Kris Battleson
HSE Manager, Richmond Refinery

July 29, 2025

Via E-mail

Bay Area Air District Attn: Compliance and Enforcement Division 375 Beale Street, Suite 600
San Francisco, CA 94105

Chevron Richmond Refinery
May 2025 Flaring Causal Analysis Report

To Whom It May Concern:

Attached is the flaring causal analysis report for May 2025 for Chevron's Richmond Refinery. This report is submitted pursuant to Regulation 12, Rule 12, Section 12-12-406. The report is due within 60 days of the end of May 2025 for any reportable flaring events that occurred during the month of May 2025.

There were three (3) reportable flaring events that occurred in May 2025.

If you have any questions, please contact Wilma Dreessen at 510-242-2894 or wilma.dreessen@chevron.com

Sincerely,

for

Kris Battleson

Attachment

cc: Danny Fung, Bay Area Air Quality Management District (via e-mail, w/ attach)
Cristobal Frias, Bay Area Air Quality Management District (via e-mail, w/ attach)
Chris Coelho, Bay Area Air Quality Management District (via e-mail, w/ attach)
Haley Downing, Bay Area Air Quality Management District (via e-mail, w/ attach)

Richmond Refinery
Chevron Products Company
A Division of Chevron U.S.A. Inc.
841 Chevron Way, Richmond, CA 94801
Tel (510) 242-1400 Fax (510) 242-3762

Attachment I

Causal Analysis Report

Chevron Richmond Refinery
Reportable Flaring Events

May 05, 2025
Flaring Due to Mechanical Failure of a Level Instrumentation

Refinery Flare Event – Cause Investigation Report

1. Date on which the report was drafted: July 17, 2025

2. The refinery name and site number:
Refinery: Chevron Richmond Refinery
Refinery Site Number: A0010

3. The assigned refinery contact name and phone number:
Contact Name: Wilma Dreessen
Contact Phone Number: (510) 242-2894

Is this a rescission/modification of a previous report: No

Date of initial report: Not Applicable

Reason for rescission/modification: Not Applicable

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4. **Identification of flare(s) at which the reportable event occurred by reviewing water seal monitoring data to determine which seals were breached during the event**

Flare	**Reportable Event (SO2 or Vent Gas Volume)**
NISO (S-6013)	SO2; Vent Gas Volume

5. **The flaring event duration for each affected flare**

Flare (Source Number)	**Event Date**	**Start Time**	**End Time**
NISO (S-6013)	05-May-25	5/05/2025 09:41	5/05/2025 19:17
FCC (S-6016)*	05-May-25	5/05/2025 08:51	5/05/2025 12:04
SISO (S-6012)*	05-May-25	5/05/2025 08:58	5/05/2025 11:02
RLOP (S-6039)*	05-May-25	5/05/2025 09:13	5/05/2025 10:52

6. A brief description of the flaring event:

On May 5th, 2025, a Gas Recovery Unit experienced an over pressure situation that led to flaring. The process system had an increase in pressure due to faulty instrumentation requiring operations to route excess flows to the relief system. This caused the flare gas recovery compressors to shut down on high level and flaring occurred.

7. A process flow diagram showing the equipment and process units that were the primary cause of the event.
See Attachment Ia.

8. The total volume of vent gas flared (MMSCF) and emissions throughout the event per calendar day:

Flare (Source Number)	Event Date	Volume (mmscf)	CH4 (lbs.)	NMHC (lbs.)	SO2 (lbs.)
NISO (S-6013)	05-May-25	1.92	76.3	5,869.8	6,938.3
FCC (S-6016)*	05-May-25	0.26	19.8	373.3	110.44
SISO (S-6012)*	05-May-25	0.17	14.4	459.8	293.5
RLOP (S-6039)*	05-May-25	0.09	0.7	12.2	42.8

**Reporting per recommendation from BAAD to include vent gas volume and emission from the other flares occurred during the same flaring event.*

9. A statement as to whether or not the gas was scrubbed to eliminate or reduce any entrained compounds and a list of the compounds for which the scrubbing was performed.

