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SEP 13 2016

Contra Costa Health
Hazardous Materials



Shell Oil Products US

Martinez Refinery
P.O. Box 711
Martinez, CA 94553-0071

September 13, 2016

Via hand delivery to CCC Hazardous Materials Division

Randall L. Sawyer
Chief Environmental Health and Hazardous Materials Officer
Contra Costa Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100
Martinez, CA 94553

Re: 30-day Report for 8/13/16 Incident (Flaring)

Dear Mr. Sawyer,

As requested by Contra Costa County Hazardous Materials Division, attached is the 30-day report regarding the flaring incident which occurred at Shell Martinez Refinery on August 13, 2016. This report meets the requirements in the "Hazardous Materials Incident Notification Policy" dated January 22, 2016.

If you have any questions, please contact me at 925-313-3079 or via email at ha.nguyen@shell.com

Sincerely,

A handwritten signature in black ink that reads "Ha Nguyen".

Ha Nguyen
Process Safety Manager

Attachments: 30-day Follow-up Notification Report Form
Investigation Report

CC: Cho Nai Cheung, CCCHMD
Michael Dossey, CCCHMD

ATTACHMENT C

**30-DAY FOLLOW-UP NOTIFICATION REPORT FORM
CONTRA COSTA HEALTH SERVICES**

<p>For CCHS Use Only:</p> <p>Received By: _____</p> <p>Date Received: _____</p> <p>Incident Number: _____</p> <p>Copied To: _____</p> <p>Event Classification Level: _____</p>

INSTRUCTIONS: A hardcopy and an electronic copy of this report is to be submitted for all Level 2 and 3 incidents or when requested by CCHS. See Attachment C-1 for suggestions regarding the type of information to be included in the report. Attach additional sheets as necessary. This form is to be used for update reports after the initial 30-day report has been submitted. Forward the completed form to:

ATTENTION: Randall L. Sawyer
Chief Environmental Health and Hazardous Materials Officer
Contra Costa Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100
Martinez, CA 94553

INCIDENT DATE: _____ 8/13/2016 _____
INCIDENT TIME: _____ 12:10 pm (approximately) _____
FACILITY: _____ Shell Martinez Refinery _____

PERSON TO CONTACT FOR ADDITIONAL INFORMATION
_____ Ha Nguyen _____ Phone number _____ 925-313-3079 _____

PROVIDE ANY ADDITIONAL INFORMATION THAT WAS NOT INCLUDED IN THE 72-HOUR REPORT WHEN THE 72-HOUR REPORT WAS SUBMITTED, INCLUDING MATERIAL RELEASED AND ESTIMATED OR KNOWN QUANTITIES, COMMUNITY IMPACT, INJURIES, ETC.

I. INCIDENT INVESTIGATION RESULTS

Is the investigation of the incident complete at this time? Yes No
If the answer is no, when do you expect completion of the Investigation?

If the answer is yes, complete the following:

SUMMARIZE INVESTIGATION RESULTS BELOW OR ATTACH COPY OF REPORT:

See attached Investigation Report.

30-DAY REPORT, PAGE 2

INCIDENT DATE: _____ 12:10 pm (approximately) _____

FACILITY: _____ Shell Martinez Refinery _____

SUMMARIZE PREVENTATIVE MEASURES TO BE TAKEN TO PREVENT RECURRENCE INCLUDING MILESTONE AND COMPLETION DATES FOR IMPLEMENTATION:

Recommendation	Responsible Manager or Individual	Estimated Completion
1. Non-destructively test (NDT) P-2054 pump wear rings during inspection after incident and determine whether wear rings are to be replaced with new.	CMD Shop Inspector	COMPLETED
2. Update P-2044 "Pump Inspection Work Scope Template" to include evaluation of cast iron wear rings for non-destructive testing or replacement with new	CMD Shop Inspector	3/30/2017
3. Update Mechanical Equipment Guidelines -020 "Wear Rings in Centrifugal Pumps" to include verbiage regarding evaluation of cast iron set-screwed wear rings for NDT or to replace with new wear ring during pump inspection and repair.	Rotating Equipment Manager	3/30/2017

STATE AND DESCRIBE THE ROOT-CAUSE(S) OF THE INCIDENT:

See attached Investigation Report.



1.0 Summary of Event

At approximately 12:10 pm on August 13, 2016, an overhead pump at the straight run hydrotreater gasoline distillation column seized unexpectedly, causing the overhead accumulator to overflow liquid gasoline into the vent gas header and the vent gas compressor knock-out pot. The vent gas compressor tripped on a controlled protective function due to high liquid level in the knock-out pot and the vent gas line was subsequently flared for relief.

