

## Fishing Case Histories

**Date:** July 2009

### **Job Objective:**

The job was to retrieve a bridge plug in a debris barrier and to get to TD and set an inflatable, then plug and abandonment. The well had been killed and shut in since 2006, and was thought to have been extensively scaled up with NORM contaminated Barium scale. This was seen on a Wireline calliper log before the temporary abandonment in 2006.

We were approached by our client in 2007 to attend a meeting to discuss the feasibility of the proposed upcoming operations in the North Sea. This operation was on a Semi submersible, and was given a 30% chance of success by the client and partners, but if successful, it would save the client around \$100 million on drilling a new intersecting well. Before the operation was attempted offshore, we were required to perform an extensive yard trial to prove the job was possible. For the yard trial we had to manufacture purpose built tools, and we were required to alter tool designs and make modifications overnight to fine tune them and eventually arrive at the optimum designs to complete the trial. The trial proved that the job was in fact feasible and provided an insight into some of the obstacles we may encounter offshore.

### **The job scope was as below:**

- Wireline to recover two shallow set isolation plugs in the well.
- Mill Barium scale down to the SSSV (***SSSV c/w damaged control line & only scale holding the flapper open***).
- Mill through the SSSV and down to a predetermined depth, using a specially designed extended PDC dressed shoe which could not be trapped by the flapper closing after the scale was removed.
- Run a swellable hold open sleeve through the SSSV to allow safe passage of future toolstrings.
- Mill and under ream scale from below the hold open sleeve and down to the packer at the top of the debris barrier.
- Mill scale inside the perforated debris barrier joint down to the top of the bridge plug.
- Recover the bridge plug (contingency was to mill out the plug with specially designed thin wall burn shoes, which were proven to perform well on the yard trial).
- Run a jetting assembly and clean out degraded mud to the reservoir depth 11,500ft. (Contingency was to mill out scale to reach reservoir depth).
- Run and set an inflatable plug @ +/- 11,400 ft.
- Run coil tubing and set a 700 ft cement plug above the inflatable.
- Tag cement and displace the well to sea water and inflow test the cement plug.
- Rig down coil tubing.

### **Job Outcome:**

The initial stages of the operation were carried out without too much problems being encountered. Due to the shallow depths being worked at, the coil tubing runs were turned around very quickly, and rapid progress was seen on a daily basis. A potential problem to recovering the plug was seen to be a restriction in the packer at the top of the debris barrier. The bridge plug had been set 12 years previously, in a well which had scaled up over the 12 years with Barium scale. Several clean up runs, VJJB and jetting runs were performed in order to remove as much scale as possible before attempting to recover the plug. The plug was latched and pulled, but the fishing neck of the plug detached and was

pulled out of the well separately. During the subsequent coil tubing fishing runs, the entire plug was recovered in several parts & without the need to mill it out (***crucially no part of the plug had fallen out of and below the debris barrier, which would have impacted on the success of gaining access to the well for the future coil tubing runs***). During this stage of the job, our Engineering Manager & Operations Engineer were in daily contact with our client, discussing new tool designs and or modifications to existing tools to enable the complete recovery of the bridge plug. As a direct result of Welltonic's commitment to design and manufacture the tools required, of which most were manufactured overnight and at the weekend, many of which were on a chopper the very next day. Therefore minimising any rig waiting time (NPT) for our client. The remainder of the job went as per programme. TD was achieved and the well was abandoned with cement plugs and tested before rigging down the coil tubing equipment.

***Note – This was arguably the most challenging coil tubing job that our client & Welltonic have ever undertaken. But it has also proved that with the proper preparation and planning, and the ability for Welltonic to react to the situation and conditions offshore which developed and changed almost daily, during the debris barrier plug recovery stage. It was possible to achieve the desired result in the end.***

**Date:** January 2009

**Job Objective:**

To clean out debris from the fishing neck and retrieve a Junk Catcher and Bridge Plug from the clients well

**Job Outcome:**

After running a standard GS c/w prong to attempt to recover the junk catcher, the GS was pulled to surface and the grapple was found to be full of loose scale and stuck in the release position. The debris was then cleaned out using a Spincat tool then two VJJB runs which came back to surface full of debris. A third VJJB run was then made and the VJJB came back to surface empty. The original GS was then RIH again to recover the junk catcher and it was then pulled free after some jarring. Due to operational requirements on another well, operations were then suspended.

**Date: October 2007**

**Job Objective:**

To fish a 46ft section of 2-7/8" sand-screens, and allow access for formation performance data gathering. The sand-screens were hung-off in a completion nipple and were known to be damaged as the well was producing sand to surface.

