



U. S. Chemical Safety and Hazard Investigation Board

RECOMMENDATION STATUS CHANGE

SUMMARY

Report:	Didion Milling Company Explosion and Fire
Recommendation Number:	2017-07-I-WI-R13
Date Issued:	December 6, 2023
Recipient:	National Fire Protection Association (NFPA)
New Status:	Closed – Exceeds Recommended Action
Date of Status Change:	March 4, 2025

Recommendation Text:

Update NFPA 61, Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities, or a successor standard, to incorporate, at a minimum, the following elements:

1. *Unify the requirements for performing dust hazard analyses to remove equipment exemptions and require the assessment of all processes, such as cyclones, as required in:*
 - a. *The 2019 edition of NFPA 652, Standard on the Fundamentals of Combustible Dust*
 - b. *Chapters 3, 5, and 6 of the CCPS's Guidelines for Combustible Dust Hazard Analysis.*
2. *Incorporate the additional guidance for Management of Change to include but not limited to:*
 - a. *Harmonize the 2019 edition of NFPA 652, Standard on the Fundamentals of Combustible Dust, requirements for section 8.12.2.4, modifications to operating and maintenance procedures, and section 8.12.2.4, employee training requirements.*
 - b. *Chapter 3 and Appendix B of the CCPS's Guidelines for the Management of Change for Process Safety, such as addressing temporary changes, operating and maintenance procedures, employee training, and dust testing results, to standardize MOC requirements across all industries that handle combustible dust.*
3. *Update the requirements for incident investigation management systems, to include but not limited to:*
 - a. *Incorporate the optional guidance of the 2019 edition of NFPA 652, Standard on the Fundamentals of Combustible Dust, as a mandatory requirement.*
 - b. *Chapters 4 and 10 of CCPS's Guidelines for Investigating Process Safety Incidents (3rd Edition).*

Board Status Change Decision:

A. Rationale for Recommendation

On May 31, 2017, an explosion and fire occurred at the Didion Milling, Inc. (Didion) facility in Cambria, Wisconsin. The fire spread throughout the facility resulting in multiple combustible dust explosions both within and external to the production equipment.

Five employees of Didion were fatally injured as the result of the incident. An additional 14 employees were injured. Several of the fatalities and injuries were caused by exposure to the flames generated by the combustible dust explosions and flash fires, while others can be attributed to the collapse of the buildings. The incident resulted in an estimated \$15.37 million in property damage.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) investigated the incident and found several safety issues including ineffective combustible dust safety management, ineffective process safety leadership, and a lack of regulatory coverage for combustible dusts. As a result of these findings, the CSB issued one recommendation to the National Fire Protection Association (NFPA). This status change summary addresses CSB Recommendation No. 2017-07-I-WI-R13.

B. Response to the Recommendation

The NFPA notified the CSB that the 1st Edition of NFPA 660, *Standard for Combustible Dusts and Particulate Solids*¹ (NFPA 660), was issued on November 16, 2024, with an effective date of December 6, 2024. The NFPA provided a summary of the changes made responsive to the recommendation, as well as other public comments submitted by the CSB, and a copy of the relevant portions of the NFPA 660 Second Draft Report to substantiate their response.

The CSB reviewed these materials and others available online² and has determined the following:

- The NFPA has met the objective of the recommendation with regards to making the requirements for DHAs, MOC, and incident investigations for facilities that handle agricultural commodities at least as protective as facilities that handle other commodities.
- The NFPA has surpassed the objective of the recommendation with regards to providing guidance on performing DHAs, MOC, and incident investigations by expanding upon what is listed in the recommendation and directing this guidance at all facilities that handle combustible dust and/or particulate solids regardless of commodity type.
- The NFPA has surpassed the objective of the recommendation by making improvements in the requirements for employee training, conducting DHAs, safeguarding by separation

¹ NFPA 660 is the successor standard to NFPA 61. The NFPA has consolidated all its standards on combustible dust hazards into a single standard to improve consistency and usability.

² The materials reviewed included the NFPA 660 First and Second Draft Reports. These materials were accessed on December 6, 2024 at <https://www.nfpa.org/codes-and-standards/nfpa-660-standard-development/660>.

and/or detachment, and inspection, testing, and maintenance for critical safeguards for all facilities handling combustible dust and/or particulate solids regardless of commodity type.

- The NFPA has surpassed the objective of the recommendation by adding requirements for operational readiness reviews when facilities are newly constructed, significantly modified, or resume operations following a shutdown for all facilities handling combustible dust and/or particulate solids regardless of commodity type.
- The NFPA has also surpassed the objective of the recommendation by adding requirements to evaluate and control fire, explosion, or toxic exposure hazards from self-heating, thermal instability, water reactive, or chemical reactive material properties for all facilities handling combustible dust and/or particulate solids regardless of commodity type.
- Finally, the NFPA has surpassed the objective of the recommendation by listing every CSB investigation on combustible dust completed from 1998 to 2015 and the Combustible Dust Hazard Study as informational references in NFPA 660.

C. Board Analysis and Decision

Consolidating all NFPA standards on combustible dust into a single streamlined standard will help reduce standard conflicts and improve safety outcomes at facilities handling combustible dust. This new document effectively captures the tragic lessons learned from the Didion Milling Company Fire and Explosion, and others, and translates them into practical requirements and guidance that if followed should serve to prevent future combustible dust incidents or at least mitigate the consequences of such incidents.

The Board appreciates the work of the leadership and staff of the NFPA and their technical committees³ and congratulates them for the publication of the new consolidated standard, NFPA 660. Based upon the information above, the Board voted to change the status of CSB Recommendation No. 2017- 07-I-WI-R13 to: “Closed – Exceeds Recommended Action.”

³ The NFPA Technical Committees on Combustible Dusts, Fundamentals of Combustible Dusts, Agricultural Dusts, Combustible Metals and Metal Dusts, Handling and Conveying of Dusts, Vapors, and Gases, and Wood and Cellulosic Materials Processing are responsible for the content of NFPA 660.