

**U.S. Chemical Safety and
Hazard Investigation Board**

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Interim Executive Authority

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Board Member



November 9, 2022

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

Docket Number: OSHA-2013-0020

Dear Sir or Madame:

Enclosed are the U.S. Chemical Safety and Hazard Investigation Board's (CSB) comments on the Occupational Safety and Health Administration's (OSHA) September 20, 2022, Federal Register Notice (87 Fed. Reg. 57520) to address the agency's Process Safety Management standard modernization rulemaking project (PSM STD Modernization). The comments address some new issues, as well as supplement our previous submission (CSB letter to OSHA Docket: OSHA-2013-0020 dated March 31, 2014) and applicable recommendations made by the CSB to OSHA and other recipients.

We thank you for this additional opportunity to provide comments. If you have any questions regarding our comments, or if we may be of further assistance, please contact Charles B. Barbee, Director of Recommendations, at 202-261-7621 or via email at charles.barbee@csb.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Steve Owens".

Steve Owens
Interim Executive Authority

A handwritten signature in blue ink, appearing to read "Sylvia E. Johnson".

Sylvia E. Johnson, Ph.D.
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 damages. The CSB issues safety recommendations based on data and analysis from investigations and safety studies and advocates for these changes to prevent the likelihood or minimize the consequences of accidental chemical releases.

The CSB provided extensive comments on the Process Safety Management (PSM) standard in the CSB’s March 31, 2014, comment letter. These comments will supplement/update the CSB’s previous comments, as appropriate. The comments below are numbered in the order found in the Federal Register Notices (87 Fed. Reg. 53020 (Aug. 30, 2022) and 87 Fed. Reg. 57520 (Sept. 20, 2022)) issued by the Occupational Safety and Health Administration’s (OSHA). In the first section are comments that address potential changes of scope of the current PSM standard. The next section addresses potential changes to particular provisions of the current PSM standard and will include additional proposals by the CSB.

SCOPE ISSUES:

Scope Issue 1. Clarifying the exemption for atmospheric storage tanks;

The CSB urges OSHA to eliminate the atmospheric storage tank (AST) exemption. This topic was thoroughly discussed in our March 31, 2014, comment letter. OSHA’s preamble to the PSM standard stated that the reason for the exemption is that ASTs were already regulated under 29 CFR 1910.106 *Flammable liquids* (106 STD). The 106 STD is intended to address fire and explosion hazards of flammable liquids, unlike the PSM standard which is to prevent or minimize the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. The 106 STD contains some requirements for how ASTs will be designed but lacks mechanical integrity requirements during design, construction, and maintenance as well as management of change analysis when changes occur.

Additionally, because of the AST exemption and litigation¹, the PSM’s coverage of certain flammables above a threshold quantity does not extend to those applicable stored flammables if they are contained in ASTs, even if they are connected to a process. To address this issue the CSB issued Recommendation No. 2001-05-I-DE-R1 to OSHA from its Motiva Enterprises Sulfuric Acid Tank Explosion investigation to expand coverage under the PSM standard to include ASTs. In addition to the CSB’s Motiva investigation, the AST exemption issue was a factor in the Caribbean Petroleum Refining Tank

¹ [Secretary of Labor v. Meer Corporation \(https://www.oshrc.gov/assets/1/6/alj95-0341.pdf\)](https://www.oshrc.gov/assets/1/6/alj95-0341.pdf)

Explosion and Fire (CAPECO) investigation and the Intercontinental Terminal Company (ITC) Tank Fire investigation (pending).

Scope Issues 2 and 3. Expanding the scope to include oil and gas well drilling and servicing; and Resuming enforcement for oil and gas production facilities;

The CSB urges OSHA to expand the scope of the PSM standard to include oil and gas-well drilling and servicing. Currently, these operations are specifically excluded from the PSM standard in 29 CFR 1910.119(a)(2)(ii). No separate OSHA standard covers drilling, however, and no other federal regulatory body oversees the safety of onshore drilling operations.

