

Safety Alert No. 306
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Trapped Pressure Beneath a Tubing Plug Blows Work String from Well



A lease operator was conducting a recompletion using both a coil tubing unit and a platform rig on an Outer Continental Shelf (OCS) platform. Upon completion of coil tubing operations, a DX pump through type tubing plug was set in the production tubing. Records indicated that at the time the plug was set, the fluid weight in the well was 12.7 pounds per gallon and that the well was static.

Upon re-entry of the well with the platform rig, several attempts were made to pump through the DX plug to ensure the well was indeed static. During each attempt to pump, the pressure slowly bled off. The operator assumed that the pressure was going into the formation and that the well was in a static state. An external cutter was then run, and the production tubing was cut below the DX plug. Upon completion of the cut the tubing parted and unexpected pressure was released into the casing annulus. The well began to flow and 807 feet of work string was blown from the well. All personnel were mustered and the blowout preventer (BOP) was closed. No injuries were reported as a result of the incident and all personnel were accounted for.

An investigation by BSEE concluded that the following factors contributed to the accident:

- Wireline jet-cutter debris and sand had accumulated on top of and inside the plug body and the equalizing sub-assembly directly beneath the plug. The presence of the debris and sand prevented the fluid from being pumped through the plug and into the formation to kill the well.
- The wireline jet-cutter debris and sand made it unlikely that the equalizing ports on the plug would open, thus preventing the identification of trapped pressure below the plug.
- The lease operator made the decision to cut the tubing below the plug with some uncertainty as to the presence of pressure trapped below the plug.

BSEE recommends the following when re-entering existing wells when uncertainty exists about the possibility of trapped pressure below previously set plugs:

- Diagnostics be thoroughly performed on wells prior to re-entry to check for trapped pressures.
- Operators develop operational procedures that account for the possibility of trapped pressure beneath previously set plugs.
- Consideration of using snubbing units for well servicing when there is any doubt as to the presence of pressure below plugs of any type.

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A Safety Alert is a tool used by BSEE 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.