

British Occupational Hygiene Society
Faculty of Occupational Hygiene

Proficiency Module Syllabus

**P902 – LEGIONELLA—Management and Control of
Evaporative Cooling and other High Risk Systems**

- Aim:** To provide background and an overview of the risk of legionella infection and how it can be controlled in Evaporative Cooling and other high risk type Systems. *[It is a requirement of this course that candidates have successfully completed P901- Legionella-Management and control of domestic type hot and cold water services. {Where both P901 and 902 courses are run on subsequent days or as a combined course then this pre-requirement is not required}]*
- Learning Outcome:** On successful completion, the student shall be able to demonstrate management control in:
- Identifying the common options for heat rejection devices other than open evaporative cooling systems.
 - Demonstrating an understanding of the basic principle of open evaporative cooling.
 - Outlining a risk assessment led approach to cooling tower fill pack removal for cleaning and also assessment of cleanliness.
 - Identifying the main types of open evaporative cooling devices and their key components.
 - Understanding in general terms the operation and importance of drift eliminators.
 - Outlining the principles of a legionella control regime, including the key elements of chemical treatment and control; outline a suitable monitoring programme.
 - Outlining the hardness cycle, indicate the importance of neutralising the acid radical in calcium hydrogen carbonate. Explain the primary effect and significance of base-exchange softening.
 - Outlining the conditions required for effective application of non-oxidising and oxidising biocides.
- Course Length:** It is envisaged this course would be run over 1 day to include a short answer examination.
- Content:**
- | <i>Topic</i> | <i>Time Allocation</i> |
|--------------------------------------|------------------------|
| 1 LEGISLATION AND GUIDANCE | 5% |
| 2 COOLING TOWER DESIGN AND OPERATION | 15% |
| 3 RISK ASSESSMENT | 15% |
| 4 WATER TREATMENT | 20% |
| 5 OPERATIONAL CONTROL | 20% |
| 6 OTHER RISK SYSTEMS | 25% |
- Note:** Reference is made in this syllabus to HSE guidance and other Industry best practice documentation. This may not be the most up-to-date relevant publications from HSE/other sources and is intended as guidance for candidates only.

1 LEGISLATION AND GUIDANCE [5%]

Acts of Parliament

Approved codes of practice, HSE guidance notes. Other industry accepted good practice sources of information.

2 COOLING TOWER DESIGN AND OPERATION [20%]

Types of cooling towers: natural draught, evaporative condensers, evaporative fluid condensers, open evaporative cooling towers.

Heat rejection mechanism

The principal components of a cooling tower

3 RISK ASSESSMENT [15%]

Role of the competent person.

Key components of the risk assessment including system schematic.

Adiabatic enhancement of dry coolers and hybrid coolers

General design considerations.

Risk assessment led approach to fill pack removal for cleaning

4 WATER TREATMENT [20%]

Routine cleaning and disinfection

Scale control, the hardness cycle and base exchange softening

Corrosion control including common corrosion inhibitors

Dissolved solids control including concentration factor and system bleed

Microbiological control including oxidising/non-oxidising biocides, silver and physical methods.

5 OPERATIONAL CONTROL [20%]

COSHH requirement for elimination

Weekly, monthly, quarterly, six monthly, and annual tasks

Precautions for units on standby

Free Cooling

Routine bacteriological testing with assessment of limitations of this data and control levels.

Records: the detail required and retention

6 OTHER RISK SYSTEMS [25%]

The techniques used for cooling towers would be extended to show how they would be directly applied to other high risk systems such as spa baths, spray humidifiers, misting systems, water features and other such systems

Further Information

1) Approved Code of practice Legionnaires disease: The control of Legionella bacteria in water systems (L8). ISBN0717617726

2) Legionnaires Disease – A Guide for Employers. ISBN 0717617734

3) Management of Spa Pools – Controlling the Risk of Infection: ISBN 090144800

4) Health and Safety Executive/Local Authorities Enforcement Liaison Committee

(HELA) 46/3 Control of Legionella in Wet Cooling Systems

5) Health and Safety Executive/Local Authorities Enforcement Liaison Committee (HELA) 46/4 Control of Legionella: investigation of outbreaks (and single cases) and single cases of Legionellosis from water systems incorporating cooling towers and evaporative condensers.

(6) HSE Legionella website <http://www.hse.gov.uk/legionnaires/>

7 EXAMINATION/ASSESSMENT

There are two elements:

1 A 45 minute BOHS examination consisting of 20 short answer questions, Points are awarded for correct answers. There is no negative marking for wrong answers. Points are then calculated as a percentage. It is necessary to obtain 50% to pass the written examination.

