

Heater-Treater Fire Forces Evacuation of Platform

National Safety Alert No. 9
May 25, 2011

A Safety Alert is a tool used by the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) to inform the offshore oil and gas industry of the circumstances surrounding an accident or a near miss. It also contains recommendations that should help prevent the recurrence of such an incident on the Outer Continental Shelf.

In September 2010, a fire occurred on a production platform during start-up operations following an inadvertent shut-in. The platform was inadvertently shut-in when a contract paint crew member unintentionally bumped the level safety high (LSH) on the glycol contactor. The fire quickly escalated to the point that all personnel abandoned the platform and entered the water. All personnel were later rescued.

A BOEMRE investigation into this incident revealed that the fire was caused by the collapse of the forced draft Heater-Treater's fire tube. Upon the collapse of the fire tube, hydrocarbons (oil and natural gas) came into contact with the fire tube's hot burner, produced flames, and ignited, eventually ejecting the Heater-Treater's flange face assembly approximately 8 to 10 feet away from the front of the vessel. Oil burst into flames as it flowed out onto the cellar deck. The fire spread quickly on the cellar deck, and then spread to the main deck where it reached combustibles and continued to spread. The platform sustained major damage.

Based on the evidence developed during its investigation, the BOEMRE investigation concluded that the fire resulted because the operator failed to adequately maintain and operate the Platform's Heater-Treater in a safe condition. Specifically:

- The Heater-Treater's fire tube experienced high temperature spikes, sustained operating heat from regular use and substantial pitting and corrosion during its nearly 30-year life, which weakened the fire tube's steel. Moreover, the Heater-Treater's normal operating pressure contributed to the collapse of the already-weakened fire tube.

- The Heater-Treater was designed for a significantly higher production (process fluid) flow rate than was likely being processed on the platform at the time of the incident. This meant that there most likely was not enough liquid being processed through the Heater-Treater to adequately dissipate heat from the fire tube and maintain proper temperature;
- The Operator failed to have an inspection plan and regularly inspect and maintain the Heater-Treater, as required by BOEMRE regulations (30 C.F.R. §§ 250.198, 803(b)), which could have prevented the incident.

Furthermore, the BOEMRE investigation found several safety deficiencies on the platform on September 2 that posed risks to the crew's safety:

- The Back Pressure Valve (BPV) controller was improperly assembled and was not adequately maintained, which caused the BPV to fail to open fully or fast enough to relieve the gas that packed the high pressure and low pressure system after the wells were brought back online. The pressure rose on the blocked system, and the PSVs on the glycol contact tower and the compressor activated;
- Electrical wiring and associated switch gear components for the firewater pump were compromised and prevented the emergency diesel generator from supplying electrical power to the firewater pump for the required 30 minutes run time, which left the crew without the means to try and fight the fire;
- Inadequate monitoring of relevant essential operating conditions while safety devices were in bypass, which prevented the crew from taking appropriate steps in response to an increase in pressure in the production train.

BOEMRE recognizes that Heater-Treaters are essential components used for processing oil and considers them to be extremely hazardous if not properly maintained and operated in an efficient manner. Therefore, BOEMRE recommends the following to Lessees/Operators in the Gulf of Mexico, the Pacific and Alaska regions that operate forced-draft liquid hydrocarbon fired components, i.e. forced draft Heater-Treaters:

- Evaluate the capacity and operating range of the Heater-Treater and related forced draft burners relative to the amount of oil being produced. If the oil production rate falls below the designed capacity of the Heater-Treater, operators should evaluate a variety of options to ensure that they are maintaining this equipment in a safe condition;
- Perform a Hazards and Operability Study (Hazop Study) of fired components that process liquid hydrocarbons, and specifically review process vent piping configurations for safe and adequate venting capabilities.

BOEMRE further recommends that all Lessees/Operators:

- Evaluate, and where necessary, update or develop their inspection plans for Heater-Treaters as required by BOEMRE regulations (see 30 C.F.R. §§250. 198, 250.803(b)), and regularly inspect Heater-Treaters;
- Review their current procedures on bypassing safety devices with their platform production crews to ensure that they include effective monitoring of relevant essential operating conditions when systems are in bypass to conform to BOEMRE regulations.

For a full report, see [BOEMRE panel report here](#).

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