ABSTRACT

Catastrophic accidents in process plants are rare. For example, the Chemical Incidents Reports Center at the Chemical Safety Board site in mid-October 2001 reported a total of 13 serious incidents in industrial facilities within the United States over a period of 28 days. Two thirds of these incidents involved fires and/or explosions, with the remaining third resulting in the release of toxic materials. Combined, the accidents resulted in six fatalities and five serious injuries. Serious as such individual events are, given the tens of thousands of processing facilities in the United States alone, the probability of a serious accident occurring at any single facility is very low indeed.

Yet, when a serious accident does occur the consequences are devastating. In addition to the direct human suffering caused by the event, the managers at the facility are likely to suffer also. At best their careers will be checked; at worst they may face criminal prosecution. Moreover many accidents, particularly those involving fires and explosions, have very serious economic consequences in terms of lost production, damaged equipment and increased insurance premiums.

These two factors – the rarity of serious events, but their seriousness when they do occur – poses a dilemma for plant management. In particular, they need to know what management issues to look for that indicate that a serious accident is in the offing. As discussed below, audits provide some guidance but they are not enough hence this article. The authors have drawn on their experiences in plant management and process safety consulting to develop a series of seven “Warning Flags” that, if flying over an organization, suggest that that the potential for a serious accident exists. Necessarily, most of the concepts in this article are subjective, being derived from personal observations, and from discussions with other experts. Hence it is difficult to “prove” these concepts rigorously, either through the use of scientific principles, or through statistical analysis. Moreover, even anecdotal information has often to be held back because such information is often part of an on-going lawsuit. Nevertheless, reviews of preliminary versions of this article by other managers and consultants who have "been there, and done that" have consistently drawn general agreement with what the suggestions made here.