

# Fiscal Year 2020

---

## Closed Recommendations Follow-Up Report



Office of Recommendations

2/2/2022

## Background

The U.S. Chemical Safety and Hazard Investigation Board's (CSB) Board Order 22, Section 13,<sup>1</sup> requires the CSB Office of Recommendations to periodically conduct a survey, or equivalent follow-up, of major closed recommendations to ascertain continued adherence by recipients to the recommendations' objectives, whether conditions have changed, and investigate other matters of interest to the CSB in relation to the effectiveness of its recommendations.

According to the Board Order, the follow-up of closed recommendations will:

- Be conducted every five years (the first survey was completed in fiscal year (FY) 2010 for the previous five years of closed recommendations);
- Focus on a sample of major recommendations, defined as those with a clear potential to reduce risks for issues of national importance;
- Ascertain by questionnaire and other relevant sources of information the extent to which recipients are adhering to CSB recommendations;
- Be used by the CSB to explore measures to improve adherence to recommendations as appropriate; and,
- Be made available to the public via the CSB website.

## Methods

A report containing a listing of all recommendations that the Board voted to close during the period of October 1st, 2014, through September 30, 2019 (FY 2015-2019), was obtained from the CSB Recommendations database. The list contained a total of 156 closed recommendations. Closed recommendations were first categorized by their final status: acceptable action, exceeds recommendation action, reconsidered/superseded, no longer applicable or unacceptable action/no response received. Closed recommendations were then grouped into one of seven categories in by intended purpose: Communicate, Fix Corporate, Fix Site, Industry Guide or Recommended Practice, other, Regulation (Federal, State, Local) Regulatory Enforcement and Voluntary Consensus Standard. The breakdown of recommendations according to these categories is shown in Table 1 in order to assess the distribution of the recommendations type and to aid in selection of follow up surveys. The closed recommendations were also sorted by recipient type as shown in Table 2 in order to assess the distribution of recommendations recipients to aid in the selection of follow up surveys.

**Table 1:** Recommendations closed between 10/1/2014-9/30/2019 by recommendation purpose

Recommendation Purpose	Number	Percentage
Communicate	4	3%
Fix corporate	31	20%
Fix site	28	18%

<sup>1</sup> CSB Board Order 22, *CSB Recommendation Program*. Section 13, *Survey of Completed Recommendations*.

<b>Recommendation Purpose</b>	<b>Number</b>	<b>Percentage</b>
Industry Guide or Recommended Practice	19	12%
Research/Data	5	3%
Regulation – Federal	14	9%
Regulation – State	9	6%
Regulation – Local	8	5%
Regulatory Enforcement	13	8%
Voluntary Consensus Standard	15	10%
Other	10	6%
<b>Total</b>	<b>156</b>	<b>100%</b>

**Table 2:** Recommendations closed between 10/1/2014-9/30/2019 by recipient type

<b>Recipient Type</b>	<b>Number</b>	<b>Percentage</b>
Academia/Training Institution	4	3%
Environmental/Labor Non-Governmental Organization	1	1%
Government – Federal	27	17%
Government – Local	16	10%
Government – State	14	9%
Industry – Corporate	36	23%
Industry - Facility	20	13%
Professional Organization	9	6%
Standards Development Organization	3	2%
Trade Association	23	15%
Union	3	2%
<b>Total</b>	<b>156</b>	<b>100%</b>

The criteria for selection of the recommendations for follow-up was based on the following guidelines in order to focus on those recommendations that were likely to have a major and continuing impact based on the criteria listed in Board Order 22:

- Recommendations that included ongoing action items.
- Recommendations where the CSB would not know if the recommendation continued to be implemented without contacting the recommendation recipient, because the recommendation was not readily available in a statute, regulation, policy or website. For those recommendations where information is publicly available, CSB completed the review of the recommendation’s current status.
- Recommendations that involved regulatory enforcement, to determine if these regulations were still being enforced in a similar manner.
- Recommendations considered to have high impact on national chemical safety and health. High impact recommendations are those which, if implemented, would create long-term, industry-wide safety improvements.

