A North Sea operator wanted to recover casing and conductor strings from a platform that was in the process of being decommissioned without the use of a jackup drilling rig. Due to the platform’s size and the reduced lift capacity of its crane, the recovery system needed to be lightweight and modular.

The scope of work was to cut and recover conductor and casing strings from nine wells at 10 ft (3 m) below the mudline. On six of the wells, the casing and conductor strings had been cut approximately 26 ft (8 m) below mean sea level, requiring a unique re-entry method without ROV intervention.

Customized Solution
To meet the operator’s objectives, Baker Hughes designed and built in-house the Retriever™ jacking unit system to incorporate all the required equipment within one unit to increase efficiency and reduce the required headcount to operate.

The unit has a four-ram jacking system with a maximum 200 mt pull capacity. A trolley system on the upper deck of the unit enables power tongs and a guillotine saw to be quickly moved onto well center, and when, operationally required. A double drill unit was installed in the lower deck to ensure that all equipment was fully rigged up and ready for use, eliminating any unnecessary double handling of surface equipment.

As part of the design, the unit also had a full manual X-Y axis skidding capability, enabling one-time rig up.

Subsea Guide System
Entry to the wells with the casing and conductor that had been cut below mean sea level was achieved by attaching a clamp to the 24-in. conductor and running guide wires from the clamp back to the underside of the jacking unit system.

Results
- Successfully removed casing and conductor from nine wells
- Completed operations with <2% NPT
- Completed operations within 1.5% of planned project duration
- Successfully accessed wells with casing and conductor cut 26 ft below mean sea level
- Eliminated the cost of a rig and removal of subsurface pipe work to allow the rig to position itself close to the platform, representing cost savings to operator of approximately £20 million

Challenges
- Small platform with restricted deck space
- Restricted crane capacity
- Entry to casing and conductor cut 26 ft below mean sea level
- Drill out of conductor fill

Baker Hughes Solution
- Purpose-built, light-weight, and modular casing jacking unit system incorporating required ancillary equipment

Lightweight and modular, the Retriever jacking unit system occupies a small platform footprint and saves mobilizing a full-size rig.
The scope to fit these clamps was included during a routine subsurface inspection of the platform jacket so additional cost to client was minimal.

The clamp and the guide wires were recovered to surface along with the conductor after the cutting operations. A load cell was inserted above one of the guide wires, allowing the team to monitor for an increase in tension that would indicate the conductor was cut and had fallen slightly. An additional sign of a successful cut was the rotation of the guide wires below the jacking unit system.

This system worked flawlessly for the first four wells but the clamps on the final two subsurface wells were damaged while attempting to gain entry with the BHA and an alternative solution was required. This involved the use of a weighted frame to lower over the conductor top to keep the guide wires firm. Although the benefits of the upfront installation of the system were lost, this alternate solution ensured the operation could be completed without further diver intervention.

**Operation Details**

With the unit and ancillary equipment rigged up and function tested, the first three operations were carried out on wells that had never been drilled out and the scope of work was to cut and recover the 24-in. conductor. With the guide wire system in place on each of the well stumps, Baker Hughes used a mill and motor assembly with an 8-in. Ultra™ XL/LS high-performance positive displacement drilling motor to clear out ~60 ft (18 m) of silt to provide access inside for the cutting assembly. With the cleanout completed, the internal cut was made using a multistring cutter, rotated on a downhole drilling motor which was powered via a surface fluid pumping package. It was then possible to latch the conductor with a fishing spear run on drill pipe and recover the cut conductor back to the platform.

The next three previously suspended wells required the 10 ¾-in. and 16-in. casing strings and the 24-in. conductor to be cut and recovered back to surface. The first operation on each well was the cleanout of the internal fill from the 10 ¾-in. casing with a mill and drilling motor. With all the internal fill removed—which included cement found ~55 ft (17 m) higher than expected in one well—it was then possible to enter the casing with a cutting assembly deployed down to the required cut depth. On two of the wells it was possible to cut through all three strings and recover the triple string to surface where they were bored, pinned, and cold cut for back load from the platform.

On the third well, a single cut was made and the 10 ¾-in. casing was found to be free from the 16-in. so it was recovered as a single string, followed by a dual cut and combined recovery of the 16-in. casing and 24-in. conductor.

The final well operations were completed on three wells that had been completed back to surface. The required Phase 1 and 2 plug and abandonment work which had been completed previously as a separate Baker Hughes operation.

All three wells required the wellhead spools and tubing hangers along with the 5.5-in. tubing to be recovered, the tubing having been previously cut as part of the Phase 2 work scope. On all three wells a downhole triple cut was successfully made, resulting in a triple string recovery which again required boring, pinning, and cold cutting on the casing jacking system.

The operation recovered to surface eight single tubing or casing strings, one dual string, and five triple strings totaling approximately 2,610 ft (795 m) of tubulars. This was possible due to a combination of single, dual, and triple downhole cuts performed with a multistring cutter run on a drilling motor.

The project was planned as a 60-day operation and was completed <62 days actual operational time. (An additional scope of work added another 18 days to the project.)

Nonproductive time for Baker Hughes was 38.75 hours (<2% of total time), with 11.5 hours of NPT due an O-ring failure on one of the new CJU rams.

The successful use of the jacking unit system proved that it was possible to complete the campaign as a standalone operation without the requirement to mobilize a jack-up drilling rig or barge—a total cost savings of approximately £20 million to the operator.