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CORK SUMMARY

OSMO HOLDER

The osmo seat assembly needed to be filled and monitored for the first several days in the vertical position. The best place to do so was to rack the assembly back in the derrick, but it needed a “holder”.

On shore, three scrap 5-1/2 drill pipe joints had the tool joints cut off, to remove the transition portion from the tube. One of these tubes was modified with a window and a base plate (see attached). The tool joints were bored out to 4-1/2” ID and cut to 10-12 in. long.

The three pipe tubes and the three machined tool joints were sent to the rig, and along with an additional 10 ft. section of pipe, were welded into an osmo holder. The additional pipe was added to the bottom so the assembly would be over 92 feet long and reach the monkey board. A window was cut into the upper most tube, to access ports on the osmo, and lift eyes were welded to the uppermost modified tool joint.

After assembly, the osmo was carried hand-over-hand to the racker and inserted into the horizontal holding pipe. A rope was placed on the upper section of the osmo. Both assemblies were then raised together and tied off into the derrick.

During deployment this holding pipe was picked up and dropped into the mouse hole, where the modified tool joints served as a place to set the mouse hole clamp.

EQUIPMENT LIST

A CORK expedition involves a great deal of equipment; seafloor structures, casing, plumbing, and tools. An extensive list of items shipped to Expedition 375 is included with the CORK files:

[375 Equipment List \(Excel\)](#)

Extra steel (plate, angle iron, and tubing) were again brought out and used. CORK legs invariably involve some on-the-fly modifications and the steel comes in handy. Also, it was recommended IODP have SIEM bring a third, contract welder along for such equipment intensive missions. The two SIEM welders are kept so busy on IODP work that they fall behind on routing ship maintenance. Luckily during 375 there were no ship-related emergencies requiring their attention.

CONSIDER: Contract welder for equipment-intensive expeditions.

TO-DO LIST

CORK Expeditions typically require a great deal of shipboard effort prior to deployment. The “To-Do-List” is attached as a record of this work. Most of the items are self-explanatory.

The pressure recorders were sent to TAMU fully-charged and running for this expedition, the first time this was done this way. Tygon tubing was left off the couplers when unpacking (TAMU engineer error). The pressure recorders were “recharged” with silicone oil on the ACORK pressure frame and the Tygon tubing installed to keep the oil from weeping out until installing the recorders.

ACORK

Mount signs
Grind two bolts on the Pressure Recorder.
Purge the pressure recorder
Hookup 1/4 fittings
Hookup 1/8 plumbing
Flow and pressure test plumbing
Weld on the angle iron guides (3X)

Top Plug

Test the non-locking plug with ERS
Check locking top plug in CORK-II and pin bolts
O-ring on Top Plug (2-339)
Get eyebolt off for Patrick

Bridge Plug

Ready the bridge plug

CORK-II

Put lock ring on CORK-II
Put on polypaks, one facing each way (after lock ring)
O-ring (460) on CORK-II
Put cardboard over seals
Finalize instrument string hookup (weak links, lifting, pins, etc.)
Check OD's on Instrument String (<2.25 below osmo, <3.625 in CORK)
Spaceout for instrument string > logging engineer

The To-DO list used to prepare the ACORKS and CORK-IIs.

U1518H AND U1519B

The two CORK installations are covered here. The schematics and the procedures used for both installations are attached. Any significant differences in deployment are pointed out below.

A brief summary of the installation times:

	U1518H*	U1519B
WATER DEPTH (MBRF)	2640.5	1011.5
14-3/4 HOLE DEPTH (M)	433.0	285.1
10-3/4 CASING LENGTH (M)	422.5	279.4
NO. OF 10-3/4 SCREENS	3	2
4-1/2 CASING LENGTH (M)	412.5	269.0
NO. OF 4-1/2 PACKERS	3	0
INSTRUMENT STRING LENGTH (M)	407	268
STEPS (TIME IN HRS)		
DRILL 14-3/4 AND FF DEPLOY BASE/CONE	61.50	28.25
RUN 10-3/4 CASING, SCREENS, UMBILICAL	21.00	14.50
MAKE-UP STINGER & ACORK	6.50	7.00
TRIP-IN AND REENTRY	14.25	3.25
RIH W/ ACORK; HANDLE VIT	21.25	8.50
ROV PLATFORM	3.25	0.00
UPPER CONE / VIT	3.75	2.25
TRIP OUT	10.25	6.25
CLEAN-OUT RUN	22.50	11.25
BRIDGE PLUG RUN	21.75	11.50
MAKE-UP CORK-II AND 4-1/2 CASING	11.00	7.00
TRIP-IN AND REENTRY	7.50	3.25
HANDLE INSTRUMENT STRING	5.00	1.50
RUN-IN AND RELEASE W/ LOGGING LINE	8.00	4.00
TRIP-OUT & SECURE	8.50	4.50
TOTAL (HRS)	226.00	113.00
TOTAL (DAYS)	9.42	4.71

HOLE WAS ORIGINALLY 'G' UNTIL BASE SLID

ACORK DEPLOYMENT

An error was made in making a casing hanger Spacer, which, ironically, was made to correct for a space-out issue in the change from drilling-in the ACORK to pre-drilling the hole. The simplest fix was to leave the adapter out and remove 7.25 in. from the height of the lower cone.

ACTION: Correct Spacer drawing OJ5408.

CONSIDER: Surplus the two existing Spacers OR re-machine.

The lower cone weldment was heavily ‘fortified’, much more so than originally designed. One caveat of freefall deploying a base/cone is the cone has to support the full weight of the base (4,375 lb in seawater).

The T-Handles, OJ6131, for the lower pressure valve bays were shortened to 2-3/4. The valves stood slightly higher than planned, and the valve handles were shortened to ensure the VIT and the ROV Platform would clear.

ACTION: Revise T-Handle OJ6131 to 2-3/4 height.

The new-type umbilical, with the three Kevlar cords for separating the armor from each of the 1/4 tubes, proved to be safer to strip, not requiring a torch to heat-up and a draw knife to strip. However, while safer, it didn’t prove to be much faster. There was 1,042 feet of umbilical remaining after the two installations.

The umbilical reel stand split pillow block bearings were not turning. The cause is not known, perhaps over-torqued or over-greased. This proved a minor inconvenience, as we were able to simply turn the umbilical reel itself. Update from second installation: A bit more grease and welding a piece of angle iron between the shaft and the reel and the shaft was then turning on the bearings.

ACTION: Have umbilical flushes with distilled water and stored inside.

With the hole pre-drilled and the base deployed earlier, the ACORK was needed as the casing running tool. The ACORK was made-up on a portion of the stinger and racked back before casing operations. The ACORK tool was flanged up, used to lower/hang-off the 10-3/4 casing in the moonpool, and then unbolted and racked back into the derrick. The ACORK stinger was long (one stand), with the ACORK almost 10m above the rig floor, and it took time to rack the assembly back safely (extra effort to tie-back to the derrick).

ACORK lower flange and Casing Base Adapter 1/4” pass-through was machined 30 deg off from each other (drawing error). This was corrected by flame-cutting a section from the ACORK flange. Long-term fix is to make the pass-throughs equal distance from the flange bolts (30 deg versus 15 deg).

ACTION: Revise Flange OJ5330 and Landing Ring OJ5404 so that 1/4” bulkheads pass-throughs are 30 deg of bolt holes on each component.

