U.S. Chemical Safety and Hazard Investigation Board

1750 Pennsylvania Avenue NW, Suite 910 | Washington, DC 20006
Phone: (202) 261-7600 | Fax: (202) 261-7650
www.csb.gov

Steve Owens
Chairperson

Sylvia E. Johnson, Ph.D.
Board Member

Catherine J.K. Sandoval
Board Member

September 25, 2024

OSHA Docket Office
U.S. Department of Labor
200 Constitution Avenue NW
Washington, DC 20210
(Via Federal eRulemaking Portal://www.regulations.gov/)

Docket Number: OSHA-2022-0012

Dear Sir or Madam:

Enclosed are comments by the U.S. Chemical Safety and Hazard Investigation Board (CSB) in response to OSHA's memorandum dated January 20, 2023, opening the above referenced docket. These comments address the questions from the document titled *Modernizing OSHA's Voluntary Protection Program* (VPP) that fall under the purview of the CSB and our vision of a nation free from chemical disasters.

We thank you for this opportunity to provide comments and renew our strong support of OSHA's goal to modernize VPP and encourage voluntary adoption of effective safety and health management systems. If you have any questions or need further information regarding these comments, please contact Mr. Charles B. Barbee, Director of Recommendations at: (202) 380-7122, or via email: CSBRecommendations@csb.gov.

Sincerely,

Steve Owens
Chairperson

Sylvia E. Johnson, Ph.D.
Board Member

Catherine J.K. Sandoval
Board Member

Enclosure

cc: Stephen J. Klejst, Executive Director - Investigations & Recommendations, CSB

Introduction:

The U.S. Chemical Safety and Hazard Investigation Board (CSB) is an independent federal agency charged with investigating, determining, and reporting to the public in writing the facts, conditions, and circumstances and the cause or probable cause of any accidental chemical release resulting in a fatality, serious injury, or substantial property damage. The CSB issues safety recommendations based on data and analysis from investigations and safety studies and advocates for these changes to prevent the likelihood of recurrence.

The CSB submits the following comments in response to the Occupational Safety and Health Administration's (OSHA) January 20, 2023, memorandum opening Docket No. OSHA-2022-0012. The purpose of these comments is to improve safety and health management systems (SHMS) at sites participating in the Voluntary Protection Program (VPP) and the modernization of the VPP.

Background:

VPP is a strictly voluntary program. Employers who participate submit information to OSHA and must exceed compliance with the OSHA Act. To qualify for the program, employers must maintain injury and illness rates below their industry average and operate a comprehensive SHMS which incorporates the elements of: Management Leadership and Employee Involvement; Worksite Analysis; Hazard Prevention and Control; and Safety and Health Training. They also must demonstrate continuous improvement.

Employers may participate in VPP through three programs: *Star*, *Merit*, and *Demonstration*. *Star* is for employers who are fully successful in meeting the criteria established by VPP, *Merit* is for employers who have developed and implemented SHMS, but who must take additional steps. *Demonstration* is for employers who operate effective SHMS that differ from current VPP requirements. *Star* participants are expected to be on the leading edge of hazard prevention methods and technology.

The VPP is intended to benefit participants by reducing injury and illnesses and the costs associated with them, as well as benefit industry in general by providing models of excellence who will influence industry practices. Information gathered by OSHA suggests that the average VPP worksite has a Days Away Restricted or Transferred (DART) rate less than half the average for its industry. The program benefits OSHA by establishing ambassadors for SHMS who provide input to OSHA and augment its limited resources.

The overwhelming majority of participants under Federal OSHA's jurisdiction are in the *Star* program. Of 1,172 participants under Federal OSHA's jurisdiction, 206 (18%) are in the chemical industry. The 2nd most well represented industry is the utility industry with 99 (8%) sites. There are also a significant number of sites in the petroleum industry.

Despite the VPP's laudable goals and history of success reducing the injury and illness rates of its participant sites, considerable risk remains at participant sites that handle hazardous substances. This is particularly true for participants in the chemical and petroleum industries where especially hazardous substances are processed in large volumes. The requirements for

such participants are essentially the same as participants with much less risk. In the CSB's view, this allows for the acceptance of participant sites with unacceptable levels of risk and a potential for catastrophic chemical-related incidents.

