

Safety Alert

Petroleum and Gas Inspectorate

Safety Alert No. 48
22 June 2011

Loss of well control

Incident

On 22 May 2011 a drilling contractor was commencing a well completion on a coal seam gas well in the Surat Basin in South West Queensland. The well had been drilled and suspended in 2009 without the installation of a kill string. Water had been pumped into the well on the day before the incident and further water was pumped into the well the next day.

The rig crew were preparing to remove the top of the well head in order to nipple-up the 11" annular blow out preventer (BOP). The driller observed that the well was 'sucking' and interpreted this to mean that the well was dead. The driller removed the 3 1/2" EUE well-head cap from the top of the hanger. It was at this point that the well started to flow water with increasing intensity. The crew pumped water into the side-outlet in an unsuccessful attempt to kill the well. An uncontrolled mixture of water and gas flowed to a height above 15 metres.



The well was safely capped 24 hours after the initial gas release, with no injuries or equipment damage. The incident is still under investigation by the Petroleum and Gas Inspectorate but findings from the operator's investigation and preliminary findings from the Inspectorate's investigation are given below.

Findings

- A well-site handover between the tenure operator and the drilling contractor had not been completed.
- A well-completion plan was not followed.
- Contractor assurance checks by the tenure operator were inadequate.
- Supervision of contractor by tenure operator was inadequate.
- No well-pressure monitoring equipment had been installed.
- The rig crew wrongly assumed a 'sucking' well was a 'dead' well.
- The size of 'stab in valves' on site was incorrect.
- The on-site contractor Safety Management Plan was inadequate.
- There were no on-site procedures for this type of well completion.
- The well-head design, without specialist tools (not on site), requires opening the well to the atmosphere to install BOP, providing only one means of well control (water pressure).
- No calculations were completed to determine the volume of the hole before starting operations.
- There was poor communication between different business areas — i.e. despite the risk of completing this type of well being previously identified, insufficient controls had been put in place.
- The influence of surrounding production wells was not taken into consideration when undertaking completions — depletion from nearby producing wells decreased water pressure in deeper coal seams in the well, allowing gas and water from upper coal seams to flow into the well bore.

Recommendations

1. That tenure operators conduct detailed contractor assurance as part of their contractual process.
2. That contractor management systems are reviewed and fully implemented.
3. That the CSG operator and production, completion and drilling contractors conduct combined risk assessments or have systems to communicate risk assessments to ensure there are adequate controls to eliminate risk of unwanted events.
4. That all well-completion risk assessments and procedures be reviewed to ensure impact of nearby wells has been adequately considered.
5. That standard operating procedures for well completion be reviewed.
6. That policies and procedures detail when specialist well-control equipment (including tools) is likely to be required.
7. That workers are adequately trained in well control and installation/removal of the well equipment in order to install BOP.
8. That well-head design be reviewed and all well heads that have no fixed hard barrier control be identified.
9. That risks for those wells that do not have fixed hard barrier pressure control be reassessed and a hierarchy of controls be used to ensure the risks are as low as practicable.
10. That all equipment used to control a well be fit for purpose.
11. That there be systems in place to calculate well volume.
12. That a process for monitoring fluid levels and ensuring that redundancy fluids are readily available be implemented.
13. That consideration be given to installing equipment to monitor well-casing pressure, such as calibrated pressure gauges.
14. That emergency procedures be in place before conducting completion, or work over, activities on a well.

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