FILE NAME: Sprayed Asbestos (SPRA)

DATE: 1972

DOC#: SPRA033

DOCUMENT DESCRIPTION: Conference Presentation - Safety and Health in Shipbuilding and Ship Repairing [Introduction of Asbestos Substitutes in a Swedish Shipyard]

FETY AND HEALTH IN SHIPBUILDING AND SHIP REPAIRING,

.cupational Safety and Health Series, ILO, Geneva, 1972.

INTRODUCTION OF ASBESTOS SUBSTITUTES IN A SWEDISH SHIPYARD

N. Sundstedt*

Abstract

Brief account of successive measures taken since 1958 in a Swedish shipyard, which have resulted in the complete elimination of asbestos as an insulation material, except in the case of fire-proofing board, substitutes for which were under test at the time of writing. The reasons for substitution in various applications and for the policy switch from partial to total elimination made in 1969 (new evidence of extent of hazard, reluctance of workers to work with asbestos) are outlined and the characteristics of substitute materials selected are indicated. It is concluded that, all in all, substitution should involve no economic burden.

*

* *

When we had the first serious discussions in Gothenburg in 1958 about the health hazards in work with asbestos, the participants (representatives of the labour inspectorate and the shipyards, physicians, safety technicians, etc.) fully realised that asbestos should be replaced as far as possible by a less dangerous material. The studies made in 1958 brought no acceptable substitute material to light. However, the discussions at the meeting and our search for a substitute resulted in increased interest in finding such a material.

In 1958 the following materials containing asbestos were in use:

1. Board, lags and pipe sections of magnesite for insulation of steam boiler, exhaust receiver and other large pipes.

[illegible] Sundstedt.

2. Magnesia mortar - to plaster the aforementioned insulation. These magnesia products contained between 12-18 per cent asbestos.

3. Cloth, yarn and cardboard containing 97 per cent asbestos.

4. Loose asbestos fibres for filling of insulating mattresses, containing 97 per cent asbestos.

5. Asbestos packings of different kinds.

6. Sprayed asbestos for insulation against fire, sound and condensation, containing 97 per cent asbestos.

7. Board of different makes for accommodation purposes, containing 10-14 per cent asbestos.

The companies producing rock wool and glass wool for insulatic purposes realised that there might be a demand for these in the shipyards. Quite soon they succeeded in producing products that could be accepted by the yards and the maritime authorities. After a few years of tests we found in 1955 that we could replace the asbestos insulation of steam boilers and exhaust pipes with wired mats of mineral wool or glass fibre. Moreover, we could replace the loose asbestos fibre in the insulation mattresses with the same material.

This switch reduced the use of asbestos at the shipyard so much that medical experts considered at that time that none of our workers was likely to contract lung asbestosis within a normal life time. The remaining work with asbestos material was done sporadica during short periods, and was therefore not considered as dangerous

In 1969, however, we had to change our minds. Two suspicious cases of asbestosis occurred in which neither of the affected persons had worked either with asbestos itself or in an environment with an "asbestos hazard".

Moreover, at a meeting organised by the Institute for Research on Occupational Diseases we learnt that asbestos was suspected of causing other pathological symptoms in addition to classical asbestosis. Although among medical experts there is substantial doubt about the connection between asbestos and the newly noted pathological changes in the lungs, the suspicion was sufficient to motivate a study aimed at completely eliminating asbestos in work s shipyards. As we had succeeded so well in finding substitutes for asbestos, we now wanted to concentrate on pursuing this effort to its logical conclusion. Another reason for avoiding asbestos was that the discussions about the hazards involved had caused such anxiety among our workers that we could expect difficulty in finding workers willing to undertake such work.

The spraying of asbestos for insulation in engine rooms and in some cases in the equipment of ships is a very dusty operation. A great deal of the sprayed asbestos falls haphazardly on places such as floor gratings, platforms, walls and engine parts, where it remain

During the last year we have not used asbestos spray in our new building. Now we insulate the latter with rock wool wire mats with a surface coating of plastic cement or sheet-metal. Instead of asbestos spraying we use rock wool board No. 337 which is fastened with welded pins and washers. As a surface coating, plastic cement, cement plaster, glass textile or the like can be used. Turbines, steam drums and other similar engine components that were formerly insulated by asbestos spraying are now insulated with asbestos-free calcium silicate (K ithorn Extra) which is plastered with plastic cement to obtain a hard surface.

Asbestos cloth is replaced by glass textile. We use Mölnlycke Tex No. 9642 or glass textile No. 6245 from "Svenska Sidenväveriet". Tests carried out by Götaverken's laboratory have proved that these glass fibre textiles will withstand higher temperatures than asbestos cloth.

Ordinary asbestos cloths contain between 15-18 per cent cotton and a small percentage of textile glue, and consequently do not endure temperatures above 400° C. Asbestos cardboard has been rejected completely, and we have not tried to find a substitute for it, as the quality of the mineral wool and glass fibre hitherto used in conjunction with it is now so good that the asbestos cardboard must be considered as unnecessary. Pipe lines with temperatures up to 340° C are insulated with rock wool pipe sections or lags and are covered with glass textile. Pipe lines with temperatures between 340-513° C are insulated with asbestos-free calcium silicate and are covered with glass textile or plastic cement.

Tube flanges and valves on pipe lines are insulated with mattresses filled with rock wool and are externally covered with glass fibre textile. Packings for tube flanges and for various engine parts are still made of rubber jointed asbestos or plaited asbestos. However, instructions have been given that "Three Bond" packing pulp or an equivalent material must be used wherever possible.

All this has now been put into practice and the last ship with asbestos in the engine room and pump room was delivered in July 1971. Only the board residue (Marinite, Navalite, Internit and Turner), which we use for the equipment of ships where there is a demand for fire-proof insulation.

It has been more difficult to find a substitute that meets the requirements for screw-retaining ability, possibility of glueing on different kinds of surface coatings, absorption of humidity, etc. We are now testing a board made of plaster and rock wool, called "Fibre Gutta", which is approved by the Board of Shipping and the classification societies. The disadvantage of this board, however, is that it is rather heavy to handle.

In October 1971 we plan to deliver the last ship with asbestos insulation and asbestos equipment on board.

But as the last ship, we have not used asbestos in manufacturi-

The substitutes of which I have given an account are the materials that we use today. The companies that manufacture rock wool, glass fibre, glass textile, plastics and tapes of different kinds are interested in obtaining their share of the market and they introduce and discuss novelties nearly every week. Recently, one of the companies presented a self-adhesive glass textile which is available in any colour. With this material, the slow and expensive work of sewing the glass textile on the pipe lines and painting is eliminated. In a year or two we shall perhaps have other substitute which are better, less expensive and more labour-saving.

To sum up, this investigation shows that in many cases one can easily abandon the use of asbestos. The reason why asbestos has been used to so great an extent is probably because of its technical qualities, and also because its use has often been a matter of pure routine, no attempt having been made to find a substitute.

As to the cost of the substitutes, it is early yet to answer this question. In some cases it may be cheaper and in others more expensive. However, taking into consideration the extra protective measures in the form of ventilation, personal protective equipment, careful housekeeping, etc., required in regular work with asbestos, it can be safely said that substitution will impose no economic burdens.