



## Five Keys to a Successful Dust Hazard Analysis

BY BRIAN EDWARDS

Combustible dust fires and explosions affect many industries, but they are particularly troubling at pellet and biomass facilities. In order to minimize the risks to your people and business, it is critical to understand the hazards specific to your process, equipment and buildings. The National Fire Protection Association provides basic guidance on how to conduct a dust hazard analysis, or DHA. The most important goal is to systematically identify where fire, flash-fire, and explosion hazards exist, and to provide recommendations for safeguards to protect against these events. The following are key factors that will ensure that your DHA is done correctly, and that your pellet plant is safer.

**Conduct the DHA at the right time.** NFPA 652, Standard on the Fundamentals of Combustible Dust, requires that existing facilities complete their DHAs by Sept. 7, 2020. It also requires that DHAs be completed concurrently with new processes and buildings. For future projects, DHAs should be conducted early in the design process, so that the required fire and explosion protection systems are identified early. You don't want to realize a silo needs explosion venting a week before the plant is set for commissioning.

**Assemble the right team.** The DHA must be led by a qualified person who understands the science of dust fires and explosions, but also needed is input from people with direct knowledge of the materials, processes and equipment being reviewed. Team members often include people from engineering, operations, safety and maintenance. When conducting the DHA, not only is the intended operating process reviewed, but there must be an understanding of what can and does go wrong. Most major incidents don't occur when plants are running perfectly; having diverse perspectives is critical to understand possible upset conditions.

**Establish the right goals.** At the highest level, the goal of a DHA is to reduce risk. The level of risk an operation is willing to accept changes from facility to facility, and so it is important to openly discuss the goal of the DHA. Should we focus on preventing human injury? Should we have a goal to prevent process downtime of over one week? Do we

want to only focus on preventing catastrophic events? If your goals are undefined or unclear, you can end up with a DHA that has a long list of recommendations that are unfocused, unnecessary, or do not match your business goals.

**Use the right method.** There are different methods for conducting a DHA. Several are based on process hazard analysis methods used in the chemical industry, such as hazard and operability (HAZOP) studies, what-if, checklist, etc. Other methods have been developed more specific to dust hazards—for example, Conversion Technology uses its own method based on likelihood of a dust cloud, likelihood of an ignition source, and severity. At its heart, though, the purpose of a DHA is to identify what can happen, how likely is it, and the consequences. Some methods, like a HAZOP, can be overly complex and time-consuming, with little value added for the extra work. Others, such as a checklist DHA, may be too generic and lack the detail needed for a complex manufacturing process. It is important that the DHA method aligns with the established goals and the complexity of the process being analyzed.

**Manage the findings in the right way.** When the DHA is complete, you will have a document that lists existing safety controls and procedures, and often, there will be a list of recommendations for additional safeguards. It is important to prioritize the list based on which recommendations will have the greatest impact on reducing risks in your operation. No one has unlimited money to spend on protection, so using the DHA to understand where to most efficiently direct those funds is important. You shouldn't look at a DHA as just another regulatory requirement; it is a powerful tool to ensure you protect your people and process in a cost-effective way.

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