In addition to the data and analysis that was provided in the CSB’s March 31, 2014, submission, the CSB issued Recommendation No. 2018-01-I-OK-R1 to OSHA from the CSB’s Pryor Trust Fatal Gas Well Blowout and Fire investigation to expand PSM or some other similar safety management system to oil and gas well drilling and servicing. As stated in the CSB’s Pryor Trust investigation report:

Historically, OSHA has long been interested in regulating oil and gas drilling and servicing operations. ... OSHA observed the unique and numerous dangers presented by oil and gas drilling operations to workers. These dangers are self-evident and include hazards related to blowouts based on the pressures at which hydrocarbon reserves are sometimes found, fires and explosions, dropped objects, crush injuries, falls from heights, dangers associated with rotary equipment, transportation-related accidents, slip and trip injuries, and myriad other hazards present at a typical drilling site.

In addition to the CSB’s Pryor Trust investigation, the lack of PSM coverage was a factor in the Wendland 1H Well Fatal Explosion investigation. Additionally, with regard to “resuming enforcement for oil and gas production facilities,” the CSB supports both PSM coverage and enforcement of PSM at oil and gas production facilities.

Scope Issues 4 and 5: Expanding PSM coverage and requirements for reactive chemical hazards; and Updating and expanding the list of highly hazardous chemicals in Appendix A;

The CSB urges OSHA to expand the scope of PSM coverage and requirements to include reactive chemical hazards. The CSB’s oldest open recommendation to OSHA from our Improving Reactive Hazard Management study (Recommendation No. 2001-01-H-R1) asks OSHA to amend the PSM standard to achieve more comprehensive control of reactive hazards that could have catastrophic consequences.

The following are the investigations completed by the CSB that involve reactive hazards: First Chemical Corp. Reactive Chemical Explosion; MFG Chemical Inc. Toxic Gas Release; Synthron Chemical Explosion; T2 Laboratories Inc. Reactive Chemical Explosion; Bayer CropScience Pesticide Waste Tank Explosion; West Fertilizer

Explosion and Fire; AirGas Facility Fatal Explosion; MGPI Processing, Inc. Toxic Chemical Release; and AB Specialty Silicones, LLC. Additionally, the following CSB investigations involving reactive hazards are still pending: Bio Lab Chemical Release (Conyers, GA) and Optima Belle LLC Explosion and Fire. These 11 chemical incidents represent 28 deaths and more than 564 injuries that required medical attention. Moreover, although obviously not within the CSB’s jurisdiction, the massive explosion in Beirut, Lebanon in 2020 further illustrates the catastrophic consequences of an Ammonium Nitrate detonation and underscores the concerns about the potential impact of incidents that might occur in the United States.²

In developing the criteria, the CSB recommends that OSHA consider the Center for Chemical Process Safety (CCPS) publication, *Essential Practices for Managing Chemical Reactivity Hazards* which provides useful guidance for identifying and managing reactive hazards at facilities. The CSB also recommends that OSHA consider New Jersey’s Toxic Catastrophic Prevention Act (TCPA), which lists individually inherently reactive chemicals as well as groups of chemicals that may become reactive when mixed with one or more substances. This program establishes coverage based upon aggregate quantities onsite vs. individual processes.

Additionally, the CSB urges OSHA to add Fertilizer Grade Ammonium Nitrate (FGAN) to the list of highly hazardous chemicals. As the CSB stated in the agency’s West Fertilizer Explosion and Fire (West) investigation report (at pg. 177):

In deciding which chemicals to regulate under the PSM standard, OSHA reviewed potential “highly reactive and explosive substances,” as required by Section 304(b) of the CAA Amendments. OSHA considered information drawn from multiple sources, including EPA, DOT, World Bank, NFPA, the Health and Safety Commission of the U.K., and the states of Delaware and New Jersey. With respect to reactives, OSHA chose to include only those chemicals with the two highest (i.e., most dangerous) reactivity ratings under NFPA 490 because of the significant risk that they posed to workers. These chemicals had reactivity ratings of 3 or 4. FGAN, however, was left off the PSM list, despite having a reactivity rating of 3. Although the agency did consider adding FGAN to the PSM list in the late 1990s, this effort failed due to “resource constraints and other priorities.” Thus, FGAN has yet to be regulated under the PSM standard.

In light of the 15 deaths and 260+ injuries resulting from the West FGAN explosion, OSHA should add FGAN to the list of highly hazardous chemicals as soon as possible. Additionally, the CSB urges OSHA establish a formal mechanism within the PSM standard to add to the list or change the threshold quantity of highly hazardous chemicals.

