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Report on Legionella Intervention Programme 2013-2014

Purpose

1. This paper reports on the programme of interventions agreed by the Board in 2013 and since undertaken by HSE, ONR and LAs on the control of legionella risks.

Background

2. Contamination of water systems by legionella bacteria is an infection risk both for employees and members of the public, with sporadic outbreaks of infection, ranging in scale in terms of numbers infected and the severity of the resulting illness (including fatalities). Legionella is not a sector-specific risk, but particular plant, processes or vulnerabilities create enhanced risks in the manufacturing, health and social care and leisure sectors.

3. Detailed analysis of legionella risks in 2012, as reported by HSL[1], showed that when the risks posed by different systems were considered with the likely impact that would arise from an associated outbreak of Legionnaires' disease, evaporative cooling systems, such as cooling towers, presented the highest risks. These were followed by hot and cold water systems (HCWS) and spa pools, then a variety of 'other risk systems'. In 2013, the Board endorsed a targeted programme to address these prioritised risks (see Annex 1) and the intervention combined a major programme of inspections and substantial stakeholder engagement, designed to:

- maximise the potential for partnership working;
- encourage industry to take ownership for risk management; and
- lead work to bring about sustained improvements in standards.

4. The revised ACOP (L8)[2] and updated Legionella Technical Guidance HSG274[3] provided enhanced advice and were key to the other activities. They built on the information in two HSE safety notices[4] (issued in 2012), which explained the precautions needed to control the risks from evaporative cooling systems and HCWS. Engagement with industry bodies to raise awareness of the necessary controls took place before and during the intervention period and, to sustain momentum, continues now (see Annex 2). This was coupled with a major programme of compliance checks (April 2013-August 2014) via inspection of cooling towers and evaporative condensers, whilst HCWS were inspected where HSE or LA intelligence suggested this was warranted (see Annex 3).

Significant Outcomes

[1] HSL Report http://www.hse.gov.uk/research/hsl_pdf/2012/hex1207.pdf?eban=rss-legionnaires-disease
[2] L8 Legionella ACoP http://www.hse.gov.uk/pubns/books/l8.htm
[3] Legionella Technical Guidance http://www.hse.gov.uk/pubns/books/hsg274.htm
[4] Safety Notices: http://www.hse.gov.uk/safetybulletins/coolingtowers.htm. http://www.hse.gov.uk/safetybulletins/legionella2.htm.

5. Key outcomes were:

a) Significant benefits from a **combined intervention approach,** achieving enhanced reach / gearing through substantial stakeholder engagement and inspection, with clarity on standards of control expected through the guidance/ACOP and legionella inspection topic pack;
b) A **comprehensive compliance picture for cooling towers and evaporative condensers**. This will inform future interventions and establishes a baseline from which industry's performance will be monitored;
c) **Better than expected management of performance by dutyholders,** based on prior experience/research. This was probably, at least in part, due to the extensive awareness-raising, including as noted in (a) the availability of HSE guidance via the HSE website, the **topic inspection pack** giving dutyholders the opportunity to prepare for the inspectors' visits, which were pre-arranged with the sites. Indeed, HSE inspectors observed that compliance improved during the intervention. However, further improvements are still required to achieve **sustained compliance**, given the potential of legionella to cause widespread harm;
d) **No appeals** against any of the 400 INs and **only 1 dispute** for any of the 625 FFI invoices, suggesting that the action taken by inspectors was invariably accepted as proportionate and justified by dutyholders;
e) **Improved inspector competence,** including Specialist Inspectors, to inspect legionella risk management systems. There is new intelligence available (eg. unusual operating or control systems) that are worthy of follow-up eg. risks associated with estuarine water systems, use of treated sewage, single pass systems, use of temperature as a control;
f) Very **productive relationships with key stakeholders** and with key government partners, such as Public Health England (PHE) and the Department of Health; and
g) **Updating and validation of the cooling tower site data** held by all the LAs (under the Notification of Cooling Towers and Evaporative Condensers Regulations 1992). Significant problems were identified with both the currency and quality of the data. With relevant partners, HSE is currently scoping a single, central, online notification system to make it easier for dutyholders to notify and update necessary information.

A: Stakeholder engagement

6. Three main groups (a-c, listed below) were targeted for face-to-face engagement to focus on 'sustained compliance' and the need for on-going, effective, management of legionella risks based on the revised L8 ACOP and HSG274. We estimate some 1360 stakeholders attended related events (further details are in Annex 2), and other groups (see 'd') were also involved.