From the 156 closed recommendations, forty-five (45) unimplemented recommendations were eliminated from the potential pool for follow-up as their closed status was listed as: reconsidered/superseded; no longer applicable, or unacceptable action/no response received. Next, eighteen (18) Federal/State/Local regulatory recommendations were eliminated as candidates to be selected as follow-up as it is unlikely after successfully implementing these regulations, the regulatory bodies who issued them would later rescind them. Recommendations staff confirmed separately that these regulatory recommendations remained in effect from when they were closed acceptably by the Board. Similarly, twenty-eight (28) closed recommendation categorized as either Industry Guides/Recommended Practices or Voluntary Consensus Standards were also eliminated as candidates to be selected for follow-up as it is unlikely that after successfully implementing changes to these guides/practices/standards, the organizations who were responsible for implementing them would rescind the changes. Again, Recommendations Staff confirmed separately that all of these recommendations remained in effect from when they were closed acceptably by the Board. Finally, four (4) Broad Communicate recommendations were eliminated from the potential pool for follow-up because these were one time actions which had been verified when the recommendation was acceptably closed by the Board and no further action was intended.

After eliminating the above records from the analysis, there were 61 recommendations remaining in the pool to select for follow-up. As the CSB uses a mailed questionnaire (“Survey”) to obtain follow-up information, the maximum number of receipts that can be surveyed per Office of Management and Budget (OMB) regulations<sup>2</sup> is limited to nine (9) which would normally result in only approximately 16% of the remaining 61 recommendations being surveyed; however, upon reviewing the pool of recommendations for follow-up, Recommendations Staff noted that several potential survey recipients had more than one recommendation listed. As a result, CSB was able to request follow-up on 22 recommendations (36%) of the 61 recommendations.

The following recommendations were selected for follow-up:

**Table 3:** Recommendations selected for follow-up

No.	Recommendation	Recipient	Category	Subject	Follow-up Method
1	2001-05-I-DE-R8	Motiva Enterprises, LLC	Fix corporate	Implement procedures so that hazardous materials are handled appropriately.	Survey
2	2007-5-I-TX-R5	Valero Energy Corporation	Fix corporate	Identify all processes in your refineries where Valero’s mandatory Emergency Isolation Valve standard is applicable and ensure that Remotely Operable Shut-Off	Survey

<sup>2</sup> Surveys are collections of information subject to the requirements of the Paperwork Reduction Act (PRA) of 1995 (Pub.L. No. 104-13, 44 U.S.C. § 3501 et seq.) and OMB’s implementing regulations (5 C.F.R. § 1320, Controlling Paperwork Burdens on the Public). OMB approval is required before CSB may collect information from 10 or more members of the public in a 12-month period. The PRA also states that collection of information that is addressed to all or a substantial majority of an industry or sector in a 12 month period, that collection is considered to be addressed to ten or more persons (5 C.F.R. 1320.3(c)(4)(ii)). The CSB surveyed neither 10 or more members of the public nor a majority of any industry.