The vent gas was not scrubbed to eliminate or reduce any entrained compounds.

10. The primary cause of the flaring event including a detailed description of the cause and all contributing factors. Also identify the upstream process units that contributed vent Gas flow to the flare header and provide other flow instrumentation data where available.

Primary causal factor: The level instrumentation failed due to plugging.

Contributing cause:
- Flare gas recovery(FGR)knock out drum's pump was cavitating.
- The normal blowdown line of the FGR discharge knockout drum was out of service

The primary contributor of the vent gas to the flare was multiple operating plants.

11. Describe all immediate corrective actions to stabilize the flaring event, and to reduce or eliminate emissions (flare gas recovered or stored to minimize flaring during the event). If a decision was made not to store or recover flare gas, explain why.

Emergency procedures were utilized to safely stabilize the impacted process plants.

12. Was the flaring the result of an emergency? If so, was the flaring necessary to prevent an accident, hazard or release to the atmosphere?

Flaring was an Emergency (defined in Regulation 12-12-201) as interpreted by the BAAD because it was caused by a sudden and infrequent equipment failure beyond the reasonable control of the Refinery. The failure of the level instrumentation led to an unexpected pressure increase within a process unit that necessitates immediate correction action to restore normal and safe operations.

13. If not the result of an emergency and necessary to prevent an accident, hazard or release to the atmosphere, was the flaring consistent with an approved FMP? If yes, provide a citation to the facility's FMP and any explanation necessary to understand the basis for this determination.

Flaring was consistent with Chevron's FMP Section 2.1 Table 2-2. Table 2-2 identifies sources that can be flared in non-emergency situations (e.g. start-up, shutdown).

14. If the flaring was due to a regulatory mandate to vent to flare, why couldn't the gas be recovered, treated, and used as fuel gas?

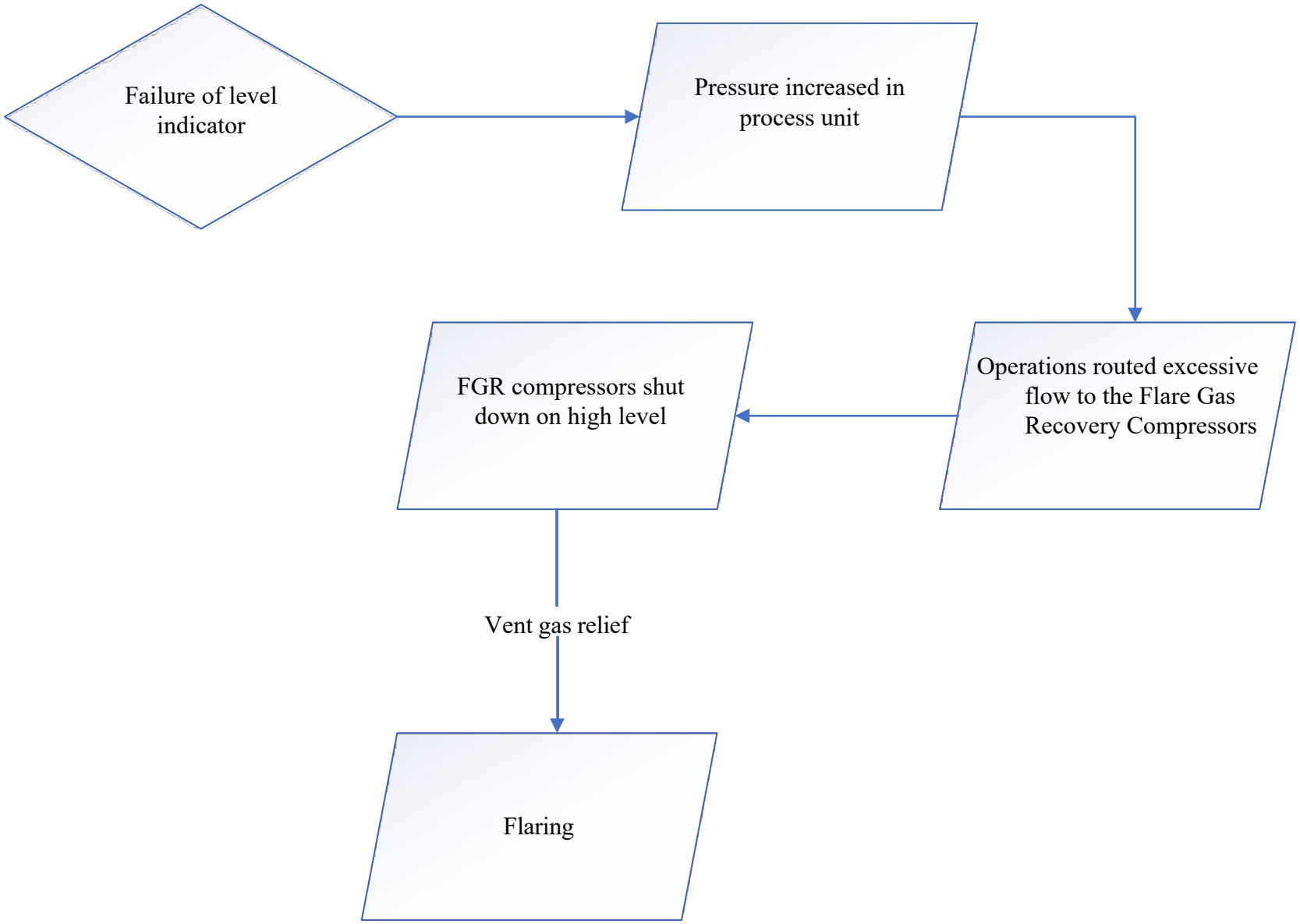
N/A. Flaring was not due to a regulatory mandate.