(a) Water treatment industry-focussed events

7. The Legionella Control Association (LCA), together with the Water Management Society and the British Association of Chemical Specialities, organised five events attended by over 560 people. Many of their members provide services to multiple dutyholders, providing specialist expertise on the management of legionella risks, so they are a key group to reach and there is a gearing effect from targeted messages on control practices, which are then propagated to different dutyholders.

(b) Dutyholder/operator events

8. LCA hosted three joint LCA/HSE regional dutyholder events, reaching around 450 people from a diverse range of industries (manufacturing, energy suppliers, education, healthcare, local councils and housing associations). The emphasis was on audience participation in extended panel discussions. Feedback clearly indicated that this was popular and enabled a better understanding of the concept of compliance, as well as how this might be achieved across a range of risk systems and industry sectors.

(c) Health and social care events

9. The HSL Research[1] showed that around 16% of Legionnaires' disease outbreaks could be attributed to HCWS in the health and social care sector, where the increased vulnerability of many individuals receiving care or medical treatment and the extensive, and often complex, water systems found, are contributory risk factors. The Institute of Healthcare Engineering and Estate Management, along with Royal Society for Public Health, are key sector stakeholders and they organised four conferences, reaching well over 350 delegates. As well as discussing the revised L8 ACOP and new technical guidance, the events were also used to promote and publicise HSE's support of the concept and benefits of Water Safety Groups and Water Safety Plans in healthcare (and their potential application in other sectors), which are seen as an important step towards achieving sustained compliance in this sector.

(d) Other stakeholder engagement

10. We contributed to technical seminars held at SPATEX, the UK's largest annual spa pools industry event. These provided opportunities to discuss the HSE/PHE guidance on spa pool risk management, which is currently under review. We also participated in a further six sector-orientated and five professional body events during the programme.

(e) *Essential use derogation for copper biocides*

11. Alongside this intervention work, HSE was working with UK copper/silver ionisation manufacturers and suppliers to secure a temporary essential use derogation from the EC, so that copper can continue to be used in copper/silver ionisation water treatment systems, to control legionella, particularly in healthcare. This followed EU action in February 2013, prohibiting the marketing and use of elemental copper, due to the absence of supporting data for this use. This derogation is temporary, but will give companies time to submit the required full dossier of data to allow for the proper assessment of copper under the Biocidal Products Directive. To aid businesses, HSE published information on its website, which is updated as the assessment progresses.

B: Inspection programme

12. Of the 5000 sites in GB notified to LAs under the Notification of Cooling Towers and Evaporative Condensers Regulations 1992, only about half were initially allocated for visits. Before any site visits took place, there was considerable effort to cleanse the data. Sites were removed for several reasons:

- sites no longer had cooling towers (or they had been replaced with a dry cooling system);

- sites had changed use /companies had gone out of business; or
- for operational reasons a visit was inappropriate (eg. a recent inspection, such as in preparation for the 2012 Olympics or an on-going investigation/ prosecution).

13. HSE, LAs or ONR considered some 2,500 sites where evaporative condensers or cooling towers were known or thought to be present. Table 1 in Annex 3 provides the headline figures, with some further data available in Annex 4.

14. Inspectors scored the management performance against four topics, judged to be key in the effective management of legionella risks:

- risk assessment
- written control scheme
- implementation of control scheme and
- record keeping.

15. As described in the topic inspection pack, the scale used was linked to the Enforcement Management Model, with 10 being 'fully compliant or verbal advice only' and 40 being 'Improvement/Prohibition Notice/ consider prosecution'.

16. HSE identified material breaches at ~ 33% of sites, meaning that at these sites at least written advice was needed to secure adequate levels of compliance; this is typical for HSE-enforced sectors. Based upon historical experience and the HSL report in 2012, this level of compliance is higher than might have been expected, but it has to be seen in the context of the extensive parallel efforts to engage stakeholders and to alert them to what was coming, including putting the legionella inspection topic pack on HSE's website, making the standards required transparent.

17. HSE served 400 Improvement and 11 Prohibition Notices on the control of legionella risk at 229 different sites. A further 100 Improvement Notices and 8 Prohibition Notices were served on ancillary issues with a possible impact on legionella control, including work at height eg. to maintain drift eliminators.

