

Incident Report

Completed by: Boone Brothers

Date: March 9, 2020

Location of Incident: BD
8195 Industrial Blvd.
Covington GA 30014

Release Point: Line 1 Vessel Room

Date of Incident: March 3, 2020

Description of Incident:

On March 3, 2020, operators were making a transfer on line 1 from the sterilization vessel to the aeration cell when an alarm was activated in the line 1 vessel room. Upon investigation it was discovered that a limit switch which controls the back-vent fan had become misaligned during contractor-led maintenance/construction activities. The misaligned cam resulted in the limit switch not immediately activating the back-vent fan when the sterilization doors were partially opened. Using the calculations for determining EtO emissions during the transfer step contained in the mass balance equations the most recent permit application, the estimated worst-case fugitive emissions, including a 4X safety factor, is 0.18 pounds.

Background:

When the sterilization cycle is complete there are gas wash cycles that remove a majority of the ethylene oxide. Upon completion of the gas washes, the operator partially opens the sterilizer door and runs the back-vent fan to capture additional ethylene oxide residuals from the product for 15 minutes. These emissions are routed to the regenerative thermal oxidizer (RTO).

At the time of the incident on March 3, 2020, the operator partially opened the door and was waiting/listening for the back-vent fan to engage. While waiting for the back-vent fan, the operator received a call from the control room operator reporting there was an alarm on the Sensodyne EO monitor, indicating a level of 10.5 ppm. Upon learning of the alarm, the operator proceeded to close the vessel door as well as the door to the vessel room door, in order to prevent any further release. The door to the sterilization vessel was open for 6 minutes.

After the door was closed, the conditions were evaluated for safe occupancy with a hand-held gas detector. At this time, the back-vent fans had become operational. The operators then resumed the process and the remainder of the contents were processed through the RTO.

Root Cause Investigation:

The investigation revealed that the back-vent fans did not operate because the proximity switch had been accidentally misaligned during contractor-led maintenance/construction activities while the plant had been off-line for a one week shut-down. This was the plant's annual shutdown to perform routine

maintenance activities, as well as perform construction work related to installation of pollution controls for fugitive emissions.

The proximity switch is affixed to a steel mount positioned at the top of the vessel door. During the construction activities the steel mount became bent, and the switch was not aligned properly to detect the door movement. When the door was opened the switch did not activate the back-vent fans and allowed some of the residual ethylene oxide to escape from the back-venting process

Corrective Actions

The following steps were taken as corrective action:

1. The proximity switch and the wiring were inspected and re-mounted and verified to be operational. Other vessels do not have the same proximity switch and will not fail in the same manner.
2. Verify the proximity switches in Madison facility are evaluated for the same potential failure mode.
3. Install a magnehelic on the duct which will indicate the system is in negative pressure when beginning the back-venting step.
4. Add a step to the start-up checklist for each vessel in Covington and Madison to verify the proximity switch activates the back-vent fans when being returned to service after a shutdown.
5. Complete re-training for all sterilization operators and maintenance techs on protocols for investigating alarms; and amend training to include notification to the Sr. Manager, Operations and Sr. Manager, EHS upon discovering a release and/or mechanical failure or malfunction.
6. Initiate new protocols for notifying Corporate EHS and Corporate Operations and Corporate Legal of any release and/or mechanical failure or malfunction.