² <https://www.csb.gov/statement-from-csb-chairman-katherine-lemos-on-massive-explosion-and-fire-in-beirut/>

Scope Issue 6. Amending paragraph (k) of the Explosives and Blasting Agents Standard (§ 1910.109) to extend PSM requirements to cover dismantling and disposal of explosives and pyrotechnics;

The CSB supports extending PSM requirements to cover dismantling and disposal of explosives and pyrotechnics. In the CSB’s Donaldson Enterprises, Inc. Fatal Fireworks Disassembly Explosion and Fire (DEI) investigation, the CSB did not issue a recommendation to OSHA, but, as a result of identifying how PSM coverage could have prevented the incident, the CSB did issue a recommendation (Recommendation No. 2011-06-I-HI-R9) to the EPA to update their permitting process under the Resource Conservation and Recovery Act (RCRA) to include rigorous safety reviews and other safety management practices, such as those required by OSHA’s PSM standard. Unfortunately, EPA declined to implement the recommendation, and as a result, the CSB closed the recommendation with an ‘unacceptable’ status.

There are multiple options to extend PSM requirements to cover dismantling and disposal of explosives and pyrotechnics (e.g., add a requirement in the 109 standard *Explosives and blasting agents* that points to the PSM Standard, modifying the scope of the PSM standard to ensure its inclusion as a *process*, etc.). The CSB urges OSHA to select the option that provides the most effective means of OSHA enforcement.

Scope Issue 7. Clarifying the scope of the retail facilities exemption;

The CSB urges OSHA to clarify the scope of the retail facilities exemption. Once OSHA adds FGAN to the list of highly hazardous chemicals (as proposed above in Scope Issue 4 and 5), OSHA should eliminate (or significantly narrow) the exemption specific to FGAN. OSHA has previously stated that the retail facilities exemption in 29 CFR 1910.119(a)(2)(i) is intended for facilities that sell highly hazardous materials in small containers, packages, or allotments to the public, and is based upon the assumption that these facilities do not generally present the same safety hazards as those encountered at establishments working with large, bulk, quantities of materials. The findings and conclusions from the CSB’s West investigation shows that assumption to be in error. As stated in the CSB’s West investigation report (at pg. 177):

Thus, FGAN has yet to be regulated under the PSM standard.

Anhydrous ammonia [NH₃], [as is Nitric Acid (HNO₃)] on the other hand, is on the List of Highly Hazardous Chemicals, Toxics and Reactives, with a threshold quantity of 10,000 pounds. CSB found that, at the time of the incident, the WFC was storing the equivalent of 34,000 pounds of anhydrous ammonia, more than three times the threshold quantity that triggers PSM coverage. CSB also discovered that the WFC had previously stored 54,000 pounds of anhydrous ammonia in 2006 and 2011. Given these facts, the WFC should have complied with the PSM standard because the company stored anhydrous ammonia, at least in 2006, 2011, and 2013, in quantities that exceeded its threshold quantity. However, CSB learned that the PSM standard did

not apply to the WFC at the time of the incident because the facility qualified under OSHA's interpretation of the standard's retail facilities exemption.

Should OSHA decide to clarify the scope of the retail facilities exemption, the clarification should include at a minimum specific information that addresses some of the aforementioned OSHA assumptions (e.g. maximum quantities, container sizes, sell to the public or end-user, etc.) Once FGAN is covered under PSM, retail facilities that store FGAN should have more specific prerequisite requirements in order for the exemption to apply to them such as container construction requirements (e.g. concrete), maximum storage amounts, separation/siting requirements, specific ventilation requirements, specific product movement (to prevent 'caking') requirements, inventory turnover (oldest sold first) requirements, and coordination and planning with local emergency planning committees and emergency response agencies. Another option would be for the exemption to be eliminated for retail facilities that store FGAN.

Scope Issue 8. Defining the limits of a PSM covered process.

The CSB does not support this concept. In fact, the CSB believes that companies/facilities with the strongest safety cultures have chosen to expand PSM coverage to most of their operations to avoid having multiple, differing, and confusing safety management systems at a single facility. It is the CSB's view that defining limits on PSM covered processes would increase confusion, exclude processes from coverage (in both compliance in non-compliance), and reduce safety.