15. Identify and describe in detail each prevention measure (PM) considered to minimize flaring from the type of reportable flaring event that occurred.
a) State whether the PM is feasible (and will be implemented), or not feasible
b) Explain why the PM is not feasible, if applicable

The prevention measure listed below is feasible and will be considered:

1. Repair the level instrumentations and develop critical checks and testing prior to startup to validate correct functionality for the critical instruments. Estimated Completion Date: 07/30/2025
2. Install a cross-tie from a reciprocating pump to the outlet of the FGR knockout drum. Estimated Completion Date: 12/30/2025
3. Repair or replace blowdown line from the FGR discharge knockout drum to the relief knockout drum. Estimated Completion Date: 08/30/2025

Attachment Ia: Flaring Due to Mechanical Failure of a Control Valve Positioner



Attachment II

Causal Analysis Report

Chevron Richmond Refinery
Reportable Flaring Events

May 22, 2025
Flaring Due to Heat Exchanger Plugging

Refinery Flare Event – Cause Investigation Report

1. Date on which the report was drafted: June 22, 2025

2. The refinery name and site number:
Refinery: Chevron Richmond Refinery
Refinery Site Number: A0010

3. The assigned refinery contact name and phone number:
Contact Name: Wilma Dreessen
Contact Phone Number: (510) 242-2894

Is this a rescission/modification of a previous report: No

Date of initial report: Not Applicable

Reason for rescission/modification: Not Applicable

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4. **Identification of flare(s) at which the reportable event occurred by reviewing water seal monitoring data to determine which seals were breached during the event**

Flare	**Reportable Event (SO2 or Vent Gas Volume)**
FCC (S-6016)	Vent Gas Volume
RLOP (S-6039)	Vent Gas Volume, SO2

5. **The flaring event duration for each affected flare**

Flare (Source Number)	**Event Date**	**Start Time**	**End Time**
FCC (S-6016)	22-May-25	5/22/2025 02:06	5/22/2025 10:07
RLOP (S-6039) *	22-May-25	5/22/2025 02:50	5/22/2025 10:50

6. A brief description of the flaring event:

On May 22nd, 2025, a heat exchanger got plugged and caused a pressure increase in the first stage discharge line. The pressure increase activated the pressure relief device and shut down the compressor causing the flaring event.