Modified OJ3280 CADA Guide to fit over HRT/Mock Hanger by cutting off upper portion and resizing to 10 in. ID.

ACTION: Create new drawing for new Guide. Mark the part with this new number.

Three short sections of 3x3 angle were welded at 45 deg below the ACORK lower bulkhead, between it and the 10-3/4 body, to act as a guide for the VIT coming back up the ACORK.

The screens were wrapped with 1x4 lumber for protection, but were not crated, which was excessive and costly (lesson from Exp 366). The screens also had an ample lead-in bevel (also learned on Exp 366).

Packers crates should be labeled “Top” or “Coupling” on both the outside of the crate and on any wrapping. This aids the rig crew in placing the packers in the proper configuration in the riser hold. In our case, the white, protective plastic wrapping obscured the crate labels.

Screens were manufactured with Line #3 (from left to right) as the in-screen sample line. The other two lines were pass-through lines. This called for reversing the make-up of the umbilical, from right to left, instead of left to right (as done on 328 Cascadia). Lines 1 and 3 were reversed at the ACORK Head to account for this, so lowest screen was connected to Zone 3/Bottom.

CONSIDER: Witness equipment leaving directly from manufacturer.

The casing adapter and the gusset fix we had to do for space-out created a bit of a challenge for plumbing from the umbilical to the ACORK. We had to route the lines through the gussets, as well as weld-on two plates to act as standoffs. This also consumed a great deal of time. The solution for the next installation was to slowly wind the umbilical to be directly below the bulkhead adapter’s bulkhead fittings. This saved a great deal of time.

CONSIDER: Plumbing at the screens and ACORK may be accelerated by using hydraulic hose, cut to length ahead of time and prepped with fittings. Quick connects, versus standard fittings, may also be considered.

The SmartTies were again fast and easy to attach and seemed to cinch the umbilical tightly to the 10-3/4 casing. The spacing was a little over a meter. One to two bands were seen on the seafloor, so they do occasionally catch and snap off.

The ROV Platform was free-fall deployed – the running tool (aka the Lunar Lander or LuLa) was not used. The running tool has been time-consuming to use, introduces risk in hanging up the VIT (to which it attaches), and its use still does not guarantee a clean deployment of the platform. With or without the running tool, the ROV Platform has on occasion hung up on the CORK body. The same happened with this deployment, with the ROV Platform tilting and hanging on the gussets just above the upper flange. (Insert pic).

CONSIDER: Retiring LuLa.

CONSIDER: Redesign the ROV Platform to avoid the “tilt and hang” problem.

NOTE: The JR uses only Crosby-brand lifting shackles for lifting.

The new 10-3/4 Cup Packer (OP7400) performed fairly well and is easier to use than the previous HRT seal. However, the 10kpsi cups that come standard from RubberAtkins are “too good”, in that they aren’t actuating fully at our lower operating pressures. A lower-rated cup design (e.g., 3kpsi or 5kpsi) would be an improvement.

ACTION: Pursue lower rated cup for 10-3/4 AND 13-3/8 Cup Packers.

The new, long NC70 Box x 5-1/2 FH Pin Xover OJ5070 for the HRT was a hit.

BRIDGE PLUG DEPLOYMENT

The expedition saw the first run of a TAMPlug (and only 2nd and 3rd hydraulic plug runs), a hydraulic-actuated plug and abandonment packer. See the attached procedure. It was run with a hydraulic release, as a backup to the standard 20 turns to the right to release. The right hand release worked. Both deployments were picture-perfect.

ACTION: Have hydraulic release tools (2X) reworked and subs cleaned, painted, and entire two sets stored.

NOTE: Need lift subs and/or lifting bales for next deployment.

NOTE: Placing the mud pump motors in serial, versus parallel, on the second deployment gave a little more control on the flow rates.

NOTE: To verify release one can pump through the upper packer assembly. No increase in pressure is a good indicator you are released.

CORK-II DEPLOYMENT

Incorrect Polypak seals (too wide for the groove) were ordered. New seals were ordered and rush delivered by boat to the JR. Installed one seal facing up, the other facing down, to account for either over-pressured or under-pressured formation. Installed 2-460 O-Ring as well to the landing bevel.

NOTE: Verify any non-o-ring style seals prior to shipping. Also, note equipment list included o-ring cord and splice kits for standard o-ring issues.

The Locking Top Plug was not made compatible with the magnetic sensor on the ERS. The body had to be machined, putting a hole in the top and gluing in a magnet.

ACTION: Modify OJ4452 and OJ4462 Top Plug drawings with both hole and magnet for ERS.

The U1518H CORK-II was adjusted for locking the Top Plug. The dog bolts were turned to lock the Top Plug Assembly into the CORK. The bolts were marked and holes drilled. Plexiglas rods (for float valves) were used to lock Top Plug bolts into place, using drill press and sand paper to shape, tapping in lightly with JB Weld.

The U1518H CORK-II was run with a Lock Ring. Installed the Ring using two chain booms and slings. Placed slings around each side of Lock Ring. Hooked chain booms to slings and to handrails on CT Roof. Pulled to open Lock Ring. Placed the CORK-II so that the handrails and the lock ring recess lined up. Opened the Lock Ring and snapped it into place. Used two large screwdrivers to temporarily hold the Lock Ring open so that the slings could be removed. The Lock Ring was not run on the second, U1519B deployment.

CONSIDER: Reducing seal area to reduce uplift force.

The running procedure is attached for each installation.

First 6-3/4 collar had not had threads cleaned up. The rest of the collars were hit-or-miss on having been prepped.

Quadrant Seal crate had been incorrectly marked (i.e., Top or "CPLG" marked on wrong end). This was verified by looking at the Osmo Seat. The coupling was placed on the correct end and the Quadrant Seal run in the proper orientation.

CONSIDER: Witness equipment leaving directly from manufacturer.

CONSIDER: Used machined guide for Quadrant Seal. Fabricated flange with gussets was a little sharp edged, bumped hard on Upper Guide Horn Lip when running.

The 4-1/2 jaws were missing for the casing tong. The 4-1/2 casing was made up with 2-3 right hand turns, then left to "bump", then 2-3 turns right, spinner, and final makeup with 3 roughnecks on chain tong/cheater. Tack weld 4 spots.

ACTION: Need to locate and rework jaws for 4-1/2" and store them with handling tools (which also need to be reworked). On the next trip out, store jaws with tongs. These were the only tongs missing on 375.

Manually drilled 1/2" hole in 4-1/2" joint #58 as equalization port, to prevent any overpressure from driving the packers up.

Used lifting sheaves for instrument string (brought two and two were on JR). Used Glomar clamps and grips (both stored on the JR) for sinker bars and instrument rope, resp.. Tie offs were every 10 meters, but every other tie-off was used (Note this is the maximum height one can use before starting to run into interference in the derrick.). Also, on the lifting sheaves, used the same lift hooks (pin-release snap shackle) as used to release VIT lift hoist.

CONSIDER: Add grooves on sinker bars and use a c-plate to safely deploy. Also weave lifting eyes into the rope 1-3m above sinker bars, seats, or any other ‘heavy’ items. An alternative is to run with standard core barrel clamps, if the sinker bars are large enough.

On U1518H the CORK-II would not latch into ACORK. On third attempt saw upper polypak seal damaged. To avoid further damage, landed and released. The CORK-II is **LIKELY NOT** latched. Note the CORK-II still has lower polypak seal and o-ring seal.