No.	Recommendation	Recipient	Category	Subject	Follow-up Method
				Valves are installed to control large accidental releases of flammable materials.	
3	2007-5-I-TX-R6	Valero Energy Corporation	Fix corporate	Establish corporate requirements for written freeze protection programs at Valero refineries subject to freezing temperatures.	Survey
4	2007-5-I-TX-R7	Valero Energy Corporation	Fix corporate	Revise Valero standards to require evaluation of jet fire scenarios and ensure more protective fireproofing for pipe rack support steel near process units containing highly pressurized flammables.	Survey
5	2008-1-I-CO-R8	Xcel Energy, Inc.	Fix corporate	Revise policies to for solicitation and procurement of construction services to ensure processes include criteria and procedures for prequalifying or disqualifying contractors based on specific safety performance measures and qualifications.	Survey
6	2008-1-I-CO-R9	Xcel Energy, Inc.	Fix corporate	Revise your contractor safety policies to require a comprehensive review and evaluation of contractor safety policies and procedures such as the permit-required confined space program and safety performance of contractors working in confined spaces.	Survey
7	2008-1-I-CO-R10	Xcel Energy, Inc.	Fix corporate	Conduct periodic safety audits of contractor selection and oversight at your power generating facilities to ensure adherence to corporate contractor procurement and safety policies.	Survey
8	2010-5-I-TX-R3	Texas Tech University	Fix site	Revise and expand the university chemical hygiene plan to ensure that physical safety hazards are addressed and controlled, and develop a verification program that ensures that the safety provisions of the plan are communicated, followed, and enforced at all levels within the university.	Survey
9	2010-5-I-TX-R4	Texas Tech University	Fix site	Develop and implement an incident and near-miss reporting system that can be	Survey

No.	Recommendation	Recipient	Category	Subject	Follow-up Method
				used as an educational resource for researchers, a basis for continuous safety system improvement, and a metric for the university to assess its safety progress.	
10	2010-06-I-HI-R6	VSE Corporation	Fix corporate	Use experts to assist VSE procurement in selecting vendors to properly handle, store, and dispose of explosive hazardous materials, including fireworks.	Survey
11	2010-6-I-WV-R7	E.I. du Pont de Nemours and Company	Fix corporate	Review all DuPont units that produce and handle phosgene that, at a minimum, observe and document site-specific practices for engineering controls, construction materials, PPE, procedures, maintenance, emergency response, and release detection and alarms, and use information from external sources to develop and implement consistent company-wide policies for the safe production and handling of phosgene.	Survey
12	2010-6-I-WV-R8	E.I. du Pont de Nemours and Company	Fix corporate	For each DuPont facility that uses, but does not manufacture, phosgene onsite: Conduct a risk assessment of manufacturing phosgene onsite against the current configuration; communicate the findings of each assessment to compile recommendations applicable to all DuPont phosgene delivery systems; and implement these recommendations.	Survey
13	2012-03-I-CA-R01	Chevron U.S.A.	Fix corporate	At all Chevron refineries, engage a diverse team of qualified personnel to perform a documented damage mechanism hazard review. This review shall be an integral part of the PHA cycle and shall be conducted on all PSM-covered process piping circuits and process equipment. The damage mechanism hazard review shall identify potential process damage mechanisms	Survey

No.	Recommendation	Recipient	Category	Subject	Follow-up Method
				and consequences of failure and shall ensure safeguards are in place to control hazards.	
14	2012-03-I-CA-R33	Chevron U.S.A.	Fix corporate	Develop a method to assign accountability at Chevron to determine whether any new Energy Technology Company (ETC) recommended program or industry best practice, such as API guidance, must be followed to ensure process safety or employee personal safety.	Survey
15	2012-03-I-CA-R34	Chevron U.S.A.	Fix corporate	Develop an auditable process to be available for all recommended turnaround work items necessary to address mechanical integrity deficiencies or inspection recommendations that are denied or deferred.	Survey
16	2012-03-I-CA-R35	Chevron U.S.A.	Fix corporate	Develop an approval process that includes a technical review that must be implemented prior to resetting the minimum alert thickness to a lower value in the inspection database.	Survey
17	2013-1-I-NJ-R6	US Ink/Sun Chemical Corporation	Fix site	At the US Ink East Rutherford facility, install automatic fire alarm systems consistent with NFPA 72 in manufacturing areas where heat generation could occur.	Survey
18	2013-1-I-NJ-R7	US Ink/Sun Chemical Corporation	Fix corporate	Revise the Capital Appropriations/Asset Request form procedures for new installations and modifications to existing equipment to require at a minimum PHA, MOC, review of engineering drawings for permits, safety management of contractors, and training of plant operators based on applicable dust collection system guidelines and standards.	Survey
19	2013-1-I-NJ-8	US Ink/Sun Chemical Corporation	Fix corporate	Develop and implement a management of organizational change protocol to allow for the transfer of knowledge and information to new personnel, at a minimum	Survey