7. A process flow the equipment and process units that were the primary cause of the event.
See Attachment IIa.

8. The total volume of vent gas flared (MMSCF) and emissions throughout the event per calendar day:

Flare (Source Number)	Event Date	Volume (mmscf)	CH4 (lbs.)	NMHC (lbs.)	SO2 (lbs.)
FCC (S-6016)	22-May-25	0.18	18.9	290.8	190.25
RLOP (S-6039) *	22-May-25	0.43	47.5	415.3	21,527.1

**Reporting per recommendation from BAAD to include vent gas volume and emission from the other flares occurred during the same flaring event*

9. A statement as to whether or not the gas was scrubbed to eliminate or reduce any entrained compounds and a list of the compounds for which the scrubbing was performed.

The vent gas was not scrubbed to eliminate or reduce any entrained compounds.

10. The primary cause of the flaring event includes a detailed description of the cause and all contributing factors. Also identify the upstream process units that contributed vent Gas flow to the flare header and provide other flow instrumentation data where available.

Primary causal factor: The water wash system was out of service causing heat exchanger plugging.

The primary contributor of the vent gas to the flare was multiple operating plants

11. Describe all immediate corrective actions to stabilize the flaring event, and to reduce or eliminate emissions (flare gas recovered or stored to minimize flaring during the event). If a decision was made not to store or recover flare gas, explain why.

The Refinery followed the operating procedures to ensure a safe shutdown while maintaining safety and minimizing environmental impact during the incident.

12. Was the flaring the result of an emergency? If so, was the flaring necessary to prevent an accident, hazard or release to the atmosphere?

Flaring was due to an Emergency (defined in Regulation 12-12-201) as interpreted by the BAAD because it was triggered by an unforeseen and infrequent equipment failure beyond the Refinery's reasonable control.

13. If not the result of an emergency and necessary to prevent an accident, hazard or release to the atmosphere, was the flaring consistent with an approved FMP? If yes, provide a citation to the facility's FMP and any explanation necessary to understand the basis for this determination.

Flaring was consistent with Chevron's FMP Section 2.1 Table 2-2 and Table 2-4. Table 2-2 and 2-4 identify sources that can be flared in non-emergency situations (e.g. start-up, shutdown).

14. If the flaring was due to a regulatory mandate to vent to flare, why couldn't the gas be recovered, treated, and used as fuel gas?

N/A. Flaring was not due to a regulatory mandate.

15. Identify and describe in detail each prevention measure (PM) considered to minimize flaring from the type of reportable flaring event that occurred.
a. State whether the PM is feasible (and will be implemented), or not feasible
b. Explain why the PM is not feasible, if applicable

The prevention measures listed below are feasible and will be considered:

