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General Headquarters
December 30, 1958

To: All Industrial Relations Managers

Threshold Limit Values

The application of the threshold limit values (maximum allowable concentration), to the single substances itemized in the Industrial Health Standard Practices, Appendix II, is relatively simple. The application of appropriate threshold limits for mixtures of substances contaminating work atmosphere, however, offers some complications.

There has been little research done on the synergistic, or combined effects of mixed toxic materials. Accordingly, Dr. Smith and I have reviewed this problem with a number of the leading health authorities and have obtained a consensus regarding the application of health standards.

The following should be the method for interpreting and evaluating the industrial hygiene survey results:

1. If the contaminant sampled is made up of a single toxic substance (dust, vapor, etc.), the appropriate threshold limit value will apply.

2. If the contaminant being sampled consists of a combination of substances, only one of which is toxic and this is present in a proportion of 25% or more, the threshold limit for the single toxic substance would be applied.

3. If the contaminant being sampled consists of multiple toxic substances and the combination of these exceed 25%, the threshold limit value for the substance having the lowest limit shall be applied.

4. Contaminants containing less than 25% of toxic substance(s), while they cannot be considered innocuous, represent a lesser hazard potential and should be evaluated individually. We will recommend an appropriate threshold value upon request.

5. The visible, or nuisance, dust should be commented on and evaluated subjectively by the industrial hygiene technician. Visual appearance and physical characteristics can be described in such terms as "dirty, covers equipment and men in short time", "gritty, can feel dust in nose and mouth", or "vapor not visible, but has disagreeable odor".

There are several methods of determining the proportion of toxic substances in survey samples. These are listed in order of their accuracy and preference:

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