



CASE STUDY

OISD/CS/2025-26/E&P/13

Dt.: 31.10.2025

INTRODUCTION

Title: Blowout after well perforation.
Location: Onshore workover rig.
Loss/ Outcome: Blowout.

BRIEF OF INCIDENT

A major incident of gas blowout was observed at a charter hired workover rig working in a workover well. The incident occurred during the pulling out of conventional perforation gun after perforating a new zone in the well. There was no fire or injury reported due to the incident. During blowout, no oil flow was reported from the well.

OBSERVATIONS/ SHORTCOMINGS

- Gas encountered against oil as planned in Workover plan: Workover plan was prepared for the development well by MDT (multi-disciplinary team). The well was believed to be oil bearing as per well plan, however after perforation, it produced gas. As per Clause 6.3.1 (B) of OISD-STD-174, for gas wells with surface pressures ranging from 3000 psi to 5000 psi, the BOP stack shall include a Blind Shear Ram. However, in this case, the well was considered an oil well based on the approved well plan hence a Blind Shear Ram was not included in the BOP stack configuration.
- During previous workover for zone transfer in different intervals, the well had produced gas instead of oil as predicted during that workover job. Also, as per testing of other offset well in the same zone, the gas flow was observed. However, the data from previous workover jobs in the same well in different zone and testing data of offset well were not utilized in formulation of this workover plan. As per clause 4.1 of OISD-STD-174, the data of offset wells should be considered for well planning which was not done.
- The uncontrolled gas flow happened due to lesser hydrostatic pressure of the well fluid than the bottom hole pressure (BHP) of perforated zone. This failure of primary barrier can be attributed to one of the following possibilities:

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- a. There is a possibility that the zone was having higher pressure than the anticipated BHP as per the plan (*Since the blowout occurred, the actual pressure encountered after the perforation cannot be ascertained*).
 - b. No fluid losses were reported during the drilling and workover jobs in the well. However, the data of nearby wells suggested that the fluid losses were reported during the workover jobs in these formation sands. The losses induced after perforation of the zone can reduce the hydrostatic pressure below BHP if the well is not filled up with fluid.
 - c. Analysis of well logging data indicated that the perforation gun was run in at an average speed which exceeded the recommended RIH speed specified in the SOP. Pull-out speed could not be verified due to the absence of time-stamped data from the logging unit. However, pull out may also have been done at a higher speed than prescribed in SOP akin to high running in speed. As a result, the possibility of swabbing-induced influx could not be ruled out as a contributing factor.
- The trip tank was not in use during the incident, and the level alarm system of the trip tank was also defunct at the time of incident. This is violation of clause 6.8 (V) of OISD-STD-174.
 - There was no well monitoring during the well perforation job. This was a violation of the JSA recommendation of well monitoring during perforation.
 - Following are the observations w.r.t. to training and competency of the rig personnel.
 - a. All the key personnel had a valid well control training certificates. However, as per the competency of personnel interacted, the level of knowledge demonstrated was not commensurate with the certificates held, thereby raising concerns regarding the authenticity of course attended and the overall effectiveness of the training received.
 - b. The installation manager, Mines Safety Officer and Area manager who had all joined recently, after transfer, did not undergo any formal induction or orientation training upon joining the new location.
 - c. MVT, first aid and firefighting training were also due for some rig crew as highlighted in the last internal audit of the rig.
 - d. Essential training as per OISD-STD-176 were not provided to the crew and were neither mentioned in the contract.
 - It seems that the blind ram was closed on wireline, which is against the condition for application of blind ram, resulting in damage to the rams.

PROBABLE REASONS OF FAILURE / ROOT CAUSE

Presumably, the root cause of the incident was gas blowout from the formation which was anticipated to be oil bearing based on inputs considered by MDT.

Contributing Factors

- a. Inadequate risk assessment for the job.

- b. Inadequate monitoring during the perforation activity.
- c. Incorrectly closing blind ram on wireline.
- d. Inadequate well control competency of rig crew.

RECOMMENDATIONS

- The organization should constitute an Independent Expert Committee for examining in detail the aspects like lapses, if any, in assuming well to be oil bearing, carrying out conventional perforations in new / unexplored zone, suggesting recommendations for well planning in case of new/ unexplored formation, review perforation SOP to include actions in case of well kick, review requirement of additional wireline BOP, etc.
The recommendations should be implemented across organization to prevent recurrence of such incident.
- Training and Competency:
 - a. Organization needs to ensure quality of training through strict Contract Management tools. Alternatively, it is suggested that system of assessment on basics of well control and safety management system should be introduced by the operator for key personnel (up to Shift in charge).
 - b. All training requirements as per OISD-STD-176 should be part of tender requirement. Management should ensure competency of crew as per tender including random checking of genuineness of certificates.
 - c. Induction training/ Orientation with specific knowledge assimilation for new assignment/ reassignment to any location/ department to be a mandatory part of the transition and Handing Over -Taking Over (HOTO) process for all assignments.
- Trip tank should be always connected and used for well monitoring to check gain/ loss in the well as per Clause 6.8(V) of OISD-STD-174.
- All perforation gun RIH and P/O operations must strictly adhere to the SOP-specified speeds to minimize the risk of swabbing and well influx.
- To effectively minimize associated risks, all control measures outlined in the Job Safety Analysis (JSA) must be strictly followed.
- The operator should develop a safety rating system to monitor the safety performance of the contractors as per clause 4.5 of the Working Group Committee Report - 2023. Contract documents should mandate penalties for safety violations to serve as an effective deterrent.

PICTURES POST-INCIDENT



PICTURE OF RAMS



TRIP TANK HOSE

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