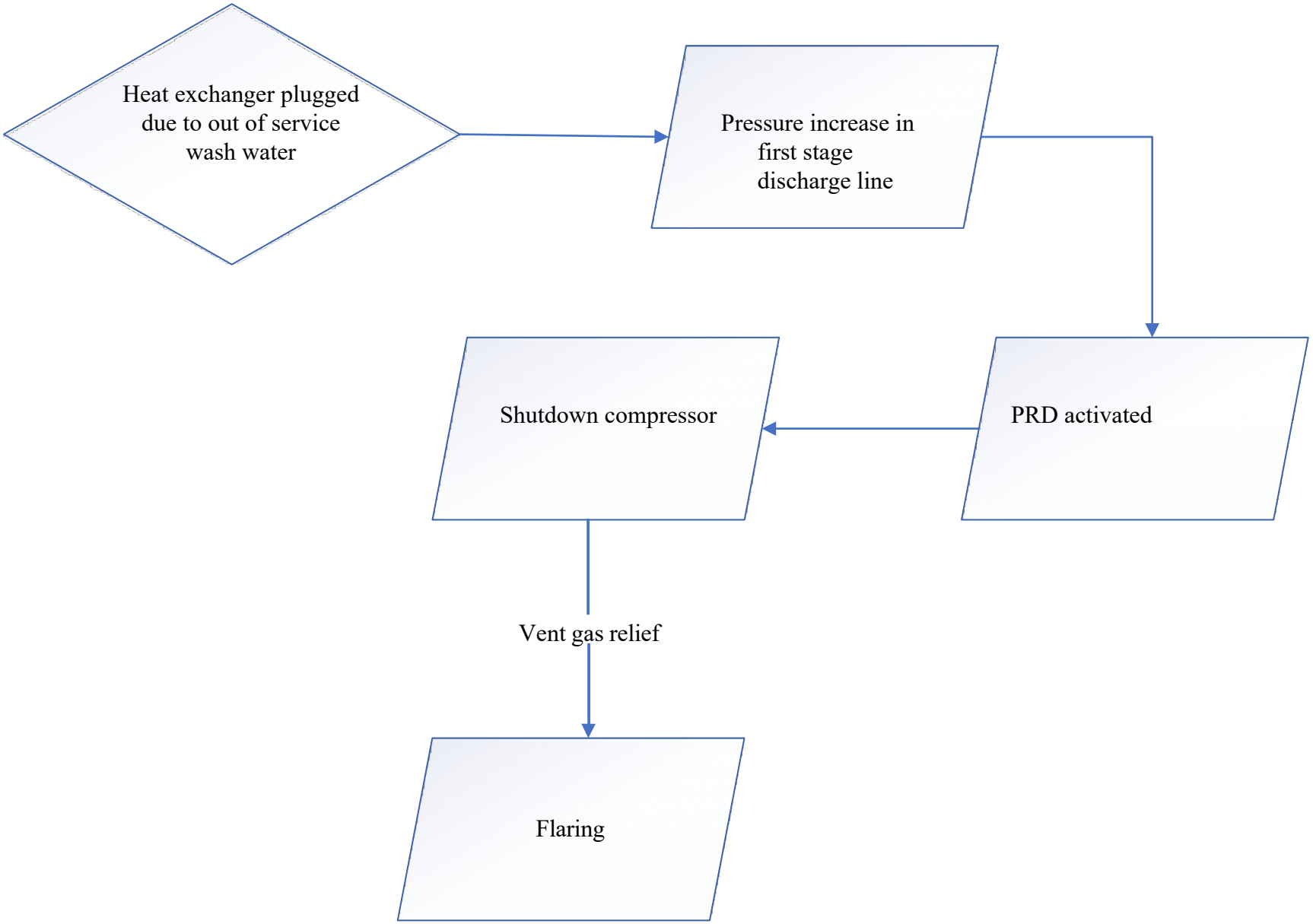
i. Add a pressure alarm on the heat exchanger discharge.

Estimated Completion Date: 10/01/2025

ii. Perform engineering evaluation of installation of dp transmitter for the heat exchanger. If a new instrument is required, create a scope input for 2028 RLOP turnaround.

Estimated Completion Date: 12/01/2025

Attachment IIa: Flaring Due to from Heat Exchanger Plugging



Attachment III

Causal Analysis Report

Chevron Richmond Refinery
Reportable Flaring Events

May 31, 2025
Flaring Due to Mechanical Malfunction of a Suction Valve

Refinery Flare Event – Cause Investigation Report

1. Date on which the report was drafted: July 17, 2025

2. The refinery name and site number:
Refinery: Chevron Richmond Refinery
Refinery Site Number: A0010

3. The assigned refinery contact name and phone number:
Contact Name: Wilma Dreessen
Contact Phone Number: (510) 242-2894

Is this a rescission/modification of a previous report: No

Date of initial report: Not Applicable

Reason for rescission/modification: Not Applicable

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4. **Identification of flare(s) at which the reportable event occurred by reviewing water seal monitoring data to determine which seals were breached during the event**

Flare	**Reportable Event (SO2 or Vent Gas Volume)**
FCC (S-6016) and Alky (S-6019)	Vent Gas Volume; SO2

5. The flaring event duration for each affected flare Flare

(Source Number): FCC (S-6016) and Alky (S-6019)
The Date(s) of the event: May 31, 2025
The start time of the event: 05/31/2025 14:33
The end time of the event: 05/31/2025 18:24

6. A brief description of the flaring event –

A pump within a process unit was being returned to service. During this process, lighter density oil was introduced as the pump was warming up to clear a hydrocarbon blockage that occurred within the pump system. As the hydrocarbon blockage cleared, conditions allowed this lighter oil into the common header of the pump system where it vaporized causing an upset in the pumps system, as well as the associated process column and related equipment. As a result, the process unit was shutdown and gases from the impacted unit were routed to the relief gas system and visible flaring occurred.

