



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

<b>Report:</b>	Chevron Refinery Fire
<b>Recommendation Number:</b>	2012-03-I-CA-R30
<b>Date Issued:</b>	January 28, 2015
<b>Recipient:</b>	American Petroleum Institute (API)
<b>New Status:</b>	Closed – Acceptable Alternative Action
<b>Date of Status Change:</b>	April 14, 2022

### Recommendation Text:

Revise API RP 574: *Inspection Practices for Piping System Components* (3<sup>rd</sup> edition) to:

- a. Incorporate as a normative reference API RP 939-C: *Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries*;
- b. Reference API RP 939-C: *Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries* when discussing that nonsilicon-killed carbon steel is susceptible to sulfidation corrosion; and
- c. In Section 9.3 *Investigation of Leaks*, require users to follow the leak response protocol requirements established in API RP 2001: *Fire Protection in Refineries* (pursuant to 2012-03-I-CA-R31).

### 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 (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. API Recommended Practice (RP) 574, *Inspection Practices for Piping System Components*, supplements API 570, *Piping Inspection Code*, by providing piping inspectors with information that can improve skill and increase basic knowledge and practices. The RP listed 50 reference documents, including other API standards, RPs, etc. Several of these documents specifically

discussed certain damage mechanisms. API RP 939-C, *Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries*, however, is not listed among the reference documents. API RP 574 does specifically inform the reader that corrosion rates can be localized in carbon steel piping; however, it does not specifically point the reader to API RP 939-C to learn more information. To align the messages presented in all piping inspection-related API guidance documents the CSB recommended that API refer the reader to the more enhanced information in API RP 939-C to increase understanding of important sulfidation corrosion characteristics and failure prevention strategies.

#### B. Response to the Recommendation

In November 2016, API published the fourth edition of API RP 574, *Inspection Practices for Piping System Components*. API made improvements to API RP 574 to meet the intent of each section of this recommendation. API RP 574 now lists API 570, *Piping Inspection Code: Inspection, Repair, Alteration, and rerating of In-service Piping Systems* as a normative reference. In Section 2 of API RP 570, *API Recommended Practice 939-C, Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries* is listed as a normative reference. Therefore, RP 939-C is considered a normative reference in API RP 574 by extension via API RP 570. In addition, API RP 574 now lists API RP 2001, *Fire Protection in Refineries* as a reference as well.

#### C. Board Analysis and Decision

The Board determined that the updates made to API RP 574, while not identical to what was requested in the recommendation, ultimately satisfied the intent of the recommendation. As such, the Board voted to change the status of CSB Recommendation No. 2012-03-I-CA-R30 to: “Closed — Acceptable Alternative Action.”