For instance, the LyondellBasell La Porte Complex in La Porte Texas was approved under the *Star* program during the summer of 2021. During that same summer this facility experienced a catastrophic release of approximately 164,000 pounds of an acetic acid mixture during maintenance of its acetic acid unit, fatally injuring two contract workers, seriously injuring a third, and causing 29 other personnel to be transported to medical facilities for evaluation and treatment. The full details of this incident are described in the CSB's LyondellBasell La Porte Fatal Chemical Release investigation report.

Participant sites with operations covered by OSHA's *Process Safety Management of Highly Hazardous Chemicals* (PSM) standard (29 CFR 1910.119), like the LyondellBasell La Porte Complex, are required to meet the same requirements as all other participant sites with slight enhancement. OSHA's directive *Voluntary Protection Programs Policies and Procedures Manual* (CPL 03-01-005) contains guidance on the evaluation of PSM issues at VPP sites. Essentially, these sites provide a supplement explaining their PSM policies and procedures with their initial application, and an additional supplement along with their annual self-evaluation following approval. There is also a requirement for a "PSM Level 1 Auditor" for the team performing the initial and reapproval on-site evaluations.

The CSB believes this approach is inadequate to meet the intent of the program, as it ignores the shortcomings of the PSM standard, which has not been updated since its promulgation in the early 1990's. This approach also ignores the hazards presented by hazardous materials that are not covered by PSM but are nonetheless capable of causing serious and even fatal injuries to employees.

Question(s):

Section II. Question 6

Should the manufacture or use of any specific hazardous materials preclude involvement or require special conditions?

No, the manufacture or use of specific hazardous materials should not preclude participation in VPP. Nevertheless, certain materials should require special conditions. Highly hazardous chemicals (HHC)which are covered by the PSM standard, materials with hazard ratings similar to PSM covered HHCs, and several other specific materials and conditions should be managed in accordance with the following considerations:

Non-PSM Covered Hazardous Materials with High Hazard Ratings

VPP participant sites should be required to manage hazardous materials with high hazard ratings, processed in large quantities, or some combination thereof in accordance with the requirements of the PSM standard, as modified by these comments, regardless of whether those materials are listed in Appendix A to 29 CFR 1910.119 (Appendix A). Appendix A is a static list of 137

chemicals that OSHA compiled from multiple sources in the early 1990s when the standard was first promulgated. The chemicals on this list were noted as warranting a high degree of management control due to their extremely hazardous properties, but they do not represent every chemical used in industry that has the potential for fatally injuring a worker.

Threshold Quantities of Highly Hazardous Chemicals

VPP participant sites should be required to manage hazardous materials listed in Appendix A in accordance with the requirements of the PSM standard, as modified consistent with these comments, regardless of whether the amount of the materials in process exceeds the listed threshold quantity. As noted, the materials listed in Appendix A are acknowledged by OSHA as requiring a high degree of management control due to their extremely hazardous properties. The amount of these materials necessary to fatally injure a worker in many circumstances is far less than the listed threshold quantities. A facility that has 10,000 pounds of anhydrous ammonia must comply with the PSM regulation (29 CFR Part 1910.119) to participate in VPP while a facility with 9,999 pounds of the same material is not required to comply with the regulation. This is not sound safety practice.

Defining the Limits of a PSM Covered Process

VPP participant sites should not be permitted to define the limits of their covered chemical processes. The CSB has never supported this concept. In fact, facilities with the strongest safety cultures often have chosen to expand PSM coverage to most or all their operations to alleviate the difficulty and confusion arising from having multiple SHMS with differing requirements. It is the CSB's view that defining limits on PSM covered processes reduces safety.

Strengthening Employee Participation (SWA)

VPP participant sites should be required to strengthen employee participation in their SHMS. They should be required to make Stop Work Authority (SWA) available to their employees and employee representatives.

The CSB has identified the lack of worker participation as a contributing factor to several incidents. To highlight this issue, in September 2019, the CSB published a Safety Digest titled *The Importance of Worker Participation*. The digest discusses four catastrophic incidents and the role that a lack of employee participation played in causing these incidents. As a result of the findings of these investigations, recommendations were issued to improve employee participation in the following general ways: Creating or improving opportunities for workers to participate directly in PSM related activities beyond what's required by the standard; empowering workers to provide input on how work is performed; and providing worker training opportunities and information sharing session which are led by workers.