SPECIFIC PROVISION ISSUES:

Specific Provision Issue 1 and 2. Including definitions of RAGAGEP and critical equipment;

The CSB supports the inclusion of these definitions to provide additional clarity, as the CSB supports Specific Provision Issues 4 and 9 which are specific to RAGAGEP and critical equipment. The CSB has used the term "safety critical equipment" in several investigations. There are many reasons why certain equipment is considered "critical equipment, and the CSB assumes that OSHA intends this term to be more broad reaching and inclusive. Therefore, it is preferable in the CSB's view.

Specific Provision Issue 3. Expanding paragraph (c) to strengthen employee participation and include stop work authority;

The CSB supports expanding paragraph (c) to strengthen employee participation and include stop work authority.

Employee Participation

The CSB has identified the lack of worker participation in process operations as a contributing factor to certain catastrophic incidents. Historically, workers and their representatives have not been properly engaged in the process operations to help identify and mitigate hazards and reduce risks. To highlight this issue, in September 2019, CSB published “Safety Digest: The Importance of Worker Participation.” The digest discusses four catastrophic incidents that led to 13 employee deaths, 179 employee injuries, and, in one case, 15,000 residents living near the facility having to seek medical evaluation. The incidents took place at an explosives manufacturing site in Nevada, a chemical production facility in Louisiana, and oil refineries in Washington and California. In addition to Process Hazard Analysis (PHA), Employee participation should also be expanded to Operating Procedures and Management of Change.

Stop Work Authority

After the 2012 Chevron Refinery fire in Richmond, California, the CSB recommended that the California State Legislature/Governor of California, in its PSM regulations, provide workers and their representatives with the authority to stop work that is perceived to be unsafe until the employer resolves the matter or the regulator intervenes. As a result, California’s PSM regulations now include stop work procedures. The CSB also made a similar recommendation to the state of Washington after the fatal explosion and fire at Tesoro Refinery. The state of Washington is currently considering changes to its PSM regulations for refineries. The CSB has consistently stated that facilities must also 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.

Specific Provision Issue 4. Amending paragraph (d) to require evaluation of updates to applicable recognized and generally accepted as good engineering practices (RAGAGEP);

The CSB supports amending paragraph (d) to require evaluation of updates to applicable RAGAGEP. Given the continual changes in the chemical sector, the consequences of a process safety incident, and the interaction of RAGAGEP with every element of PSM, it is critical that OSHA mandate that the PSM standard require the evaluation of updates applicable to RAGAGEP. The CSB has investigated several chemical incidents where the evaluation (and implementation) of certain RAGAGEP could have prevented the incident from occurring.

Specific Provision Issue 5. Amending paragraph (d) to require continuous updating of collected information;

The CSB supports amending paragraph (d) to require continuous updating of collected information. Performance-based standards, such as PSM, must strive for continual

improvement. As the chemical sector is always changing, additional risks may appear as well as opportunities to address them.

Additional Input

- The CSB urges that Process Hazard Analysis (PHA) documentation should be included as Process Safety Information (PSI). Currently, the PSI regulatory language states: “The compilation of written process safety information is to enable the employer and the employees involved in operating the process to identify and understand the hazards posed by those processes involving highly hazardous chemicals.” However, while the hazards of the highly hazardous chemicals are included in the PSI, the hazards of the *process* that involves those chemicals is not. It is virtually impossible to “understand the hazards posed by those processes involving highly hazardous chemicals” without the PHA information.

Specific Provision Issues 6, 7, and 8. Amending paragraph (e) to require formal resolution of Process Hazard Analysis team recommendations that are not utilized; Expanding paragraph (e) by requiring safer technology and alternatives analysis; Clarifying paragraph (e) to require consideration of natural disasters and extreme temperatures in their PSM programs, in response to E.O. 13990;

PHA Recommendations

The CSB supports amending paragraph (e) to require formal resolution of PHA team recommendations that are not utilized. PHA recommendations are the strongest preventive measures under PSM. 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 (or “utilized”), risk is not reduced. There must be a formal resolution to the recommendation, including documenting the reasoning behind why the recommendation will not be implemented, AND, in order to reduce risk, fully documenting what actions will be taken instead to achieve an equivalent level of safety.