CONSIDER: Using swellable rubber in future.

CONSIDER: Using longer, better guidance to latch in CORK-II’s.

CORK-II was run without lock ring on U1519B. It was also run with a non-locking Top Plug.

No ROV Platform was deployed on U1519B.

The schematics for the CORK installations are attached.

DOWNHOLE TOOLING

SETP S/N2:

Following the corrupt data returned by this tool on Exp 372 some tests were made with results below:

- 1) When tool was started, data was written to and displayed on the monitor as normal. However, following the deployment when ADTEMP.DAT file was uploaded from tool, data was corrupted. The Persistor drive was formatted and the application re-loaded which appeared to have fixed the above.
- 2) The ADTEMP.DAT file was now normal, however, it did not contain the pressure txd data, although this data was displayed on the monitor with start-up. e-mail 4-1-2018.
- 3) Uploading data-files from Persistor were failing intermittently. This appeared to be caused by the Belkin USB/Serial converter. The spare device acted similar. A direct connection to Com1 on the PC cleared above.

ACTION: It was decided to return this tool for further investigation to College Station.

ERS:

- 1) Replace ERS S/N2 Drive-motor (OM1802) with new. Replaced motor was installed Exp-368.
- 2) Requested PO for 2 x new motors.

ACTION: Two (2) replacement motors are on order and will be sent during tie up period

- 3) Epoxied magnets to Cork necks for the ERS “Tool present” function.

Underreamer:

The suggestion was made by the CT’s to investigate the use of some type of filter or screen at the drain hole to see if it lowers the

VIT:

- 1) Fit coax connector to spare Telemetry Pod S/N2 Port2.
- 2) Fit coax connector to NTSC camera, S/N1 and deployed to 2800m. OK.

ACTION: Plan to cut corroded section of umbilical at frame-end and re-terminate in Subic.

- 3) Requested Umbilical maintenance.

CONSIDER: Integrating umbilical maintenance recommendations into VIT system operations manual. Maintenance should include freshwater washdown after last VIT frame recovery during an expedition, and washdown of umbilical with Bri-Lube prior to storage.

- 4) Request PO for VIT Winch Levelwind overhead camera.
- 5) Request PO for new Re-Entry wide FOV camera.

ACTION: Orders placed for replacement wide FOV camera and VIT winch levelwind camera. To be installed during tie-up period

- 6) Sonar was damaged when it was lowered onto the re-entry cone at hole U1518H. Replaced with spare. Damaged sonar S/N 08540 300172 to be returned for repair.
- 7) For the first time since being installed, a re-entry cone was detected by the sonar, after applying settings provided by IODP on sonar operation.
- 8) Tilting the Altimeter ~5deg away from drill-string resulted in stable operation. Requested Engineering change for bracket to support above.
- 9) Requested a spare Altimeter to be ordered.

ACTION: Spare altimeter ordered, scheduled to be sent to Subic for storage

- 10) Added a small shroud to minimize interference of altimeter with sonar. Altimeter output is now stable below 50m from sea floor.
- 11) Interference from Altimeter not significant at sonar High range. Does not appear to be an issue currently.
- 12) Operators requested changes to HD-VIT.exe program to simplify the “Infinity Focus” setting to Survey and Re-entry cameras.

ACTION: Dean to reprogram the camera control software to allow for easier infinity focus.

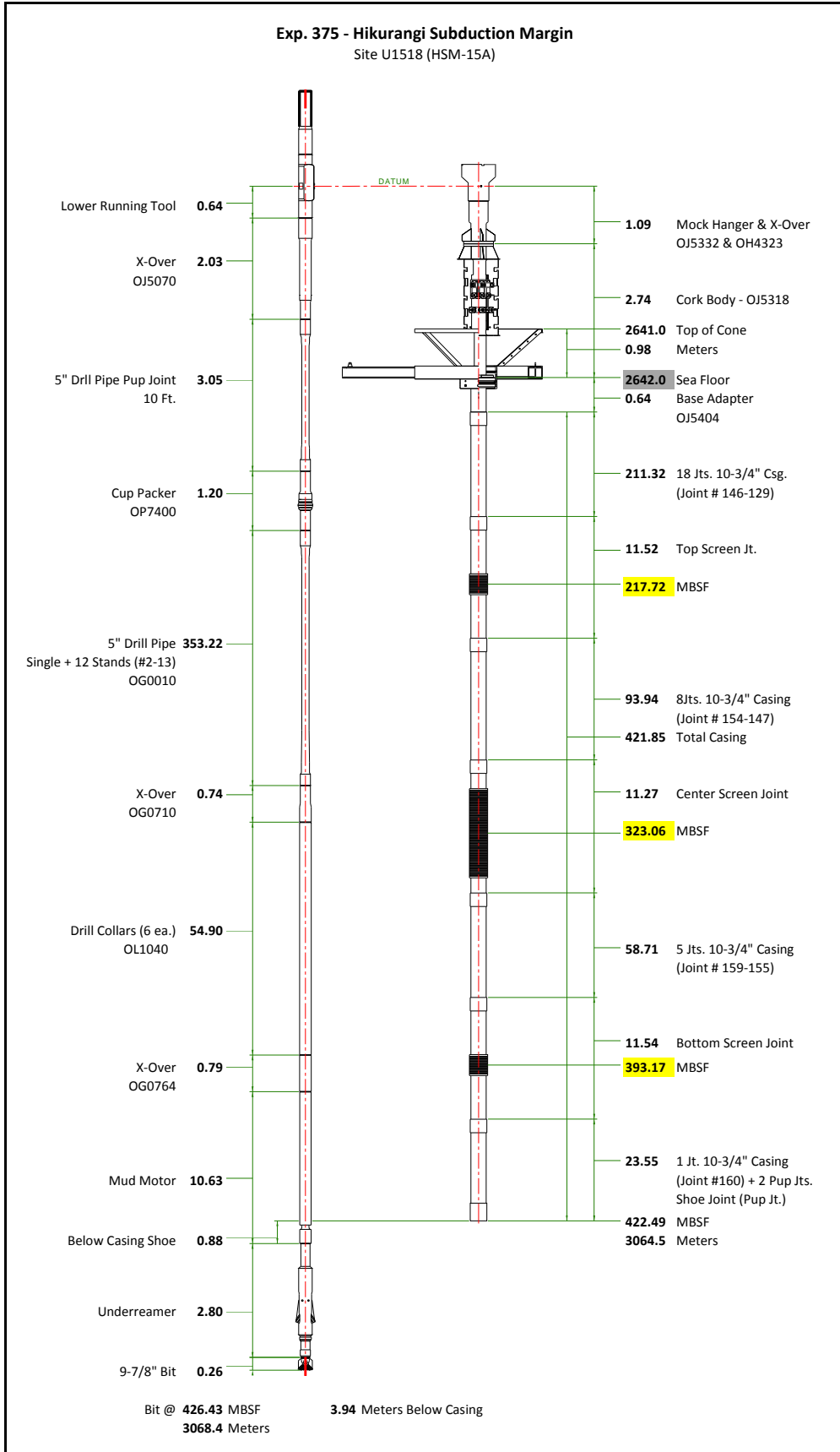
- 13) Gyro: Earth-rate drift (ERD) calculation in the HD-VIT control program is wrong. At 38deg Lat, the Earth-rate is 14.36d/h. HD-VIT gives it at 9.45d/h.