18. LA inspectors sent a letter or served a notice at 21% of LA sites. LAs issued Improvement Notices at 9 sites and sent letters to a further 112. The different enforcement profile for the LA sector may reflect the need to address local dutyholder factors and /or the size and location of their cooling towers/ evaporative condensers.

19. The levels of dutyholder performance and related enforcement action were broadly consistent between England, Scotland and Wales and in all three countries, the worst 'compliance' scores were recorded for the 'implementation of the written control scheme'. Across all 4 measures, the percentage of sites achieving the highest level of compliance (scoring 10), increased steadily as the intervention programme progressed, supporting the suggestion that good practice was shared across the industry due to the high level of awareness raising and stakeholder engagement, promoting key messages on how to meet standards required.

20. There has been one successful proactive prosecution so far (http://press.hse.gov.uk/2014/dudley-company-fined-for-failing-to-manage-dangerous-bacteria/).

21. Notifications of Contraventions were issued against a number of service providers (water treatment companies outside the scope of this programme). It is reasonable to expect this also to have a gearing effect, with the learning being shared across company regions and with other clients.

C: Research and development

22. HSE's Legionella Technical Working Group, which reports directly to HSE's Legionella Committee, has met quarterly and is overseeing research to:

- better determine the nature and extent of the legionella risks posed by water systems, including novel aspects of legionella control, and
- investigate options available for risk reduction, to better inform future industry good practice.

23. Recent activity has focussed on the rapid testing techniques, in particular Polymerase Chain Reaction, for detecting legionella bacteria and on paper industry research projects to help evaluate legionella risks within this industry sector. Work continues in a number of other areas and further research is planned on the role of thermostatic mixing valves in the elevation of legionella risks in HCWS.

Future work

24. Taking account of the findings and key outcomes described in paragraph 5, we propose that the post-intervention programme activities should consolidate the progress that has been made by:

a) Continuing key **stakeholder work to raise the awareness and competence of dutyholders and service providers**, **including Water Treatment Companies** - this will include an LCA-led event in Scotland in March 2015. Water Safety Plans and Water Safety Groups (see paragraph 9) represent a holistic approach to managing the risks from HCWS in health care and social care premises, and we plan to explore the potential for collaborative work in this area especially with the LCA, PHE and others. Later, it might also be appropriate to consider auditing standards of compliance eg. in NHS trusts;
b) **Consolidating changes to guidance** eg. spa pools, updating the legionella microsite and engaging with other stakeholders to achieve the optimum arrangements for hosting and partnering;
c) Continuing to **address legionella risks where they arise as part of routine inspections** on other matters;
d) **Targeting dutyholders with legionella risks, where local intelligence gives concern** that the management of risk is poor;
e) **Assessing the risks from dry/wet systems**, an emerging technology that was outside the scope of the programme;
f) Ensuring any additional learning can be taken from the data e.g. to determine any **sector-specific trends** for future intervention plans; and
g) Producing a **strategic plan** for the work of the Legionella Committee over the next 3-5 years as part of HSE's work-related ill-health strategy.

Action

25. The Board is asked to note the outcomes from the legionella programme, and the future work planned.

Paper clearance

Cleared by SMT on 4th March 2015.

Annex 1

Background to development of the Legionella Intervention Programme

1. In 2011, HSE's Legionella Committee commissioned the HSL and the Biological Agents Unit **to analyse the outbreaks of Legionnaires' disease over the previous ten years**. The analysis showed that outbreaks could be attributed to a range of risk systems, but that evaporative cooling systems (such as cooling towers), hot and cold water systems and spa pools were responsible for the majority. In June 2012, the Committee also requested that HSL **review the formal enforcement action taken by HSE in relation to legionella control over the previous five years**, to identify any trends and failures to meet the standards described in the Approved Code of Practice L8 (note at that time, it was under review and has now been re-issued – see footnote 2). A report of both analyses was produced (see footnote 1).

2. The underlying causes of the outbreaks and the reasons for HSE enforcement mirrored the findings of the Barrow-in-Furness report into the outbreak in 2002 (when seven members of the public died and 180 others suffered ill health) and the report took into account the emerging findings of the outbreaks of Legionnaires' disease in Edinburgh, Stoke-on-Trent and Carmarthen in 2012. These point to dutyholders continuing to have difficulty in maintaining sustained compliance in this area.