No.	Recommendation	Recipient	Category	Subject	Follow-up Method
				including initial or refresher training in the following: safety and health procedures; lessons learned from previous incidents; technical information for equipment; and routine plant operations.	
20	2015-02-I-CA-6	Torrance Refining Company	Fix site	Implement protective systems that prevent ignition of flammable gases inside of the electrostatic precipitator, for each mode of operation.	Survey
21	2015-02-I-CA-R7	Torrance Refining Company	Fix site	Require identification of all safety critical equipment and consequence of failure for each mode of operation and ensure safety-critical devices can successfully function when needed. Develop and implement a policy that requires the Torrance refinery to: specify each safety-critical device's safety function; identify the consequences of failure of each safety-critical device; specify testing strategy used to verify whether the safety-critical device can function as intended to perform its required safety function; and maintain target availability for each safety-critical device through inspection and maintenance.	Survey
22	2015-02-I-CA-R8	Torrance Refining Company	Fix site	In the event safety critical equipment is operated beyond its inspection and/or maintenance interval, require the Torrance refinery to perform a risk evaluation to identify the safety consequences of the extended operation. Require that each mode of operation, including but not limited to normal operation, start up, shut down, and "Safe Park" modes of operation, is evaluated during the risk evaluation.	Survey

The recommendations that were selected for follow-up involved a variety of important chemical safety and health issues, such as continued implementation of safe handling of hazardous materials, contractor

safety, remote operation of shut-off valves, preventive maintenance programs, identifying the function of safety critical equipment and consequences of failure, laboratory safety, incident and near-miss reporting, and periodic audits with shared findings and tracked recommendations.

Following the selection of the recommendations, a survey questionnaire containing four to five questions was prepared and mailed to follow-up on recommendations one through 22 in Table 3 (nine total surveys were sent, as seven surveys each inquired about two or more recommendations together). These recommendations were considered recommendations for which CSB Recommendations staff would not be able to ascertain the current status of implementation without directly contacting the recipient.

An example of a Survey is attached as Appendix A. The first question of the survey asked if the recipient is continuing to implement the CSB recommendation. If not, the recipient was asked to provide a brief explanation as to why. The second question asked if the method of implementing the CSB recommendation had changed in any way since the Board informed the recipient that the recommendation had been closed. If any changes had been made, then the recipient was asked to explain them. The third question asked if the recipient understood the CSB recommendation upon initial receipt. If the recipient did not, he/she was then asked to explain. The fourth question asked if the CSB's expectations regarding the actions needed to successfully close the recommendation were clear. If not, the recipient was asked to explain.

A cover letter signed by the Director of Recommendations, was enclosed with each survey. The cover letter explained the purpose of the survey and asked recipients to return it in a provided postage paid envelope within 30 days of receipt. Follow-up emails with the original cover letter and survey attached were sent to recipients who failed to return the survey within the 30-day response period reminding them to return the Survey.

Copies of all letters, surveys (initial and completed) along with background preparation materials and this report have been entered into the recommendations database.

