



INDUSTRY ALERT: CHEVRON RICHMOND REFINERY PIPING FAILURE

On August 6, 2012, a piping failure occurred in the #4 Crude Unit at the Chevron U.S.A. Inc. (“Chevron U.S.A.”) refinery in Richmond, CA. The failure involved an 8” carbon-steel atmospheric gas-oil piping line from the atmospheric distillation tower.

The company’s incident investigation is ongoing. Close physical examination of the failed pipe has been limited, and the complete results of metallurgical testing may not be known for some time. Chevron U.S.A. would like to share some potentially significant preliminary information regarding the incident.

The gas-oil piping line in which the failure occurred had been regularly inspected at multiple sentinel corrosion monitoring locations (CMLs). After a November maintenance turnaround, based on corrosion monitoring results, Chevron U.S.A. increased the number of CMLs and frequency of inspections. Unfortunately we did not inspect the individual component that failed, which was less than 5 feet in length.

An area of interest in Chevron U.S.A.’s investigation of the incident is whether the pipe failure resulted from general thinning of the 5 foot piping component. As described in API RP 571⁽¹⁾, the damage mechanism consistent with general thinning in this kind of process stream may be sulfidation corrosion.

Sulfidation corrosion can occur wherever sulfur compounds are present in a hydrocarbon stream and the temperature exceeds approximately 450 °F. As discussed in API RP 939C⁽²⁾, when exposed to sulfidation-corrosion conditions, individual carbon-steel piping components with low silicon content (less than 0.10 wt% Si) can corrode at an accelerated rate not readily detected even by multiple CMLs. Piping supplied as ASTM A53 may be at greatest risk. Chevron U.S.A. is inspecting all components in similar carbon steel systems exposed to sulfidation-corrosion conditions.



(1) API RP 571 “Damage Mechanisms Affecting Fixed Equipment in the Refining Industry,” Second Edition, April 2011

(2) API RP 939C “Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries,” First Edition, May 2009.