

**OIL INDUSTRY SAFETY DIRECTORATE
NOIDA**

SAFETY ALERT

Process and Engineering

No.: **P&E:18/02**

Title: **Fire in Pre heat Exchanger Train**

Location: **Crude Distillation Unit**

Type: **Ignition of Vapor cloud in contact with hot surface**

Result/ outcome: **Fire, Property damage. No causality was reported.**

What Happened?

A preheat exchanger of Crude Distillation Unit was under preparation for handing over to maintenance for cleaning. While draining the exchanger shell side diesel content, the associated OWS drain line was found choked. The OWS funnel was also in choked condition. While trying to de-choke the OWS drain line, sudden dechoking of the line resulted in uncontrolled release of hot hydrocarbon, which formed a vapor cloud and started spreading in the vicinity. Due to already erected scaffolding and the odd location of the drain line isolation valve, the drain line could not be isolated immediately. Fire was initiated due to auto ignition in contact with hot surface of the nearby heat exchanger, which was in service.

What Caused It?

The cause of the fire is sudden release of hydrocarbon from the OWS drain line on the diesel side of preheat exchanger during the unplugging activity and ignition of vapour cloud upon contact with hot surface of nearby exchanger. The amount of diesel released to atmosphere is expected to be higher than the shell side hold up of the exchanger due to passing inlet valve.

Recommendations:

- ❖ Working condition of OWS and CBD draining system for thorough draining of equipment should be ensured. The activities like dechoking should be carried out with proper Job safety analysis.
- ❖ During erection of scaffolding, it is to be ensured that operation of valves in that area and movement is not obstructed.
- ❖ During the preparatory activities for handing over of exchanger, it is to be ensured that steam is introduced in shell and tube sides only after depressurization of hydrocarbon on both sides.
- ❖ Approved SOP to be prepared for commissioning and decommissioning of different types of exchangers, all concerned to be made aware of and strict compliance to be ensured.

This alert is based on the Investigation report submitted by Refinery and published for information purpose only. This information should be evaluated to determine its applicability in your operations, to avoid reoccurrence of such incidents.