Safer Technology and Alternatives Analysis

The CSB supports expanding paragraph (e) by requiring Safer Technology and Alternatives Analysis (STAA). The EPA made a similar proposal in the agency’s recent Risk Management Plan (RMP) Notice of Proposed Rulemaking (NPRM).³ If done properly this 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 for owners and operators to address inherent safety. Expanding upon paragraph (e) by requiring owners or operators to consider safer technology and alternative risk management measures could eliminate or reduce risk from process hazards. Using EPA’s proposed language, in addition to engineering and administrative controls, owners and operators of facilities would have to consider the

³ <https://www.regulations.gov/document/EPA-HQ-OLEM-2022-0174-0003>

application of the following safer technology measures, in the following order: inherently safer technology (IST) or inherently safer design (ISD), passive safeguards, active safeguards, and, lastly, procedural safeguards. OSHA is also aware of the hierarchy of controls as some of the concepts are discussed on the agency's website.⁴

The CSB has made recommendations from various investigations supporting this concept, including: Xcel Energy Company Hydroelectric Tunnel Fire (Recommendation Nos. 2008-1-I-CO-R2, R16, and R17), Tesoro Refinery Fatal Explosion and Fire (Recommendation Nos. 2010-8-I-WA-R1, R2, R3, R5, and R14), Macondo Blowout and Explosion (Recommendation Nos. 2010-10-I-OS-R5 and R11), Chevron Refinery Fire (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 (Recommendation Nos. 2015-1-I-TX-R1, R2, R3, and R4) and Philadelphia Energy Solutions (PES) Refinery Fire and Explosions (Recommendation No. 2019-04-I-PA-R2).

Natural Disasters

The CSB supports clarifying paragraph (e) to require consideration of natural disasters and extreme temperatures in their PSM programs. The EPA also made a similar proposal in their recent RMP NPRM.

The CSB is concerned with facility preparedness in the face of increasingly frequent natural disasters and extreme temperatures, as these events provide limited advance warning and are challenging to predict in terms of intensity and 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 CSB identified the August 2017 Arkema Inc. chemical plant fire in Crosby, Texas, as a significant incident caused by natural hazards (natural disasters and extreme temperatures). The increased occurrence of events caused by natural disasters and extreme temperatures like the Arkema incident 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.

Additional Input

- **Damage Hazard Mechanism Reviews (DHMRs):** The CSB urges OSHA to consider expanding paragraph (e) to include DHMRs to identify and evaluate damage mechanisms that may affect the covered process. It is intended to ensure that all potential hazards caused by process conditions, process materials, and external mechanisms are identified, analyzed, and the hazards are controlled or eliminated.

⁴ <https://www.osha.gov/safety-management>

- Based upon CSB experience in reviewing PHA revalidations, in general, they do not appear to be effective. The CSB proposes that in lieu of a PHA revalidation, evaluate the process again using a different methodology from paragraph (e)(2) other than the previously used methodology.

Addition Input with regard to expanding paragraph (f).

The CSB urges OSHA to expand paragraph (f) to require that the development of Operating Procedures includes a team with expertise in engineering and process operations, and that the team shall include at least one employee who has experience and knowledge specific to the process being evaluated.

Specific Provision Issues 9 and 10. Expanding paragraph (j) to cover the mechanical integrity of any critical equipment; Clarifying paragraph (j) to better explain “equipment deficiencies;”

The CSB supports expanding paragraph (j) to cover the mechanical integrity of any critical equipment. When a piece of critical equipment fails or is out of commission for a period of time, whatever made that piece of equipment ‘critical’ is negatively impacted. Including this requirement in paragraph (j) ensures that all critical equipment is tested and inspected, as well as properly operated and maintained.

The CSB also supports clarifying paragraph (j) to better explain “equipment deficiencies.” In this case, clarification, possibly with some examples, should reduce maintenance programs that unexpectedly allow equipment to ‘run-to-failure’ and will help assure safe operations.