In the CSB's Chevron Richmond Refinery Fire and Tesoro Anacortes Refinery Fatal Explosion and Fire investigations, recommendations were made requiring that employees and their representatives should have the authority to stop work that is perceived to be unsafe or that presents a serious hazard until the matter can be resolved by the employer or a regulator can intervene. Had such authority existed at these facilities prior to these incidents, the incidents may have been prevented or their consequences mitigated. Facilities must have effective measures in place for incident prevention that will foster a "culture of safety" wherein workers are encouraged and empowered to advocate for their safety on the job. The CSB believes that any program that does not appropriately enable workers to exercise stop work authority in necessary circumstances can allow risks to occur and accumulate. Participant sites must work with employees, and their representatives, to ensure a safe work environment recognizing that stop work authority is a joint responsibility amongst management and non-management employees.

Requiring Evaluations of Updates to Recognized and Generally Accepted Good Engineering Practice (RAGAGEP)

VPP participant sites should be required to evaluate updates to applicable RAGAGEP and implement new requirements where such requirements are applied retroactively and/or deemed necessary for the continued safe operation of the facility. Given the continual changes in the chemical sector, the consequences of a process safety related incident, and the interaction of RAGAGEP with every element of the PSM standard, it is critical to require the evaluations of these updates. The CSB has investigated several chemical incidents where the evaluation and/or implementation of certain RAGAGEP could have prevented the incident or mitigated its consequences.

Formal Resolution of Process Hazard Analysis (PHA) Recommendations

VPP participant sites should be required to formally resolve the recommendations from their PHA team that are not implemented. PHA recommendations are potentially the strongest preventive measures resulting from the PSM standard. After a hazard is identified and analyzed, it must be controlled or eliminated for risk reduction to occur. When a PHA recommendation is not implemented, risk is not reduced. There must be a formal resolution to the recommendation, including documenting the rationale behind why the recommendation will not be implemented, and, to reduce risk, fully documenting what actions will be taken instead to achieve an equivalent level of safety, where necessary.

In the CSB's Bio-Lab Lake Charles Chemical Fire and Release investigation report it was noted that although Bio-Lab was not required to follow the requirements of the PSM standard, they chose to conduct PHAs on their process. During their 2010 PHA, recommendations were made for Bio-Lab to "consider evaluating warehouse roof structures for hurricane conditions" and "verify warehouse is built to withstand high winds," but the company did not implement the recommendation and never formally closed out the recommendation.

On August 27, 2020, approximately 10 years later, extreme winds from Category 4 Hurricane Laura severely damaged buildings allowing rainwater to contact stores of a water-reactive chemical causing a decomposition reaction which released a large plume of hazardous gases including toxic chlorine. Also, the heat from the reaction resulted in a fire which destroyed a production building and damaged additional structures. Had Bio-Lab implemented the recommendation of their PHA team, this incident may have been prevented or its consequences mitigated.

Safer Technology and Alternative Analysis (STAA)

VPP participants should be required to employ Safer Technology and Alternative Analysis (STAA) when conducting PHAs. If done properly, STAA would require the use of inherently safer systems analysis and the hierarchy of controls to establish appropriate safeguards for identified process hazards. Currently, there is no explicit requirement to ensure inherently safer design. Requiring participants to consider safer technology and alternative risk management measures could eliminate or reduce risk from process hazards. Participants should employ safer technology measures in the following order: inherently safer technology (IST) or inherently safer design (ISD); passive safeguards; active safeguards; and lastly, procedural safeguards such as administrative controls and/or personal protective equipment.

The CSB has made recommendations from various investigations supporting this concept, including: Xcel Energy Company Hydroelectric Tunnel Fire (CSB Recommendation Nos. 2008-1-I-CO-R2, R16, and R17), Tesoro Refinery Fatal Explosion and Fire (CSB Recommendation Nos. 2010-8-I-WA-R1, R2, R3, R5, and R14), Macondo Blowout and Explosion (CSB Recommendation Nos. 2010-10-I-OS-R5 and R11), Chevron Refinery Fire (CSB Recommendation Nos. 2012-3-I-CA-R4, R7, R13, and R21) Kleen Energy Natural Gas Explosion (Recommendation No. 2010-7-I-CT-R10, R11, R12, R13, R14, and R15), Bayer CropScience Pesticide Waste Tank Explosion (Recommendation Nos. 2008-8-I-WV-R6, R7A, and R7B) DuPont La Porte Facility Toxic Chemical Release (CSB Recommendation Nos. 2015-1-I-TX-R1, R2, R3, and R4) and Philadelphia Energy Solutions (PES) Refinery Fire and Explosions (CSB Recommendation No. 2019-04-I-PA-R2). Had STAA been employed by these facilities these incidents may have been prevented or their consequences mitigated.