**Job Outcome:**

Welltonic manufactured two Heavy Duty Flow Release Spears, the first was to catch the inside of the Lock and the second was to catch the inside of the screens incase they had parted.

The first run was to carry out a sand-fill clean out using nitrified fluids, this operation was a success, and a total of 70ft was made.

The second run was to attempt to pull the sand-screens with a standard flow release 3.5" GS in conjunction with a 2.25" Bi-directional Hydraulic Jar, the Accelerator was left out due to the small working window between the coiled tubing stripper and swab valve.

Several attempts were made to wash into and latch the profile but with no success.

The third run was to run the Heavy Duty Flow Release Spear to catch the lock below the GS profile, once again with the jar but no accelerator. The fish neck was circulated / jetted for 30mins to ensure clear, pumping ceased allowing the slips to engage in the

lock. After 3 upward jars the fish was free.

Upon breakout at surface, it was observed that the complete section of screens had been retrieved.

A further run was performed to TD to ensure access for the data gathering tools.

**Date: May 2007**

**Job Objective:**

To release a TCP Gun Hanger c/w 350ft of guns that had not released during perforating and push the assembly to the rat hole below the perforations to allow further perforating to be performed.

**Job Outcome:**

Welltonic manufactured a Flow Release Pulling Tool to suit the Fishing Neck in the Gun Hanger.

The tool was run to depth in conjunction with a 2-7/8" Bi-directional Hydraulic Jar and Accelerator and the Fishing Neck was jettted to ensure it was clear of debris. Once the Pulling Tool was latched into the profile in the fishing neck, upward jarring was performed to shear the screws in the hanger and release. The complete assembly was then pushed to TD, whereupon pumping commenced to enable a flow release and leave the formation clear for further perforating.

**Date: March 2007**

**Job Objective:**

To retrieve a Junk Catcher and two Bridge Plugs that could not be retrieved on Wireline

**Job Outcome:**

The Junk Catcher had a standard GS Profile fishing neck for retrieval; however wireline could not engage any tools in the profile. Welltonic designed and built a Flow Release Spear to engage in the bore below the profile as Fishing Neck damage was anticipated. The spear was run and the Junk Catcher was retrieved on the first attempt. (The Catcher was 70% full of debris)

The Plug Pulling Tool (external fishing neck) was run but could not engage the plug. Welltonic recommended a modification to the Pulling Tool. The modification was performed offshore. The modified tool was run and the plug was retrieved after some extensive jarring.

The second plug was retrieved with the same BHA.

**Date: February 2007**

**Job Objective:**

To mill out an unknown restriction below the wellhead and retrieve a SSSV which had been in the well for 20 years.

**Job Outcome:**

A 3.875" Taper Mill was run in conjunction with a 2-3/8" Motor to mill through the obstruction. The obstruction was milled and the well was drifted to ensure sufficient bore for the retrieval of the SSSV. The SSSV was retrieved with a GS run in conjunction with an Impact Hammer and Accelerator. This then allowed the well to be killed in preparation for a workover.

**Date: October 2006**

**Job Objective:**

To retrieve a Packer Setting Tool that had been left in hole as it could not be released from the packer.

**Job Outcome:**

There was not sufficient overpull available at the downhole end of the CT to allow the tool to be mechanically over-ridden. The drop ball was pumped to the MHA Release Piston, leaving a good Fishing Profile looking up.

Initially, two fishing options were mobilized, a Jar and Gas Accelerator with a standard retrieval tool to be used as a final option and Pack-off tool to ensure all fluid pumped went through the setting tool as it was suspected that the Burst Disc had burst. Whilst the Pack-off was getting mobilized and run, Welltonic designed and made a retrieval tool with an external Pack-off shroud. This would allow the setting tool to be fully functioned and retrieved in one run. This tool was rested onshore and performed as designed. The tool was then sent offshore where it was run and the Setting c/w the BHA was retrieved to surface.

**Date: September 2006**

**Job Objective:**

To release a Packer that had restricted access.

**Job Outcome:**

A packer had to be released. However there was a restriction the top mandrel of the packer. This restriction would not allow the packer release shifting tool access to the lower releasing mandrel; hence the packer could not be released.

Welltonic designed and manufactured a special expandable spear to go through the restriction and release the packer. As the spear was to run on 2-7/8" HT-PAC pipe the spear could not be held in the release position by pumping out of the hole. A special shear release was incorporated into the setting cone. The release was set up for 43K over-pull. A centralizer was incorporated into the BHA to locate the top of the packer as a no-go. When the centralizer was tagged on the packer; depths were correlated and the BHA was pulled back 43" so the spear was straddled across the releasing sleeve. The pump rate was brought up to 1.2 barrel per min at 2,700 psi to shear the screws. The pump was then stopped and the pressure was allowed to equalize. This functioned the tool into the set position. A 12K over-pull was applied to the releasing packer sleeve. The sleeve sheared, thus unsetting the packer. A further 43K over-pull was applied to shear the spear release cone. The spear was then pulled out of the hole in the collapsed position. Packer and completion were then able to be pulled to surface.

