Plant failure causes ammonia leak

Issued: October 1997

(Previously titled - Ammonia Plant Failure)

Purpose

This Alert is issued to inform employers, self-employed persons, designers, manufacturers and suppliers of ammonia plant of a recent incident involving the failure of an oil filter.

Background

The failure of an oil filter on an ammonia compressor caused an ammonia leak and subsequent evacuation. One person was admitted to hospital but was released after several hours observation. The filter had been installed approximately seven months prior to the leak. The filter consisted of a filter element contained in a stainless steel sump, with an o-ring seal, and a nickel plated brass locking-ring (see figure 1). The locking-ring split, allowing the sump to come off, and oil and ammonia to escape (see figures 2 and 3).

An independent report found the cause of locking ring failure to be stress corrosion cracking which can occur in brass "...in the presence of ammonia and very small levels of contamination in surface moisture or condensation". The report also found that "The presence of ammonia in the environment and the applied stress on the filter locking-ring when it is tightened would promote the propagation of stress corrosion cracking".

Preventative Measures

In order to prevent similar failures it is recommended that the locking-ring material be changed from a copper based alloy to a material that is not susceptible to stress corrosion cracking and which meets the mechanical requirements specified by the designer.

Further Assistance

Should you require further assistance please contact your nearest WorkCover office. Copies of the Acts, Regulations and Codes of Practice are available from Information Victoria.
The Code of Practice for Plant is also available from WorkCover offices.
This document is in the public domain and may be freely copied or reprinted.
October 1997, P12/97