Refridge Flash Fire

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Enform

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Description of Incident:

An operator recording equipment readings (logging) at the refrigeration (refridge) building observed scorch marks on the exterior of the building and glycol/steam venting out of a pressure release vent on the still column. The scorch marks were located above the reboiler unit as well as on the reboiler unit itself and the associated piping and insulation.

Scorched Exterior of Refridge Building

Scorched Piping/Insulation Under Reboiler

What Caused It?

A buildup of condensate in the system.

- The reboiler is designed to flash off water and any associated hydrocarbons, including benzene, by heating the glycol to approximately 120°C.
- If hydrocarbons are present at a sufficient volume in the glycol, a hydrocarbon-glycol foam can form on the surface of the glycol within the glycol accumulator.
- In this case the buildup was such that it triggered the pressure release vent, releasing hydrocarbon vapours that subsequently ignited.
- The precise cause of ignition is unknown, but may have been the hot reboiler exhaust stack.

Contributing Factors Included:

- Failure to maintain a glycol/condensate interface in the Low Temperature Separator. Personnel felt that glycol skimming was not required because the location no longer produced condensate.
- Operators were not trained in maintaining the interface in the Low Temperature Separator.
- The pressure release vent on the still column was undersized.

Corrective/Preventative Actions:

- The pressure release vent was replaced with a properly fit for purpose design.
- Operators received additional training in the maintenance of glycol refrigeration systems.
- Operators will skim the glycol accumulator on a regular basis. This task may have the potential for operator hydrocarbon exposure (namely benzene), therefore an exposure assessment was recommended.
- Sampling of the gas and glycol will be conducted on a regular basis.