Specific Provision Issue 11. Clarifying that paragraph (l) covers organizational changes;

The CSB supports clarifying that paragraph (l) covers organizational changes. The CSB found that organizational changes increase the risk of catastrophic chemical incidents at facilities and are seldom, if ever, addressed under the PSM standard. The CSB’s BP America Refinery Explosion (BP Texas City) investigation demonstrated how corporate mergers, leadership and organizational changes, and budget cuts can lead to catastrophic incident. As a result, the CSB issued a recommendation (Recommendation No. 2005-04-I-TX-R9) to OSHA to amend the PSM standard to require a Management of Change (MOC) review be conducted for organizational changes that may impact process safety.

Additional Input

- The CSB urges that additional clarifying language be included in paragraph (l) that explain that an MOC review should be very much like a condensed PHA. The primary difference is that there is not an established goal for an MOC. However, in the clarification, it should be established that the goal of an MOC (like that of a PHA)

is to identify the hazards brought about by the change and control or eliminate them. During the investigation of chemical incidents, the CSB has reviewed many MOCs. Their quality ranges from poor to exceptional. The poor ones tend to meet minimum documentation requirements, and as such, offer minimal risk reduction. Additional clarification would provide a goal and (as a condensed PHA) allow for recommendations to enable a facility to meet that goal.

- The CSB urges that paragraph (l) be expanded to require that MOC review will be conducted by a team with expertise in engineering and process operations, and the team shall include at least one employee who has experience and knowledge specific to the process being evaluated.
- The CSB urges that paragraph (l) be expanded to include that if a change covered by paragraph (l) revises scenarios addressed in PHA (paragraph (e)) then the PHA should be updated accordingly (with the PSI updated in turn).

Specific Provision Issue 12. Amending paragraph (m) to require root cause analysis;

The CSB, in general, supports amending paragraph (m) to require root cause analysis. However, “root cause” must be very clearly defined by OSHA in the PSM standard, as the EPA did in their RMP NPRM. The EPA proposed to define “root cause” as a “fundamental, underlying, system-related reason why an incident occurred.”

The CSB’s Formosa Plastic Vinyl Chloride Explosion investigation, the BP America (Texas City) Refinery investigation, and the Millard Refrigerated Services Ammonia Release investigation found that root causes of prior, similar incidents were not identified, which contributed to subsequent incidents.

Additional Input

- The CSB urges that incident investigations that involve a process safety event (such as an accidental release) should be required to review how the hazard was addressed in the PHA. The PHA should then be updated as appropriate based upon the findings.
- The CSB urges that paragraph (m)(7) be modified from a ‘5-year retention’ to ‘the lifetime of the process.’ This change would ensure that PHA teams are aware of all applicable incident investigations every time they update (or revalidate) the PHAs.

Specific Provision Issue 13. Revising paragraph (n) to require coordination of emergency planning with local emergency-response authorities;

The CSB supports revising paragraph (n) to require coordination of emergency planning with local emergency-response authorities. Several CSB investigations have identified that insufficient pre-emergency planning and coordination between facilities and local emergency response authorities, to include the local emergency planning committees (LEPCs) did not appropriately mitigate incident consequences, including the deaths,

injuries, or threat of physical harm of workers, emergency responders, and members of the community. These include the MFG Chemical Inc. Toxic Gas Release; EQ Hazardous Waste Plant Explosions and Fire; Bayer CropScience Pesticide Waste Tank Explosion; DuPont Corporation Toxic Chemical Releases; Millard Refrigerated Services Ammonia Release; and, most notably, West Fertilizer Explosion and Fire.

Specific Provision Issue 14. Amending paragraph (o) to require third-party compliance audits;

The CSB supports amending paragraph (o) to require third-party compliance audits. Poor compliance audits have been cited by the CSB as a contributing factor to the severity of past chemical incident investigations, such as the First Chemical Corp. Reactive Chemical Explosion investigation, the BP America (Texas City) Refinery Explosion investigation and the Valero (McKee) Refinery Propane Fire investigation. The CSB has also required third party compliance audits to be conducted to satisfy some of its recommendations, such as in the CITGO Refinery Hydrofluoric Acid Release and Fire investigation, DPC Enterprises Glendale Chlorine Release investigation, Xcel Energy Company Hydroelectric Tunnel Fire investigation, Williams Olefins Plant Explosion and Fire investigation, and, although not covered by the PSM standard, Loy Lange Box Company Pressure Vessel Explosion investigation.

