

FLARE CAUSAL ANALYSIS REPORT

*Flaring Associated with #3 HDO Startup and H2 Imbalance – Public Copy
March 6, 2023*

- 1) Date on which the report was drafted.**
May 23, 2023
- 2) The refinery name and site number.**
Tesoro Martinez Refinery, Plant # B2758
- 3) The assigned refinery contact name and phone number.**
Sharon Lim, Advance Environmental Engineer, (925) 335-3467
- 4) Identification of the flare(s) at which the reportable event occurred by reviewing the water seal monitoring data to determine which seals were breached during the event.**
West Air Flare, **S1012**
- 5) The flaring event duration for each affected flare:**
 - a. The date(s) of the event**
March 6 – 8, 2023
 - b. The start and end time of the event**
Starting time 8:00 AM
Ending time 2:34 PM
 - c. The net duration of the event (in hours and minutes)**
54 hours and 34 minutes
- 6) A brief description of the flaring event**

Flaring resulted from #3 HDO (S-850) shutdown due to the loss of instrument air.
- 7) A process flow diagram showing the equipment and process units that were the primary cause of the event.**
Process Flow Diagram has been redacted in public copy.
- 8) The total volume of vent gas flared (MMSCF) throughout the event.**
Based on the Regulation 12 Rule 11 Flare Monitoring report, the net gas flow to the flare was 8,054,000 SCF.
- 9) The emissions associated with the flaring event per calendar day:**
 - a. # methane emitted
 - b. # non-methane hydrocarbon emitted
 - c. # SO₂ emitted

See Table 1 for summary

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Table 1

Date	Methane (lbs/D)	Nonmethane (lb/D)	SO2 (lbs/D)
3/6	518	259	7
3/7	654	237	9
3/8	397	302	3
Total	1570	799	19

Also provide the assumptions used to calculate emissions associated with the flaring event if they are different from those used for reporting under Regulation 12 Rule 11.

The emissions associated with this flaring event were based on the methodology used for reporting under Regulation 12 Rule 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 scrubbing was performed.

The vented gas which was flared was not scrubbed.

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.

On March 6, 2023, 3HDO shutdown when the recycle HDO pump tripped. The pump tripped due to low level at the recycle surge drum V-224. Circulation was restarted and the furnace was relit. Operations attempted to flush the product fin fans E-4603 with Renewable Diesel but were unsuccessful prior to plugging. The fin fans are normally used to cool the product prior to sending the product to the storage tank. Superheat blankets remained installed on parts of the fan outlet piping and were turned on. Additional blankets were installed to melt the product lines. It took additional days to melt the product lines before the unit could be restarted.

During restart activities, TV-3162B was found with the air blocked in. This controls the flow to the recycle drum V-224. TV-3162B is the stripper bottoms fin fan bypass valve and typically operates around 45% open. With the loss of instrument air, the valve closed. A lock was added to the instrument air valve to prevent future inadvertent shutoff and to assure flow back to V-224.

H2 continued to be flared during this period. H2 Plant is up and running prior to other units as hydrogen is essential for the reactions.

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

H2 Plant rate was kept at low rates to decrease the vent gases to flare. We used the flare gas recovery compressor to recycle vent gas to 5 Gas Plant when 5 Gas compressor temperatures and BTU content of the fuel gas allowed.

- 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 the result of an "emergency" as defined by the BAAQMD.

“Emergency: A condition at a petroleum refinery beyond the reasonable control of the owner or operator requiring immediate corrective action to restore normal and safe operation that is caused by sudden, infrequent and not reasonably preventable equipment failure, natural disaster, act of war or terrorism or external power curtailment, excluding power curtailment due to an interruptible power service agreement from a utility.”

- 14) If not the result of an emergency and necessary to prevent an accident, hazard or release to 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.**

Yes, this is consistent with our FMP. Please see Section 3.4.1 Startup and Shutdown of Process Units and page 23 for hydrogen imbalance.

- 15) If the flaring was due to a regulatory mandate, to vent to the flare, why couldn’t the gas be recovered, treated, and used as fuel gas?**
Not applicable.

- 16) Identify and describe in detail each preventative measure (PM) considered to minimize the flaring from the type of reportable flaring event that occurred:**

- a. **State whether the PM is feasible (and will be implemented), or not feasible**

The following prevention measures were feasible and executed:

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TV-3162B instrument air was locked open to assure adequate instrument air supply. This will also allow the flow controller to send the appropriate amount of recycle back to V-224.

Minimum hydrogen was produced until #3 HDO started up to minimize hydrogen to the flare and fuel gas systems. Some hydrogen was sent to the fuel gas and combusted in heaters.

b. Explain why the PM is not feasible, if applicable

Not applicable.

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