Natural Disasters

VPP participant sites should be required to consider natural disasters and extreme temperatures when conducting PHAs and implementing other aspects of the PSM standard. The CSB is concerned with facility preparedness in the face of increasingly frequent natural disasters and extreme temperatures, as these events provided limited advance warning and are challenging to predict in terms of intensity at specific locations. Rigorous advanced planning is critical to react successfully to emergency situations, and requires both equipment and process design, as well as training and routine practice.

The Arkema Inc. Chemical Plant Fire investigation detailed the August 2017 incident that occurred in Crosby, Texas, as a significant incident caused by natural hazards (natural disasters and extreme temperatures). The Bio-Lab Lake Charles Chemical Fire and Release previously described is another such incident. The increased occurrence of events caused by natural disasters and extreme temperatures like the Arkema and Bio-Lab incidents highlight the importance of evaluating the potential effects of natural disasters and extreme temperatures and other natural hazards on process operations. This includes both site-specific and regional impacts on emergency management and other local aid providers.

Simultaneous Operations (SIMOPs)

VPP participant sites should be required to develop and implement a program to manage safety and health during simultaneous operations (SIMOPs). The program should include: identification of potential SIMOPs; identification of potential hazardous interactions; evaluation and implementation of necessary safeguards to allow for safe SIMOPs; coordination, including shared communication methods, between the SIMOPs; and inclusion of emergency response personnel or services in the planning and coordination of the SIMOPs.

SIMOPs are when multiple independent operations occur at one location at one time. Events related to one activity may impact the safety of personnel or equipment for another operation. On November 13, 2020, seven workers were exposed to a release of hydrochloric acid at the Wacker Polysilicon facility in Charleston, Tennessee. The bolts of a graphite heat exchanger were overtightened causing it to crack and release hydrochloric acid. The employees working on the heat exchanger were equipped with personal protective equipment while other employees working on insulation in the area were not. Due to limited egress options from the fifth-floor platform where both teams were working, several of the employees working on the insulation climbed over the rail of the platform to escape the release. All these employees fell to the ground. One of the employees died from the fall, and the other two were seriously injured. Another employee suffered chemical burns. From the CSB's Wacker Polysilicon Chemical Release investigation report CSB Recommendation No. 2021-01-I-TN-R1 called on OSHA to promulgate a standard covering SIMOPs and including the requirements described above.

Mechanical Integrity (MI) of Critical Equipment

VPP participants should be required to apply mechanical integrity (MI) requirements to any critical equipment affecting a process, not just the equipment listed in 29 CFR 1910.119(j)(1). The failure or loss of use of a 'critical' piece of equipment negatively affects process safety and increases the potential for a catastrophe whether it's listed in the standard or not. The determination of whether a piece of equipment is needed to ensure process safety is best left to the judgement of individual facilities supported by PHA rather than a static list in a standard. Applying MI's requirements for written procedures, inspection and testing along with its requirements for correcting deficiencies and quality assurance to all pieces of 'critical' equipment will greatly reduce risk at these facilities.

Managing Organizational Changes

VPP participants should be required to apply to management of change (MOC) requirements to organizational change. The CSB has found that organizational change increases the risk of catastrophic chemical incidents at facilities and is seldom, if ever, addressed for the effect it will have on facility safety. The CSB's BP America (Texas City) Refinery Explosion investigation demonstrates how corporate mergers, leadership and organizational changes, and budget cuts can lead to catastrophic incidents. As a result, CSB Recommendation No. 2005-04-I-TX-R9 was issued, calling on OSHA to amend the PSM standard to require MOC requirements be applied to organizational change that may impact process safety.