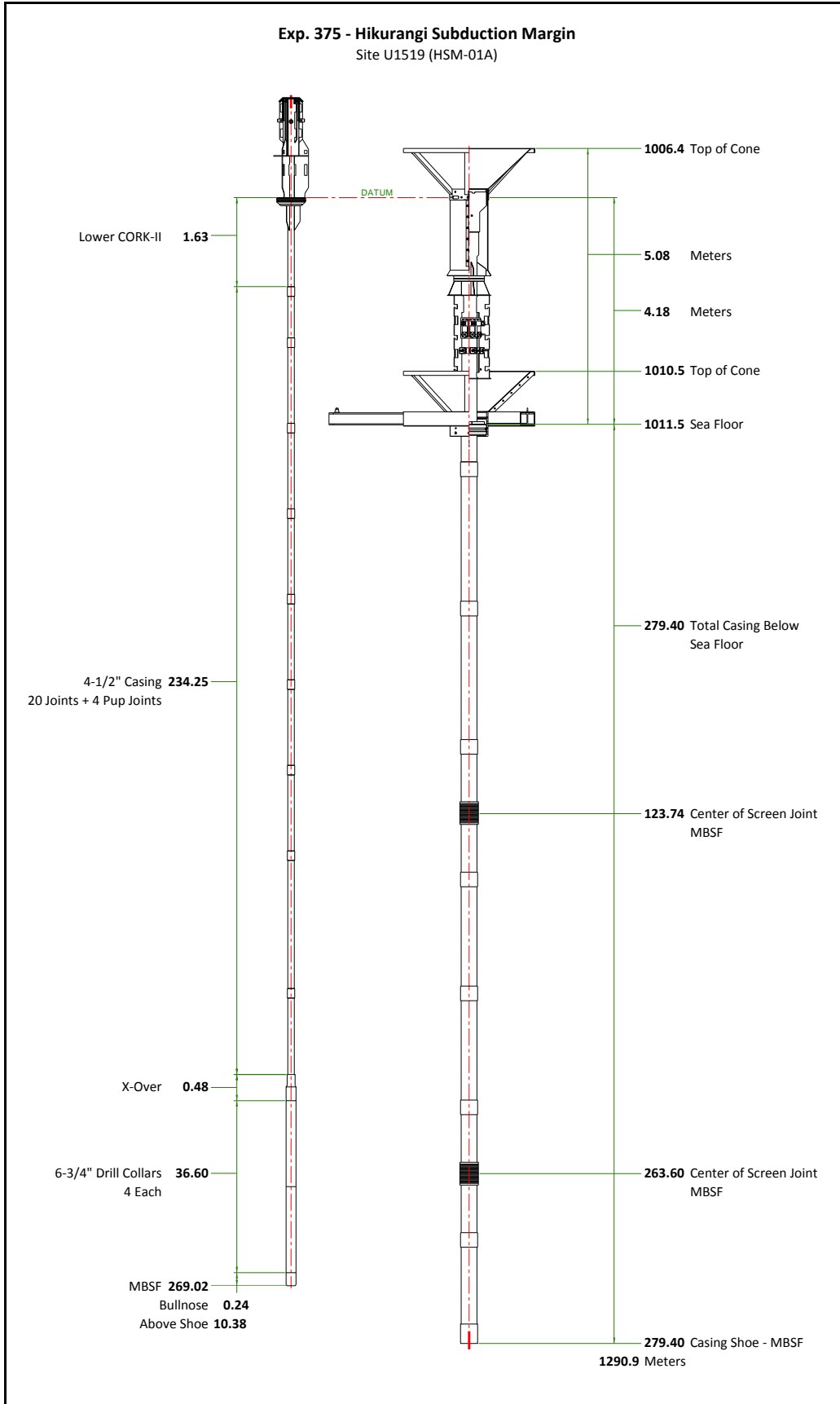
ACTION: Dean to verify programming of the ERD calculation

- 14) Did an OTDR measurement on the Brown fiber from DP to VIT-Frame. Appeared to be normal
- 15) Exercised FO-Instruments/devices.
- 16) CTs requested a replacement drawing set for all current parts.

ACTION: Engineering group to send new drawing book set to ship

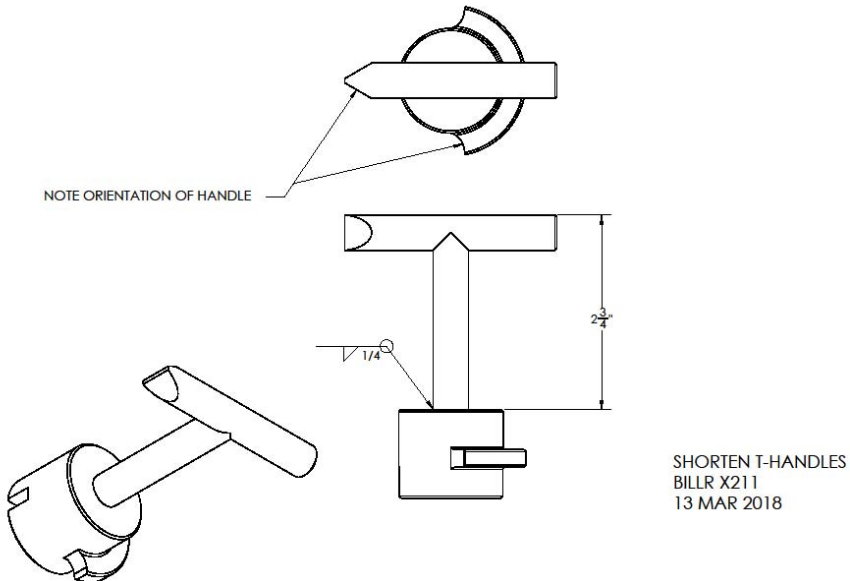
- 17) RigWatch Codes were renewed during the expedition. New Expiration dates are XXXX







The base with funnel. Note the height of the funnel has been “chopped” down. Also, additional struts have been added.



Top; The valves, signage for the U1519B ACORK.
Btm; Reduced height handles for pressure (lower) bay – both sites



The umbilical staged forward of the moon pool.



Stripping the armor off the umbilical to make a connection.