The CSB urges OSHA to define “third party audit” as well as establish competency and independence requirements similar to what the EPA proposed in their RMP NPRM. Additionally, the CSB urges OSHA to require a third-party audit be conducted after any incident meeting the criteria in paragraph (m)(1) as well as every 10 years following the PHA update (or revalidation).

Specific Provision Issue 15. Including requirements for employers to develop a system for periodic review of and necessary revisions to their PSM management systems (previously referred to as “Evaluation and Corrective Action”);

The CSB supports including requirements for employers to develop a system for periodic review of and necessary revisions to their PSM management systems (previously referred to as “Evaluation and Corrective Action”). A performance-based safety system strives for continual improvement. As such there must be a way of evaluating it.

A key finding in the CSB’s BP Texas City 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, the CSB issued a recommendation (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 needed to identify leading and lagging indicators for nationwide public reporting as well as indicators for use at individual facilities. It also needed to include methods for the development and use of the performance indicators.

The recommendation was successfully implemented in 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 the Chevron 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 require the reporting of leading and lagging process safety indicators, such as the action item completion status of recommendations from damage mechanism hazard reviews. This recommendation also was successfully implemented.

The CSB urges that in addition to information from paragraphs (m) and (o), leading and lagging indicators should also be identified and reported, as appropriate, per the CSB recommendations above and recommends using API RP 754 as guidance.

Specific Provision Issue 16. Requiring the development of written procedures for all elements specified in the standard, and to identify records required by the standard along with a records retention policy (previously referred to as “Written PSM Management Systems”).

The CSB supports requiring the development of written procedures for all elements specified in the PSM standard, and to identify records required by the standard along with a records retention policy (previously referred to as “Written PSM Management Systems”). This requirement ensures that appropriate records are generated and retained that would not only give reference to the entire PSM program but would also facilitate other elements within the PSM program such as PSI and Compliance Audits. Documenting a program also ensures consistency, supports comprehension and compels compliance, all of which are needed for program intended to increase safety and reduce risk

Additional Input regarding Process Data Standards.

The CSB urges OSHA to develop national Process Data Standards that requires process data to be recorded. Currently, there are no process data standards specified for safety purposes. Because plant instrumentation is generally driven by manufacturing or process quality and/or efficiency needs and not to learn from and prevent chemical incidents, process data often is not maintained. Additionally, to the extent that data is maintained, the data is typically maintained in a proprietary format and not shared with non-customers.

There are many examples of data recording to reconstruct an incident in order to learn from it and prevent its recurrence. These include but are not limited to automobiles which have Event Data Recorders (EDRs), ships which have Voyage Data Recorders (VDRs), and aircraft which have Flight Data Recorders (FDRs) (a.k.a. the “black box”). The concept is not a new one, but it has never been a consideration in process safety.

The CSB believes that from a safety perspective there should be specific minimum process data requirements specifying information that should be recorded. For instance, in addition to instrumentation data, VDRs and FDRs record all verbal and radio communications on the bridge of a ship and in the cockpit of an aircraft. The following are additional considerations for process data (not an all-inclusive list):

- The data should be collected in intervals that are useful (e.g., per second or faster). CSB investigators have seen data recording that occurs once every sixty seconds. This data is not very useful as a tremendous amount of change can occur in a sixty second interval.
- The data should be available in common or readily exportable formats that can be easily interpreted. Proprietary formats benefit no one except for the seller of the format. Data that cannot be easily retrieved and interpreted has little value.
- The data should be protected from the damage caused by a chemical incident (e.g. explosions, fire, chlorine release, etc.). It can be stored locally in an indestructible “black box” or stored electronically offsite or ‘in the cloud.’
- The data should be maintained for use after a chemical incident. It should not be overwritten. Once an incident occurs, the data that led up to the incident should be maintained at least until all investigations are concluded.
- The data should be provided to OSHA, EPA, and the CSB upon request within their jurisdiction and authority. Additionally, it should be available to PSM covered facility incident investigators whether internal or third-party.

The following CSB investigations had issues with ready access to process data: DuPont La Porte Facility Toxic Chemical Release; AirGas Facility Fatal Explosion; Arkema Inc. Chemical Plant Fire; BP - Husky Chemical Release and Fire, and, although not covered by the PSM standard, Loy Lange Box Company Pressure Vessel Explosion.