7. A process flow diagram showing the equipment and process units that were the primary cause of the event.

See Attachment IIIa.

8. The total volume of vent gas flared (MMSCF) and emissions associated with the flaring event per calendar day

Attachment III

Flare	Calendar Day	Volume (MMSCF)	CH4 (lbs.)	NMHC (lbs.)	SO2 (lbs.)
FCC	May 31, 2025	0.46	60.8	807.9	1,292.1
Alky	May 31, 2025	0.13	12.1	244.8	126.6
RLOP*	May 31, 2025	0.0057	0.5	2.8	187.1
SISO*	May 31, 2025	0.0054	1.6	4.1	38.2

**Reporting per recommendation from BAAD to include vent gas volume and emission from the other flares occurred during the same flaring event*

9. A statement as to whether or not the gas was scrubbed to eliminate or reduce any entrained compounds and a list of the compounds for which the scrubbing was performed.

The vent gas was not scrubbed to eliminate or reduce any entrained compounds.

10. The primary cause of the flaring event includes a detailed description of the cause and all contributing factors. Also identify the upstream process units that contributed vent Gas flow to the flare header and provide other flow instrumentation data where available.

Primary causal factor: Lighter density oil (Medium Cycle Oil or MCO) migrated through suction valves that were not fully closed due to a malfunctioning engagement between the valve gate and the valve seat.

Contributing Causal factor: Checklist expectations when using MCO to clear hydrocarbon blockages during the pump warm-up were unclear

The primary contributor of the vent gas to the flare was multiple operating plants

11. Describe all immediate corrective actions to stabilize the flaring event, and to reduce or eliminate emissions (flare gas recovered or stored to minimize flaring during the event). If a decision was made not to store or recover flare gas, explain why.

Emergency procedures were utilized to safely shut down the impacted process plants.

12. Was the flaring the result of an emergency? If so, was the flaring necessary to prevent an accident, hazard or release to the atmosphere?

Flaring was due to an Emergency (defined in Regulation 12-12-201) as interpreted by the BAAD because it was triggered by an unforeseen and infrequent equipment failure beyond the Refinery's reasonable control.

13. If not the result of an emergency and necessary to prevent an accident, hazard or release to the atmosphere, was the flaring consistent with an approved FMP? If yes, provide a citation to the facility's FMP and any explanation necessary to understand the basis for this determination.

Flaring was consistent with Chevron's FMP Section 2.1 Table 2-2 and Table 2-4. Table 2-2 and 2- 4 identify sources that can be flared in non-emergency situations (e.g. start-up, shutdown).

14. If the flaring was due to a regulatory mandate to vent to flare, why couldn't the gas be recovered, treated, and used as fuel gas?

N/A. Flaring was not due to a regulatory mandate.

15. Identify and describe in detail each prevention measure (PM) considered to minimize flaring from the type of reportable flaring event that occurred.
a) State whether the PM is feasible (and will be implemented), or not feasible
b) Explain why the PM is not feasible, if applicable

The prevention measure listed below is feasible and will be considered:

1. Perform an engineering evaluation and provide a recommendation on a different design or configuration of the manual block valve that can be used in this application to allow for improved isolation.
   Estimated Completion Date: 11/19/2025

2. Evaluate the feasibility of installing a local position indicator to the manual valves to determine the current position.
   Estimated Completion Date: 11/19/2025

3. Update the pump warm-up checklist to include clear expectations when using Medium Cycle Oil to clear hydrocarbon blockages.
   Estimated Completion Date: 09/24/2025

Attachment IIIa: Flaring Due to Mechanical Failure of Suction Valve