



U. S. Chemical Safety and Hazard Investigation Board

RECOMMENDATIONS STATUS CHANGE

SUMMARY

Report:	Chevron Refinery Fire
Recommendation Number(s):	2012-3-I-CA-R07
Date Issued:	April 19, 2013
Recipient:	Board of Supervisors, Contra Costa County, California
New Status:	Closed – Acceptable Alternative Action
Date of Status Change:	May 11, 2018

Recommendation Text(s):

Revise the Industrial Safety Ordinance (ISO) to require the documented use of inherently safer systems analysis and the hierarchy of controls to the greatest extent feasible in establishing safeguards for identified process hazards. The goal shall be to drive the risk of major accidents to As Low As Reasonably Practicable (ALARP). Include requirements for inherently safer systems analysis to be automatically triggered for all Management of Change and Process Hazard Analysis reviews, prior to the construction of new processes, process unit rebuilds, significant process repairs, and in the development of corrective actions from incident investigation recommendations.

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. 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 determined that the pipe failure was caused by sulfidation corrosion, a damage mechanism that causes piping walls to thin over time.

In addition to identifying several contributing causes of the incident at the refinery, the CSB found a serious gap in the city and county's regulatory oversight needed to detect this serious damage mechanism in order to prevent the failure. The CSB found that the Contra Costa County (CCC) Industrial Safety Ordinance¹ (ISO) did not require the use of a recognized methodology for making an objective determination of the effectiveness of safeguards in place to prevent potentially hazardous consequences. A more detailed safeguard analysis which gives sufficient consideration of the principles of inherently safe technology and to driving risks As Low as

¹ The ISO is a program intended to prevent and reduce the probability of accidental releases of regulated substances that have the potential to cause significant harm to the public health. The ISO works by requiring facilities to submit a safety plan to the City, setting requirements on the contents of the safety plan and safety program, and ensuring a process for public review of the safety plan and authorization of the City to require changes in the safety plan.

Reasonably Practicable (ALARP) could have identified the need to upgrade the metallurgy of the piping to a material less susceptible to sulfidation corrosion.

B. Response to the Recommendation

On June 17, 2014, CCC amended its ISO to require inherently safer systems analysis (ISSA) with the goal of reducing risk to ALARP. On October 1, 2017, the newly adopted California Occupational Safety and Health Process Safety Management (PSM) standard became effective. This standard requires, among other things, that refineries conduct a Hierarchy of Hazard Controls Analysis (HCA) for all existing processes.

The amended ISO language also states that if “the root cause analysis report or an associated incident investigation report recommends a **major change** that could reasonably result in a major chemical accident or release, the stationary source shall commence an ISSA.” The CSB’s intent was that an ISSA should *always* be conducted when considering corrective actions following a significant incident, not only if the incident investigation recommends a **major change**, as is currently written in the ISO. Current ISO language may allow for an ISSA to not be conducted if the result of the incident investigation recommends a replacement in-kind, rather than a major change. CCC sent a letter to the CSB which stated that the new CalARP regulations require Damage Mechanism Reviews for all existing processes, which should cover the possibility of a replacement-in-kind.

C. Board Analysis and Decision

Since the ISO, the California PSM Standard and CalARP together fulfill the intent of the CSB’s recommendation, the Board voted to change the status of CSB Recommendation No. **2012-3-I-CA-R07** to: “**Closed – Acceptable Alternative Action.**”