Root Cause Analysis (RCA)

VPP participant sites should be required to perform root cause analysis (RCA) when conducting incident investigations. The "root cause" must be clearly defined, and should be interpreted to mean "a fundamental, underlying, system-related reason why an incident occurred" or similar. The CSB's Formosa Plastic Vinyl Chloride Explosion, BP America (Texas City) Refinery Explosion, Millard Refrigerated Services Ammonia Release, Didion Milling Company Explosion and Fire, and Wendland 1H Well Fatal Explosion investigations found that the root causes of similar but less impactful incidents occurring before these catastrophes were not identified, which contributed to these subsequent incidents. Had these facilities identified the root causes of previous incidents these catastrophic incidents may have been prevented or their consequences mitigated.

Coordination of Emergency Planning with Local Emergency-Responders

VPP participant sites should be required to coordinate their emergency response plans with local emergency-responders. Numerous CSB investigations have identified insufficient pre-emergency planning and coordination between facilities and local emergency response authorities, to include the local emergency planning committees (LEPCs), as having contributed to the severity of the impact of these incidents. These include the MFG Chemical Inc. Toxic Gas Release; EQ Hazardous Waste Plant Explosions and Fire; Bayer CropScience Pesticide Waste Tank Explosion; DuPont La Porte Toxic Chemical Release; Millard Refrigerated Services Ammonia Release; and, most notably, West Fertilizer Explosion and Fire. More recent incidents where a lack of prior coordination and planning led to undesirable outcomes include the MGPI Processing, Inc. Toxic Chemical Release, Bio-Lab Lake Charles Chemical Fire and Release, Foundation Food Group Fatal Chemical Release, and Intercontinental Terminals Company (ITC) Tank Fire. Had these facilities effectively performed pre-emergency planning and coordination with local emergency response authorities the consequences of these incidents may have been mitigated.

Third-Party Compliance Audits

VPP participant sites should be required to engage in third-party compliance audits. Poor compliance audits have been noted by the CSB as a contributing factor to past chemical incidents. This condition was noted in the First Chemical Corp. Reactive Chemical Explosion, BP America (Texas City) Refinery Explosion, and the Valero McKee Refinery Propane Fire investigations. The CSB has also issued recommendations in several investigations requiring third party compliance audits. These include the CITGO Refinery Hydrofluoric Acid Release and Fire, DPC Enterprises Glendale Chlorine Release, Xcel Energy Company Hydroelectric Tunnel Fire, Williams Olefins Plant Explosion and Fire investigations. Also, although they are not covered by the PSM standard, the Loy Lange Box Company Pressure Vessel Explosion investigation contained a similar recommendation. "Third party audit" should be defined to ensure sufficient independence and competency of the auditor. These audits should be conducted after any incident meeting the criteria found at 29 CFR 1910.119(m)(1) as well as at least every third audit cycle. Had effective compliance audits been performed at these facilities, these incidents may have been prevented or their consequences mitigated.

PSM Management Systems Periodic Review

VPP participant sites should be required to develop a system for periodic review of and necessary revisions to their PSM programs. This concept was previously referred to as "Evaluation and Corrective Action" in federal register notices regarding the PSM standard. Performance based SHMS should strive for continuous improvement. To ensure that this occurs requires a system of measurement and evaluation. A key finding in the CSB's BP America (Texas City) Refinery Explosion investigation was that the oil refining and chemical industry sectors did not have an effective system of indicators in place to both evaluate performance and promote the continuous improvement of management of process safety.

Consequently, in the CSB's BP Texas City report the CSB issued Recommendation No. 2005-04-I-TX-R6a to the American Petroleum Institute (API) to develop a consensus standard that addresses performance indicators for process safety in the refinery and petrochemical industries. The standard was intended to identify leading and lagging indicators for nationwide public reporting as well as indicators for use at individual facilities. The CSB also needed to include methods for the development and use of the performance indicators. The recommendation was successfully implemented upon publication the third edition of ANSI/API RP 754, Process Safety Performance Indicators for the Refining and Petrochemical Industries, dated April 2021.

The CSB identified similar issues in its Chevron Richmond Refinery Fire investigation and issued a recommendation (Recommendation No. 2012-03-I-CA-R10) to the state of California to require that all oil refineries identify and report leading and lagging process safety indicators, such as action item completion status of recommendations from damage mechanism hazard reviews. This recommendation was also successfully implemented by the state.

