

Chevron fire exposes unsafe crude switch

Chevron's August 2012 Richmond refinery fire that injured six workers¹ and sent 15,124 residents to the hospital² spotlights a growing safety threat. Refining "dirtier" crude oil—in this case crude that has more sulfur—increases already serious chemical incident risks. Consider these events:

2005: The Richmond crude feedstock begins to exceed 1.25% sulfur consistently in an ongoing switch to higher sulfur crude oil.³

January 2007: A fire caused by leaving a pipe in the wrong kind of service reveals corrosion by sulfur in the crude unit.⁴

Mar–Jun 2008: CBE warns higher sulfur crude is increasing corrosion, flaring, and refinery-wide incident risk at Richmond.⁵

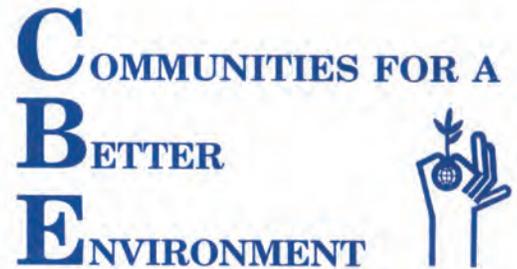
May 2009: Industry self-guidance warns of increased corrosion risk at refineries that switch to higher sulfur crude.⁶

Oct–Nov 2011: Corrosion by sulfur is found in the Richmond crude unit gas oil line that later fails in the August 2012 fire and part of this pipe is replaced,^{7,8} as fires that appear to have different causes occur in the Richmond lube and crude units.^{9,10}

Nov 2011–Jan 2012: Workers warn that Chevron ignores widespread and accelerating corrosion following the Richmond refinery's switch to higher sulfur crude.⁹

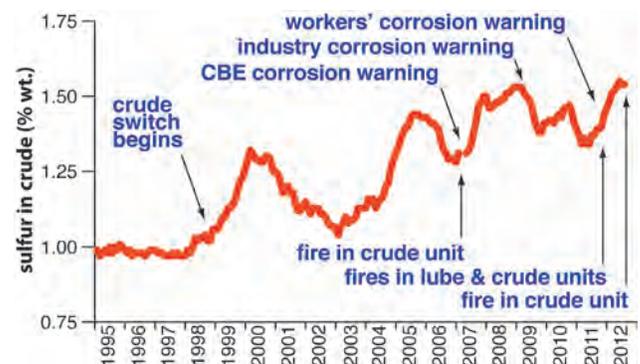
6 August 2012: Part of the corroded crude unit gas oil pipe that was left in place during Oct–Nov 2011 is found leaking. Chevron

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The plume from the Richmond refinery fire moments after ignition on 6 August 2012, seen from across the Bay in San Francisco. U.S. Chemical Safety Board evidence: Photo www.Fototaker.net

The black smoke indicates particulate matter in the plume. Uncontrolled burning of petroleum oils is known to emit hydrocarbons, particulate matter, sulfur and nitrogen compounds, and other harmful chemicals in a "toxic soup" of air pollution.



Sulfur in crude refined at Richmond 1995–Jul 2012
Rolling annual average of monthly data.³ See text for details of the related events noted in this chart.

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keeps running the leaking unit for hours until the pipe ruptures as its insulation is removed. The rupture spews hot gas oil that forms a vapor plume workers barely escape before it ignites in a disastrous fire.^{1,7}

11 September 2012: Inspection finds that the ruptured pipe section had lost 80% of its thickness to corrosion.⁷

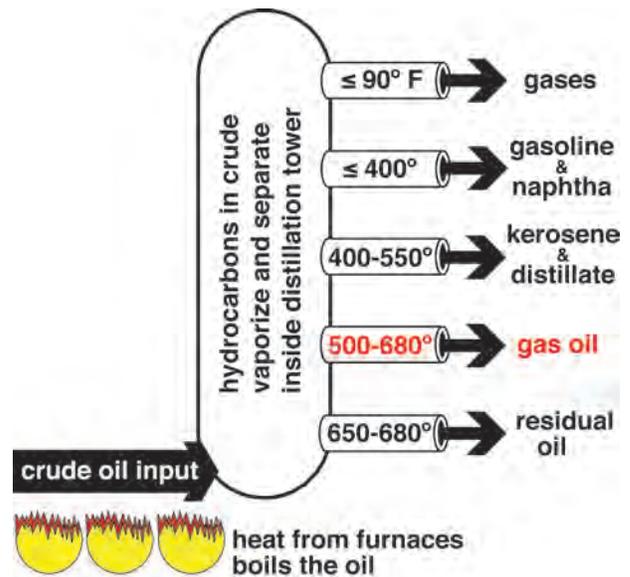
25 September 2012: Chevron admits it had reason to suspect corrosion by sulfur from its crude in the pipe that failed on 6 August.^{6,11}

