After several challenges and three sidetracks in an offshore well due to complex formations with lost circulation, a customer decided to plug and abandon a well. However, Baker Hughes suggested a liner drilling solution. A 7 x 95/8-in. TORXS™ expandable liner system and an 8½-in. EZCase™ bit were chosen to drill and case the problematic section.

The customer objective was to drill a 131 ft (40m) length of 8½-in. section from the 10,597 ft (3230m) point to the 10,728 ft (3270m) point to be able to case and isolate this troublesome zone. Another customer goal was to switch from oil-based mud (OBM) to a water-based mud (WBM) system to continue to the next section.

Surpassing the customer goal, the Baker Hughes liner system drilled a 152.5 ft (46.5m) length of 8½-in. section to the 10,748 ft (3276m) point. A total of 62.3 ft (19m) of that length was drilled with complete lost circulation, saving the well.

The average rate of penetration (ROP) on the system was 11.7 ft/hr (3.57m/hr) at the transition zone and 9.44 ft/hr (2.88m/hr) with complete lost circulation, weight on bit (WOB) 6 tons, and 333 gallons per minute (1260.5 liters per minute). Additionally, the liner hanger system worked under 6,000 ft-lb (182.8m-kg) to 18,000 ft-lb (5486.4m-kg) torque 80 to 90 RPM and internal pressure from 500 to 2000 psi. No other systems can perform under these conditions. Baker Hughes drilled the hole, set the liner, and set the liner top packer in one trip.

After the hole was drilled and cased, the liner was set and the annulus was sealed. The liner drilling running tools were pulled.
out of the hole, saving the well and leaving the hole in good condition to continue drilling the 6½-in. section to accommodate a completion system with Baker Hughes EQUALIZER™ inflow control devices and REPacker™ reactive element packers.

After this successful job, the customer realized that not only was the well saved, but they also saved USD 7.5 MM in non-productive time (NPT) compared to standard drilling. Drilling this section normally takes as long as 60 to 250 days. On this job, the 8½-in. section was drilled in 23 days with a WBM system compared to a minimum of 60 days with an OBM system. Because of different pore pressure zones, the customer was also able to drill the next section with a WBM system, saving even more time and money.

This Baker Hughes liner drilling operation was the first global deployment with a TORXS expandable liner hanger and EZCase liner drilling system. Because of this successful job, the customer has adopted this as their standard deployment method in a problematic formation.