



Safety Alert

From the International Association of Drilling Contractors

ALERT 05 – 18

INADVERTENT UNLATCHING OF WELLHEAD CONNECTOR

WHAT HAPPENED:

Recently a semi submersible inadvertently unlatched the subsea wellhead connector on a recently perforated well. Upon the wellhead connector unlatching the differential pressure between the weighted completion fluid in the riser and the normal seawater pressure caused the stack to separate from the wellhead and the seal to be lost. The fluid level in the riser equalized to the seawater hydrostatic. The subsequent loss of hydrostatic pressure allowed an influx of crude oil into the well bore. Quick action in getting the connector re-latched and the seal reestablished averted a catastrophic well control and environmental situation.

How did this occur?

Prior to running the stack two weeks previously, maintenance was performed on the stack. During this maintenance several hoses were disconnected to perform certain maintenance exercises, in particular, the wellhead connector hoses on the Yellow Pod side were disconnected to test the hydraulic operating system of the connector. It is not 100% certain which hoses in the connector circuit on the Yellow Pod were crossed, it is certain that the lock and unlock circuits were crossed. Prior to running the BOP the stack was pressure tested on the stump and function tested on the skid beams. The Function Test Checklist was used and completed by the Subsea Engineer who was operating the functions from the HPU and had rig personnel and a Subsea Trainee verifying the functions. It appears that poor communications and possible lack of understanding led to the crossed hoses and the resulting incorrect operation of the connector during the function testing. **This was the first failure of our verification system.**

Upon landing onto a previously run subsea tree, the Subsea Engineer powered up the system, selected the Blue Pod, and latched the wellhead connector. The latching up operation was witnessed by Rig Management via the ROV. The observations showed that the connector was locked and an over pull was successfully carried out. Although not called for in his procedures, the Subsea Engineer switched to the Yellow Pod to check on the operation of the connector. However, it appears that poor communication and lack of understanding of the process did not detect that the connector had gone to unlock upon switching from the Blue Pod to the Yellow Pod. (The stack had down weight on the wellhead and seawater in the riser – this precluded the stack lifting seen later.) Believing things were okay, the Subsea Engineer switched back to the Blue Pod, and the BOP was tested using the Blue Pod. Rig operations proceeded for two weeks with the BOP stack operating on the Blue Pod and the problem went undetected. **This is the second failure of our verification system.** After the well had been perforated and prior to completion operations, the Subsea Engineer prepared for the required bi-weekly pressure test of the BOP system which was to be conducted with the Yellow Pod. The Subsea Engineer switched to the Yellow Pod while the rig crew was preparing to run the test plug. Just prior to running the test plug into the riser that it became apparent that the fluid level had fallen significantly in the riser. The ROV was run to bottom and it was verified that the wellhead connector had unlocked and the BOP had lifted approximately 3". The Subsea Engineer noted that all indicators on the Yellow Pod circuit showed the connector to be locked. The Subsea Engineer switched back to Blue and it was observed that the connector immediately attempted to go to lock position. The well was brought under control and the rig proceeded to clean up the fluid in the riser and well. The responding team's investigation surmised that there were crossed hoses on the wellhead connector Yellow Pod circuit. To temporarily correct the operation of the wellhead connector, the pilot lines at the hose reels were switched and the proper operation of the connector confirmed on the Yellow Pod circuit. **The seriousness of this incident cannot be understated. A major environmental incident was barely averted.**

Why did this occur?

1. Hoses were not installed properly and the work was not checked by a competent person on completion.
2. The company Function Test Checklist Procedures failed to detect the improper operation prior to running the BOP.

The Corrective Actions stated in this alert are one company's attempts to address the incident, and do not necessarily reflect the position of IADC or the IADC HSE Committee.

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3. A further opportunity to detect improper operation of the connector was missed during the landing and latch up operations.

CORRECTIVE ACTIONS: To address this incident, this company issued the following:

Directives

1. Where the control circuits on the wellhead or LMRP connector are disturbed for whatever reason, the Senior Subsea Engineer or a Subsea Supervisor (if present) will personally verify and document that the circuits are reinstated correctly.
2. The Senior Subsea Engineer onboard or a Subsea Supervisor (if onboard) will personally observe, verify, and document the function tests performed prior to running the BOPs. The Function Test Check List will be used during the tests. Competent personnel will assist the Subsea Engineer by operating the control system from a control station selected by the Subsea Engineer. A pre-job meeting will be held where all Safety, Operations, and Communications details are agreed upon prior to commencing the operation. A JSA must be completed prior to commencement. It is the responsibility of the OIM to insure that competent personnel are made available to assist the Subsea Engineer during this process.
3. Over pull and pressure testing:
 - a) Upon initial landing of the BOP upon the wellhead, visual confirmation via ROV or Rig TV of the wellhead being latched with the initial Pod selected will be verified by the OIM.
 - b) An over pull of at least 50,000 lbs. above landing weight will be conducted and verified by the OIM with the initial Pod selected.
 - c) Upon satisfactory completion of the first over pull the opposite Pod will be selected, with visual confirmation that the connector remains latched after selection is complete. A second over pull of at least 50,000 lbs. above landing weight will be conducted and verified by the OIM.
 - d) Pressure testing of the wellhead connector seal of at least 500 psi will also be conducted initially using both Pods. One test on the standby Pod is sufficient. These pressure tests must be done before any well operations are conducted that could expose any formation to the BOPs.

Action Item – All Semi-submersibles

1. Changes to the individual rig's BOP stack function test checklist and running procedures must be made to include the above directives immediately. Once completed, forward the procedures to the assigned Subsea Supervisor for review and approval.
2. These corrective actions are effective immediately upon receipt of this alert on a fleet wide basis. Any deviation requires a Management of Change (MOC) approved at the Vice President level.

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