Section 6

Syllabus

The qualification is structured into seven sections, each with an indicative time allocation:

	Topic	Time allocation
1.	Legislation and guidance	5%
2.	Cooling tower design and operation	15%
3.	Risk assessment	20%
4.	Water treatment	20%
5.	Operational control	15%
6.	Other risk systems	20%
7.	Record keeping	5%

1. Legislation and guidance (5%)

Educational objectives
Candidates should have a detailed understanding the key pieces of legislation and guidance which underpin best working practice in managing and controlling legionella risk.

1.0.1 Acts of Parliament.
1.0.2 Approved codes of practice, HSE guidance notes, regulations, British Standards. Other industry-accepted good practice sources of information.

2. Cooling tower design and operation (15%)

Educational objectives
Candidates should understand the different types and key components of open and closed circuit evaporative cooling systems and their principal functions, including in general terms the operation of drift eliminators. They should also learn about the use of alternative lower-risk means of achieving heat rejection.

2.0.1 Types of cooling towers: natural draught, evaporative condensers, evaporative fluid condensers, open evaporative cooling towers.
2.0.2 Heat rejection mechanism.
2.0.3 The principal components of a cooling tower water system.

3. Risk assessment (20%)

Educational objectives
Candidates should have a detailed practical and theoretical understanding of how to carry out a risk assessment of a system and the risk assessment approach to fill pack removal for cleaning, including means of appraising cleanliness.

3.0.1 Roles of the named duty holder and responsible person.
3.0.2 Key components of the risk assessment including system schematic.
3.0.3 Adiabatic enhancement of dry coolers and hybrid coolers.
3.0.4 General design considerations.
3.0.5 Risk assessment-led approach to fill pack removal for cleaning.

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4. Water treatment (20%)

Educational objectives
Candidates should be able to analyse, interpret and evaluate in general terms the key elements of a chemical treatment regime for open evaporative cooling systems, the hardness cycle, base exchange softening, corrosion control, the effect of increasing pH on halogen biocides, concentration factor, bleed and half life.

4.0.1 Routine cleaning and disinfection.
4.0.2 Scale control, the hardness cycle and base exchange softening.
4.0.3 Corrosion control including common corrosion inhibitors.
4.0.4 Dissolved solids control including concentration factor and system bleed.
4.0.5 Microbiological control including oxidising/non-oxidising biocides, alternative treatment techniques.

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5. Operational control (20%)

Educational objectives
Candidates should fully understand all the requirements for regularly monitoring for legionella risk in water systems, and how to carry out routine testing.

5.0.1 COSHH requirement for elimination.
5.0.2 Weekly, monthly, quarterly, six monthly, and annual tasks.
5.0.3 Precautions for units on standby.
5.0.4 Free cooling.
5.0.5 Requirements for monitoring for legionella bacteria.
5.0.6 Routine bacteriological testing with assessment of limitations of this data and control levels.

5.0.7 Records: the detail required and retention.

6. Other risk systems (20%)

Educational objectives
Candidates should be able to analyse, interpret and evaluate the legionella risks posed by other industrial water systems, and implement appropriate control regimes. This includes emergency water systems (fire, safety showers, eye wash stations); stand alone or fixed washing devices (for vehicles, components, products or other items); air humidification systems; fogging and misting devices; air scrubbers.

The techniques used for cooling towers and evaporative condensers would be extended to show how they would be directly applied to other high risk systems. This should include systems such as:

6.0.1 Industrial spray humidifiers and misting systems.
6.0.2 Air Handling Units (AHU's) and humidifier systems.
6.0.3 Deluge and sprinkler systems and other fire suppression systems.
6.0.4 Emergency showers.
6.0.5 Wet scrubbers used for treatment of fume, dust, paint, gas etc.
6.0.6 Vehicle and component wash down systems including power jet wash systems.
6.0.7 Machine and lathe cooling systems.
6.0.8 Water softeners, and other such systems wherever a respirable water based aerosol can be created.

7. Record keeping (5%)

Educational objectives
Candidates should fully understand what records they are required to keep for their water systems, in order to comply with legislation.

7.0.1 Regulatory requirements for record keeping.