The spare overhead pump was started and levels returned to normal. The vent gas compressor was then restarted and flaring was stopped. The flaring lasted for approximately 26 minutes.

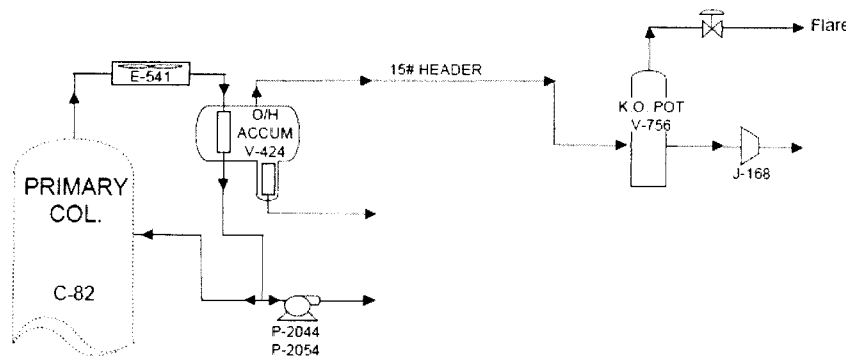
2.0 Impact

The pump trip caused a 26 minute flaring event and odor complaints from the surrounding community.

3.0 Process Background

The primary column (C-82) separates gasoline to diesel range hydrocarbons. The column overhead accumulator (V-424) stabilizes the column overhead liquid product by allowing vent gases to evolve to the 15# header before the liquid is pumped by overhead pumps P-2044 or P-2054 to a downstream process unit. The vent gas from the overhead accumulator is routed by the 15# header to the vent gas compressor knock-out pot (V-756) prior to being compressed through the vent gas compressor (J-168). The vent gas compressor has a controlled protective function to trip on high knock-out pot level to prevent liquid from going to the compressor. See process flow diagram below for details.

At approximately 12:21 pm J-168 tripped on a controlled protective function due to high liquid level in V-756. The increasing liquid level in the knock-out pot was caused by an overflow from the upstream overhead accumulator, V-424. The level in V-424 began to increase when overhead pump P-2054 tripped unexpectedly. At the time of the pump trip, the spare overhead pump (P-2044) was drained and blocked in due to a potential fugitive emission leak on a fitting of the seal flush tubing. After it was determined that the spare pump (P-2044) was safe to re-start, Operations started pump P-2044 and levels returned to normal.



Process Flow Diagram (PFD)



4.0 Incident Timeline

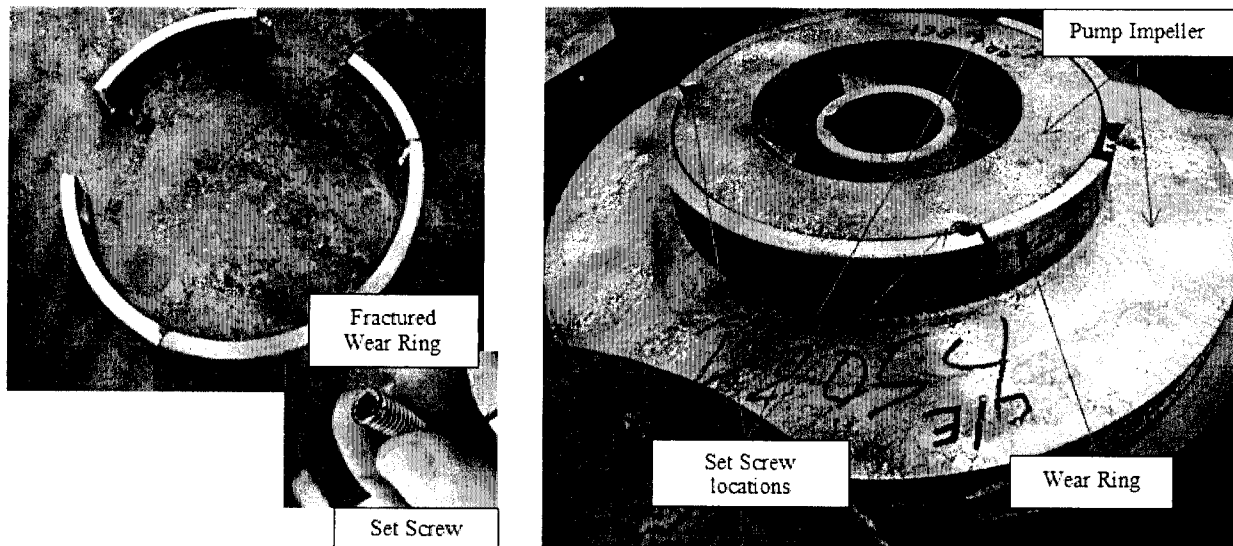
The times referenced below are approximations based on a variety of information sources. All times are reported in 24 – hour format.