3. The HSL analysis considered both the risks posed by different systems and the likely impact that would arise from an outbreak, and these underpinned the 'Revised programme of interventions for the control of Legionella risks in workplaces', which was agreed by the HSE Board in January 2013 http://www.hse.gov.uk/aboutus/meetings/hseboard/2013/300113/pjanb1309.pdf

The risk-based approach to targeting and planning interventions

Risk criteria

4. The following criteria were used to determine the risk groupings:
- Numbers and scale of outbreaks arising from the system
- Levels of compliance associated with the system/sector
- Complexity of the systems involved
- Profile of the industry and the key players.

(A) Risk level 1

Cooling towers and evaporative condensers[5]

5. These systems operate at optimum temperatures for the growth of bacteria. They are re-circulating systems that can allow bacteria to build up within the system and generate large quantities of aerosol that, if uncontrolled and dispersed, can spread into the general environment, potentially affecting the general public. Such systems are generally associated with a larger number of exposures during individual outbreaks, and can be described as low frequency/high impact

[5] Cooling towers and evaporative condensers are devices that provide cooling in a range of applications from industrial processes to air conditioning systems

occurrences. An initial estimate of the costs of a legionella outbreak from this type of source is upwards of £4.3 million[6]. In 2013, it was estimated there are around 5,800[7] such potential sources.

6. **Planned activity:** HSE issued a safety notice on 27 July 2012 to draw the attention of those in control of cooling towers and evaporative condensers to their duties and the responsibility to control the risks from legionella in such systems. This has been followed up by targeted compliance checks and the work with industry bodies to promote necessary controls to help dutyholders manage legionella risks.

(B) Risk level 2

Hot and cold water systems

7. These ubiquitous systems operate at optimum temperatures for the growth of legionella bacteria and they may be connected to outlets and showers that can generate an aerosol when in use. In some premises, the water system can be extremely complex e.g. hospitals, but the majority of premises have much simpler systems (such as in care homes, hotels, etc). Hot and cold water systems are associated with low numbers being exposed and little or no off-site impact. However, outbreaks in hospitals are characterised by an increased likelihood of major ill health effects or death following infection because the exposed population is more vulnerable.

8. **Planned activity**: HSE issued a safety notice on 19 September 2012 to draw attention to the key aspects of the proper management of the risks from legionella in water systems, other than cooling towers and evaporative condensers. We have followed this up by engaging with key stakeholders in the health care sector to promulgate the essential messages and to identify emerging issues. These have been targeted at senior managers, in-house estates management and building services, as well as via relevant associations, water treatment companies and cleaning contractors. In addition, HSE and LAs have considered whether individual dutyholders and/or premises warrant further interventions, depending on intelligence on their health and safety performance.

Spa pools

9. These systems generally operate at optimum temperatures for growth of bacteria, including legionella. They are re-circulating systems that, when not properly controlled, allow bacteria to build up within the system and the mode of operation generates an aerosol in the vicinity of the breathing zone of the user/s. The HSL review of outbreak data indicates that, in GB, the ill health outcomes from exposures in spa pools are sometimes less serious, e.g. Pontiac fever[8]. However, they are associated with large numbers of exposures during individual outbreaks.

[6] Provided by CSEAD for an outbreak of 50 confirmed cases and 2 fatalities, but known to be a significant underestimate at this stage.
[7] Figures estimated from numbers provided by LAs in June 2012; this was later refined to ~5,000 sites.
[8] An outbreak in the Netherlands in the late 1990s did result in 28 deaths, though this was in very unusual circumstances.

10. **Planned activity:** In addition to engagement with sector stakeholders, LAs have considered whether individual dutyholders and/or premises warrant further interventions, depending on intelligence on their health and safety performance. The HSE/PHE 'Management of Spa Pools' guidance is currently being reviewed to align with L8 ACOP and the technical guidance on legionella, HSG274.

(C) Risk level 3

11. These systems include fire sprinkler units, pressure washers, spray humidifiers, fogging and water misting systems, emergency showers, train/car and bus washes, outdoor and indoor fountains and water features, composting facilities and irrigation systems. In fact, any industry that uses water for processes such as washing, misting and cooling may pose a legionella risk as such systems commonly allow water to stagnate and generate aerosols that can potentially be spread into the environment. They are variable in nature and scale and are less likely to affect large numbers of people.

12. **Planned activity:** Based on current evidence, we will not undertake direct pro-active HSE or LA interventions to premises in this category, other than the safety notice issued on 19 September 2012. In many cases, dutyholders only need to undertake a basic assessment that confirms the risks are negligible or, where this is not the case, identifies easily implemented controls for simple low risk systems - this is of particular relevance here as legionella bacteria can increase to high levels with the right conditions in a matter of days or weeks. HSE's legionella technical guidance, HSG274 Part 3, sets out the broad principles for risk control for such risk systems (other than evaporative cooling systems and hot and cold water systems).