Although VPP PSM Supplement B addresses some metrics and indicators, this information should be augmented in accordance with the guidance contained within ANSI/API RP 754, or equivalent. The information also should be collected more frequently than annually and distributed amongst participating sites to identify broad industry trends and/or common areas of over or under performance.

Written PSM Management Systems

VPP participant sites should be required to develop a written program describing their implementation of all elements of the PSM standard as modified by these comments. They should also identify records essential to process safety and set a retention policy. This concept was previously referred to as "Written PSM Management Systems" in Federal Register notices regarding the PSM standard. This would benefit the program by ensuring that the appropriate records are generated and maintained while also supporting comprehension and compelling adherence with the program, all of which are necessary to reduce risk.

Reactives

The PSM standard, as modified consistent with these comments, should be applied to participant sites that operate a process involving reactives, including those with hazards that result from process specific conditions and combinations of chemicals as well as those that are self-reactive. The compilation of process safety information for such materials should be sourced from multiple resources and be sufficiently consulted such that the hazards are understood and controlled. The PHA for these materials should be augmented such that the hazards of these materials are thoroughly evaluated and fully understood. The CSB has been urging OSHA to update the PSM standard to better address reactive hazards for over 20 years through the issuance of recommendations as well as providing comments as a part of the rulemaking process.

Chemical reactions can rapidly release large quantities of heat, energy, and gaseous byproducts if not managed properly. Uncontrolled reactions have led to explosions, fires, and toxic emissions which in turn have led to death and serious injury to people, damage to physical property, and adverse effects on the environment. The incidents that occurred at Napp Technologies in 1995 and Morton International in 1998 raised concern over reactivity hazards to the national level.

In 2002, the CSB issued its first hazard study, entitled "Improving Reactive Hazard Management," which also contained the CSB's first recommendation to OSHA on reactive chemicals. CSB Recommendation No. 2001-01-H-XX-R1 called on OSHA to modify the PSM standard as described above. The recommendation was reiterated in AirGas Facility Fatal Explosion; Midland Resource Recovery Explosion; AB Specialty Silicones, LLC; and Bio-Lab Lake Charles Chemical Fire and Release investigations. To date, OSHA has not updated the PSM standard to improve the management of chemical reactivity hazards, but rather relies on loosely applicable requirements of the *Hazard Communication* standard (29 CFR 1910.1200) and the General Duty Clause as a basis for determining the safety of the conditions of the facilities that operate processes involving these materials.

On December 8, 2020, an explosion at the Optima Chemical LLC facility in Belle, WV led to the death of one employee, injuries to two others, and a community shelter-in-place order for a two-mile radius around the facility. The explosion was caused by an unexpected decomposition reaction during the dehydration of a chlorinated isocyanurate compound in a rotary double cone dryer. The CSB's investigation report on the Optima Belle Explosion and Fire. issued CSB Recommendation No. 2021-02-I-WV-R13 calling on OSHA to modify the PSM standard to achieve more comprehensive control of reactive hazards as described above with updates. This recommendation improved upon and, therefore, superseded CSB Recommendation No. 2001-01-H-XX-R1 from the Improving Reactive Hazard Management hazard study.

Ammonium Nitrate

The PSM standard, as modified by these comments, should be applied to participant sites that operate a process involving ammonium nitrate (AN). Alternatively, a specific set of criteria should be developed and applied to participant sites that operate a process involving ammonium nitrate. These criteria should be based on applicable guidance from the National Fire Protection Association (NFPA) and include requirements for: prohibiting combustible materials of construction for facilities and bins storing AN; automatic sprinkler systems and fire detection systems for indoor storage areas; ventilation where necessary; isolation of AN storage areas from storage or combustible, flammable, or other contaminating materials; and separation distances between AN storage areas and other hazardous chemicals, processes, and facility boundaries.

On April 17, 2013, a massive AN explosion at the West Fertilizer Company facility in West, Texas fatally injured 15 people (12 volunteer fire fighters and three members of the public) and caused hundreds of injuries. The explosion is believed to have been caused by a fire that started in an adjacent area of the facility that was allowed to spread because of the use of combustible materials of construction and a lack of a sprinkler system, among other conditions at the facility. The CSB issued its West Fertilizer Explosion and Fire investigation report on January 28, 2016. As a result of the incident, the CSB issued CSB Recommendation No. 2013-02-I-TX-R5 calling on OSHA to add AN to the list of highly hazardous chemicals regulated under the PSM standard, or to revise the *Explosives and Blasting Agents* standard (29 CFR 1910.109) to emphasize its coverage of facilities such as the West Fertilizer Company and include requirements similar to NFPA 400 (2016) *Hazardous Materials Code*.

