

**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 building hot and cold water services. [Syllabus GM.1] (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.

<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

Candidates are required to demonstrate that they have carried out, possibly under supervision, evaluation of one water system, A copy this reports must be submitted to BOHS within three months. Details of the report requirements are available as a separate document GN.6 (010609) from BOHS Head Office or from the BOHS web site [www.bohs.org](http://www.bohs.org)

Successful completion of the above will lead to a:

**PROFICIENCY CERTIFICATE**  
in  
**LEGIONELLA—Management and Control of Evaporative Cooling and other High Risk Systems**