December 2012: Analysis confirms sulfur corroded the pipe that failed on 6 August.⁸

February 2013: Despite these events, Chevron still seeks permits for a project at Richmond to enable processing crude with up to 3% sulfur¹²—twice as much as the refinery's current 1.5% sulfur crude feed.³

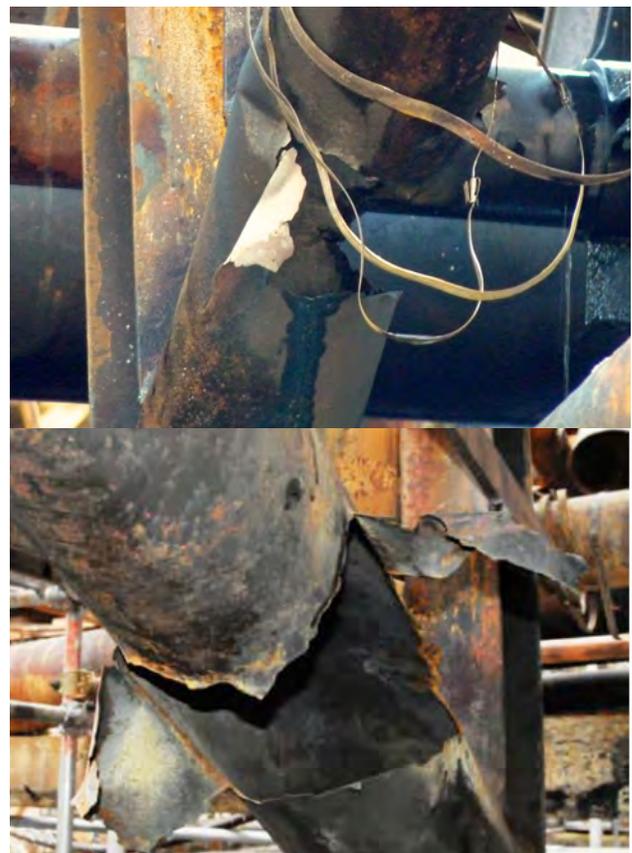
Refining dirtier crude makes an industry where government oversight has too frequently been unable to prevent catastrophic chemical spills, fires, and explosions even more dangerous. Refiners should not switch to dirtier crude feedstock when less hazardous options are available. Community and worker health and safety depend on it.

References: (1) Chevron 10/31/12 30-day Report to Contra Costa County. (2) C.C. County's count as of 8/23/12. (3) CBE analysis of data from Chevron (4/10/08 City of Richmond PC Agenda Rpt for EIR SCH#2005072117, Att 6) and USEIA (company-level imports). (4) Chevron 4/18/07 Final investigation report to C.C. County. (5) CBE 3/20/08 and 6/5/08 comments on EIR SCH#2005072117. (6) API 5/09 Recommended Practice 939-C. (7) U.S. Chemical Safety Board (CSB) report, 9/11/12 Richmond City Council mtg. (see city video transcript). (8) Anamet Report #5004.7920B. (9) California OSHA Inspection #314328980. (10) C.C. County 11/14/11 reports for Case No. 11-11-14-01. (11) Chevron 9/25/12 Industry alert. (12) Chevron 5/23/11 Revised Renewal Project Application to the City of Richmond.



This diagram of atmospheric crude distillation shows typical boiling temperature ranges (cut points) for various components ("cuts") of whole crude.

Red text: the piping that failed in the 6 August 2012 fire carried hot (~650° F) atmospheric gas oil.⁷



Two views of the rupture in the corroded crude unit gas oil pipe that fed the 6 August 2012 fire. U.S. Chemical Safety Board evidence.