Flammable Liquids in Atmospheric Storage

The atmospheric storage exemption found at 29 CFR 1910.119(a)(1)(ii)(B) should not be applied at VPP participant sites. The CSB has been urging OSHA to eliminate this exemption for years. The stated basis for this exemption is that flammable liquids in atmospheric storage were already covered to a certain extent by OSHA's *Flammable Liquids* (106 STD) standard (29 CFR 1910.106) when the PSM standard was promulgated. Though the 106 STD and PSM share a similar purpose, the PSM standard's requirements are far more protective than those found in the 106 STD. The 106 STD contains some design requirements and limited requirements applicable

to these processes based on the nature of the operation of the facility but falls far short of the wholistic approach for managing these hazards required by PSM.

The CSB has investigated several serious incidents involving flammable liquids in atmospheric storage. These include the Motiva Enterprises Sulfuric Acid Tank Explosion, Caribbean Petroleum Refining Tank Explosion and Fire, and Intercontinental Terminals Company (ITC) Tank Fire investigations. The CSB issued recommendations affecting flammable liquids in atmospheric storage to OSHA in both the Motiva Enterprises and Caribbean Petroleum Refining investigations. These recommendations were eventually superseded by CSB Recommendation No. 2019-01-I-TX-R7 from the ITC investigation, which calls on OSHA to eliminate the atmospheric storage exemption from the PSM standard.

Oil and Gas

The PSM standard, as modified consistent with these comments, should be applied to participant sites in the Oil and Gas industry. Currently the PSM standard is not being applied to oil and gas production facilities due to an enforcement stay based on the need of an economic analysis. Oil and gas well drilling and servicing operations are specifically excluded from the PSM standard based on the exemption found at 29 CFR 1910.119(2)(ii).

OSHA originally intended for the PSM standard to apply to oil and gas production facilities, and the CSB has been urging OSHA to expand the scope of the PSM standard to include oil and gas well drilling since the release of the Pryor Trust Fatal Gas Well Blowout and Fire investigation report. The stated basis for excluding oil and gas well drilling and servicing from coverage under the PSM standard was that OSHA had already undertaken rulemaking for a standard specific to these operations at the time PSM was promulgated. This is the same basis stated for this industry's exclusion from coverage under OSHA's *Control of Hazardous Energy* (LOTO) standard (29 CFR 1910.147). However, the proposed standard was never promulgated. There have been two serious incidents involving oil and gas well drilling and servicing investigated by the CSB: the Pryor Trust Fatal Gas Well Blowout and Fire and Wendland 1H Well Fatal Explosion investigations.

The CSB issued a recommendation to OSHA to apply PSM – or develop a new standard with a safety management system framework similar to PSM – to oil well drilling in the Pryor Trust investigation. This recommendation was superseded by CSB Recommendation No. 2020-04-I-TX-R4 from the CSB's Wendland investigation, which expands the previous recommendation to apply to oil and gas well servicing as well. The CSB also issued CSB Recommendation No. 2020-04-I-TX-R3, which calls on OSHA to apply LOTO to oil and gas drilling and well servicing, in the Wendland investigation.

Cryogenic Asphyxiants

A specific set of criteria should be developed and applied to participant sites that operate a process involving cryogenic asphyxiants. These criteria should include requirements for: the design, construction, and installation of process equipment; atmospheric monitoring for oxygen deficiency; emergency shutdown systems capable of being operated without endangering personnel; employee training and hazard awareness; emergency action planning; and the elements of PSM deemed appropriate and necessary.

On January 28, 2021, a liquid nitrogen release at the Foundation Food Group's Prepared Foods Division in Gainesville, GA led to the death of six employees and multiple injuries. The release was caused when the control system of one of the facility's immersion freezers failed causing an uncontrolled amount of liquid nitrogen to be supplied to the unit, overfilling it. The nitrogen rapidly vaporized creating an oxygen-deficient environment. The two employees troubleshooting the freezer when the release occurred were immediately asphyxiated. Other employees suffered asphyxiation while attempting to investigate the release and/or rescue the first two victims. As a result of the CSB's Foundation Food Group Fatal Chemical Release investigation report, the CSB issued CSB Recommendation No. 2021-03-I-GA-R4 calling on OSHA to promulgate a standard covering cryogenic asphyxiants and including the requirements described above.

