# Safety Scene: Industrial Explosions

Krystal Gabert, Editor

***Interview with Howard Mavity, Partner, Fisher & Phillips LLP***

*Chem.Info*'s recurring Safety Scene feature focuses on how to improve safety in processing plants. In this installment, we looking at explosion hazards facing processors, what the fallout of an industrial explosion can be and what processors can do to mitigate their risks. We spoke with Howard Mavity of the law firm Fisher & Phillips about industrial safety.

**Q: What factors present the greatest threat of explosion within processing plants?**

**A:** First, manufacturers face Industry setting challenges.

Since the catastrophic Imperial Sugar explosion (where I was onsite for the first seven days) most food processors recognized some potential for combustible dust explosions and "deflagration," which refers to the catastrophic pressure wave caused by the startled cloud of dust triggered (and ignited) by the initial explosion. However, so many factors are at play that even comparable "baking" facilities may present widely varying amounts of problems, or none at all.

Likewise, "breading" processes and powdered beverages may present significant risks, and properly stored silos of sugar raise little concern. My point is that few safety and production subjects depend more on the specific facts.

One point is clear: almost every food processor which uses or generates small particles should conduct a Process Hazard Analysis (PHA) to determine hazards, and

if necessary, solutions.

Second, manufacturers face  operational challenges

An attitude of "we've never had a problem before" is a significant problem. Processors would do well to remember that the sugar refinery had gone over 90 years without an event... until one factor changed. Many food processes and equipment have not changed in many years, and combustible dust control was not the manufacturer's concern when they were developed.

"Management of Change" is my largest concern. Many are aware of Process Safety Management (PSM) related to certain refrigeration and freezer processes. But they have not stopped to consider the role of unintended consequences in the context of combustible dust hazards. According to public accounts, a number of factors changed at the sugar plant, but one much discussed change was the addition of more enclosure of conveyors in response to food safety concerns. Combustible dust explosions require certain factors to be present: proper material and particle size, oxygen, ignition source and containment. A processor may make changes that seemingly have nothing to do with safety, only to change the combustible matrix.

All facts of food processing and its vendors and contractors display considerable ignorance of combustible dust hazards and applicable National Fire Prevention Association (NFPA) consensus standards.

A processor may assume that a trusted vendor or contractor will consider combustible dust when changing or installing lines and equipment, but that assumption may be misplaced. More worrisome is the fact that internal engineering and maintenance may have made modifications for years to lines and equipment; again with no specific consideration of combustible dust. This process also generates many problems with guarding, interlocks, e-stops and lock-out procedures.

**Q: How can manufacturers mitigate these risks?**

**A:** Every processor with any possibility of combustible dust issues should retain an engineer or expert with specific experience with combustible dust process hazard analysis (PHA).

OSHA does not yet have a specific general industry combustible dust standard and instead primarily cites applicable NFPA consensus standards under its 5(a)(1) General Duty power. Compliance Officers cannot possibly carryout the detailed PHA required to determine effective solutions during the brief period of an OSHA inspection. Therefore, the Compliance Officer often follows the "prescriptive approach" set out in OSHA's Combustible Dust Enforcement Directive. They go down the checklist and issue citations, which may or may not be appropriate. In this context, OSHA cannot possibly know what abatement is needed.

Thus, the employee is left to scramble to determine through testing and the PHA process what is necessary. It is more efficient for the processor to obtain a PHA,

which involves both expert and practical involvement of the company, and then be able to challenge OSHA to criticize their approaches. Costly engineering changes may be necessary, and some OSHA Regions and State Plans claim that employers spend an average of almost $1 million per plant in abatement after OSHA citations. However, a PHA may determine that the history and risk may also be reduced by addressing ignition sources, housekeeping and training. Better to do this before OSHA shows up.

Finally, I first consider "housekeeping" when I go to any manufacturing or construction workplace. Similarly, if an OSHA Compliance Officer identifies significant dust accumulation, he or she is likely to dig further. Although OSHA's interest may be triggered by visible dust collection systems or MSDS's referencing combustibility, many combustible dust inspections are triggered by poor housekeeping.

**Q: What is a processor's liability — with regard to either its employees or its customers — after an explosion occurs?**

**A:** Few combustible dust events are "small," and many result in deaths. While the likelihood of an event may be small, the outcome is usually disastrous. In addition to the obvious workers compensation claims and OSHA citations, employees and their families often view such catastrophic facts as an opportunity to try to show bad facts sufficient to overcome the rule that workers compensation is the "exclusive remedy" protections of the workers compensation process.

Explosions are random in their effects. Often contractor personnel working onsite may be harmed, and are not typically covered by the processor's workers compensation system. Neighboring businesses may be disrupted. The processor will likely be drawn into litigation against equipment manufacturers, and such litigation can destroy a company. Brand and reputation have never been more important, and a smoldering ruin where the plant used to be is a devastating hit for reputation. One cannot understand the harm to employee morale, or the probability that OSHA and other regulators may thereafter closely scrutinize the entire company.

**Q: Are you seeing any trends — perhaps certain kinds of explosion-related accidents recurring around the country or a certain segment of the processing market (pharma, food, gas, etc.) in which there has been a growing number of these types of accidents?**

**A:** One sees natural gas and similar incidents, but combustible dust-related incidents seem to predominate. In addition to baking and food processing, industries presenting exposure include plastics manufacturers, and wood and metal products. In OSHA's 2008 Report, the first- and second-largest sectors for citations were wood and food products. However, in these industries, the particle size, processes and chemical make-up often result in few combustible dust hazards, despite the fact that under the correct circumstances the materials present a hazard.

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