**Date: March 2006**

**Job Objective:**

To restore full access to the wellbore by retrieving 6,800 ft of 1.50" Coiled Tubing that had been left in the hole.

**Job Outcome:**

Coiled Tubing was run in hole with a continuous overshot and pack off. Several attempts were made to latch the fish with different pump rates and weights. It was unable to latch so CT pulled out of hole and the toolstring was changed out to a Dressing Wash Shoe. This was then run in hole and cleaned over the top of fish, pulled out of hole and inspected. There were good indications that the fish was inside the shoe. The continuous over-shot was re-run but was still unable to latch the fish, so was pulled out of hole. The continuous overshot was then run on a motor. The fish was latched first

time and pulled out of hole. The BOP slip and tubing rams were closed and the well was killed. The tubing was spliced to a recovery reel and recovered to surface. All coil tubing and BHA were recovered.

**Date: January 2006**

**Job Objective:**

To restore full access to the wellbore by retrieving a Wireline BHA and several thousand feet of wire that had been left in the hole.

**Job Outcome:**

Wireline got stuck in the hole with pressure / temperature gauges. Wire broke at surface and all was lost in the hole. Subsequent wire-line fishing operations balled up the wire but were then unable to pull wire to surface.

Wireline sheared off, leaving the wireline grab in the hole. Coiled tubing was rigged up and ran in the hole with a flow release SB style pulling tool. The fish was latched and pulled to surface with 5,000lbs over pull. Wireline was then rigged up and recovered all the remaining wire but could not latch the wireline toolstring due to sand fill on top of the fish. Coiled tubing was then rigged up again and ran in the hole with a flow release SB style tool. Coiled tubing then washed on top of fish and latched the fish successfully. Light jarring was required before the fish came free. All wire and fish were recovered.

**Date: July 2004**

**Job Objective:**

To restore full access to the wellbore by retrieving an E-line BHA consisting of Running tool, Setting tool and CCL that had been left stuck in the hole.

**Job Outcome:**

A BHA consisting of Jar, Accelerator and GS Flow Release Pulling tool was RIH to retrieve the stuck BHA. The fish was latched at 11,139ft. After confirming the fish was latched by applying an overpull, the jars were re-cocked and a jarring programme was performed. The jars were fired 40 times, with an applied overpull of between 10 – 15,000 lbs. The fish remained stuck. The decision was taken to attempt two further jars with an applied overpull of 20 and 25,000 lbs. The assembly came free after jarring with a 25,000 overpull. The assembly was recovered to surface whereupon it was confirmed that the complete assembly consisting of Running tool, Setting tool and CCL had been retrieved.

**Date: July 2002**

**Job Objective:**

To perform an open hole clean out (+/- 500ft) using a jetting BHA and a milling BHA.

**Job Outcome:**

The job started with the jetting BHA, which achieved good results. The milling BHA was then used, no depth was gained using the motor. At surface the mill showed excessive wear suggesting something hard/ metal in the well. After an LIB run was performed this was found to be a wireline tool string. After running various tools (JDC, JDC with Bell guide and JDC inside a wash pipe extension with a wall hook guide) into the well the rope socket and 8ft of stem was recovered. The LIB was rerun and the impression of a K-Joint QLS was on the LIB. The next BHA run was a Motor with a skirted overshot; this recovered a shock absorber, knuckle joint and part of a memory gauge. The customer was very happy with the outcome and may go back and finish the job in the future.

**Date: October 2001**

**Job Objective:**

To recover 8,500ft of 1-1/2" coil tubing (broken at surface across tree vales) using 2-1/8" Cutter / Snipper tool.

**Job Outcome:**

The fishing assembly was run in to latch the top of the fish; approximately 2,000lbs was set down onto the fish and an over-pull taken to confirm that fish was inside BHA. At this point we attempted to get circulation through the Coil and this was achieved with good returns. Circulating was continued until clean returns at surface. The Coil was then pulled to surface, BOP's closed (slip and tubing rams) the riser was then bled down and any pressure build up observed. The riser was then disconnected to expose the BHA with the fish. BHA was cut off and the both ends of the coil connected together and pull tested. The riser was then made up and pressure tested before opening the BOP's and pulling the fish to surface. All of the Coil and BHA were successfully removed from the well.