

Exposures to Asbestos from work on Removal of Compressed Asbestos Fibre (CAF) Gaskets

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The oil and gas industry has many facilities where there are large numbers of gaskets on flanges and valves within pipework. Many of these were installed at a time when compressed asbestos fibre (CAF) gaskets were the normal material used for the purpose.

Many CAF gaskets are known to still be present, but there has also been significant replacement of CAF gaskets during servicing.

Significance of condition of CAF gaskets

The study comprised a literature review followed by a telephone survey of targeted contacts to gather information that would help assess the relevance of the published information to the oil and gas industry

Given the extent of work expected to be required on replacing CAF gaskets, this study was undertaken to provide information that would assist decisions on future work practices.

The Energy Institute (EI) tendered the work to the Institute of Occupational Medicine (IOM) to undertake a study to assess concentrations that might arise from compliant and non-compliant methods of removal of compressed asbestos fibre (CAF) gaskets.

The study comprised two phases:

- The first phase was a review of published information.**
- The second phase was a series of structured telephone interviews to obtain information on current practice for work on CAF gaskets in the oil and gas industry and to request any unpublished exposure data that might be made available for this report.**

The literature review addressed compliant and non-compliant methods of removal of CAF gaskets, the latter being relevant to situations that may arise on occasion if gaskets are not recognised as being asbestos.

- Compliant methods would mean methods in compliance with current guidance (in HSE's Asbestos Essentials, guidance sheet a25).
- 'Non-compliant' methods would include methods used in the past and methods that might be used currently for gaskets believed to be non-asbestos.

One of the objectives for this literature review was to assess whether the available information on exposures during non-compliant removal of CAF gaskets provided an adequate and reliable estimate of likely exposure in such circumstances.

This literature review sought to develop from the information available in published and unpublished literature, a sound basis for assessing the potential levels of exposure to asbestos in the oil and gas industry from work to remove gaskets that contain asbestos (i.e. compressed asbestos fibre CAF gaskets).

This involved compiling the information available, and then examining the circumstances and work procedures which were likely to have had an important effect on the concentrations of airborne fibres.

Published information was available from the following types of studies:

- Measurements of concentrations during manufacturing processes, and these indicate the propensity of CAF gaskets to release fibres;**
- Studies of concentrations during removal of CAF gaskets, often during the era when CAF gaskets were still being manufactured and installed as replacements;**
- Workplace tests conducted specifically to assess concentrations during removal of CAF gaskets with different levels of precautions;**
- Simulation studies, where CAF gaskets have been removed from flanges or surfaces that have been brought into a test facility where conditions are controlled.**

Concentrations of airborne dust and fibre are dependent not only on the source of the dust, but also on the ventilation and dilution.

The literature review was not expected to characterise the ventilation / dilution throughout the oil and gas industry.

However, high levels of natural ventilation would be advantageous where flammable vapours might escape. In particular, the offshore oil and gas industry operates in conditions where it is normal to have high levels of natural ventilation (in many operational areas).

By contrast, simulation studies can be and have been conducted in enclosed conditions to prevent spread of airborne dust) where there will be much less dilution of any dust released.

Therefore, it was also important to gather information about the typical operating conditions where work may take place involving gaskets in the oil and gas industry so that information from all available studies can be properly interpreted for their significance on likely concentrations in the relevant conditions. This was done in the second phase of the study.

Confidentiality for telephone survey.



Interviewees were informed that the information collected during these series of telephone interviews would be treated as confidential and would be anonymised before publication.

Examining “Compliant” and “Non Compliant” methods through accidents and incidents.

Phase II of the Study – telephone interviews

The second phase of the study comprised telephone interviews with contacts within the oil and gas industry based on an agreed range of topics.

The interviews were intended to seek information under the following headings

- Where the (potential CAF) gaskets might be used in broad (sector of operation & product) and narrower {premises, plant & process or processes} terms;**
- Approximate dates of when equipment or plant with CAF gaskets was first and later used in process and plant;**
- Means of identifying if gaskets might contain (or not) asbestos;**
- Types of asbestos-containing gaskets potentially still in service;**
- The procedures and practices for removing gaskets ‘containing’ and ‘not containing’ asbestos;**
- Control measures used during removal and replacement of gaskets ‘containing’ and ‘not containing’ asbestos;**
- Relevant measurement data.**

Conclusion from the combined phases of the study

The published data for removal of gaskets with wet methods (Cheng and Mc Dermott 1991, and Spence and Rocchi, 1996) combined with the previously unpublished data (received from interviewees) indicate that exposures during removal of CAF gaskets with application of control measures (wetting etc.) demonstrate concentrations substantially less than 0.1 fibres/ml, i.e. substantially less than the current UK Control Limit.

If CAF gaskets are removed with current levels of standard precautions, the likely exposure levels are very low and consequently risk very low.