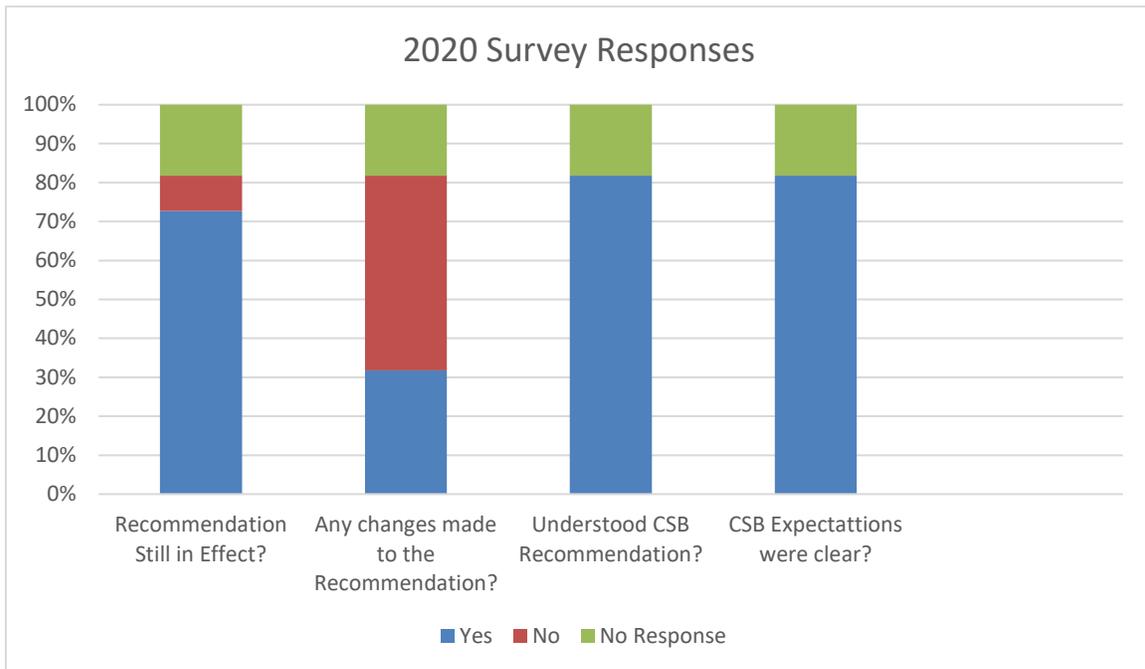
## **Results**

The CSB received responses from eight of nine (88%) surveys sent. This response rate exceeds historical response rates to mail surveys conducted of organizations (e.g., 35%).<sup>3</sup> A survey was sent to Senior Counsel for Chevron U.S.A. for four recommendations, but Chevron declined to participate. This section describes the results obtained from the survey responses received.

---

<sup>3</sup> Baruch Y and Holtom B. 2008. Survey response rate levels and trends in organizational research. *Human Relations*. 61(8):1139-1160.

**Table 1: Summary of Survey Responses 2020**



**Question 1 – Are CSB Recommendations Still in Effect?**

Of the 18 recommendations for which the CSB received survey responses, 15 were found to still be in effect (83%).

**Question 2 – Any Changes Made to the Implementation of the Recommendation Since Closure?**

Of the 18 recommendations for which the CSB received survey responses, eight (44%) were found to have had changes made to the implementation of the CSB recommendation since it had been closed by the Board.

The changes to these recommendations were found to either improve or have no effect on the recommendation’s implementation. In response to Recommendation No. 2010-5-I-TX-R3 from the Texas Tech University Lab Explosion investigation, to revise and expand the university chemical hygiene plan to ensure that physical safety hazards are addressed and controlled, and develop a verification program to ensure that safety provisions are communicated, followed, and enforced, Texas Tech responded that the Institutional Laboratory Safety Committee updates the process on an annual bases, and has updated guidance on the supervision of minors working in research spaces, changed the definition of energetic materials to align with Federal guidelines, and changed reporting of “chemical hazards” to “high-concern chemical hazards,” providing a list of chemicals of specific concern to the campus. In response to Recommendation No. 2008-1-I-CO-R9 from the Xcel Energy Company Hydroelectric Tunnel Fire investigation, to revise contractor safety policies to require a comprehensive review and evaluation of contractor safety policies and procedures, Xcel noted that minor process improvements and additional control measures had been identified. In response to Recommendation No. 2008-1-I-CO-R10, to

conduct periodic safety audits of contractor selection and oversight, Xcel stated that it has improved the process by bringing in a third-party administrator.

