



MANAGEMENT OF LEGIONELLA RISK ON SHIPS

1 Organisations involved

Dutch Transport and Water Management Inspectorate (Inspectie Verkeer en Waterstaat)

2 Description of the case

2.1 Introduction

Passengers and crew on ships are potentially at risk of exposure to *Legionella* bacteria contaminating water supplies in the same way as guests and staff in a hotel are at risk. Examples of sources include potable water, water for washing, showers and baths, water in spa pools, etc., and fire hydrants. However, on board ship there are added complications. The risk may be greater because the water has to be taken on board and stored (bunkered). This makes it important that the source and quality of the water taken on board is known, although this may not always be possible in some countries. Conditions for storage of water on board ship are important, especially as they may be affected by temperature extremes when travelling in tropical regions. Any of the above factors are exacerbated because on longer journeys people will be on board continually for extended periods and therefore there is the greater potential for exposure to any contamination. A further complication is that the regulations that normally apply to mainland buildings do not necessarily apply to ships, because they do not have jurisdiction.

The Netherlands Transport and Water Management Inspectorate (Inspectie Verkeer en Waterstaat; IVW) acts on behalf of the Dutch waters management authority Rijkswaterstaat, the water boards and the provinces, whose remit is permitting and the enforcement of statutory and regulatory provisions relating to water management and maintenance. IVW conducts audits and checks, and acts as an advisor on enforcement issues and on procedural and process related improvements in water management. As part of these tasks, a need was identified for guidance specific to *Legionella* risks on ships, to raise awareness of potential risks to health and of legislative requirements to assess and control risks.

2.2 Aims

The aim of this guidance was as follows:

- To clarify the legislative position and responsibilities for ensuring hygienic water quality on board ship;
- To provide the basic information needed to assess and manage the risk of *Legionella* contamination of water systems in general;
- To highlight the additional risks and management issues that go beyond those for typical water systems and that are specific to shipboard water systems.

CASE STUDIES

Picture 1: The front cover of the *Legionella* guide for ships



Source: *Inspectie Verkeer en Waterstaat; IVW*

2.3 What was done, and how¹?

Outbreaks of Legionnaires' disease have been reported globally in association with ships' water systems, and travel is a major risk factor associated with Legionnaires' disease. The new document updated previous guidance to provide more detail on risk assessment and risk management. The *Legionella* guidance was issued as an information brochure available through the IVW website and aimed at those with overall responsibility, i.e., employers (ship managers or owners) and those directly responsible on a daily basis, i.e., the captain/shipmaster.

In summary:

- The updated brochure, issued by the Netherlands Transport and Water Management Inspectorate (IVW), provides fundamental information on factors leading to the growth of *Legionella* in water systems in general. It also provides information on infection, including transmission, infection rates and human health risk factors.
- Information on the prevention of *Legionella* in water systems is presented in the context of systems in use on ships. This highlights the importance of sourcing clean water supplies to take on board and practical control measures such as temperature control.
- The guidance is a valuable source of the information needed by ship owners regarding the legal framework for assessing and controlling risk of legionellosis for crew and passengers. Some legal measures, such as those covering clean water supplies and swimming pool waters, do not apply to ships. However, ships are covered by the Dutch Occupational Health and Safety Act (the 'Arbo-Act'), which covers control of *Legionella* risk.

¹ What was done, including challenges faced and overcome

CASE STUDIES

- Under this Act, for commercial shipping the responsibility for carrying out preventive measures lies with the employer, i.e. the ship manager or owner, but it is the job of the captain/shipmaster to ensure that his ship is safe. It is a legal requirement that a general *risk inventory and evaluation* (RI&E) is completed for all sea-going and inland vessels, and a stipulation is that within the RI&E particular attention must be paid to the risk of *Legionella*. The guidance also refers to pleasure craft. Although these craft are not covered by the above regulations, it urges owners to take responsibility to ensure users are not placed at risk.
- A section in the brochure lists points of special interest on ships, highlighting aspects of ships that might be a critical focus of potential *Legionella* contamination. This is a practical guide that lists all the components of a ship board water system under the following headings: Water intake; Water mains installations; Bath systems; Climate treatment; Hoses; Household apparatus. Each topic is dealt with by assessing the risk factor, that is, the likelihood of colonisation by *Legionella* bacteria. Where appropriate, recommendations are given for monitoring or maintenance, including what to do and with what frequency.

The brochure is available on the IVW web site as a six-page downloadable PDF file. As it is expected that the brochure will be printed off and kept with other maintenance documents on board ship or by service contractors for shipping agents, the printed version of the brochure has eyelets so that it can be kept in a binder.

2.4 What was achieved ²?

- Guidance was issued outlining the regulations as they apply to Legionella management, with specific reference to how they apply to water systems used in inland shipping and seagoing vessels.
- The departments in charge of supervising the regulations under the Arbo-Act are listed.
- Practical advice on contamination control, including controlling water temperature, is provided.
- A protocol for drawing up a risk analysis and management plan was outlined, including the establishment of an emergency plan in the event of a contaminated water sample or case of Legionnaires' disease.
- A limit of detection of 100 colony-forming units, above which remedial action must be taken, is suggested, although for more details on sampling and testing the user of this document would need to refer to other advisory guidance.
- Cross-references are provided to further useful sources of information, including sampling and testing resources.

² The outcome should be recorded here, including what was not achieved as well as any cost benefit analysis. This would also include anything created as part of the action (e.g. creation of a website for more information, and any social partner views)



2.5 Success factors

Factors influencing the successful production of this guidance included recognition of the potential problems associated with shipboard water systems by technical specialists supporting IVW. IVW worked with the Medical Adviser of the Netherlands Shipping Inspectorate, a physician with maritime expertise, and the policy department of the Ministry of Transport, Public Works and Water Management to draft the current guidance. This is one in a series of web site-based guidance notes and information provided by the Medical Adviser about several infectious diseases relevant to maritime transport. These supplement general information given in the Dutch Maritime Medical Guide to provide a coherent single source of information for ship owners.

2.6 Further information

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2.7 Transferability

The information on legal requirements is specific to the Netherlands. However, the basic information about risk factors and controls required for ship-based water systems, and the practical advice within this brochure, is universally applicable.

2.8 Abstract

Legionella outbreaks have been linked to ships, and onboard water systems are a risk factor. The Transport and Water Management Inspectorate of the Netherlands (Inspectie Verkeer en Waterstaat) has produced guidance on managing these risks. Information on prevention of Legionella in water systems is presented in the context of the systems in use on ships. Information is also given about the enforcement authorities for different types of shipping, and about Legionella risk analysis and management plans.

3 References, resources

1. Legionella (English language version)
http://www.ivw.nl/english/Images/Brochure%20legionella%20Engels_tcm268-232076.pdf
(The brochure also lists web links to other Netherlands sites that provide information on the health and safety legal framework relevant to ships and information on Legionnaires' disease).
2. Netherlands Transport and Water Management Inspectorate (Inspectie Verkeer en Waterstaat; IVW): <http://www.ivw.nl/>. Details of their work is described in a brochure available at http://www.ivw.nl/Images/CorpBrochENG_tcm247-211267.pdf
3. Legionella oracle – an information source on at-risk water systems:
www.legionellavraagbaak.nl
4. Netherlands Health and Safety Portal: www.arbo.nl