Annex 2

Summary of stakeholder engagement undertaken as part of the intervention

1. An important element of the intervention programme was to engage, face-to-face, with the variety of dutyholders and others with responsibilities for the control of legionella risks across a range of industry sectors.

2. Events held throughout the programme fell broadly into three categories:

- water treatment companies and those involved in legionella risk management services;
- dutyholder/operators; and
- sector-specific industry events.

3. The content was tailored to the audiences and to reflect progress, with the key messages remaining consistent. The concept of 'sustained compliance' and the need for on-going effective management of legionella risks provided a central theme, with the revised L8 ACOP and HSG274 technical guidance document being important in focusing discussions on proportionate and effective risk management. (The two safety notices issued in 2012 started this process). Staff from HID, FOD, CCID and OPSTD were all involved in these events.

Water treatment industry-focussed events

4. Proactive engagement with industry bodies at an early stage, and regularly throughout the programme, meant that this important stakeholder group was kept informed of programme goals and the approach that regulators would adopt. Promulgation of key messages to their clients by delegates who attended the events ensured effective and efficient 'gearing' to deliver information to a far wider audience.

5. The Legionella Control Association (LCA) was instrumental in delivery of a significant proportion of this element of the programme. Open Days in May and September 2013 and October 2014 were given over largely to HSE, to explain the programme and discuss the concept of sustained compliance. Discussion of the topic inspection pack, particularly the 'compliance indicators', helped to clarify the approach to be taken by inspectors at sites operating evaporative cooling plant.

6. Over 120 delegates attended, including operators of such plant, for whom the topic pack was directly relevant, as well as other customers for whom the principles therein were also pertinent and applicable. Feedback was that the availability of the topic pack via the HSE website was a very positive step. Delegates were able to use the information to better inform clients, some using it as the basis of training modules for staff and clients. For some operators and their water treatment professionals, this was an opportunity to assess the current arrangements for legionella risk management and to make adjustments. This was confirmed in later LCA regional events. It is likely that the opportunity to prepare for the inspectors' visits at an early stage in the programme influenced the outcome of many inspections and could explain the good levels of compliance witnessed at several sites.

7. The Water Management Society (WMS) and the British Association of Chemical Specialties' (BACS) Water Treatment Group are the principal industry bodies addressing matters relating to legionella control in the UK. They founded the LCA in 1999 and have a large and broad membership. Participation in WMS and BACS events provided further opportunities to reach water treatment professionals with key roles in influencing levels of compliance and standards of risk control. WMS events were held in February and June 2014 and BACS hosted a one-day conference in April 2014. Over 120 delegates attended each WMS event, with over 80 delegates at the BACS conference.

Dutyholder/operator events

8. LCA hosted joint LCA/HSE regional dutyholder events, in Newcastle (February 2014), London (March 2014) and the Midlands (April 2014). Delegates represented a diverse range of industries. The emphasis was on audience participation in extended panel discussions. These allowed effective discussion of specific matters raised. Feedback clearly indicated that this was popular and enabled a better understanding of the concept of compliance, as well as giving practical advice on how this might be achieved across a range of risk systems and industry sectors.

9. Around 150 delegates were present at each venue (manufacturing, energy suppliers, education, healthcare and local councils and housing associations).

Other sector/industry-specific events

Health and social care

10. The HSL research paper provided valuable insight on outbreaks of Legionnaires' disease attributed to hot and cold water systems (HCWS) and on HSE enforcement taken in relation to inadequacies in legionella risk control in these systems. Around 25% of outbreaks could be attributed to HCWS and a significant proportion (16% of total outbreaks) occurred in the public services sector. For both the outbreak and enforcement data, inadequacies in risk assessment and control schemes were the main areas where failings were identified. For these reasons, the programme targeted HCWS in the public services sector at a number of stakeholder events.

11. This sector includes, amongst other industries, healthcare services. Effective legionella risk management is of importance due to the enhanced vulnerability to Legionnaires' disease of many individuals receiving care or medical treatment. Other contributing risk factors include the extensive and often complex water systems found, for example, in hospitals.

