



**American
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Kristen Kulinowski, Ph.D.
Interim Executive Authority
United States Chemical Safety
and Hazard Investigation Board
1750 Pennsylvania Avenue, NW
Washington, DC 20006

RE: Chemical Safety Board Call to Action on Combustible Dust

Dear Dr. Kulinowski:

The American Fuel & Petrochemical Manufacturers (“AFPM”) is pleased to submit these comments to the U.S. Chemical Safety and Hazard Investigation Board (“CSB”) regarding the Call to Action: Combustible Dust, released on October 24, 2018.¹ AFPM is a trade association whose members comprise virtually all U.S. refiners and petrochemical manufacturers. Our members are committed to providing and maintaining a safe work place environment.

The commitment from the petroleum refining and petrochemical manufacturing sectors to a safe workplace is well-reflected in our safety performance record. Since 2010, both the refining and petrochemical industries have reduced the process safety event incident rate by approximately 40%.² Over the past 30 years the refining and petrochemical industries have reduced their total recordable incident rate by a factor of 10, to .7 per 100 employees for refining and .8 per 100 employees for petrochemical, according to the 2017 U.S. Bureau of Labor Statistics.³ This is 5 times lower the total recordable incident rate of the entire manufacturing industry, which stands at a rate of 3.5.⁴

This type of performance is only achieved with a strong culture of safety and understanding of the risks involved in the manufacturing process. Our members put robust and effective practices

¹ U.S. Chemical Safety and Hazard Investigation Board. CSB News Release. CSB Releases Call to Action on Combustible Dust Hazards. 2018, October 24. CSB Releases Call to Action on Combustible Dust Hazards. <https://www.csb.gov/csb-releases-call-to-action-on-combustible-dust-hazards/>. Last accessed 2018, December 16.

² American Fuel & Petrochemical Manufacturers (AFPM) 754 Performance Metrics. <https://www.afpm.org/754-reporting/>. Last accessed 2018, December 18.

³ U.S. Department of Labor. Bureau of Labor Statistics. *Industries at a Glance. Petroleum and Coal Products Manufacturing: NAICS 324*. <https://www.bls.gov/iag/tgs/iag324.htm>. Last accessed 2018, December 16.

⁴ U.S. Department of Labor. Bureau of Labor Statistics. Injuries, Illnesses, and Fatalities. Table 1. Incidence rates of nonfatal occupational injuries and illnesses by industry and case types, 2017. https://www.bls.gov/iif/oshwc/osh/os/summ1_00_2017.htm. Last accessed 2018, December 18.



and procedures in place to ensure equipment is running safely and the employees understand proper operations.

AFPM and our member companies look forward to participating in this safety discussion with the CSB. In general, our members strongly believe that combustible dust explosive events can be reduced by understanding existing workplace exposures and then following applicable Occupational Safety and Health Administration (“OSHA”) regulations complimented by relevant National Fire Protection Association (“NFPA”) standards listed in Appendix A. Below are AFPM’s answers to CSB’s Call to Action.

In real-world working conditions, where dust is an inherent aspect of the operation, can a workplace be both dusty and safe?

Our member companies identify compounds and operating environments that can create combustible dust explosion hazards as required by OSHA regulations and through the use of NFPA 652 and NFPA 654 standards. Our member companies also use additional tools, described in Appendix A, to identify where environmental conditions can create combustible dust hazards and how to mitigate them appropriately.

In such working environments – where the amount of ambient/fugitive dust cannot be wholly eliminated 100 percent of the time – how does an individual or organization distinguish between an acceptable or safe level and one that has been exceeded? How often does judgement or experience play a role in such decisions? Should it?

Recognizing that working conditions and risks vary across facilities, AFPM member companies use NFPA 652 and NFPA 654 standards to understand the hazards of dust accumulation. The standards also include a variety of appropriate mitigations and good engineering practices to eliminate those hazards, that our members have implemented.

How are hazards associated with combustible dust communicated and taught to workers? What systems have organizations successfully used to help their employees recognize and address dust hazards?

Refiners and petrochemical manufacturers assess combustible dust explosion hazards in a similar manner to the assessment of other risks and hazards that exist in the manufacturing process. Companies utilize their management systems to inform employees and to document training on hazards. In addition, NFPA provides guidance on training and communicating combustible dust explosion hazards to employees.



OSHA's Hazardous Communication (HAZCOM) provides guidance on when to include combustible dust on the Safety Data Sheet.

What are some of the challenges you face when implementing industry guidance or standards pertaining to dust control/management?

Our member companies use the appropriate NFPA standards for their processes, listed below in Appendix A, to develop and implement dust control management systems. These standards provide guidance on how to include combustible dust explosion hazards in the safety management system which help mitigate and eliminate these types of hazards.

If companies/facilities need to use separate or different approaches in order to comply with both sanitation standards for product quality or food safety and those associated with dust explosion prevention, then how do you determine what takes priority? Is the guidance clear?

Our member companies follow the applicable safety regulations and standards related to combustible dust in the chemical manufacturing process. These standards are the same for both food-grade and non-food grade products.

How should the effectiveness of housekeeping be measured? What methods work best (e.g., cleaning methods, staffing, schedules)?

Our member companies follow the appropriate NFPA standards for their processes, listed below in Appendix A, which defines housekeeping requirements to eliminate combustible dust explosion hazards.

As equipment is used and ages, it requires mechanical integrity to maintain safe and efficient operability. How does inspection, maintenance, and overall mechanical integrity efforts play a role in dust accumulations, and how are organizations minimizing such contributions in the workplace?

