

ture, but it will not eliminate them. Nevertheless, delaying tactics will render such incidents more costly — socially, politically, and economically — than would otherwise be the case.

This report should be required reading for any corporate or governmental official who feels that Love Canal was a short-lived blip on the screen — it clearly shows that the scientific/health/social interface can be very cloudy if not handled properly from the viewpoint of the persons involved.

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*Management of Safety: Concepts and Tasks (A Unified Approach to Achieve Safety and Quality)*, by N.S. Sreenivasan, Works Manager, IDL Chemicals Limited, P.O. Sonaparbat, Rourkela 769016, Orissa, India, 136 pages, paperback, 1984; available from Mr. Sreenivasan at above address.

Perhaps an explosive manufacturing facility is the ultimate proving ground of effective management, since quality control and safety are so closely interrelated, and must be at a high level if plant and personnel are to survive. As works manager of an explosive plant, the author of this "safety guide" has organized both his personal as well as company philosophy on "safety" as an integral part of a well-managed business. Beginning with the stated company philosophy on excellence in quality and safety, and its social philosophy, expressing the need not only to comply with laws but to go beyond (such as including the workers' family as the focal point by way of introducing regular diagnostic health checks), the booklet outlines the general basic approaches to safety management, pointing out that the gap between precept and practice is often too wide, and that "safety", to be successful, must be integrated into the system at every step from top management to the operator at the work site.

"Management of Safety: An Interview", and "Basic Concepts of Safety" present fundamentals in an outline, and stress that many aspects are frequently overlooked in the era of laws and regulations, which, like bandaids, were put in place to control specific, rather than general problems. Each functional group in the plant must have clear guidelines which are outlined as to their safety activities, including design, research and development, purchase and stores, manufacturing, maintenance, quality control, personnel, marketing and consumer service, as well as the plant safety office.

"Safety Policy and Objectives" outlines basic principles which guide the actions of a company. The chapter on manuals on safety procedure with specific topics which should be addressed is excellent. Examples are shown of the procedure for introduction of a new chemical into the operation, a flame/work permit system, a job-preparation and job-sequencing procedure, and dismantling/erection procedures.

In a chapter on operator control, which is the heart of the booklet, the difference between "control of safety by the operator" and "controlling the

operator for safety" is clearly defined, with the conclusion that "control by" is superior. In other words, the operator must have both training and initiative to perform his tasks properly and safely. Mr. Sreenivasan feels that conventional safety training techniques have fallen on uninterested ears and bored minds. Instead, he sees self-control by the operator as the best approach. A two-page checklist of assessment of controllability aids in the evaluation process. Prevention at the source is seen as the base of all safety activities. Management controllability is not overlooked, however, since management has a key role in implementing health and safety rules at any given location, including the correction of unsafe conditions and facilities which are normally beyond the operator's control.

The assurance (or monitoring or audit) of safety is outlined, with common deficiencies leading to lapses in safety outlined. This list includes 211 specific items, and is most interesting. On the positive side, the planning for safety in a project includes a checklist of 88 questions and points to be considered, and a review mechanism for planning. Training for safety and keeping up the tempo of safety activities includes an interesting discussion of the "QC Circle Phenomena". Quality circles are defined as small groups of workers within a work area who meet weekly to discuss quality problems and take action within their area. Evolving from the Japanese post-WWII activities, such circles now number over a million, with membership of 10 million. No longer confined to quality, it now includes safety, facilities, morale, control, and other aspects dedicated to keep up the tempo of improvements in every field, with "self-control" as the proper approach.

To improve the organizing for safety, a typical safety set-up is analyzed, followed by an outline of safety planning, assurance, and co-ordination. To evaluate the "maturity" of safety management, the concept of maturity evaluation is noted, to insure that new challenges and changes will be anticipated and taken in stride.

Several illustrations are given involving the explosives industry, including choice of technology (nitroglycerin explosives vs. slurry), evaluation of semi-automatic machines, clearing and cleaning of equipment before maintenance, unusual occurrence/accident report forms, a safety plan of a job assigned to a sub-contractor, and a shop safety-audit checklist. References to 23 articles and 19 books complete the discussion.

To this reviewer, whose interest in safety began when he witnessed a fatal explosion in an explosives plant decades ago, this discussion by Mr. Sreenivasan reflects a new look at "safety" as a part of "quality control", with full recognition that both operator and manager must assume and actually take responsibility and initiative at the work station as well as in the board room. The subject deserves wide consideration by labor, management, and government regulators, and this booklet should be widely read and utilized.

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