



U. S. Chemical Safety and Hazard Investigation Board RECOMMENDATIONS STATUS CHANGE SUMMARY

Report:	Chevron Refinery Fire
Recommendation Number(s):	2012-3-I-CA-R11
Date Issued:	April 19, 2013
Recipient:	California State Legislature, Governor of California
New Status:	Closed – Acceptable Alternative Action
Date of Status Change:	May 30, 2018

Recommendation Text(s):

Establish a multi-agency process safety regulatory program for all California oil refineries to improve the public accountability, transparency, and performance of chemical accident prevention and mechanical integrity programs. This program shall:

- 1. Establish a system to report to the regulator the recognized methodologies, findings, conclusions and corrective actions related to refinery mechanical integrity inspection and repair work arising from Process Hazard Analyses, California oil refinery turnarounds and maintenance-related shutdowns;*
- 2. Require reporting of information such as damage mechanism hazard reviews, notice of upcoming maintenance-related shutdowns, records related to proposed and completed mechanical integrity work lists, and the technical rationale for any delay in work proposed but not yet completed;*
- 3. Establish procedures for greater workforce and public participation including the public reporting of information; and*
- 4. Provide mechanisms for federal, state and local agency operational coordination, sharing of data (including safety indicator data), and joint accident prevention activities. The California Department of Industrial Relations will be designated as the lead state agency for establishing a repository of joint investigative and inspection data, coordinating the sharing of data and joint accident prevention activities.*

Board Status Change Decision:

A. Rationale for Recommendation

On August 6, 2012, the Chevron Refinery in Richmond, California, experienced a catastrophic pipe failure in a crude unit causing the release of a flammable hydrocarbon process fluid which partially vaporized into a large cloud. Nineteen Chevron employees engulfed by the vapor cloud narrowly escaped avoiding serious injury. The ignition and subsequent continued burning of the hydrocarbon process fluid resulted in a large plume of unknown particulates and vapor.

Approximately 15,000 people from the surrounding area sought medical treatment in the weeks following the incident.

The U. S. Chemical Safety and Hazard Investigation Board's (CSB) investigation found that the pipe failure was caused by sulfidation corrosion, a damage mechanism that causes piping walls to thin over time. The CSB also found that the California Process Safety Management (PSM) regulation did not require the conducting of formal damage mechanism hazard reviews, and that the Process Hazards Analysis (PHA) team for the crude unit at the Richmond refinery did not identify the damage mechanism sulfidation corrosion as a potential cause of a leak or rupture in the piping. Additionally, the CSB found that the California PSM regulation did not require the use of a recognized methodology for making an objective determination of the effectiveness of safeguards in place to prevent a hazardous consequence from occurring. A more detailed safeguard analysis, which requires sufficient consideration of the principles of inherently safer technology and to driving risks As Low As Reasonably Practicable (ALARP), could have identified the need to upgrade the metallurgy of the piping to a material less susceptible to sulfidation corrosion.

The CSB concluded that the systematic and documented consideration of inherently safer systems and the hierarchy of controls to the greatest extent feasible by Chevron and other process plants during PHAs, Management of Change (MOC) analyses, prior to new construction, rebuilds, and repairs, and in the development of corrective actions from incident investigation recommendations, would provide a more adequate degree of protection from incidents like the one that occurred on August 6, 2012.

Finally, the CSB concluded that the reporting of leading and lagging process safety indicators to the relevant regulators would be an important driver for continual improvement of refinery operations in the state of California. The reporting of indicators and additional information related to activities such as damage mechanism hazard reviews and maintenance-related shutdowns promotes greater transparency and facilitates increased collaboration between regulators and industry in chemical accident prevention.

Based on these findings, the CSB issued six recommendations to the California State Legislature and the Governor. This recommendation pertains only to the establishment of a multi-agency process safety regulatory program.

Response to the Recommendation

California has a multi-agency approach in that Cal/OSHA, Cal EPA, the California Governor's Office of Emergency Services (Cal OES), and local Unified Program Agencies (UPAs) such as Contra Costa County. Each agency plays a role in chemical accident prevention through enforcement of their regulations that have recently been strengthened. In addition, the newly adopted California Accidental Release Prevention Program (CalARP) Regulations and Contra Costa County's Industrial Safety Ordinance (ISO) provide some level of public transparency and accountability by publicly reporting the status of process safety indicators.

The newly adopted CalARP Regulation requires facilities to annually report indicator data to Cal OES and the local UPA. Cal OES will make these public by posting them on their website.

In addition, the newly adopted California PSM for Petroleum Refineries regulation (Section 5189.1) provides additional requirements for worker participation in new subsection (q). The

updated CalARP Regulation also provides for greater public access to information and participation. For example, the UPA makes the Risk Management Plan (RMP) available to the public for review and comment.¹

B. Board Analysis and Decision

Although not all the specific subsection provisions of this recommendation were adopted in the state of California, the new CalARP and CAL-OSHA PSM for Petroleum Refineries regulations meet the intent of the recommendation, so the Board voted to change the status of Recommendation No. 2012-30I-CA-R11 to **“Closed- Acceptable Alternative Action.”**

¹ 19 CCR § 2745.2 (c). For a copy of the CalARP Regulations see <http://www.caloes.ca.gov/FireRescueSite/Documents/CalARP%20Regs%20Title%2019%20Division%202%20Chapter%204.5.pdf> (accessed May 9, 2018).