Date	Time (24 hr)	Description of Event
5/31/16 - 6/14/16	--	P-2054 (Spare Pump) was overhauled. Scope included new pump shaft, mechanical seal repair, and bearing replacement. All other components met dimensional specification.
8/2/16 – 8/7/16	--	P-2044 (Main Pump) was observed to have a potential fugitive emission leak on a fitting of the seal flush tubing. P-2044 was drained, and blocked in for maintenance. P-2054 was put online.
8/13/16	11:59	Air cooler (E-541) was put online to decrease process temperature.
8/13/16	12:10	Pump P-2054 tripped on high amps
8/13/16	12:12	High Level Alarm in overhead accumulator V-424
8/13/16	12:15	Attempted to restart P-2054
8/13/16	12:18	High Level Alarm in J-168 knock-out pot (V-756)
8/13/16	12:21	J-168 tripped on high knock-out pot level and the 15# vent gas header was sent to the flare for relief
8/13/16	12:23	Flaring started
8/13/16	12:25	P-2044 was lined up and restarted (after it was determined safe to re-start)
8/13/16	12:28	V-424 level drops and is no longer in alarm
8/13/16	12:29	V-756 knock-out pot level was drained
8/13/16	12:30	2 odor calls came in from neighbors
8/13/16	12:43	J-168 was restarted
8/13/16	12:49	Flaring stopped

5.0 Causes of the Incident

The overhead pump (P-2054) tripped on high amps due to a resistance in the pump's forward rotation. The resistance to rotation was caused by friction between the impeller wear ring and the pump wear ring. The outer diameter of the impeller wear ring increased and touched off on the inner diameter of the pump case wear ring.

The pump's wear rings allow for small running clearances between the rotating impeller and stationary pump casing. The wear ring material is cast iron and is attached to the impeller by set screws. See photo below for reference. Cast iron is a common material in wear rings due to the material's resistance to galling.



P-2054 Impeller and Fractured Wear Ring

The impeller wear ring was found to be fractured at the set screw locations, as seen in the picture above. The causes of this incident were deduced basis visual inspection of the fractured wear rings, pump overhaul history and process conditions around the time of the incident.

The cause of the fracture was likely due to an existing crack in the wear ring at a set screw location. It is likely that a process temperature change caused the existing crack to propagate and the wear ring fractured. Approximately 10 minutes prior to the overhead pump trip, an upstream air cooler (E-541) was actively placed online to decrease process temperature. The process temperature was decreased about 30°F and was operating within temperature limits.

The initial crack in the wear ring was likely due to the fact that the wear ring had been subject to thermal stresses over the life of the wear ring. Stress from thermal fatigue on the wear ring could be caused by pump start-up and shut-down activities or thermal fatigue could be caused by heat that was applied to the impeller, as part of common maintenance practice, for impeller removal from the shaft during pump overhauls.

The overhead pump (P-2054) was rebuilt with the existing impellers and a new shaft during the June 2016 overhaul. The pumps wear rings satisfied dimensional checks and visual inspections during the pump rebuild, and thus the pump was returned to service. Wear rings are left in place when visually inspected, however, making it difficult to identify cracks at the inner diameter of a set screw location.



6.0 Recommendations

Recommendation	Responsible Manager or Individual	Estimated Completion
1. Non-destructively test (NDT) P-2054 pump wear rings during inspection after incident and determine whether wear rings are to be replaced with new.	CMD Shop Inspector	COMPLETED
2. Update P-2044 "Pump Inspection Work Scope Template" to include evaluation of cast iron wear rings for non-destructive testing or replacement with new	CMD Shop Inspector	3/30/2017
3. Update Mechanical Equipment Guidelines - 020 "Wear Rings in Centrifugal Pumps" to include verbiage regarding evaluation of cast iron set-screwed wear rings for NDT or to replace with new wear ring during pump inspection and repair.	Rotating Equipment Manager	3/30/2017