Combustible Dust

A specific set of criteria should be developed and applied to participant sites that operate a process involving combustible dust. These criteria should be based on applicable guidance from the National Fire Protection Association (NFPA) and include requirements for: hazard recognition; dust hazard analysis; management of change; incident investigation; engineering controls; building design; fugitive dust management; operating procedures; process safety information; training; emergency response; and personal protective equipment. The CSB has repeatedly urged OSHA to promulgate a standard on combustible dust through the issuance of recommendations as well as providing comments as a part of the rulemaking process.

In 2003, there were three catastrophic dust explosions resulting in the death of 14 workers, many injuries, and substantial property and other damage. Although the incidents occurred in different types of processes and different industry segments they shared many common causes.

Following investigation of these incidents the CSB conducted a hazard investigation study on combustible dust. The study, entitled "Combustible Dust Hazard Investigation," determined that from 1980 to 2005 there were at least 281 major combustible dust incidents in the United States resulting in the death of 119 workers, injury to 718 workers, and untold property damage. As a result, the CSB issued a recommendation to OSHA to issue a standard designed to prevent combustible dust fires and explosions in general industry. This recommendation was reiterated in the CSB's Imperial Sugar Company Dust Explosion and Fire and Hoeganaes Corporation Fatal Flash Fires investigations. To date, OSHA has not issued a comprehensive standard on combustible dust, but rather relies on a patchwork of vague and/or out of date standards and the

General Duty Clause as a basis for determining the safety of the conditions at facilities that can produce combustible dust.

On May 31, 2017, combustible dust explosions at the Didion Milling facility in Cambria, Wisconsin, fatally injuring five employees and injuring 14 others. The explosions were caused by smoldering product within process equipment which eventually led to a primary deflagration and several secondary deflagrations. The CSB's investigation report on the Didion Milling Company Explosion and Fire issued CSB Recommendation No. 2017-07-I-WI-R10 calling on OSHA to promulgate a standard on combustible dust including the requirements described above. This recommendation superseded the following CSB recommendations: 2006-1-H-R1 from the Combustible Dust Hazard investigation, 2008-05-I-GA-R11 from the Imperial Sugar investigation, and 2011-04-I-TN-R1 and 2011-04-I-TN-R2 from the Hoeganaes Corporation investigation.

Remote Isolation of Process Equipment

Participant sites should be required to evaluate their processes specifically for their ability to remotely isolate major pieces of process equipment, such as vessels and tanks for production and storage, during an emergency. To be considered effective, the means of isolation should be capable of being activated without endangering the lives of workers and/or emergency responders or putting them at risk of serious injury. Over the last several years, the CSB has investigated numerous incidents where the consequences of these occurrence escalated following a loss of containment due to the lack of effective remote isolation of equipment.

In July 2024, the CSB issued a Safety Study entitled "Remote Isolation of Process Equipment" that calls for greater use of remote isolation equipment at chemical facilities. This study addresses several catastrophic incidents where the consequences of the incidents could have been significantly reduced if effective remote isolation of process equipment had been in place. Although guidance in certain industries has been available for many years, it is often not followed, leading to catastrophic results. As a result, the CSB issued CSB Recommendation No. 2024-01-H-R3 calling on OSHA to update the PSM standard to require an evaluation for the need for remote isolation devices for major process equipment.

Conclusion:

The implementation of the important safety elements discussed above is supported by the enabling legislation of VPP and necessary to ensure that VPP participant sites effectively manage the risks associated with their processes. As VPP is a strictly voluntary program which requires its participants to exceed compliance with the OSH Act and *Star* participants are expected to be on the leading edge of safety, it is possible that some participants have already implemented one or more of the suggestions outlined in these comments. The CSB is concerned, however, that many of the VPP participants have not done so and/or are not aware of these concepts. Until a facility effectively manages the hazards of its processes and hazardous

materials, the facility does not have an effective SHMS. Implementation of the CSB's suggestions will help drive chemical safety excellence to protect communities, workers, and the environment.