



## Dust Explosion in Indiana

On October 29, 2003, an aluminum dust explosion occurred at the Hayes Lemmerz International-Huntington, Inc. facility in Huntington, Indiana. One worker was killed and six others were injured in the explosion. The U.S. Chemical Safety and Hazard Investigation Board (CSB) investigated the accident and found that the explosion occurred in the scrap re-melting system, a system used to re-melt chips of aluminum scrap from wheel machining operations.

The CSB said in its report that the accident was the result of several factors. First, the chip feed system was releasing excess aluminum dust, but the company did not perform a review to examine why this was occurring. The company made temporary patches to the system to repair holes that had worn through ducts and pipes, but dust and chips still blew through unrepaired leaks. Second, the CSB stated that the company did not properly design its dust collection system. Third, the company did not ensure that the dust collection system and installation followed industry guidance. Finally, the company had experienced several fires, but did not have a formal root cause and corrective action system to investigate these incidents. For example, just hours before the accident, a duct fire had occurred that was extinguished. Employees told CSB investigators that such fires were frequent events.

The report also said that, while formal procedures existed, employees received no formal training on those procedures. According to the report, “The lack of formal training for the chip and dust collection systems’ operators and maintenance personnel led to acceptance of abnormal conditions — the ‘normalization of deviations,’ such as flashes during chip feed startup and fires in the fume exhaust ducts.”

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**Lessons Learned:** Analyses after accidents often show that clues existed before the mishap occurred. Such clues frequently take the form of anomalies observed during the lifecycle of a project. An anomaly is an apparent problem or failure that occurs during verification or operation and affects a system, subsystem, process, support equipment or facilities. Anomaly or problem reporting and corrective action, therefore, can play an important role in system safety analyses. An effective anomaly report and corrective action process not only allows for the reporting of problems, but also implements a closed-loop process for finding and fixing the root cause of a problem. In the case of this accident, if the near-misses had been properly reported and analyzed, it may have been prevented.

Readers are encouraged to review the full accident and mishap investigation reports referenced here to understand the often complex conditions and chains of events that led to each accident discussed here. Additional lessons learned are available at [www.systemsafetyskeptic.com](http://www.systemsafetyskeptic.com). ☒

### References

U.S. Chemical Safety and Hazard Investigation Board, “Investigation Report: Aluminum Dust Explosion (1 Killed, 6 Injured), Hayes Lemmerz International-Huntington, Inc., Huntington, Indiana, October 29, 2003, Report No. 2004-01-I-IN, September 2005.