



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

<b>Report:</b>	Chevron Refinery Fire
<b>Recommendation Number(s):</b>	2012-3-I-CA-R04
<b>Date Issued:</b>	April 19, 2013
<b>Recipient:</b>	City of Richmond, California
<b>New Status:</b>	Open – Acceptable Response or Alternate Response
<b>Date of Status Change:</b>	August 12 <sup>th</sup> , 2015

### 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 flammable hydrocarbon process fluid which partially vaporized into a large cloud, resulting in 19 employee injuries and 15,000 people from the surrounding area seeking medical treatment. 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 found that the Contra Costa County Industrial Safety Ordinance did not require the use of recognized methodology for making an objective determination of effectiveness of safeguards in place to prevent potentially hazardous consequences. A more detailed safeguard analysis which gave sufficient consideration of the principles of inherently safe 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.

#### B. Response to the Recommendation

On July 1, 2014, the City of Richmond amended its ISO to require inherently safer systems analysis (ISSA) with the goal of reducing risk to ALARP. While the language added to the ISO is a significant step towards satisfying the CSB recommendation, the ISO should require the use of hierarchy of controls and require that ISSA is *always* conducted when considering corrective actions following a significant incident, not only if the incident investigation recommends a major change, as is currently written.

#### C. Board Analysis and Decision

As the amended ISO language requiring ISSA is significant progress towards implementing CSB Recommendation No. 2012-3-I-CA-R04, the Board voted to change the status of CSB Recommendation to: “**Open-Acceptable Response or Alternate Response.**”