



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

Report:	Chevron Refinery Fire
Recommendation Number:	2012-03-I-CA-R27
Date Issued:	January 28, 2015
Recipient:	American Petroleum Institute (API)
New Status:	Closed – Acceptable Action
Date of Status Change:	April 14, 2022

Recommendation Text:

Revise API RP 571: Damage Mechanisms Affecting Fixed Equipment in the Refining Industry to:

- a. Describe the potential for increased rates of sulfidation corrosion occurring in low-silicon carbon steel in Section 4.4.2.3 Critical Factors;*
- b. Specify that sulfidation corrosion rates in carbon steel piping can be significantly faster in a few, individual piping components in section 4.4.2.5 Appearance or Morphology of Damage; and*
- c. Refer the reader to the 100 percent component inspection or pipe replacement requirements detailed in API RP 939-C: Guidelines for Avoiding Sulfidic Corrosion Failures in Oil Refineries (pursuant to recommendation 2012-03-I-CA-R26) and API 570: Piping Inspection Code: In-service inspection, Rating, Repair, and Alteration of Piping Systems (pursuant to 2012-03-I-CA-R28(c)) for carbon steel piping circuits susceptible to sulfidation corrosion that may contain low-silicon components.*

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. 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.

As a part of its investigation, the U.S. Chemical Safety and Hazard Investigation Board's (CSB) examined the 1) Chevron organization, emergency response, and safety culture; 2) industry leak response standards; and 3) mechanical integrity industry standards. The CSB identified several contributing causes of the incident relating to various American Petroleum Institute (API) codes, standards, recommended practices and guidelines, that address piping corrosion, damage mechanisms, inspections, material verification and fire protection. As a result of these findings, the CSB issued six recommendations to API. This status change summary pertains to CSB Recommendation No. 2012-03-I-CA-R27.

B. Response to the Recommendation

In March 2020, API published the third edition of API Recommended Practice (RP) 571 *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*. API made substantial improvements to API RP 571 that satisfy each section of this recommendation. The changes strengthen the RP and increase awareness of the issues related to sulfidation corrosion identified in the investigation.

C. Board Analysis and Decision

The Board determined that the updates made to API RP 571 satisfied all the requirements of the recommendation. As such, the Board voted to change the status of CSB Recommendation No. 2012-03-I-CA-R27 to: “Closed—Acceptable Action.”