12. The Institute of Healthcare Engineering and Estate Management (IHEEM) is the largest UK organisation for the healthcare estates sector and its members, along with other healthcare professionals, are key stakeholders in legionella control. HSE spoke at the IHEEM conferences in October 2013, and May and November 2014.

13. HSE also spoke at the Royal Society for Public Health's (RSPH) conferences in May 2013 and 2014, providing the opportunity to consider water hygiene matters in work places in the public services sector. The revised L8 ACOP and revised guidance on risk management in healthcare and care homes (an important addition

to the new guidance in Part 2 of HSG274), focused discussion. The RSPH and IHEEM events provided opportunities to promote and publicise HSE's endorsement of the concept, and benefits, of Water Safety Groups and Water Safety Plans in healthcare and their potential application in other sectors (adapted from World Health Organisation and introduced in the Department of Health's HTM 04-01 Addendum, 'Water systems – Advice for augmented care units'[9]). This approach to water hygiene management is seen as an important step towards achieving effective, on-going control in HCWS of legionella risks and risks associated with other water-borne pathogens. Over 200 IHEEM members attended HSE's session at the conference.

Spa pools

14. Spa pools are significant legionella risk systems and this was underlined by the outbreak of Legionnaires' disease in Stoke-on-Trent in 2012. In February 2014, HSE contributed to technical seminars held at SPATEX, the UK's largest annual spa pools industry event. The event provided the opportunity to discuss and provide an update on the HSE/PHE guidance on spa pool risk management, which is currently under review.

Other stakeholder events

15. There was further valuable HSE input and contribution at other stakeholder events, with the extensive involvement of HSE's Occupational Hygiene specialist inspectors. Five events took place between March 2013 and July 2014 at meetings of professional bodies (CIEH, BOHS, IOSH) and HSE gave presentations at a further 6 meetings to representatives from the food and drink, paper, foundry and metalworking industries. HSE specialists also provided input to the South West Legionella Group, who met every couple of months and whose purpose was to share experiences, and conduct peer review etc., throughout the intervention.

Publications

16. In addition, complementary articles were published in a significant number of journals and publications eg LCA, WMS, BACS, H&V, IHEEM, RSPH and other trade/professional body media, throughout the programme.

[9] HTM 04-01 Addendum Water systems – Advice for augmented care units https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/140105/Health_Technical_Memorandum_04-01_Addendum.pdf

Annex 3

Summary of proactive inspections of evaporative cooling plant

1. An important element of the intervention programme was a comprehensive programme of inspections at sites operating notifiable evaporative cooling plant. These visits took place between April 2013 and August 2014.

Table 1 – Summary of inspection intervention data:

Number of:	HSE		LA	
Cooling Towers and Evaporative Condensers originally identified via LA registers	Approximately 5000 sites			
Sites initially allocated (pre-data cleansing)	2477		621	
Sites 'confirmed' in scope	1988		---[10]	
Interventions carried out	1906 (96% of in scope)		576[11] (rating data for 275 sites)	
Sites where enforcement was required due to interventions:				
HSE (Material Breaches/Notifications of Contravention on relevant sites, or Notices)	625 (33% of interventions)			
LA (Letters and Notices)			121 (21% of interventions - 112 letters and 9 Notices)	
Improvement Notices served (more than one being served at a number of HSE sites)	400	At 229 sites (12%)	9	At 9 sites (1.6%)
Prohibition Notices served	11		0	

Background:

Preparation

2. Significant preparatory work was undertaken involving the production of an information pack for inspectors, including revised operational guidance on the inspection of evaporative cooling plant http://www.hse.gov.uk/legionnaires/assets/docs/cooling-tower-programme-inspection-pack.pdf. This very comprehensive document was reinforced by a series of inspector briefing events (19 half-day sessions for HSE staff and over 60 LAs given by Specialist Inspectors) and 3 two-day training events for 75 inspectors in legionella risks and risk management. These were presented by combinations of specialists, inspectors and policy advisors.

[10] LAs took a different approach to confirming sites for the intervention (exclusions being applied at different stages), and from the data available it is not possible to provide directly comparable data for HSE's 'sites confirmed in scope'.

[11] LAs already record data on their existing IT systems, so completion of the dedicated database was voluntary – hence only having data for 275 sites of the 576 sites identified by LAs.

3. HSE Occupational Hygiene Specialist Inspectors conducted 68 joint visits with inspectors to consolidate the learning. Inspectors provided positive feedback following each consolidation visit, and a number of inspectors commented that they felt much more confident and better informed regarding the relevant questions to ask dutyholders.