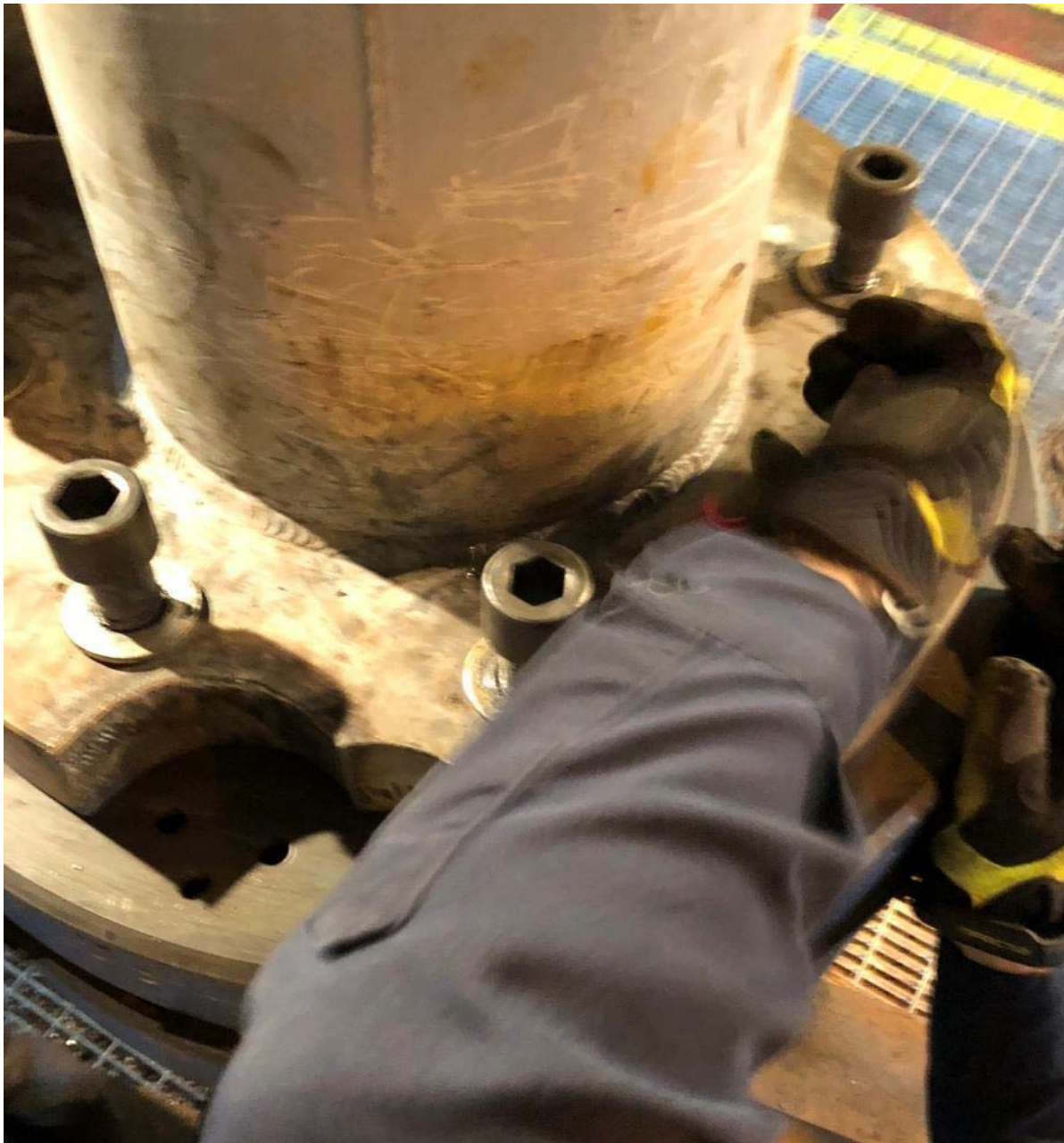
The ACORK in the derrick.



The Platform and Funnel Guide (gray) on top of the Mock Hanger (red).



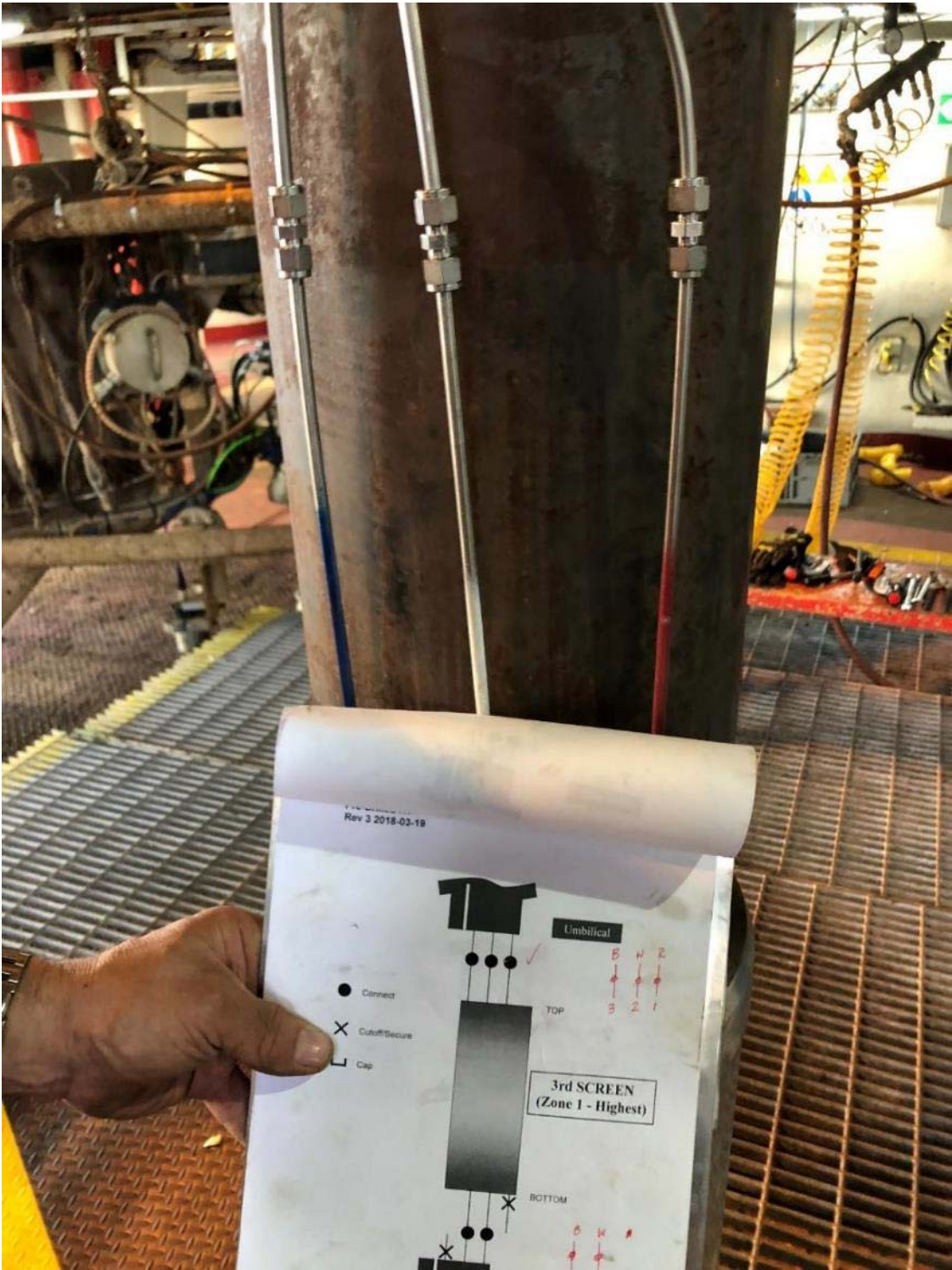
The ACORK being lowered through the rig floor.



The Lower Flange on the ACORK had to be flame-cut to allow the bulkhead holes in the Base Adapter to clear.



The plumbing on the U1519B ACORK. The umbilical was brought around to the pass-throughs on the Base Adapter to make the connections simpler and quicker.



The plumbing from top of screen to the umbilical. The screens were incorrectly manufactured – the red/sample line should have been on the left, followed by the white and blue pass-throughs.



The ROV Platform hung above the valve bay on U1518H.