In response to Recommendation No. 2015-02-I-CA-R8, from the investigation of the ExxonMobil Refinery explosion in Torrance, California, to perform a risk evaluation to identify the safety consequences of an extended operation, Torrance responded that its Process Safety Management plan has been updated to be consistent with the recent amendments to the California PSM regulations.

In response to Recommendation No. 2001-05-I-DE-R8 from the investigation of the Motiva Enterprises Sulfuric Acid Tank Explosion, to conduct periodic audits of storage tank mechanical integrity and design, unsafe condition reports, hot work, management of change, and accountability systems at Motiva oil refineries, Motiva noted that it made minor adjustments to its audit process to reflect organizational changes of Motiva through the years.

Finally, in response to Recommendation No. 2013-1-I-NJ-R6 from the investigation of the Combustible Dust Explosion Fire at the US Ink facility in East Rutherford, New Jersey, to install automatic fire alarm systems consistent with NFPA 72 at the US Ink East Rutherford facility, US Ink/Sun Chemical noted that the facility has since been closed and so the recommendation is no longer being implemented. In response to Recommendation No. 2013-1-I-NJ-R8, US Ink/Sun Chemical stated that updates always occur in the size of an organization such as Sun Chemical to address site conditions, training requirements, or equipment technology improvements.

### **Question 3– Understanding of the CSB Recommendations upon Initial Receipt**

Of the 18 recommendations for which the CSB received survey responses, all (100%) stated that they understood the CSB's recommendation.

### **Question 4 – CSB Expectations Clear Regarding Actions Needed for Successful Closure**

Of the 18 recommendations for which the CSB received a response, all (100%) stated that they understood expectations for successful closure of the recommendation.

### **Conclusions**

This audit of recommendations closed between October 1, 2014, and September 30, 2019, shows that a majority of the CSB recommendations surveyed continue to be implemented after the recommendations were closed, and that recipients of CSB recommendations understood both the recommendation when issued and CSB's expectations for actions required for successful closure. The sample size and criteria for selecting the recommendations included in the audit allow CSB Recommendations staff to generalize that CSB recommendations remain in effect, and thus continue to have benefits for chemical safety beyond the time during which they are tracked by CSB Recommendations staff. The audit did not yield any new insights as to potential improvements that could be made in CSB recommendations development or follow-up programs.

This audit is intended to ensure that CSB recommendations closed by the Board remain in effect after closure and is not intended or designed to determine the impact of CSB recommendations. Baseline data on the frequency of chemical accidents and ongoing data collection on chemical incidents would assist in determining trends in chemical incidents following the implementation of CSB recommendations. Such information is collected through the CSB's incident screening database, wherein incident information is collected from media sources; however, this database is not a complete registry of incidents, and relies upon information provided by media reports, which are often inaccurate. More reliable data on chemical incidents occurring in the United States would help the CSB to determine the efficacy and lasting effects of its recommendations.

**APPENDIX A – Sample survey**

**Thank you for completing the 2020 US Chemical Safety Board Recommendations Survey.**

**Please kindly complete this survey and return within 30 days. For any questions, contact: [Redacted]**

Has Valero continued to install ROSOVs where needed?	<input type="checkbox"/> YES <input type="checkbox"/> NO If not, please explain:
Has the process for identifying where ROSOVs are needed changed at all since the recommendation was first implemented?	<input type="checkbox"/> YES <input type="checkbox"/> NO If so, please explain:
Did you understand the CSB recommendation clearly upon receipt?	<input type="checkbox"/> YES <input type="checkbox"/> PARTLY <input type="checkbox"/> NO If partly or not, please explain:
Were the CSB expectations regarding the actions needed to successfully close this recommendation clear to Valero employees?	<input type="checkbox"/> YES <input type="checkbox"/> PARTLY <input type="checkbox"/> NO If partly or not, please explain: