Blowout contingency

One of the most proactive steps taken in recent years in HTHP drilling and well control planning is the implementation of a blowout contingency plan (BCP). Most operators have emergency preparedness plans in place in one form or another.

In fact, the governments presiding over most offshore regions in the world require some sort of emergency plan be in place prior to issuing the drilling permit. In addition to the company’s standard emergency plan, many operators have a BCP that specifically covers well control events. The BCP may take the form of an area wide (or regional) plan or a one-off site specific plan for the HTHP well being drilled. The BCP should include the following:

- Immediate response activities
- Emergency organization
- Well capping procedures
- Well killing procedures
- Specialized well control equipment
- Hazardous fluids, such as H2S and CO2
- Logistics
- Relief wells

The site specific plan itself may take many shapes. Some plans only address the organization needed to support a blowout intervention project while others only address the drilling of a relief well in the event of a blowout.

When a regional BCP has been written and implemented that addresses the necessary organizational structure, equipment, etc., site specific relief well planning for the HTHP well should be added to enhance the plan. Relief well planning should include many topics. The relief well design should be as comprehensive as the original well design if not more so. The drilling hazards presented by the blowout well such as subsurface charging as well as those indigenous to the area will need to be considered. A complete relief well plan will contain:

- Relief well target selection
- Surface location selection
- Relief well trajectory design
- Casing point selection and design
- Dynamic kill modeling
- Kill fluid design
- Kill operations recommendations
- Gas dispersion modeling
- Subsea plume modeling (if drilling from a floating vessel)

The dynamic kill models should not only be considered. A complete relief well plan will contain:

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- Relief well trajectory design
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- Kill operations recommendations
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- Subsea plume modeling (if drilling from a floating vessel)

The dynamic kill models should not only be considered a surface blowout, but an underground blowout as well. Reservoir data is critical to proper relief well design so that the blowout model is as accurate as possible. As drilling on the HTHP well progresses, the data obtained should be reviewed and compared to the data used in the relief well plan. If substantial differences exist, the relief well plan should be modified as required in order to keep it valid.

Some operators have dynamic kill modeling capabilities in-house and produce their own relief well plans. Oil company personnel are not likely to be highly experienced in blowout control. As a result, these operators should consult well control specialists form time to time to ensure that they include the latest state-of-the-art principles and methods in their plans.

Pre-planning for HTHP wells can greatly benefit the operator in not only drilling performance but in conventional as well as non-conventional well control operations. The pre-planning should include: detailed well design engineering, HTHP awareness training for all personnel, equipment inspection, and blowout contingency planning.

Added attention to these areas during the HTHP project design and execution can pay huge dividends in the form of reduced time and cost for the operator.

Author

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