



# Equalizing Tools Combine to Deliver Time Savings

UNITED KINGDOM

## CHALLENGE

- » Reduce the substantial rig time and risk involved with decommissioning and sidetrack completion operations

## SOLUTION

- » Both Hydraulic and RED and eRED® valve technologies to remove intervention activity and reduce rig costs and risk

## RESULTS

- » Saved rig time and operational costs through use of Hydraulic RED and eRED systems
- » Reduced operational exposure to potential weather-induced downtime by saving approximately 36 hours of rig time
- » Decreased operational risks by saving rig time and eliminating need to rig up surface pressure control equipment

## OVERVIEW

The Foinaven oil field, operated by BP, is located west of the Shetland Islands. In a single-bore producing well in the Western flank, in line with predictions, water cut had gradually increased. As a result, a sidetrack well was designed to move the bottomhole location away from the advancing water front while capturing additional resources.

BP had successfully used the Halliburton Hydraulic RED valve (hydraulic remote equalization device) as a shallow-set barrier in several platform operations, but the sidetrack well would be its first use of the tool in a subsea application. Likewise, the Halliburton eRED® electronic remote equalization device had performed well in several platform operations for BP in the UK and Norway.

## CHALLENGE

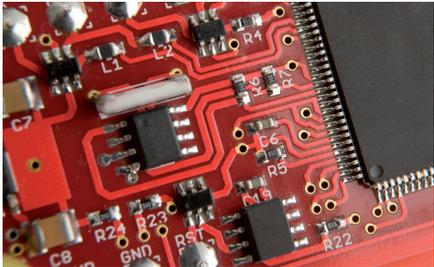
The plan was to use both Hydraulic RED and eRED valve technologies during the main stages of both operations as part of an ongoing drive to remove intervention activity and reduce rig costs and risk.

## SOLUTION

### Phase 1 Operation – Decommissioning the well

After a deep-set barrier was installed, the tubing was cut and the well contents were circulated to kill fluid. The shallow barrier set in the tubing hanger was a standard 4.875-in. lock and Hydraulic RED valve assembly. Once installed, it was tested to 5,000 psi, the tree was removed, and the blowout preventer (BOP) was fully tested, as required, against the Hydraulic RED valve.

Normally, the dual-bore riser would be made up and deployed, which is a time-consuming operation. On this occasion, having the Hydraulic RED valve as part of the shallow barrier meant that BP was in a position to pull the completion on drillpipe. Once the hanger was latched, the Hydraulic RED valve opening command was successfully applied, and the shallow barrier was equalized. With the well equalized, the upper completion was retrieved without the need for any intervention.



### Phase 2 Operation – Recompleting the well

With the new sidetrack drilled and the lower completion and reservoir isolation valve installed as a deep-set barrier, it was time to run the upper completion. This contained a standard hydrostatically-set production packer, tubing-retrievable safety valve (TRSV), and hanger assembly. An eRED valve was pre-installed into the hanger below a standard 4.875-in. lock. This assembly had been installed and fully tested onshore, and the equalizing ball placed in the open position.

Once the hanger was landed, the production packer was hydraulically set, the tubing string was pressure tested, and the TRSV inflow tested. With all testing completed, the command for the eRED valve to close was applied, and the hanger barrier was tested from above. This enabled the drilling BOP to be removed; the subsea tree was then installed and tested against the eRED valve. Finally, the command to open and equalize the valve was given, and the reservoir barrier was tested to prove integrity. With good tests confirmed, the hanger lock and eRED assembly were retrieved without the need to rig up surface pressure control equipment.

### RESULTS

Both the Hydraulic RED and eRED valves worked as designed, and, between the initial decommissioning stage and subsequent recompletion stages, use of the Hydraulic RED and eRED valve systems provided a total time savings of approximately 36 hours.

**SAVED**

**36**

HOURS

**OF RIG TIME**

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