

Attachment II

Causal Analysis Report

Chevron Richmond Refinery
Reportable Flaring Events

March 12, 2021

Flaring Due to Startup of Hydrogen Plant Train 2

Refinery Flare Event – Cause Investigation Report

1. Date on which the report was drafted: May 25, 2021

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: Brandon Sutter

Contact Phone Number: (925) 394-8773

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 12, 2021

The start time of the event: 3/12/2021 10:51 AM

The end time of the event: 3/12/2021 10:13 PM

The net duration of event (in hours and minutes): 11 hours, 22 minutes

6. A brief description of the flaring event –

On March 12, 2021, the Chevron Richmond Refinery started up Hydrogen Plant Train 2. The plant had been shut down to repair the faulty pressure control valve discussed in Attachment I. The Hydrogen plant start-up procedures include routing flows to relief, which resulted in flaring. The vent gas volume exceeded 500,000 SCF at the Hydrogen Flare on March 12, 2021.

7. A process flow diagram showing 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) throughout the event

Flare	Volume (MMSCF)
H2	14.2

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

Flare	Calendar Day	CH4 (lbs.)	NMHC (lbs.)	SO2 (lbs.)
H2	March 12, 2021	3,102	64	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.

Root cause: Startup of Hydrogen Plant Unit Train 2 while adhering to unit procedures.

The main contributor of vent gas flow during this event originated from Hydrogen Plant Unit 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 proceeded with the start-up activities per the procedure in a timely fashion 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 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 plant start-up due to facility and relief system design. Operational activities were consistent with start-up procedures.

Flaring Due to Hydrogen Plant Start-up

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On March 12, 2021, the Chevron Richmond Refinery started up Hydrogen Plant Train 2. The plant had been shut down to repair a faulty pressure control valve. The Hydrogen plant start-up procedures include routing flows to relief, which resulted in flaring.