Identification of sites with cooling towers/evaporative condensers

4. Substantial resource was invested to identify relevant sites in GB by contacting LAs for details of operators of evaporative cooling equipment in their respective authorities. There is a requirement under the Notification of Cooling Towers and Evaporative Condensers Regulations 1992 to notify the LA before such plant is installed and upon cessation of use.

5. An exercise to 'cleanse' the data provided by LAs began with HSL writing to the ~5,000 sites registered in GB asking each site to fill in an on-line questionnaire (used to aid prioritisation of visits). Around 2200 of these letters could not be delivered. This exercise revealed that a considerable number of sites that had registered their cooling plant had subsequently dispensed with it. This was usually because it was either no longer needed or it had been replaced with a dry cooling system and, in some cases, the companies no longer existed. Thus, the programme has enabled LAs to obtain more accurate data on the location of such cooling plant.

6. The sites remaining were allocated to the relevant regulatory authority by local area staff and local knowledge was deployed to target the intervention further eg. a site may have been excluded if there was a valid operational reason (e.g. prosecution or other on-going investigation) or the site was visited in the last two years (e.g. sites visited prior to the London 2012 Olympic Games centres and areas where there had been recent outbreak investigations), and the Inspector had gained sufficient assurance that the dutyholder was able to achieve sustained control of the risks from legionella. However, the different approaches to the triage process, and the data recorded, make it impossible to make direct comparisons between LA and HSE interventions.

Inspection activity

7. Inspections commenced in April 2013 following a pilot involving both HSE and the LA in the Glasgow area and included all relevant HSE Directorates and ONR (31 sites), as well as inspections performed by LAs.

8. Sites were scored against four topics: risk assessment; written control scheme; implementation of control scheme and record keeping. As described in the topic inspection pack, the scale used was linked to the Enforcement Management Model, with 10 being fully compliant or verbal advice only and 40 being Improvement/Prohibition Notice/ consider prosecution.

Results

9. Some of the key data on which our analysis is based is provided in Annex 4, but this is only an extract of the full data set. It indicates that, for both HSE and LA inspections, the level of enforcement was lower than might have been expected, based on HSE's historical experience and the HSL research[1] published in 2012. This could be due, in part, to the high-level of stakeholder engagement, leading to the

main messages being shared more widely, as well as the sharing of the topic inspection pack.

HSE

10. Just under 33% (625/1906) of HSE inspections resulted in enforcement (Material Breach or higher). The 400 INs and 11 PNs on COSHH-related issues were served at a total of 229 sites, which is 12% of the sites inspected (an average of 1.8 Notices per site - 67 sites received two Notices, 26 sites received three Notices and a total of 15 sites, up to six).

11. Approximately 67% of sites assessed as being in compliance was a better level of compliance than expected and of the third which fell below the required standards, most only had shortcomings in respect of one or two of the areas assessed.

12. A further 100 Improvement Notices were served on other issues (nearly 80% on work at height, which may be relevant to maintenance of cooling plant). Analysis of the scoring data indicated that around 18% of HSE visits attracted a score of 30 for the written scheme of control and its implementation (combined totals) and approximately 7% of visits scored 30 for inadequacies in risk assessment. Only 4% of HSE visits scored 30 for poor record keeping.

13. Fewer than 2% of inspections recorded scores of 40 and those that did followed a similar trend to the scores of 30, with risk assessment and written schemes accounting for the majority. Less than 1% of scores of 40 were allocated to failings in record keeping.

14. Over the period of the intervention programme, the trend across all of the measures rated (as described at paragraph 8), shows the proportion gaining the highest level of compliance (scoring 10), steadily increases. This bears out anecdotal feedback from inspectors.

LAs

15. The picture of compliance amongst LA-enforced sites is similar, but there were differences in approach to defining visits in scope and the data recorded, which make comparisons difficult.

16. The LA scoring data are more difficult to interpret. The figures indicate that 121/576 (21%) of interventions resulted in enforcement action, yet only 9 INs. This lower rate may be explained by differences in approaches to providing written advice compared to HSE's, despite the guidance provided in Table 1 of the topic inspection pack. Also, the different enforcement profile for the LA sector may reflect the need to address local dutyholder factors and /or the size and location of their cooling towers/ evaporative condensers. Regardless of this, scores of 30 and 40 were, in the main, allocated to failings in risk assessment and the written scheme and its implementation, mirroring the HSE scoring profile.

