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A REVIEW OF THE CONTROL OF ASBESTOS PROCESSES IN
THE CENTRAL ELECTRICITY GENERATING BOARD

J.A. Bonnell, J.R. Bowker, R.C. Browne,
J.F. Erskine, R.M.P. Fernandez, & P.M.O. Massey

Central Electricity Generating Board,
Courtenay House,
18 Warwick Lane,
London, E.C.4P 4EB

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The Asbestos Industry Regulations 1931 were limited in their application to specified processes in factories and workshops, the so called "scheduled processes" and it was not clear whether such processes as defined existed at electricity generating stations but it was assumed that they did not.

Case finding in some areas of the country in the middle 1950's suggested that there were cases of asbestosis amongst ladders who had been employed in the industry for long periods of time. It was difficult to obtain a clear assessment because the pattern of lagging work varied not only from one part of the country to another but from one power station to another: but these findings were sufficient to alert the medical services of the industry to the potential problems.

Reports of the association of slight or even transient exposure to asbestos with the development of mesothelioma of the pleura after a long latent interval resulted in the establishment of a scheme for careful medical surveillance of all persons who were exposed either directly or incidentally to asbestos-containing lagging material. Environmental surveys confirmed the desirability of such a scheme. This was introduced in 1962 and led to the discovery of further cases during the next few years.

Code of Practice

The Board were advised by their medical officers in August 1965 of the serious potential problem of asbestos exposure and they immediately ordered an enquiry into the

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implications of discontinuing the use of asbestos and the possibility of introducing substitute materials or other methods of thermal insulation into new power stations. It was recommended that a Code of Practice be prepared to prevent the formation of airborne asbestos in workplaces occupied by unprotected personnel and for improving the protection provided for personnel working with asbestos. A draft code was prepared early in 1966. It was circulated for use on a trial basis during the maintenance period of 1967, and on the experience gained in these trials the Code of Practice was introduced for general use in 1968.

The Code defined asbestos, stated the nature of the risk to health, explained the methods to be employed for protecting staff against airborne dust and outlined the policy for introducing alternative materials. Adequate training of all persons was stipulated and all supervisors were to be issued with copies of the code and required to be familiar with its requirements. Dust monitoring of the atmosphere was also specified.

Recommendations were made about working procedures including thorough wetting before stripping operations commenced stressing the need to prevent the formation of slurry which could dry later and form an additional dust source: the removal of dry dust by exhaust ventilation if wetting was not practical and the issue of approved personal protective clothing and equipment. For the removal by stripping of old lagging the site of the work must be isolated and its limits defined by the placing of rope barriers together with the posting of adequate warning notices. The men working inside the roped off

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enclosure are by definition "asbestos workers", the number of men employed inside the roped off enclosure are kept to a minimum. It was accepted that adoption of the code would slow down the rate of working during stripping operations, but it was stipulated that contractors should be required by contractual obligations to conform with its requirements.

Asbestos-free thermal insulating materials

The maximum temperature to which thermal insulating materials are exposed at power stations is 593°C. (1100°F.). A Research and Development programme was commenced to test various commercially available asbestos free thermal insulating materials in 1966, this covered the use of all thermal insulation materials from preformed sections for steam pipework to the application of sprayed mineral wools to turbine cylinders and steam chests. The latter process is necessary because of the desirability to obtain evenly distributed insulation and the avoidance of hot spots a process which creates a high level of airborne dust. By 1969 a sufficient number of satisfactory alternative materials had been tested and shown to be satisfactory, the decision was taken to abandon the use of asbestos containing materials throughout the Board. Since this time all contracts for thermal insulating materials used within the CEGB specify that these must be asbestos free. The decision was reported to the Industry's National Joint Advisory Council, at which the Members and Senior Officers of the Electricity Boards and the Trade Unions consult on all matters concerning health and safety, in April 1969. At the

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same meeting the use of the Code of Practice referred to above was also ratified.

The alternative materials tested have included combinations of various mineral wools, artificially produced mineral fibres, ceramic fibres and glass fibres with calcium silicate and magnesia. Problems were encountered in the early days in finding alternative materials for spraying. For ease of identification the asbestos free materials are dyed in distinctive colours so that they can be readily recognised.

Medical Evidence

The first case of asbestosis in the industry was reported in 1949 in a man who had been employed as a lagger for 13 years in an old power station in Manchester.

The pattern of lagging work varied from one power station to another, and in many cases was wholly carried out by contractors. Individual medical officers investigated the health of ladders in the London area in 1956 when 4 cases including one mesothelioma were reported amongst 80 ladders investigated radiographically. A similar survey carried out in the North East in 1958 showed that 2 out of 19 ladders had evidence of asbestosis of the lungs, both had been exposed for over 40 years.

A further survey in the Midlands in 1965-66 showed that 3 out of 77 ladders and ladders mates with exposures ranging from 8 - 18 years had evidence of mild or moderate asbestosis, there was in addition a further case of mesothelioma in this group.

Since this time there have been 45 cases of asbestosis including 3 cases of bronchogenic carcinoma.

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8 cases of mesothelioma and 13 cases of pleural plaques. These cases however do not indicate the prevalence of asbestosis amongst CEGB employees nor is this a measure of the incidence of the disease. Many of these cases were only diagnosed after retirement.

Up until the late 1950's studies were aimed at investigating the possible occurrence of asbestosis amongst ladders and ladders mates, but as the association of mesothelioma and pleural plaques with brief exposures to asbestos became evident, it became clear that virtually all the trades involved in maintenance work at power stations were potentially at risk, these included fitters and fitters mates, riggers and crane drivers. For this reason it became necessary to establish a prospective study of all asbestos workers. One of the problems that immediately arose was the definition of an "asbestos worker". It was eventually decided that since all work with asbestos containing lagging material should be isolated, that areas should be roped off, and persons who worked within the roped off area would be classed as asbestos workers. They would require regular medical examination with chest radiography and their names entered in a special register at each power station. Regular environmental surveys should be carried out and the air concentrations at the barriers should be kept within the limits recommended by the British Occupational Hygiene Society Standard.

The history of the control of asbestos containing lagging materials and asbestos related diseases in the electricity generating industry in England and Wales is an

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excellent example of co-operation between management, medical services and research departments in industry. The problem has been solved for the future, but there still remains the need for stringent precautions in dismantling and stripping of old lagging material.

Medical surveillance of those people who have been exposed will continue, there are however a number of people who having spent many years working in power stations on various jobs may have been transiently exposed to asbestos dust and it is not possible to identify such individuals, and they are not included in the group under surveillance.

One unexpected and gratifying feature of the decision by the CEGB, a major user of thermal insulating materials, to abandon the use of asbestos containing lagging materials is the stimulus given to manufacturers to search for alternative materials, thus giving an impetus to the use of asbestos free lagging materials in other industries.

Conclusion

The policy adopted for the protection of ladders in the Central Electricity Generating Board was based on (1) the finding of alternative asbestos-free thermal insulating materials and (2) the preparation and imposition of a code of practice for use at power stations where large quantities of asbestos lagging materials existed and (3) continued medical surveillance of all exposed personnel.