CATASTROPHE ALERT

On May 08, 2012, Employees were changing caustic to lower PH in a Gas Recovery Unit. The employees were dumping the caustic into an open storm drain system to lower the high PH level. Onsite management and employees that had worked in the Alky Unit were accustomed to dumping product into the drain system. Two (2) employees began lining up valves and started draining product from a Caustic Wash Tank. The more experienced of two employees had not performed this task in over four (4) years. Shortly after line-up of the valves the employee with the most experience was called away, leaving the employee with the least amount of experience alone and with no written procedures to finish the line-up and manage the draining of material. Both employees were aware that hot work was being performed on the unit, but were both unaware of the consequences of dumping the caustic material, which contained butanes, into an open storm drain system that drained throughout the area. At approximately 10:20 a.m., an employee announced over the unit radio channel "There's a vapor cloud and it's headed towards the welders, shut them down". One employee proceeded to block in the Caustic drain at the caustic manifold. The employee closed a secondary block of the drain located where the caustic drain line enters through the grating into the storm drain system. At about the same time a Flash Fire occurred, while the employee was standing over the drain. A total four (4) workers were exposed to a flash fire which resulted in burns to skin from fire resulting in 1st, 2nd, and 3rd degree burns, and some workers had inhalation exposure to chemicals/smoke involved in the fire. The source of the ignition appeared to be smoldering insulation materials created when a third party contractor overheated insulation during a post-weld stress relieving process using improperly maintained electrical equipment that was not considered approved electrical equipment.

Significant Factors:

- Unit supervision and employees underestimated the risk of draining to the unit's storm drain system, while active and approved Hot Work permits were in the affected area.
- Unit supervision and workers had never considered the consequences of draining product from the unit into the open storm drainage system, or that butanes would be released when caustic was being dumped.
- Unit supervision and workers felt they understood the process and that when they observed clear product through the site glass they knew to close valves to prevent butanes from being released into the storm drainage system. However, the site glass was not functioning properly and no one really understood the chemistry involved or the potential hazards.
- Previous butane vapor releases that occurred while draining the container and pressures were not reported and investigated per the Incident Report and Investigation Procedures to understand cause(s) and implement corrective action to prevent further butane vapor releases.
- There were no written and/or approved operating procedures for draining the container to the unit's hydrocarbon sewer.
- Procedures for the unit had not been reviewed in any previous Process Hazard Analysis since 2007.

Recommendations:

- Brief all employees on the facts and circumstances of this catastrophe accident.
- Ensure management/employees are trained on OSHA general industry rules applicable to work being performed in the refinery.
- Train/retrain all employees on hazards associated with this incident to recognize and avoid unsafe work conditions when working in the refinery environment.
- Ensure all electrical equipment being used at the facility is maintained properly and approved equipment.