



## Gas Release During Abandonment Operations

*During operations to recover the tubing, as part of a well abandonment, a sudden release of gas occurred. The well was eventually shut-in and made safe although unfortunately during the incident one of the crew members sustained a painful injury while evacuating from the site.*

*The investigation highlighted gaps in the implementation of the Management of Change process, in Planning and Procedures and in the Equipment used. It also identified that elements of Human Factors contributed to the incident.*

*The IOGP Wells Expert Committee/Well Control Incident Subcommittee believes that this incident description contains sufficient lessons to be shared with the industry. We further encourage the recipients of this mail to share it further within their organization.*

### What happened?

Immediately after severing the mandrel to release a straddle packer at ~700ft a loud sound was heard, and fluid flow observed. The gas and water release lifted the shooting nipple sitting in the slips in the rotary and one of the split master bushings was ejected from the rotary table, rolled across the rig floor through the V-door and landed on the ground beside the catwalk. The well was eventually shut-in with the blind shear rams via the remote BOP panel.

A service hand fleeing the location, scaled a normally closed gate, fell and fractured his thigh.

### What Went Wrong?

Gas trapped in the annulus below the packer was released into the wellbore when the packer mandrel was cut. The wellbore fluids, gas and water, were released at surface as the BOP was not closed around the shooting nipple. The annular BOP was likely damaged as the shooting nipple was ejected out of the well and the well could only be closed in using the blind shear rams.

- The risk of the trapped pressure was not identified at the planning stage.
- Barrier diagrams for most stages of the operation were missing from the programme.
- With zero pressure on the tubing and annulus the rig-site team were confident the risk of excess pressures coming to surface was minimal.
- A previous deep cut on the tubing had resulted in fluid losses being observed and based on this experience, and expecting a similar effect when releasing the upper packer, the decision was taken not to close the BOP in order to monitor the well via the trip tank. It is subsequently believed the losses were misdiagnosed and the volume change was actually compression of gas in the tubing x casing annulus.
- The fluid in the well was believed to have ~2,500psi overbalance on reservoir pressure reinforcing the belief that it was not necessary to close the BOP during tubing operations.

- The size and rig-up of the shooting nipple did not comply with company standards. The shooting nipple was locally manufactured, on the rig, and no QA/QC certification could be identified.
- The driller tried to stop flow by closing the annular BOP. When flow did not stop the driller evacuated the rig floor and the well was closed in by supervisors at the remote panel.
- The injured party was new to the rig but had no 'buddy' assigned and had not participated in any emergency drills on site.

### **Corrective Actions and Recommendations:**

- Management of Change refresher training for all personnel.
- Well Programmes to include barrier plans for all planned activities.
- Shooting Nipple to be considered as a component of pressure control equipment and subject to the same design, manufacture and inspection criteria.
- Review frequency of emergency drills to ensure key and new personnel are captured.

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