Our member companies invest significant resources in maintaining robust Mechanical Integrity (MI) programs that include predictive and preventative maintenance. These programs help to minimize the conditions that could result in a combustible dust explosion event.

What are some of the challenges to maintaining effective collection systems?

All mechanical equipment is subject to wear over time. Our member companies use predictive and preventable maintenance as part of their MI programs to identify possible wear and ensure the equipment is properly maintained and



replaced per manufacturing and American Petroleum Institute standards on mechanical integrity.

**How common are dust fires in the workplace that do not result in an explosion?
Does this create a false sense of security?**

Where combustible dust explosion hazards exist, they have been identified and mitigated. Neither dust fires nor explosions are common in our member company workplaces.

Are workers empowered to report issues when they feel something needs to change with regard to dust accumulation? What processes are in place to make these concerns known?

Yes, our member companies train and encourage employees to report hazards and unsafe environments. They promote a culture of safety that includes near-miss reporting and incident investigations as well as implementing corrective measures, as appropriate. OSHA's Free Workplace Poster – Job Safety and Health: It's the Law⁵ is visible in all facilities. This serves as one of many reminders to workers that they can report a workplace hazard, accident, or incident, without retaliation.

How can combustible dust operators, industry standard organizations, and regulators better share information to prevent future incidents?

There has been improved publicity and awareness on the explosion hazards associated with combustible dust. The CSB has been a leader in disseminating these materials. AFPM and our member companies encourage the CSB to continue to increase awareness across all industries, especially to those facilities with fewer resources who may not be aware that their operations may have combustible dust explosion hazards. Of the 105 dust incidents from 2006-2017 listed by the CSB⁶, there are only 5 coming from the chemical manufacturing industry, none of which are our members. Our member companies believe that these efforts, in addition to existing standards and regulations, will make the workplace safer and prevent future incidents.

⁵ U.S. Department of Labor. Occupational Safety and Health Administration. OSHA's Free Workplace Poster. Job Safety and Health: It's the Law. <https://www.osha.gov/Publications/poster.html>. Last accessed 2018, December 16.

⁶ U.S. Chemical Safety and Hazard Investigation Board. Dust Incidents 2006-2017. https://www.csb.gov/assets/1/17/csb_dust_incidents.pdf?16406. Last accessed 2018, December 28.



AFPM and its member companies appreciate the opportunity to offer comments on the Call to Action. We remain keenly interested in continuing this dialog and look forward to discussing how you will be using this information in the near future. Please contact Alyse Keller, (akeller@afpm.org), (202) 457-0480, with questions.

Alyse Keller
Specialist, Safety Programs
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Appendix A: Current Combustible Dust Standards, Regulations, and References

The following list includes examples of standards that may apply to combustible dust risk. Given the variation from facility to facility, a one-size-fits-all approach is inappropriate. As such, individual operators must choose which standards are most appropriate to implement at their facilities.

- NFPA 652 - Standard on the Fundamentals of Combustible Dust
- NFPA 654 - Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
- NFPA 68 - Standard on Explosion Protection by Deflagration Venting
- NFPA 69 - Standard on Explosion Prevention Systems
- NFPA 70 - National Electrical Code®
- NFPA 499 - Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
- OSHA Safety and Health Information Bulletin entitled Combustible Dust in Industry: Preventing and Mitigating the Effects of Fire and Explosions⁷
- OSHA Combustible Dust Publications⁸
- OSHA’s Free Workplace Poster – Job Safety and Health: It’s the Law
- OSHA Fact Sheet, Hazard Alert: Combustible Dust Explosions⁹
- 29 Code of Federal Regulations (“CFR”) § 1910 Subpart D, Walking-working surfaces (1910.22, Housekeeping)

⁷ U.S. Department of Labor. Occupational Safety and Health Administration. Directorate of Standards and Guidance Office of Safety Systems. Combustible Dust in Industry: Preventing and Mitigating the Effects of Fire and Explosions. SHIB 07-31-2005; updated 11-12-2014. <https://www.osha.gov/dts/shib/shib073105.html>. Last accessed 2018, December 16.

⁸ U.S. Department of Labor. Occupational Safety and Health Administration. Publications Include: Combustible Dust Explosions – Poster, Combustible Dust: Protecting Workers from Combustible Dust Explosion Hazards Fact Sheet, and Hazard Communication Guidance for Combustible Dusts. <https://www.osha.gov/Publications/combustibledustposter.pdf>. Last accessed 2018, December 16.

⁹ OSHA Fact Sheet, Hazard Alert: Combustible Dust Explosions. March 2008. https://www.osha.gov/OshDoc/data_General_Facts/OSHAcombustibledust.pdf. Last accessed 2018, December 16.



- 29 CFR § 1910 Subpart E, Exit routes, emergency action plans, and fire prevention plans (1910.38, Emergency action plans)
- 29 CFR § 1910 Subpart G, Occupational health and environmental control (1910.94, Ventilation)
- 29 CFR § 1910 Subpart J, General environmental controls (1910.146, Permit-required confined spaces)
- 29 CFR § 1910 Subpart L, Fire protection (1910.157, Portable fire extinguishers / 1910.165, Employee alarm systems)
- 29 CFR § 1910 Subpart N, Materials handling and storage (1910.176, Handling materials / 1910.178, Powered industrial trucks)
- 29 CFR § 1910 Subpart R, Special industries (1910.269, Electric power generation / 1910.272, Grain handling facilities)
- 29 CFR § 1910 Subpart S, Electrical (1910.307, Hazardous (classified) locations)
- 29 CFR § 1910 Subpart Z, Toxic and hazardous substances (1910.1200, Hazard communication)