Discussion of Issues with Formosa, IL Chemical Accident

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As noted by Seeward (14 Mar. 2007), when investigators probed the Formosa accident in Illinois, the Chemical Safety and Hazard Investigation Board (CSB) found that the company and plant management were deficiency because they did not take into account the potential harm that might result in the event of significant human error. The fact is that human error is always a likely occurrence for any system in which humans interact. This is why computer programmers consistently define "foolproof" as any system that is inaccessible to users. Safety systems are woefully inadequate if they rely on 100% compliance from human users. For this reason it is important to insist that companies have safety systems in place that have built-in protections against human error. Any system without such protections cannot be relied upon to prevent accidents over any significant period of time. In the case of the Formosa plant, the consequences of not planning for divergences from written instructions were catastrophic, resulting in five worker deaths, three injured workers, and the evacuation of residents from the entire area around the plant. In addition, a system that requires workers doing complex tasks to always consult and obey written instructions is equally inadequate. For this reason it is important that catastrophic accidents such as that at Formosa be avoided by requiring more stringent protections and safety system.

The immediate cause of the accident was clearly the worker who bypassed the safety interlock. However, the root cause of the accident sits with the designers of the system that had safety systems that were inadequate to account for human error, and management that relied solely on extensive written instructions, did not provide employees with adequate training in the correct use of the system, and did not think ahead about consequences to workers, to the company and to the neighborhood around the plant in the event that the safety systems were

breached by human error. Such hazards could be assessed using a job hazard analysis as specified by OSHA (OSHA, 2001 Revised). OSHA's job hazard analysis, if properly conducted, would have given high priority to the Formosa worker's task because it fell into the category of having potential to cause severe/disabling injuries, because it could be caused by a single action (i.e., overriding the safety interlock), and because it was a task that was complex enough that written instructions were required (OSHA, 2001, Revised). Furthermore, since the CSB had previously notified Formosa that its emergency planning and safety processes and systems were inadequate, the heaviest burden of responsibility must lie with management that did not look far enough ahead, did not adequately train workers, and did not perform an adequate risk analysis of the situation at their plants.

References

OSHA. (2001 Revised). Job Hazard Analysis. *U.S. Dept. of Labor Occupational Safety and Health Administration.* Document OSHA 3071 2002 (Revised). Available from: https://www.osha.gov/Publications/osha3071.html#R3

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