems too <input type="checkbox"/> Some supervision	<input type="checkbox"/> Risk assessment below par; some evidence of unsafe systems of work for dealing with hazards <input type="checkbox"/> Ad-hoc supervision, written scheme needs improvement	<input type="checkbox"/> Poor or inadequate risk assessment for dealing with serious hazards <input type="checkbox"/> Poor supervision, poor written scheme <input type="checkbox"/> Falls > 2m not adequately controlled	<input type="checkbox"/> No risk assessment Un-safe systems of work for dealing with serious hazards immediate improvement required <input type="checkbox"/> Supervision inadequate written scheme poor; immediate <input type="checkbox"/> Improvements needed <input type="checkbox"/> Poor access and/or physical controls; immediate <input type="checkbox"/> Improvements needed <input type="checkbox"/> Work in confined spaces/ inadequate working space around machinery <input type="checkbox"/> Falls > 2m possible; immediate work required <input type="checkbox"/> Several people exposed to hazards
Systems in place for the control of these activities inc active monitoring of contractors	<input type="checkbox"/> High standards of physical controls <input type="checkbox"/> Good access <input type="checkbox"/> Excellent housekeeping <input type="checkbox"/> Employees aware of risks and how to control them	<input type="checkbox"/> Good standard of physical controls. <input type="checkbox"/> Good access <input type="checkbox"/> Good standards of housekeeping <input type="checkbox"/> Employees aware of significant risks and important control measures	<input type="checkbox"/> Adequate access and/or physical controls <input type="checkbox"/> Housekeeping acceptable <input type="checkbox"/> Several people exposed to hazards <input type="checkbox"/> Limited awareness of risks/control measures	<input type="checkbox"/> Evidence of inadequate access and/or physical controls <input type="checkbox"/> Falls > 2m not adequately controlled	<input type="checkbox"/> Several people exposed to hazards <input type="checkbox"/> Employees unaware of some significant risks or controls <input type="checkbox"/> Several people exposed to hazards	<input type="checkbox"/> Poor access and/or physical controls; immediate <input type="checkbox"/> Improvements needed <input type="checkbox"/> Work in confined spaces/ inadequate working space around machinery <input type="checkbox"/> Falls > 2m possible; immediate work required <input type="checkbox"/> Several people exposed to hazards
Selection, use of appropriate equipment						
Working environment, general conditions inc. design and layouts						

Health Performance	High standards	Good standards	One or more minor shortcomings	Standards variable but lower than the benchmark	Standards generally unsatisfactory	Standards unacceptable	
Health Risk	Negligible	Low	Medium Low	Medium High	High		
Standard general health conditions	Good		Reasonable	Poor	Poor- Immediate improvement required		
<i>Typical follow up</i> →	Compliance in all areas that matter, best practice too.		Broad compliance in areas that matter	Some compliance in areas that matter	Limited compliance in areas that matter	No real compliance in areas that matter	No compliance
Summary Benchmark ↓	Letter		Letter or Enforcement Letter	Enforcement Letter and or Improvement Notice	Enforcement Notice	Probable Prohibition Notice or Prosecution	
Risk Control Indicator (typical)	<ul style="list-style-type: none"> <input type="checkbox"/> Drift minimised with high efficiency drift eliminators <input type="checkbox"/> Effective risk assessment, well documented safe systems of work <input type="checkbox"/> Good supervision and monitoring <input type="checkbox"/> High standards of physical controls <input type="checkbox"/> Good access <input type="checkbox"/> Excellent water quality <input type="checkbox"/> Employees aware of risks and how to control them 	<ul style="list-style-type: none"> <input type="checkbox"/> Drift minimised with high efficiency drift eliminators <input type="checkbox"/> Risk assessment done <input type="checkbox"/> Adequate safe systems of work <input type="checkbox"/> Adequate supervision <input type="checkbox"/> Good standard of physical controls. <input type="checkbox"/> Good access <input type="checkbox"/> Good standards of water quality <input type="checkbox"/> Employees aware of significant risks and important control measures 	<ul style="list-style-type: none"> <input type="checkbox"/> Drift eliminators fitted <input type="checkbox"/> Risk assessment, some adequate safe systems of work but evidence of unsafe systems too <input type="checkbox"/> Adequate supervision <input type="checkbox"/> Adequate access and/or physical controls <input type="checkbox"/> Water quality acceptable <input type="checkbox"/> Employees aware of significant risks and important control measures 	<ul style="list-style-type: none"> <input type="checkbox"/> Drift may not be effectively controlled <input type="checkbox"/> Dead legs present <input type="checkbox"/> Poor risk assessment evidence unsafe systems of work for dealing with serious hazards <input type="checkbox"/> Ad-hoc supervision <input type="checkbox"/> Evidence of inadequate access and/or physical controls <input type="checkbox"/> Limited awareness of risks/control measures 	<ul style="list-style-type: none"> <input type="checkbox"/> Drift not effectively controlled <input type="checkbox"/> Dead legs not controlled effectively <input type="checkbox"/> Poor water quality <input type="checkbox"/> Employees unaware of significant risks or controls <input type="checkbox"/> Poor supervision of control measures or some measures are absent altogether 	<ul style="list-style-type: none"> <input type="checkbox"/> No effective risk assessment and unsafe systems of work for dealing with serious hazards; <input type="checkbox"/> Proliferation likely with no real control <input type="checkbox"/> Aerosol production uncontrolled e.g. aerosol entrained in ACU intake. <input type="checkbox"/> Temperatures and/or stagnation allow growth which is uncontrolled <input type="checkbox"/> Other poor water quality issues which are uncontrolled. <input type="checkbox"/> Supervision inadequate <input type="checkbox"/> Access problems <input type="checkbox"/> compound control 	
The location of the water system per se. increases risk potential e.g. the design of intake and extract systems the proximity of a vulnerable group							
Control of conditions to minimise the proliferation of f Lp in the water system kept within accepted control limits e.g. water quality , temperature, stagnation and time.							
The creation and dissemination of breathable droplets minimised							