Overall

17. Broadly speaking, for both regulatory authorities where enforcement was necessary, risk assessment and the written scheme of control and its implementation appear to be the topics of greatest concern. This indicated that a relatively small number of dutyholders had difficulties in complying in these key areas. Based upon HSE's historical experience and the HSL report in 2012, dutyholders' performance in managing legionella risks was better than expected. As noted above, this could be due, in part, to the advance notice of inspections via the programme's stakeholder engagement work and the timely publication of the topic inspection pack. Both provided dutyholders and their water treatment specialists with the opportunity to review and revise their arrangements and to improve standards of compliance. In this respect, the programme can be deemed to have been effective, in the short-term, at least.

18. The increased emphasis on risk assessment and control measures required for the effective safe operation of evaporative cooling plant, in the recently revised ACOP and Part 1 of HSG274, may also have influenced levels of compliance. Additional guidance on HSE's revised legionella web pages is also expected to have had positive influences on compliance standards.

19. However, as the HSL report identified, failing to adequately control legionella risks from cooling plant had, on average, led to nearly 30 people being infected, and it could be expected that between 10-15% of these would result in fatalities. So it is important that companies remain vigilant to achieve sustained compliance.

20. Detailed analysis of the failings that led to the service of notices will be undertaken to identify those specific areas where improvements were required, so that this information can be made available to dutyholders.

Annex 4

Results of Legionella Cooling Tower and Evaporative Condenser Inspections as part of the Legionella Intervention from April 2013 to August 2014.

1. **Total number of sites visited by HSE broken down by geography and sector.**

Country	Agriculture	Construction	Extractive Utilities	Manufacturing Excluding Chemicals (FOD & ONR)	Chemical Manufacturing (HID)	Services	Waste & Water Management	All Sectors
England	15	9	26	1160	176	167	19	1572 **(82.4%)**
Scotland	0	1	6	154	15	16	3	195 **(10.2%)**
Wales	2	0	4	103	20	10	0	139 **(7.3%)**
Total	17	10	36	1417	211	193	22	1906
Percentage	**0.9%**	**0.5%**	**1.9%**	**74.3%**	**11.1%**	**10.1%**	**1.2%**	**100%**

2. **Total number of visits undertaken by HSE to these sites where a material breach was identified by the inspector (FFI Visits) broken down by geography and sector.** (These figures will include sites where any FFI was recorded i.e. sites where a NoC was issued but not necessarily a notice)

Country	Agriculture	Construction	Extractive Utilities	Manufacturing Excluding Chemicals (FOD & ONR)	Chemical Manufacturing (HID)	Services	Waste & Water Management	All Sectors
England	4	1	7	416	27	59	6	520 **(83.2%)**
Scotland	0	1	4	48	0	5	2	60 **(9.6%)**
Wales	0	0	2	35	5	3	0	45 **(7.2%)**
Total	4	2	13	499	32	67	8	625
Percentage	**0.6%**	**0.3%**	**2.1%**	**79.8%**	**5.1%**	**10.7%**	**1.3%**	**100%**

Note: A material breach being identified at a minimum of 625 sites equates to 32.8% of sites visited by HSE.
Figures in Table 2 for the Chemical Manufacturing Sector (HID), would not include Top Tier COMAH sites if a breach was found, as these sites do not operate a FFI charging regime. This explains why a Notice can be served (see Table 3) without FFI being recorded.

3. **Number of notices served by HSE for COSHH-related legionella issues served by HSE, broken down by geography and sector.**

Country	Agriculture	Construction	Extractive Utilities	Manufacturing Excluding Chemicals (FOD & ONR)	Chemical Manufacturing (HID)	Services	Waste & Water Management	All Sectors
England	2	2	0	254	10	34	3	305 **(74.2%)**
Scotland	0	2	5	62	1	3	4	77 **(18.7%)**
Wales	0	0	0	26	1	2	0	29 **(7.1%)**
Total	2	4	5	342	12	39	7	411
Percentage	**0.5%**	**1.0%**	**1.2%**	**83.2%**	**2.9%**	**9.5%**	**1.7%**	**100%**

Note the total number of notices issued by HSE as part of this initiative was 511; as shown above 411 were for COSHH-related legionella issues (including 11 Prohibition Notices). Nearly 80% of the remainder, related to Work at Height (possibly related to access to cooling towers, in order to maintain them), with the next highest number ~ 6 being associated with Provision and Use of Work Equipment (PUWER).