Letter to the Editor

Legionella Colonization of Powder Paint Pretreatment Tunnels

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We write to highlight a previously potentially overlooked source of Legionnaires’ disease.

Two middle-aged men from the same factory were diagnosed with Legionnaires’ disease in the same week. A joint investigation by Health and Safety Executive (HSE), Health Protection Agency, Local Authority Environmental Health Officers, and the company concerned identified an aqueous pretreatment tunnel as the potential cause (Coetzee et al., 2009).

Aqueous pretreatment tunnels are designed to spray steel parts with degreaser and phosphate to clean and prepare the parts for paint spraying. After each stage, water is used to spray the parts to rinse off excess degreaser and phosphate. This generates vapour that may be inhaled after escaping from either end of the tunnel or via overhead monorail slots.

Although the water is not heated, the degreaser and phosphate tanks are raised to 55–60°C. Through contact and run off this raises water temperatures to 30–40°C typically. The water is recycled and stored, which together with nutrients from iron and debris may encourage Legionella colonization. Sampling confirmed the presence of Legionella pneumophila (LP) in the water tanks (1.7 to 3 × 10⁴ c.f.u. ml⁻¹). Other similar tunnels were tested with four of five proving positive for LP growth (range 41–1800 c.f.u. ml⁻¹).

Pretreatment tunnels differ from cooling towers in several respects. They may have extraction, but unlike cooling towers drift eliminators are not routinely fitted. Vapours escape at sufficiently high level to allow distribution throughout a factory. Furthermore, since the water tanks may hold tens of thousands of litres, water is conserved and recycled. The business need to run the plant to capacity and a design that renders cleaning difficult to achieve effectively may lead to the accumulation of debris and biofilm.

Risk assessments undertaken by apparently specialist companies in other plants had concluded that the risk was ‘low’ and no specific action was recommended.

No previous case reports have been found, supporting the assertion that the risk may be ‘low’. However, the presence of water being stored >20°C, nutrients, and generation of spray implies a foreseeable risk and we contend that action is required (HSE, 2000). Control actions might include:

- Substitution of an ambient temperature pretreatment process (further artificial heating or cooling is unlikely to be cost-effective)
- Regular discharge of water (although this presents problems with environmental discharge permits and cost)
- Scheduled cleaning and disinfecting of tanks, pipework, and spray heads
- Elimination of deadlegs
- Maintenance of extraction, seals, pipework, tanks, and spray heads
- Use of biocide to control colonization if other measures are ineffective
- Monitoring of water quality including bacterial counts and LP cultures as part of a managed system overseen by a responsible person.

Wider HSE enquiry showed that there was little appreciation of this risk from the manufacturers of aqueous pretreatment plants, water treatment companies, or duty holders.

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