Cooling tower maintenance and other controls for the effective management of Legionella risk

COOLING TOWER MAINTENANCE AND OTHER CONTROLS FOR THE EFFECTIVE MANAGEMENT OF LEGIONELLA RISK

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EXECUTIVE SUMMARY

This document has been commissioned by the EI to provide technical guidance on what controls are required to manage Legionella risks in cooling towers. The guidance was developed to complement the EI publication *Legionellosis risk management and Legionella control – Guidance for oil and gas facilities, offshore platforms and refineries* with respect to cooling towers.

The aim of this EI document is to provide more specific and practical guidance than that provided in the HSE Approved Code of Practice and Guidance Document, *Legionnaires' disease: The control of Legionella bacteria in water systems* (from now on referred as 'L8'), which gives broad guidance suitable for a range of cooling systems. Often, the facilities design and particular operating practices on some oil and gas facilities can lead to uncertainty as to what actions or precautions need to be taken to meet both legislative requirements of Legionella risk management and practical control.

1 INTRODUCTION

This Technical guidance on cooling tower maintenance and other controls for the effective management of Legionella risk sets out a framework to assist an operator of cooling towers and evaporative condensers to meet the requirements of current relevant legislation in the United Kingdom.

Legionnaires' disease, is a type of pneumonia which was named after an outbreak of a severe pneumonia which affected a number of people attending the 1976 American Legion Convention. Unlike many other bacterial control issues in the oil industry, the control of Legionellosis is a legislative requirement. The management of Legionella risk is relevant to a range of HSE codes of practice and regulations.

Detailed information in the EI's *Legionellosis risk management and Legionella control. Guidance for oil and gas facilities, offshore platforms and refineries* (2012) is aimed at informing industry on health symptoms and the ecology of Legionella as well as providing descriptions of relevant general legislation.

Besides the legislation covering occupational health and safety in the United Kingdom and guidance for managing health and safety at work, The Notification of Cooling Towers and Evaporative Condensers Regulations 1992 require operators of all such devices to notify the local authority when installed. Any changes to the information required to be notified under the regulations (including duty holder changes) should always be notified within one month after their occurrence. Where a device ceases to be in service , or is intended to be decommissioned, that fact should always be notified to the local authority concerned as soon as is reasonably practicable after the cessation. This requirement does not apply where the device is out of service for maintenance or for seasonal shutdown.

The disease was first recognised in July 1976 when an outbreak occurred at an American Legion Convention held at the Belle Vue Stratford Hotel in Philadelphia, USA. The cause of the outbreak was unknown, and it took scientists until January 1977 to isolate the bacterium responsible which they named Legionella pneumophila.

The bacterium was thought to have been present in the hotel's cooling towers. Water droplets in the form of an aerosol contaminated the hotel's air conditioning systems allowing the bacterium to come into contact with the convention guests, a highly susceptible population.

The first recorded outbreak in the UK occurred in April 1985, when 175 patients were admitted to Stafford hospitals with a chest infection or pneumonia. A total of 28 people died. Medical diagnosis showed that Legionnaires' disease was responsible and the immediate epidemiological investigation traced the source of the infection to the air-conditioning cooling tower on the roof of Stafford District Hospital.

The largest recorded outbreak in the UK occurred at Barrow-in-Furness, Cumbria in August 2002. Seven members of the public died and 180 people suffered ill-health as a result of the outbreak caused by a poorly maintained cooling water system located at a council- owned arts and leisure facility in the town. The subsequent hearings concluded that there were significant failings, including:

– Poor lines of communication and unclear lines of responsibility.
– Failure to act on advice and concerns raised.
– Failure to carry out risk assessments.
– Poor management of contractors and contract documentation.
– Inadequate training and resource.
– Individual failings.

This technical guidance document refers to cooling towers and evaporative condensers only and major topics covered are:

– types of cooling tower;
– operation of cooling towers;
– system dynamics;
– chemical treatment programme;
– different modes of operation;
– dosing control and equipment;
– routine monitoring;
– maintenance activities;
– health and safety issues;
– management duties and responsibilities;
– risk assessment;
– tower design considerations, and
– demolition.