



**U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region**

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Water-Treating Facility Upset Leads to Fire on Production Platform

An upset condition in the water-treating facilities caused a fire on a production platform. High- and intermediate-pressure separators route produced water to a skimmer tank and then to a flotation cell on the platform. One of the separators experienced a gas blowby condition either because of a malfunctioning level controller or excessive sand or debris preventing closure of the dump valve. As a result, the downstream skimmer tank was subjected to excessive fluids and pressure. As the liquid level in the tank increased, the level safety high sensor activated the inlet shutdown valve (SDV). The SDV (butterfly valve), however, was rated for only 360 psi working pressure and was therefore unable to shut off the flow of produced water and gas. These circumstances led to an overflow condition in the flotation cell, splashing produced water on a 440-volt transformer, shorting it out, and igniting the gas.

As the fire progressed, the emergency shutdown system (ESD) was activated. The ESD shut in the wells and activated the fixed water-spray (deluge) system within the well-bay area. In addition, fuel gas for the turbine compressor was vented through a 6-inch vent that was routed down the platform leg, and discharged below the waterline under the ongoing fire at the flotation cell. The vent gas subsequently migrated upward and ignited. The gas burned off, engulfing the entire platform at one point for a short time.

The deluge system protected the wells from the fire. As the vent gas depleted, the fire subsided into smaller fires on the platform. These smaller fires were extinguished by platform personnel utilizing handheld and wheeled unit extinguishers.

There were no injuries, and property damage was minimal; however, this could have been a major accident. Discharge vents terminating down a platform leg, regardless of submerged depth, are undesirable since the upward migration of gas may pose a threat to the production facility. Therefore, consideration should be given to the installation or modification of all booms used for flaring or venting flammable gases in a vertical, upward configuration or such that they ensure safe discharge away from the production facility. If personnel had been on the platform at the time of the fire, they could have been seriously injured.

To prevent recurrence of this type of accident, the operator has taken the following steps:

1. The electrical transformer has been moved outside the production area.
2. The separator, heater treater, skimmer tank and stock tank were cleaned of sand and debris.
3. The inlet shutdown valve to the skimmer tank has been removed. Safety devices have been installed on the skimmer tank and flotation cell to shut in wells.
4. A flare boom will be installed on the facility in a vertical, upward configuration.