

Attachment VI

Causal Analysis Report

Chevron Richmond Refinery
Reportable Flaring Events

March 10 - 11, 2023
Flaring Due to Startup of Hydrogen Plant Train 2

Refinery Flare Event – Cause Investigation Report

1. Date on which the report was drafted: May 24, 2023

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: Duy Nguyen
Contact Phone Number: (510) 242-3132

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

Date of initial report: Not Applicable

Reason for rescission/modification: Not Applicable

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)
H2 (S-6021)	Vent Gas Volume

5. The flaring event duration for each affected flare

Flare (Source Number): H2 (S-6021)

The Date(s) of the event: March 10 - 11, 2023

The start time of the event: 03/10/2023 00:02 AM

The end time of the event: 03/11/2023 10:17 PM

6. A brief description of the flaring event –

On March 10 - 11, 2023, Hydrogen Plant Train 2 started up. Hydrogen Plant startup procedures include routing flows to relief and subsequent flaring. Operations timely proceeded with the startup activities per the procedure to reduce the emissions.

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

See Attachment IIb.

8. The total volume of vent gas flared (MMSCF) throughout the event

Flare	Volume (MMSCF)
H2	12.2

9. The emissions associated with the flaring event per calendar day

Flare	Calendar Day	CH4 (lbs.)	NMHC (lbs.)	SO2 (lbs.)
H2	March 10, 2023	390	70	0
H2	March 11, 2023	1,676	276	0

Assumptions used to calculate emissions – consistent with the reporting under Reg. 12-11.

10. 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.

11. 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: Procedures are designed to adhere to unit and flare system design.

The primary contributor of the vent gas to the flare was the Hydrogen Plant Train 2.

12. 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.

Operations timely proceeded with the startup activities per the procedure to reduce the emissions. The Hydrogen Plant does not have flare gas recovery.

13. 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 not due to an Emergency (defined in Regulation 12-12-201) as interpreted by the BAAQMD.

14. 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 2-4. Table 2-4 identifies sources that can be flared in non-emergency situations (e.g. start-up, shut-down).

15. 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.

16. 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

Flaring cannot be prevented during Hydrogen Plant startup due to facility and relief system design. Operational activities were consistent with startup procedures.

Flaring During Startup of Hydrogen Plant Train

Signature: 
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