northwest Clean Air agency
1600 South Second Street
Mount Vernon, WA 98273-5202
ph 360.428.1617
fax 360.428.1620
www.nwcleanair.org

Air Operating Permit Excess Emissions Report Form Part II

Name of Facility	Shell, Puget Sound Refinery	Reported by	Tim Figgie
Date of notification	November 13, 2013	Incident type: breakdown/ upset/startup or shutdown	Breakdown/upset
Start Date	November 13, 2013	Start Time:	6:30 PM
End Date	November 14, 2013	End Time:	1:00 AM
Process unit or system(s): SRU 3 and 4			

Incident Description

On November13 at approximately 6:30PM the SRU3 tripped out due to a high incinerator stack temperature reading, which proved to be a false reading. The stack thermocouple read incorrectly due to a faulty computer card that caused an uncommanded instrument reconfiguration from a linear to a logarithmic scale. This caused the temperature to read approximately 200 degrees higher than the actual stack temperature. When the temperature reading showed high the automatic control system diverted air from the combustion air header to the stack for cooling. This caused a pressure drop in the header to below the safety trip point for combustion air flow to the incinerator burners, tripping the incinerator and the SRU3.

After SRU3 tripped Operations immediately routed all amine acid gas (AAG) to SRU4 and then began the restart process of SRU3. With all AAG in SRU4 the oxygen-to-H2S ratio dropped, causing high SO2 in the SRU4 incinerator stack. The SRU4 ran out of ratio for approximately 2.5 hours. The delay in balancing the SRU4 ratio was because the Operator was working to restart SRU3 as well as working to balance ALKY2 and Flare Gas Recovery units that were also upset for unrelated reasons. The SRU4 SO2 emissions dropped to normal when the SRU4 ratio was brought inline.

This event resulted in the following exceedances, with the associated lbs emitted:
- SRU3: 8, 12-hr avg periods above the 250ppm limit (1.2 lbs SO2 emitted)
- SRU4[a]: 3, 1-hr avg periods above the 1000ppm SO2 @ 7% O2 limit (24,470 lbs emitted).

a- note that it was discovered after the incident that the SRU4 SO2 CEMS probe was found to be partially plugged, restricting sample flow and causing a delayed response time. Therefore, process data was used to determine the time frame of the incident and to estimate emissions.

Immediate steps taken to limit the duration and/or quantity of excess emissions:

Operations immediately began troubleshooting the problem.

Applicable air operating permit term(s): 5.8.12, 5.8.15, 4.10 and 4.11

Estimated Excess Emissions:	Pollutant(s):	Pounds (Estimate):
Based on engineering calculations	SO2	24,470

The incident was the result of the following (check all that apply):

- ☐ Scheduled equipment startup
- ☐ Scheduled equipment shutdown
- ☐ Poor or inadequate design
- ☒ Careless, poor, or inadequate operation
- ☐ Poor or inadequate maintenance
- ☒ A reasonably preventable condition

Did the facility receive any complaints from the public?

- ☒ No
- ☐ Yes (provide details below)

Did the incident result in the violation of an ambient air quality standard

- ☒ No
- ☐ Yes (provide details below)

Root and other contributing causes of incident:

The root cause of the initiating trip of SRU3 was due to a faulty computer system that caused a false high temperature output that caused the SRU3 trip. The SRU4 high readings resulted from operating the unit out of O2-to-H2S ratio control.

The root cause of the incident was:

(The retention of records of all required monitoring data and support information shall be kept for a period of five years from the date of the report as per the WAC regulation (173-401-615))

- ☒ Identified for the first time
- ☐ Identified as a recurrence (explain previous incident(s) below – provide dates)

Are the emissions from the incident exempted by the NSPS or NESHAP "malfunction" definitions below?

- ☐ No
- ☐ Yes (describe below)

Excess emissions from the SRU3 trip are the result of an unavoidable equipment malfunction and, therefore, are exempt. The SRU4 excess emissions were not the direct result of an equipment malfunction although the SRU3 malfunction required that operational adjustments be made to SRU4 that lead to high emissions.

Definition of NSPS "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or failure of a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 60.2
Definition of NESHAP "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 63.2

Analyses of measures available to reduce likelihood of recurrence (evaluate possible design, operational, and maintenance changes; discuss alternatives, probable effectiveness, and cost; determine if an outside consultant should be retained to assist with analyses):

The faulty computer system that caused the SRU3 trip is being replaced over approximately the next year. Corrective action for the SRU4 incident includes new written procedures for single SRU operating scenarios and additional training of SRU operations personnel.

Description of corrective action to be taken (include commencement and completion dates):

See above

If correction not required, explain basis for conclusion:

See above

Attach Reports, Reference Documents, and Other Backup Material as Necessary. This report satisfies the requirements of both NWCAA regulation 340, 341, 342 and the WAC regulation (173-400-107).

Is the investigation continuing? ☒No ☐Yes

Is the source requesting additional time for completion of the report? ☒No ☐Yes

Based upon information and belief formed after reasonable inquiry, I certify that the statements and information in this document and all referenced documents and attachments are true, accurate and complete.

Prepared By: _ Mike Osborne/Parrish Miller Date: ___ December 6, 2013

Responsible Official or Designee: _____ Date: 12/12/13