2 Report submission

1 *General Requirements*

1.1 In order to be awarded a Certificate for this examination, candidates are required to provide evidence of field proficiency. To satisfy this requirement candidates are required to demonstrate that they have carried out, possibly under supervision, at least one field assessment of water systems under their direct or indirect control. (see below for content requirements). The report must show to the examiner that the candidate is competent to do the work.

The report will be examined for qualification purposes and will be returned to the candidates if requested or, if not, destroyed.

The report submitted must be the candidate's own work (i.e. it must have been written by the candidate himself/herself). It must not be the work of his supervisor, although it is permissible for the studies to be carried out under supervision. Where the work is carried out under supervision, a signed statement by the supervisor, stating that the work is that of the candidate, must accompany the report. If this situation applies to one or both of your reports, please make the exact circumstances clear either in the report itself or in a covering letter. Failure to do so may delay the processing of reports.

Studies and reports carried out by a team will only be acceptable if ownership of the report can be claimed by the candidate alone. Only in exceptional circumstances will reports for studies carried out on the same premises and the same system be allowed to be submitted. Reports must be written by each individual candidate and the analytical data should be as measured by the candidate.

Candidates are expected to submit the relevant reports to BOHS within three months of the date on which they were notified that they had passed the written examination.

Where candidates have not submitted a report within three months of passing the written examination, the period shall be deemed to have lapsed and candidates will be required to re-sit the whole examination. Exceptions to this three month rule will be considered in certain circumstances only (e.g. serious illness/disability, involuntary unemployment). Written requests for consideration should be made as soon as the need is known, because only in very exceptional circumstances will an extension be granted after the three month period has actually lapsed. In the case of illness/disability please include a brief description of the illness/disability, and an estimate of the expected duration, if known. In the case of involuntary unemployment, please give an indication of the expected duration of the unemployment. All requests will be treated in the strictest confidence

Within two weeks of receipt, BOHS will issue an acknowledgment that it has received the reports, which will include an estimate of the time it anticipates it will take to process them. BOHS cannot accept any liability for non-receipt, so recommends that reports are sent by Recorded/ Special Delivery or a courier service.

1.9 A Certificate of Authorship must be completed for each report submitted to BOHS at the same time as the reports themselves.

1.10 Both the report and examination result must be acceptable to the Society in order for the candidate to be awarded the Proficiency Module Certificate.

1.11 If a candidate's reports is not acceptable to BOHS they will be returned to the candidate with an explanation, and a set timescale in which to clarify the points raised, amend and re-submit reports, provide new reports, etc.

1.12 BOHS retains the right to refuse to accept reports where there is evidence of submission of misleading documentation or plagiarism. Where there is evidence that a candidate has fraudulently submitted reports or documentation BOHS may bar any further submissions from that candidate. If evidence of plagiarism of the submission of misleading documents is found after the award of a certificate BOHS retains the right to withdraw the award. Candidates may appeal in writing against the rejection of reports or withdrawal certificates through the general appeals procedure.

2 *Report Contents*

2.1 There is no restriction on the maximum length of each report but at least a four page A4 typed report is expected.

2.2 The report must be properly structured and would normally be expected to include some or all of the sections below. If it is not customary for reports produced by your organisation to include all these, candidates must provide it/them either on a supplementary sheet or in an accompanying letter.

2.2.1 a title page, including a title and/or number by which the report can be identified

2.2.2 a concise summary

2.2.3 Introduction or background including a description of the age and nature of the water system, including its purpose.

2.2.4 description of work, process etc. methodology including risk assessments and safety procedures

2.2.5 evaluation of the system identifying risks of Legionella and defining adequacy or not of control measures

2.2.6 Sketch/diagram of the system

2.2.7 reference tables and graphs etc as appropriate

2.3 Where reference is made in the report to legislation, approved codes of practice or other documentation this must be the current situation and not out of date references.

2.4 Where the report consists of only typed up notes (e.g. a field log and/or sampling list) this will not provide sufficient information (because it will contain no detailed information on the system being evaluated, or the way the study was carried out) and will be rejected.

2.5 Reports will also be rejected and returned to the author for correction and resubmission where they contain misleading or inconsistent information and where the report, for example, does not contain certain information (e.g. results of measurement included in the report and/or assumptions only, immediate action recommendations on a dangerous situation).

2.6 For the purpose of confidentiality, reports may be edited to delete/blank out the name of the company/organisation commissioning the report.

2.7 Where the report is generated from a computer generic report that requires the author to put information in about the premises being surveyed, please ensure that the information required has actually been put into the report.

Successful completion of the above will lead to a:

PROFICIENCY CERTIFICATE
in
LEGIONELLA—Management and Control of Cooling Water Systems