



CASE STUDY

OISD/CS/2025-26/E&P/21

Date: 04.02.2026

INTRODUCTION:

Title: Gas blowout incident at Workover Rig

Location: Onshore- Workover Rig

Loss / Outcome: Blowout.

BRIEF OF INCIDENT

A gas blowout incident occurred at a well immediately after perforation of the target interval during a conventional perforation operation at a workover rig. Uncontrolled gas flow was observed, and emergency response procedures were activated. No injuries or fire were reported. An attempt to shut in the well using the production BOP (blind ram) while the wireline string was still inside the hole was unsuccessful.

Observation / Lapses

- a. Geo Technical Order (GTO) indicates oil throughout the depth, whereas as per the offset well the said zone of 4m in the present well was gas bearing and during drilling, several times gas influx was observed.
- b. Offset well was used as the reference for planning. GTO of this well indicated the interval to be oil-bearing, however Offset well encountered gas in the same zone. The perforation plan was not reviewed on the basis of drilling difficulties at the present well, thereby increasing operational risk.
- c. CBL-VDL does not suggest good bond throughout the depth, however it is not clear whether this was given any due cognizance while making workover plan.
- d. The mud density planned in the final phase of drilling was lower than those actually used during the last stage of drilling. At the time of perforation, a lighter completion fluid was used compared to the heavier drilling mud used during actual drilling.
- e. BOP stack had no shear ram, violating Clause 6.3.1, making it impossible to shear wireline and seal the well during gas flow. Blind ram closure could not seal the well with the wireline inside the well.
- f. The trip tank was kept isolated during perforation, which violated Clause 6.8(V) of OISD-STD-174.

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- g. During wireline tool recovery, pull out was done too quickly, which may have further contributed by swabbing effect and situation worsened.
- h. Fire water pump was not available at site.

PROBABLE REASONS OF FAILURE / ROOT CAUSE:

- Poor Planning and Risk Assessment
 - a. Assuming oil bearing sand in spite of gas shows during drilling.
 - b. Workover well plan relied on offset well data instead of actual well conditions & not reviewed after drilling.
 - c. Kill fluid weight was not adequate for formation pressure.
 - d. BOP stack lacked a blind shear ram (BSR) which is violation of Cl.6.3.1 of OISD-STD-174.
 - e. Inadequate well control Competency.
- Through-Tubing Perforation (TTP) was not evaluated as an alternative option, considering all the complications and the lack of RCI (Reservoir Characterization Instrument log) data.

CONCLUSION:

The uncontrolled well flow occurred due to poor planning, underestimation of formation pressure, and weak well control preparedness. Key safety barriers were missing. Although the situation was controlled without fire, the incident shows gaps in risk assessment, equipment readiness, and well control practices that need to be corrected to prevent recurrence.

RECOMMENDATIONS:

1. An Independent Expert Committee should be constituted for examining in detail, the following aspects:
 - a. Lapses in drilling as well as workover planning and its execution considering all related aspects.
 - b. Review requirement of wireline Pressure Control Equipment (PCE)
 - c. Selection of BOP stack.
 - d. Carrying out conventional perforations.
 - e. Review perforation SOP to include actions in case of well kick.
 - f. Suggesting recommendations for drilling as well as well planning and execution.
2. The planning team should be well trained to plan the well GTO and workover plan considering all available inputs and hazards judiciously. Approval of the plans should be provided after thorough review.
3. Job Safety Analysis (JSA) should clearly mention control measures and mitigation strategies of anticipated hazards.
4. Trip tank should always be connected and operational during perforation/workover as per Cl.6.8 of OISD-STD-174.

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5. Kill fluid should be properly selected to maintain primary barrier with adequate safety margin.
6. Perforation guns should be pulled out as per approved SOP to reduce swabbing effect and influx risk.
7. Firefighting system at workover rigs should comply with OISD-STD-189 requirements.
8. Well control knowledge and skills are very important during any well activity. Operator should look into the well-controlled competency of personnel.
9. Manuals/SOPs/Emergency Response Plan (ERP) etc. should be reviewed and revised based on recommendations as per point no.1 above.

SITE PICTURES:



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Damaged BOP

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