Top; The 10-3/4 Cup Packer.
Btm; The cup showing
erosive wear after one of the
casing runs.





The HRT being deployed on U1520C.



The U1518H swellable packers being swung forward from the helipad and the protective wrapping removed at the rig floor.

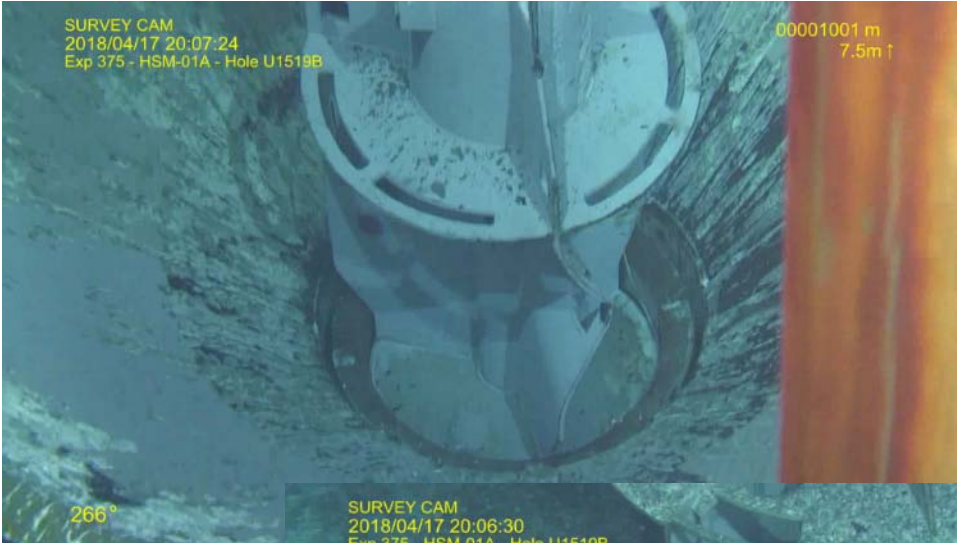




The quadrant seal. Note the proper orientation of the osmo seat.



The instrument string being deployed on U1518H, using the lifting bales.



U1519B, from the top; The damage to the CORK-II, the valve bay, and the top plug landed.

HIKURANGI ACORK RUNNING GUIDELINES

Pre-Drilled Hole

Rev 3 2018-03-19

Pre-Deployment

1. Prepare CORK tally and installation plan.
2. Verify 10-3/4 casing and pup space-out for installation.
3. Strap three 10-3/4" screens (12-3/4 OD). The 1st and 3rd screen will be 6.5 ft. screen sections, The 2nd (middle screen) has a 24.5 ft. screen section.
4. Verify (or set) the DTU950 underreamer arms to 14-3/4".
5. Make-up the ACORK Mock Hanger OJ5332 to the HRT Running Tool and stinger subs. Makeup a modified sub to hold the OJ3280 CADA Guide just above the Mock Hanger, to act as a guide for both the ROV Platform and the Top Funnel.
6. Stage the casing hanger frame to the moonpool (will hang off 10-3/4).
7. Torque the 10-3/4 Cup Sub and make-up to drill pipe pup.
8. Pressure-test all ACORK lines. Verify identification (signs and hook-ups), and valve handle orientation.
9. Paint Site/Hole No. on CORK and both funnels.
10. Install 32" Guide Sleeve in VIT.
11. Install the Pressure Meter Data Logger Package on the CORK Wellhead. Verify and test (just prior to deployment)

Umbilical/Moonpool

12. Stage the Flatpack 3x1/4" umbilical reel/stand. Untighten the bolts on the split bearings and makeup to 1560 in-lb (130 ft-lb).
13. Weld the stand to the floor. Recommend weld (2) full sides of each leg. Do not just tack – if the casing parts the umbilical will pull the reel/stand toward the moonpool.
14. Hang banana sheave in the moonpool, as near as possible to the center of the moonpool. Run umbilical thru and tie-off.

HIKURANGI ACORK RUNNING GUIDELINES

Pre-Drilled Hole

Rev 3 2018-03-19

15. Install metal grating over moonpool door gap to provide a safe working platform. There is additional grating and 3x3 angle to cover the mouse hole (safety issue identified on previous expedition).
16. Rig-up work table for moonpool area.
17. If there is space available, stage ROV platform near moonpool. Have bolt kit ready.
18. Stage the following in or near the moonpool:
 - a. Fittings,
 - b. Smart-ties (plastic banding) with Installation Tool and snips.
 - c. Rope/Cable-ties (for tying off umbilical),
 - d. Cutting wheel and end cutters for umbilical,
 - e. Tools for dressing hydraulic lines.
 - f. Duct tape.
 - g. Wrenches, tubing cutters, miscellaneous tools for tubing hook-up.
19. As a backup: string cutting torch into moonpool for heating the umbilical jacket for stripping. Get hot work permit.
20. Radios between drill floor and moonpool are highly recommended.

Deployment

ACORK

21. Pickup ACORK Mock Hanger with stinger subs. Make up to drill pipe/knobbies (to be racked back) and pickup.
22. Swing ACORK thru split stabber.
23. Pull bushings.
24. Pickup with ACORK with eyebolts/slings.
25. Lower ACORK into rotary and set on floor. Secure w/ tuggers.
26. Lower Mock Hanger/HRT and bolt-up flange to ACORK.
27. Pickup Mock Hanger/ACORK assembly and rack back.
28. Replace bushings.

HIKURANGI ACORK RUNNING GUIDELINES

Pre-Drilled Hole

Rev 3 2018-03-19

ACORK Assembly

Casing: 10-3/4 J55 40.5# ~4500 ft-lb torque. Tack weld all connections.

10-3/4 Screens: Set directly on the riser skate. Do NOT set on racker. Each screen has a corresponding hydraulic diagram.

Umbilical: Feed over sheave. During running, place Smart Tie every 1m to secure. Tape over connections.

29. Run casing per ODL casing tally.
30. Pickup 10-3/4 Screen #1 (6.5 ft. screened section) and make-up.
31. Make-up next casing joint.
32. Lower Screen to moonpool.
33. Plumb Screen #1 and umbilical per diagram.
34. Pickup/make-up casing joints per tally. Attach umbilical as casing string is lowered.
35. Pickup 10-3/4 Screen #2 (24 ft. screen section) and make-up.
36. Pickup/make-up next casing joint.
37. Lower Screen to moonpool.
38. Plumb Screen #2 and umbilical per diagram.
39. Pickup/make-up casing joints per tally.
40. Pickup 10-3/4 Screen #3 and make-up.
41. Pickup/make-up next casing joint.
42. Lower Screen to moonpool.
43. Plumb Screen #3 and umbilical per diagram.
44. Pickup/make-up casing joints per tally.
45. Tie off umbilical.
46. Lift Base Adapter with eyebolts/slings and makeup to casing.
47. Pickup 10-3/4 string with elevator and rig slings.

HIKURANGI ACORK RUNNING GUIDELINES

Pre-Drilled Hole

Rev 3 2018-03-19

48. Pull bushings and bowl. ACORK wellhead is 30 in. diameter.
49. Lower 10-3/4 string to moonpool and hang off on casing frame.
50. Replace bushings and place in slips.

