UK P&I CLUB

Ship Type: Bulk Carriers   Trade Area: Worldwide

Bulletin 47 - 05/98 - Grain fires caused by fumigants - Dangers of using Hydrogen Phosphide (Phosphine)

We would bring to Members attention that a continuing source of fires and explosions on grain ships is the use of hydrogen phosphide (phosphine) as a fumigant.

It may seem rather odd that the most commonly used procedure for fumigation of grain in ships holds involves the use of a highly flammable gas which when it reaches a certain concentration can spontaneously ignite.

The popularity of this method of fumigation is undoubtedly because of the relative ease of application. Sachets of fumigation strips containing either magnesium phosphide or aluminium phosphide are distributed either on the surface of the cargo or below the surface by means of probes. Water vapour from the cargo can penetrate into the solid phosphide which reacts with it releasing phosphine gas which is highly toxic and potentially spontaneously combustible. Too much gas in the ullage space of the cargo hold could produce a concentration sufficient for spontaneous ignition.

The risk of a fire using this technique can be minimised by :

-       Placing the fumigation strips at varying depths in the cargo using a probe, and not just on top of the cargo.

-       Using aluminium phosphide which gives a slower release of phosphine on a long sea voyage

-       Magnesium phosphide, which generates phosphine at a faster rate, may be used for a short sea voyage.

-       At the end of the voyage, the fumigant strips can be retrieved if they have been tied together.

-       Using them only strictly in accordance with the manufacturer's instructions

Further advice can be found in:

1.   Recommendations on the Safe Use of Pesticides in Ships 1996. IMO publication as supplement to the IMDG Code

2.   UK Department of Transport M Notice (M.1534)

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