U.S. Chemical Safety Board Continues Investigation of Two Accidents at the Hoeganaes Corporation Facility

May 11, 2011

Investigation Details:
Hoeganaes Corporation Fatal Flash Fire

Testing Concludes that both Accidents Involved Combustible Metal Dust

Nashville, Tennessee, May 11, 2011 – The U.S. Chemical Safety Board (CSB) today released test results confirming preliminary conclusions that two flash fires which occurred at the Hoeganaes Corporation plant in Gallatin, Tennessee—one fatal—involved the combustion of iron powder which had accumulated throughout the facility and became airborne in combustible concentrations. A flash fire on January 31st killed one worker and seriously burned another. A similar fire occurred on March 29th and caused one injury.

The Hoeganaes plant, which employs approximately 175 workers, manufactures "atomized" iron powder that is sold to the automotive and other industries for the production of metal parts using powder metallurgy.

The first incident occurred on January 31 as two maintenance mechanics on the overnight shift inspected a bucket elevator that had been reported to be malfunctioning due to a misaligned belt. The bucket elevator, located downstream of an annealing furnace, conveyed fine iron powder to storage bins. The two mechanics were standing alone on an elevated platform near the top of the bucket elevator, which had been shut down and was out of service until maintenance personnel could inspect it. When the bucket elevator was restarted the movement immediately lofted combustible iron dust into the air. The dust ignited and the flames engulfed the workers causing their injuries. A dust collector associated with the elevator was reported to have been out of service for the two days leading to the incident.

The second incident occurred less than two months later on March 29 when a plant engineer, who was replacing igniters on a furnace, was engulfed in combustible dust which ignited. In the course of the furnace work, he inadvertently dislodged iron dust which had accumulated on elevated surfaces near the furnace. He experienced serious burns and bruises as a result of this second event; a contractor witnessed the fireball but escaped without injury.

"Tests conducted on samples of metal powder - collected from the plant - determined that this material is combustible," said CSB Investigator-in-Charge Johnnie Banks.

"The team observed significant quantities of metal dust on surfaces within close proximity to the incident locations. This was of particular concern as metal dust flash fires present a greater burn injury threat than flammable gas or vapor flash fires. Metal dust fires have the potential to radiate more heat and some metals burn at extremely high temperatures in comparison to other combustible materials." In addition to visible dust particles in the air, 2 to 3-inch layers of dust were observed on flat surfaces, rafters, and railings throughout the facility.

Mr. Banks said in the course of reviewing company documents, the CSB found that last year Hoeganaes submitted 23 dust samples from the Gallatin facility to an independent laboratory for testing and 14 were found to be combustible. Furthermore, investigators found that the facility had documented multiple reports of flash fires during repairs on furnace belts at their facility located in Cinnaminson, New Jersey, which resulted in two injuries in 2000 and one fatality in 1996.

Mr. Banks said, "The presence of combustible dust was known by Hoeganaes at the times of the accidents; it appears the risks were not adequately addressed by the company."

The CSB investigation will examine the company's dust prevention efforts at the facility and its compliance with the National Fire Protection Association Standard 484 that details requirements for dust collection systems, dust cleaning frequency, and building construction and egress provisions.

In 2006 the CSB completed a study of combustible dust fires and explosions, which identified 281 incidents that occurred from 1980 to 2005, killing 119 workers and injuring more than 700. The study findings resulted in a recommendation to the U.S. Occupational Safety and Health Administration (OSHA) to develop a standard that comprehensively addresses

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combustible dust explosions. In 2009, OSHA agreed to develop a combustible dust standard. OSHA is currently in the early stages of the rulemaking process for the standard.

CSB Board Member John Bresland said, “Combustible dust is an often overlooked hazard at manufacturing facilities, as CSB investigations back to 2003 demonstrate. Among our open recommendations to OSHA from previous accidents is a call for a comprehensive combustible dust standard designed to protect workers and reduce or prevent dust-related hazards. The CSB will be closely following the discussion at OSHA’s upcoming Combustible Dust Expert Forum on May 13, as regulatory options to eliminate this workplace hazard are reviewed and evaluated.”

The CSB is an independent federal agency charged with investigating serious chemical accidents. The agency's board members are appointed by the president and confirmed by the Senate. CSB investigations look into all aspects of chemical accidents, including physical causes such as equipment failure as well as inadequacies in regulations, industry standards, and safety management systems.

The Board does not issue citations or fines but does make safety recommendations to plants, industry organizations, labor groups, and regulatory agencies such as OSHA and EPA.

For more information, contact Public Affairs Specialist Hillary Cohen, 202-261-3601, cell 202.446.8094 or Sandy Gilmour, 202-261-7614, cell 202-251-5496