ACORK Drill-In BHA

51. Run Drill-in BHA per sheet.
52. Flow test motor and underreamer in moonpool.
53. Trip in on drill pipe.
54. Run 10-3/4 cup sub in stinger, Can be made up to drill pipe pup for handling.
55. Make-up Mock Hanger / ACORK to top of stinger.

Run ACORK

56. Pull bushings and bowl.
57. Lower ACORK assembly to moonpool.
58. Bolt ACORK flange to Base Adapter.
59. Pickup ACORK string.
60. Run umbilical and plumb to ACORK per diagram. Secure.
61. On pressure valves (lower rack);
 - a. Turn all (3) valves to “ZONE” (handles pointing down).
 - b. Open all (3) purge valves (on top of “T” going to pressure logger).
 - c. Remove cap on data logger comm port.
62. On sample valves (upper rack), open all valves to “ZONE” position (vertical).
63. Open moonpool doors.
64. Lower ACORK into water. Replace bushings.
65. Wait (10) minutes for air to purge from lines.

HIKURANGI ACORK RUNNING GUIDELINES

Pre-Drilled Hole

Rev 3 2018-03-19

66. Raise ACORK and close moonpool doors.
67. On pressure valves, close all (3) purge valves.
68. On sample valves (upper rack), close all valves (horizontal).
69. Secure all valves with rubber bands.
70. Take photos of all bays.
71. RIH w/ ACORK to below keel.
72. RIH w/ VIT configure w/ 32" guide sleeve. Verify clearance over ACORK assembly. Verify underreamer space-out w/ ACORK.
73. RIH w/ ACORK and VIT.
74. Reenter hole.
75. Park VIT above ACORK wellhead.
76. Activate mud motor and underreamer, engage heave compensator, and RIH till ACORK is 4-10m above wellhead (heave dependent).
77. POOH w/ VIT.

ROV/Submersible Platform Deployment

78. Assemble the ROV/Submersible Platform around the drill string on top of the moonpool doors.
79. Using a rope, raise the platform with tuggers to clear lower guidehorn lip.
80. Open the moonpool doors, lower the platform, and cut loose.
81. RIH with VIT.
82. Verify platform is in place.
83. POOH w/ VIT.

Run Reentry (Top) Funnel

84. Assemble the reentry funnel around the drill string on top of the moonpool doors.

HIKURANGI ACORK RUNNING GUIDELINES

Pre-Drilled Hole

Rev 3 2018-03-19

85. Run rope from tie-off point, thru pad eyes on funnel, to hoist.
86. Open moonpool doors, lower the funnel, and cut the rope.
87. Deploy VIT.
88. RIH w/ VIT.
89. Verify reentry funnel landed.

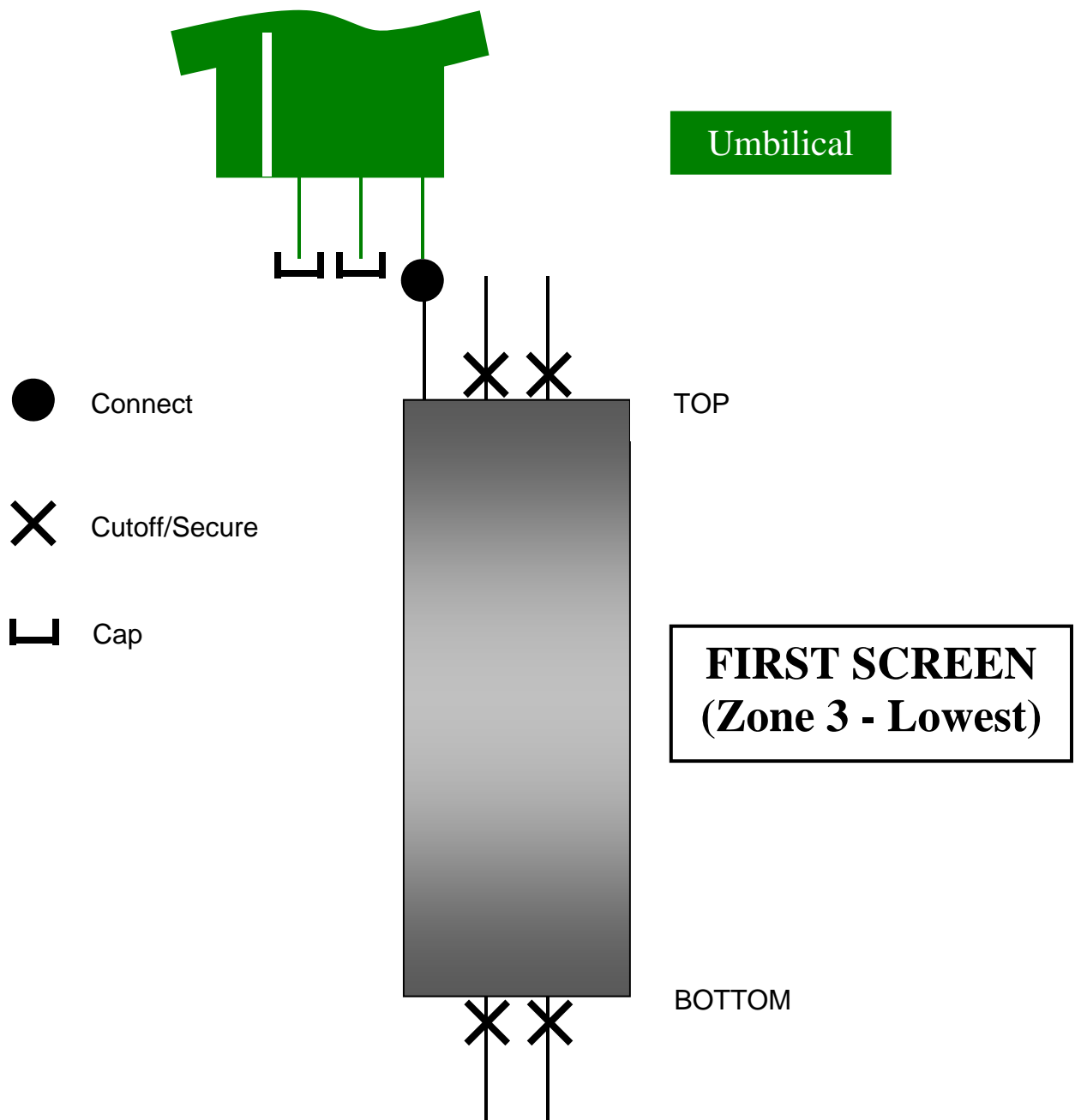
Land ACORK and Drill String Release

90. Record weight of ACORK assembly.
91. Lower string and land ACORK.
92. Drop HRT go-devil.
93. After landing, pressure 600-800 psi to release.
94. Pull up 4-5m. Verify weight.
95. Pressure above 1,200 psi to shift go-devil piston (POOH dry).
96. POOH w/ drill string to just above ACORK.
97. Verify/video record installation with VIT.
98. POOH w/ VIT.
99. POOH w/ drill string.

