SANS 893-1 AND SANS 893-2: TOWARDS BETTER PROTECTION AGAINST LEGIONNAIRES’ DISEASE

Legionnaires’ disease was first identified after a large outbreak of pneumonia among people who attended an American Legion Convention in Philadelphia, USA in 1976 in which 34 people of the 221 cases died. A previously unrecognised bacterium was isolated from lung tissue samples, and was subsequently named *Legionella pneumophila*.

Since this first recorded outbreak, experience has shown that cooling towers, evaporative condensers and hot and cold water systems in a wide variety of workplaces present a risk of exposure to *Legionella* bacteria. Other systems have also been identified that can present a risk of exposure to these bacteria (including ultrasonic humidifiers and foggers, water misting systems, spray humidifiers, air washers, wet scrubbers, water softeners, emergency showers and eye wash sprays, sprinkler and hose reel systems, lathe and machine tool coolant systems, spa baths or saunas, horticulture misting systems, dental equipment, car-bus washes, indoor fountains and water features).

The recent publication of two new national standards aimed at lessening exposure to *Legionella* bacteria is thus of considerable importance to those working in many water-based industries and processes. They are SANS 893-1, *Legionnaires’ disease Part 1: Risk management* and SANS 893-2, *Legionnaires’ disease Part 2: The control of Legionella in water systems*. As their names suggest, SANS 893-1 provides guidelines for the risk management of *Legionella* bacteria in any undertaking, while SANS 893-2 focuses on requirements for designing and managing hot and cold water systems that could create and transmit water droplets (and thus *Legionella* bacteria): particularly cooling towers and evaporative condensers. As recent research has shown that *Legionella* bacteria can cause infections after travelling in water droplets at least 6 km from their source, large cooling towers and evaporative condensers are mentioned in considerable detail in SANS 893-2.

Rob Stewart, the technical specialist actively involved with both standards, comments on them as follows:

Why were the standards written?: “Firstly, to lessen the risk of outbreaks of Legionnaires’ disease (LD). There have been instances where water treatment technicians have suspected that the samples they are delivering to the NHLS Legionella lab are related to a suspected outbreak of Legionnaires’ disease (LD). Probably due to fear of negative media exposure by the companies concerned, these possible outbreaks were never investigated by the relevant authorities. So we have been getting hints as to the strong possibility of a bigger problem which has been covered up.”
“There are other reasons why LD is poorly understood in SA. While this disease is notifiable (doctors who diagnose cases are bound by law to report them to the relevant authorities, e.g. National Dept. of Health), few doctors routinely test for it. In South Africa we see very few notifications. This is possibly due to (1) when prescribing antibiotics, doctors try to cover all causes of pneumonia (2) it is expensive to test for LD and doctors want to spare patients extra costs, and (3) doctors and the public lack an awareness of LD).

“Another reason for developing these standards is that people involved in water-treatment and related industries have frequently requested standards or documentation, as there are virtually no SA documents for people to refer to. People reasoned “If there are no documents, standards or guidelines then why must we take it seriously?”

“One of the aims of the Legionella Action Group (LAG) is to create a greater awareness of LD. So, when this project was suggested to our committee, the consensus was that developing these standards were urgently needed.

“There is a greater awareness of LD overseas, and this results in specific tests being conducted in patients where there is a suspicion of LD. Thus, we have seen quite a few travel-related cases reported in tourists returning to Europe from SA. The NHLS, NICD and NDOH have been involved in these investigations, and this has resulted in several investigations of accommodation sites in SA.

Who will need to use the standards?
“LD is linked to urbanisation, power generation, and any industry that utilises water. It thus relates to any cooling system (regardless of size) or open water system that is exposed to prevailing winds or that has the potential to create an aerosol (such as buildings with a centralised air conditioning system, or a building with a complex plumbing system).

“Thus, users of the standard will include any industry that has cooling towers and other water systems, as well as facility managers (hospitals, old age facilities, office blocks, hotels, shopping centers, cruise ships etc), owners of large properties, health and safety officers, air-conditioning companies, and water treatment companies.

Other points to consider: “LD is mainly acquired in a hospital, from a community, or by travel (domestic or international). Legionella bacteria will multiply where one or more of the following conditions exist in a water system, namely: stagnation, increase in temperature and sediment.

“Examples of this are:
• **Temperature** – this organism thrives between the temperatures of 20 °C to 50 °C. *Cold-water systems above 20°C and hot water systems below 50°C are thus especially at risk.*

• **Stagnation** – when there are redundant water pipes in a building or lengths of pipe with blind ends or where taps are not used frequently – all this can produce stagnant water which allows Legionella to thrive and multiply.

• **Sediment** – this usually occurs in water tanks or boiler tanks. Over time there is a build up of sediment which favours the survival and multiplication of *Legionella*.

“For treatment:

• Air condition systems need to be constructed, run and maintained according to the guidelines set out in the new standards.

• Water systems should be maintained at < 20 °C for cold water and > 50 °C for hot water. Although very laborious, it is possible to heat treat plumbing systems that are not too extensive. This is done by setting the geyser / boiler temperature at 65 °C and then flushing each outlet for 5 – 10 minutes.

• Stagnant systems should be flushed regularly.

• Water tanks and boilers should be cleaned to remove all sediment once a year.

• Chemical biocides can be used to kill *Legionella* in potable and air conditioning water systems.

• Systems should be treated for scale and corrosion inhibitors in order to reduce the likelihood of scale and deposits that will favour the growth of organisms.”

For further information, please contact:
To purchase the standards:

Standards Sales at the SABS
Telephone 012 428-6883
Fax 012 428-6928
Email sales@sabs.co.za
The standard can also be downloaded directly from our secure standards webstore (www.store.sabs.co.za) on entry of a credit card number.

Information on the technical content of these standards:
Rob Stewart, Technical specialist
NHLS Infection Control Services Lab, Wits Medical School
Tel: +27 11 489 8578 / 011 717 2496
Email: Rob.Stewart@nhls.ac.za

Media enquiries:
Portia Sebulela, Senior Communications Specialist
Telephone 012 428-6739
Email Portia.sebulela@sabs.co.za
ADDITIONAL BACKGROUND INFORMATION:

- While *Legionella* bacteria produce Legionnaire’s disease (with a high fever and pneumonia), the same bacteria can cause a milder respiratory illness called Pontiac fever, which resembles acute influenza.

- Infection normally occurs after inhaling an aerosol containing *Legionella* bacteria. A recent study provided evidence that *Legionella pneumophila* can travel airborne at least 6 km from its source.

- A team of French scientists reviewed the details of an epidemic of Legionnaire’s disease that took place in Pas-de Calais in northern France in 2003-2004. There were 86 confirmed cases during the outbreak, of whom 18 died. The source of infection was identified as a cooling tower at a petrochemical plant, and an analysis of those affected in the outbreak revealed that some infected people lived as far as 6-7 km away from the plant.

- In 2010, a study by the UK Health Protection Agency reported that 20% of cases may be caused by infected windscreen washer systems filled with pure water. The finding came after researchers spotted that professional drivers are five times more likely to contract the disease. No cases of infected systems were found whenever a suitable washer fluid was used.


- In January – February 2012, three British pensioners died after contracting Legionnaire’s disease while staying in a four star beach hotel at the Costa Blanca, Spain. A further 11 people (7 British holidaymakers and four Spaniards) also contracted the disease.