

Safety Alert

Notice No. 18
February 18, 2005

WELL-CONTROL EQUIPMENT CIRCUMVENTION

An operator experienced a loss of well control while performing a workover/completion operation. During the operation, completion fluid pumping was shut off so that a tubing hanger lockdown pin could be removed from the wellhead to allow visual alignment of the tubing hanger. Removal of the pin circumvented the blowout prevention well-control equipment. The well began to flow through the lockdown pin opening. The driller closed the annular preventer, but this increased the flowing pressure out of the 1.5-inch opening, preventing rethreading of the pin back into the tubing hanger.

The well progressively flowed completion fluid (seawater) and then a mixture of seawater and hydrocarbons out of the opening. Up to three barrels of crude oil sprayed onto grating, decking, and walls in the wellbay, with an estimated three gallons spilling into the Pacific Ocean. Natural gas was discharged in the general direction of the flare boom, increasing the potential for ignition. Platform personnel manually shut down operations and activated the deluge system. The flare, which continued to burn residual system process gas after the platform shutdown, was eventually extinguished with dry chemical extinguishers, preventing potential ignition of the gas plume by the flare. Rig pumps were used to pump seawater into the well through the kill line on the blowout preventer stack until the flow rate through the lockdown pin opening decreased enough to allow installation of a valve assembly; the valve was then closed, stopping the flow from the well.

An MMS investigation of the incident identified two direct causes and four possible contributing causes:

Direct causes

1. The rig personnel stopped pumping completion fluids into the well which caused an imbalance in the hydrostatic pressure against the Monterey Formation, allowing the well fluids to migrate up through the piping to the wellhead on the platform.
2. The tubing hanger lockdown pin was completely removed from the wellhead assembly. Removal of this pin circumvented the blowout preventer system and provided an exit point for the wellbore fluids.

Potential causes

3. The operator and its contractors did not adhere to the MMS-approved Application for Permit to Modify (form MMS-124) and field rules. This allowed conditions to develop that were conducive to well-control problems.
4. Inadequate and/or inappropriate training with respect to performing the inherently unsafe operation of removing the lockdown pin may have contributed to the incident.
5. The well was not closely monitored for flow or fluid level during the split tubing hanger landing operation. A lack of immediate appropriate action by the rig crew may have resulted from this inattentiveness to developing well conditions.
6. The operator relied upon their contractors' extensive experience to perform the job correctly. However, the operator provided inadequate supervision to the contractors. In addition, the operator and contractors failed to complete a Job Safety Analysis for this operation.

Therefore, MMS recommends that:

1. Lessees and operators develop specific procedures or revise existing procedures for landing dual string casing hangers so that circumvention of the well-control system is eliminated.
2. Well-control training and safety meetings cover potential consequences of well-control system circumvention.
3. Operators review and/or provide detailed work procedures to be used by company and contract employees.
4. Rig crews and third-party personnel be instructed to conform to approved Applications for Permit to Modify and field rules.
5. Job Safety Analyses be conducted for all tasks involving potential hazards.

This Safety Alert can be found on our Website
at: <http://www.mms.gov/omm/pacific/offshore/safety/satoc.htm>