IFA
Institut für Arbeitsschutz der
Deutschen Gesetzlichen Unfallversicherung

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Focus on IFA's work

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Hygiene investigations aboard sea-going vessels

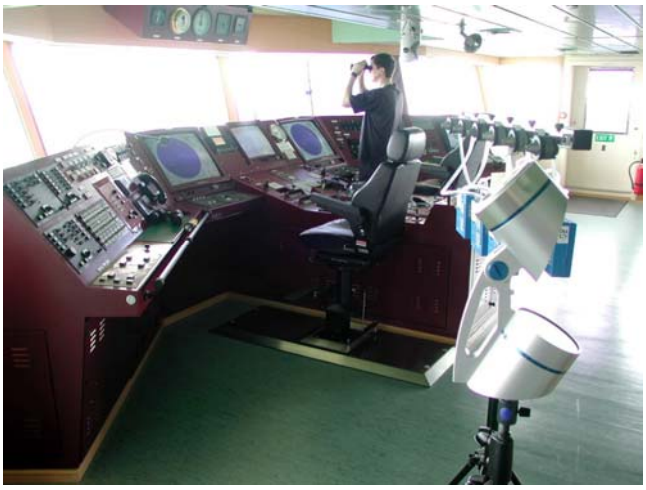
Problem

On the basis of observations by occupational physicians of the then See-Berufsgenossenschaft [Institution for Statutory Accident Insurance and Prevention in the Maritime Industries], roughly 50% of all cases of illness aboard German sea-going vessels relate to diseases of the upper respiratory tract. This suggests a correlation between these diseases and the air-conditioning systems aboard the vessels. For this reason, the interior air was investigated microbiologically on a variety of ship types and under different climatic conditions (shipping routes).

Activities

Microbiological investigations of the interior air quality on different ship types under different climatic conditions were initiated in 2002. Air samples were taken in work areas, living quarters and social rooms. The quality of the outdoor air was taken as the reference for assessment of the measured values.

Air and material samples (e.g. humidifier water and filter materials from the air conditioning system, shower water, contact plate samples from supply air ventilators) were investigated directly on board as well as in the IFA's microbiological laboratory for their content of bacteria, moulds, yeasts and endotoxins.



Measurement of airborne germs on the bridge

To sample the air, two measuring systems with different measurement principles were used. These were the IFA's filtration-based inhalable dust sampler (PGP-GSP system) and the impactor MAS 100 from Merck, which collects bioaerosols on solid nutrient media.

Results and Application

The results show that more bacteria than moulds occur in the interior air of vessels – contrary to the findings at work areas on land. The highest microorganism counts tended to be found in the employees' living quarters. There also seems to be a relationship between interior air quality and the shipping route. The longer the voyage and the greater the number of climatic zones passed through, the higher the microorganism concentrations that were recorded.

Legionella or endotoxins have not been detected on the investigated vessels. Along with the air samples, nasal swabs were taken of crew members and microbiologically examined. There were indications of a correlation between colonization of the mucous membranes of the nose and room air quality.

This study, so far the only one of its kind worldwide, met with great interest at the 5th Scientific Conference of the International Occupational Hygiene Association (IOHA) 2002 in Bergen (Norway). The See-Berufsgenossenschaft continued this series of tests on other ships so that recommendations for the installation and maintenance of ships' air conditioning systems can be given on the basis of extensive data.

Area of Application

Shipping companies, occupational safety experts, supervisory staff, company doctors

Additional Information

- Meyer, G.; Kolk, A.; Schneider, G.: Manual for hygiene and maintenance of heating, ventilation and air-conditioning installations on seagoing vessels. Ed.: BGIA – Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung, Sankt Augustin; See-Berufsgenossenschaft, Hamburg 2009 www.dguv.de/ifa, Webcode e96951

Expert Assistance

IFA, Division 2: Chemical and biological hazards

Berufsgenossenschaft für Transport und Verkehrswirtschaft [German Social Accident Insurance Institution for the transport industry], Hauptabteilung Gesundheitsschutz, Referat See

Literature Requests

IFA, Zentralbereich

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