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

Report:	Chevron Refinery Fire
Recommendation Number(s):	2012-3-I-CA-R5
Date Issued:	April 19, 2013
Recipient:	City of Richmond, CA; Mayor and City Council
New Status:	Closed – Acceptable Action
Date of Status Change:	February 15, 2016

Recommendation Text(s):

Monitor and confirm the effective implementation of the damage mechanism hazard review program (2012-03-I-CA-R1[1] and 2012-03-I-CA-R2[2]), so that all necessary mechanical integrity work at the Chevron Richmond Refinery is identified and recommendations are completed in a timely way.

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 escaped, narrowly 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 CSB's investigation found that the pipe failure was caused by sulfidation corrosion, a damage mechanism that causes piping walls to thin over time. The CSB concluded that additional enforcement steps by the local regulators were necessary to ensure that damage mechanism hazard reviews were adequate to confirm the proper conduct and completion of necessary mechanical integrity work at the Richmond refinery. Consequently, the CSB issued a recommendation to the City of Richmond to monitor Chevron USA's implementation of its damage mechanism hazard review (DMR) program. The CSB made a parallel recommendation to the Contra Costa County Board of Supervisors (CSB Recommendation No. 2012-3-I-CA-R8).

B. Response to the Recommendation

The Chevron Richmond refinery is in the jurisdiction of the City of Richmond and therefore must follow the requirements of the Richmond Industrial Safety Ordinance (RISO). The Hazardous Materials Program of Contra Costa Health Services administers and enforces the RISO. Contra Costa County Hazardous Materials Program (CCHMP) staff have participated in numerous meetings with Chevron for the refinery modernization project in which they observed discussion between the third party consultants retained by

[1] CSB Recommendation No. 2012-03-I-CA-R1: At all Chevron U.S. 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 Process Hazard Analysis 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 and consequences of failure, and shall ensure safeguards are in place to control hazards presented by those damage mechanisms. Analyze and incorporate into this review applicable industry best practices, Chevron Energy Technology Company findings and recommendations, and inherently safer systems to the greatest extent feasible.

[2] CSB Recommendation No. 2012-03-I-CA-R2: At all California Chevron U.S. refineries, report leading and lagging process safety indicators, such as the action item completion status of recommendations from damage mechanism hazard reviews, to the federal, state, and local regulatory agencies that have chemical release prevention authority.

the City of Richmond to review DMRs. CCHMP also met with the consultants during the California Accidental Release Prevention Program (CalARP)/RISO audit in October 2013 to discuss Chevron's review of equipment with potential high-temperature sulfidation exposure. CCHMP has also reviewed the status of DMR incorporation into the process hazard analysis (PHA) program.

The City of Richmond also made several revisions to its RISO, which, after the 2014 updates, included requirements to report process safety indicators. The RISO revisions, including requirements to report leading and lagging indicators, became effective on September 30, 2014, with the first year of indicators to be reported on June 30, 2015. CCHMP provided CSB staff with the indicators submitted by Chevron USA (CUSA).

C. Board Analysis and Decision

As the City of Richmond has monitored the implementation of CUSA's DMR program and has required that indicators be reported to provide oversight for implementation of its mechanical integrity program recommendations, the Board voted to designate CSB Recommendation **No. 2012-03-I-CA-R5** with the status "**Closed – Acceptable Action**."