HIKURANGI ACORK RUNNING GUIDELINES

Pre-Drilled Hole

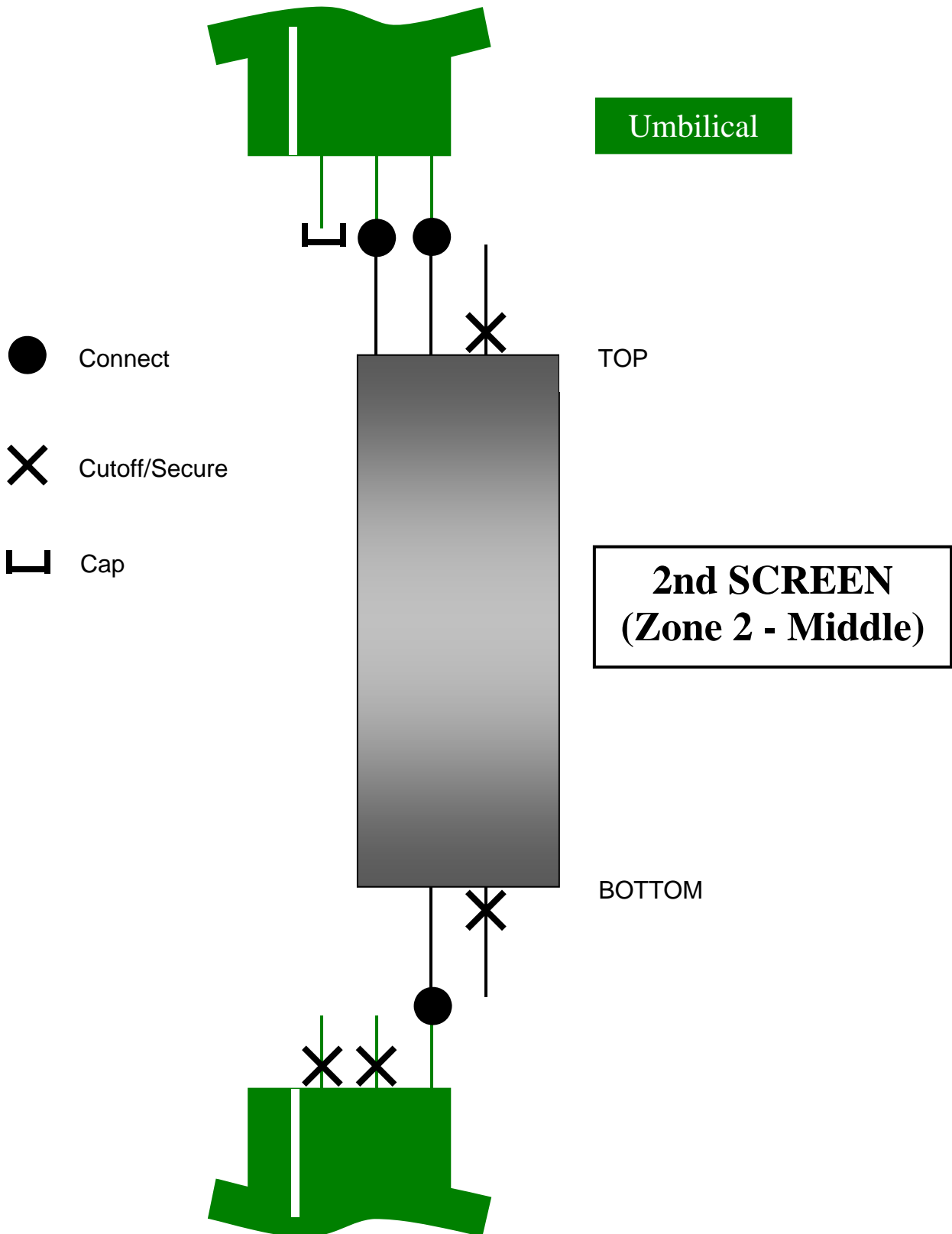
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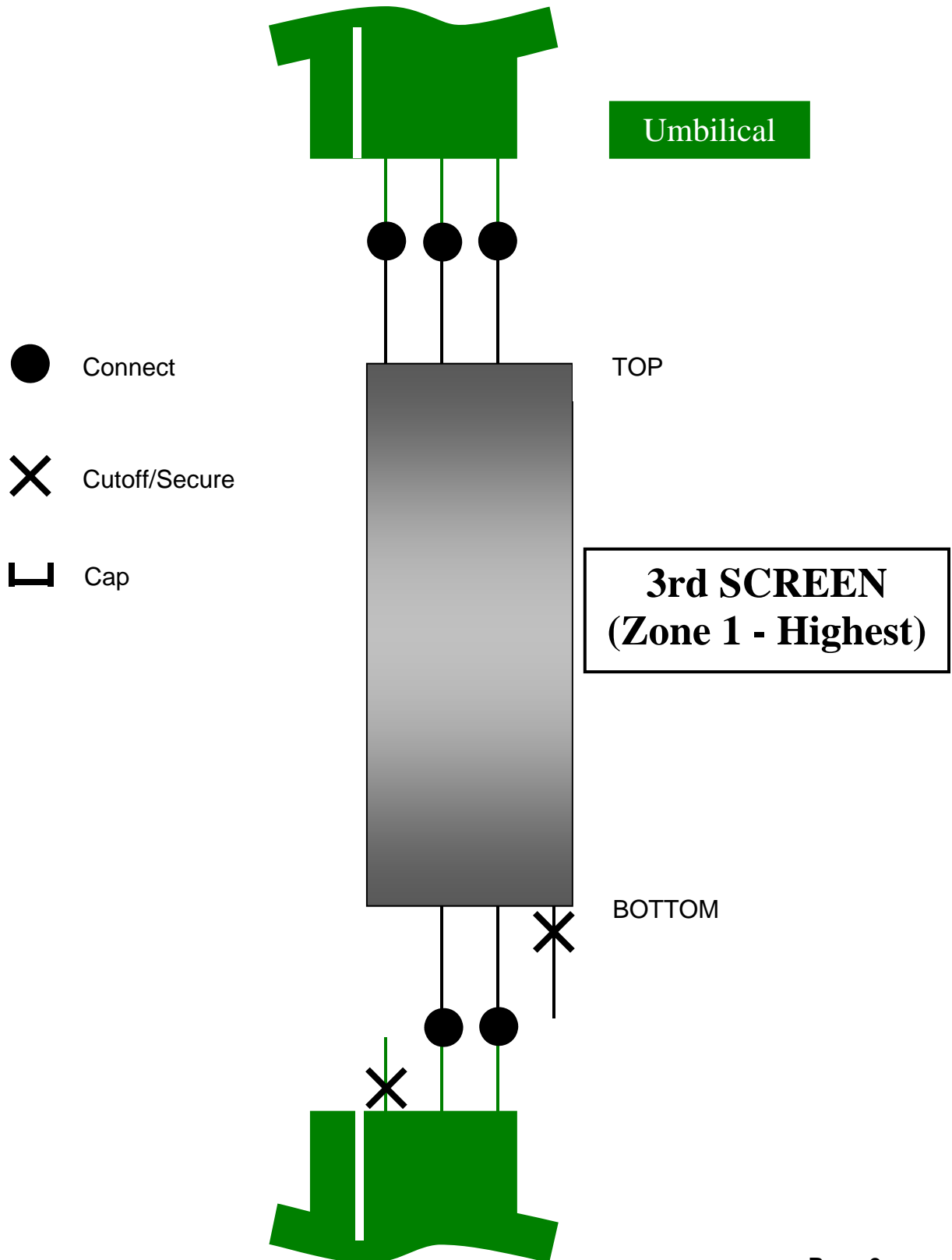
HIKURANGI ACORK RUNNING GUIDELINES

Pre-Drilled Hole

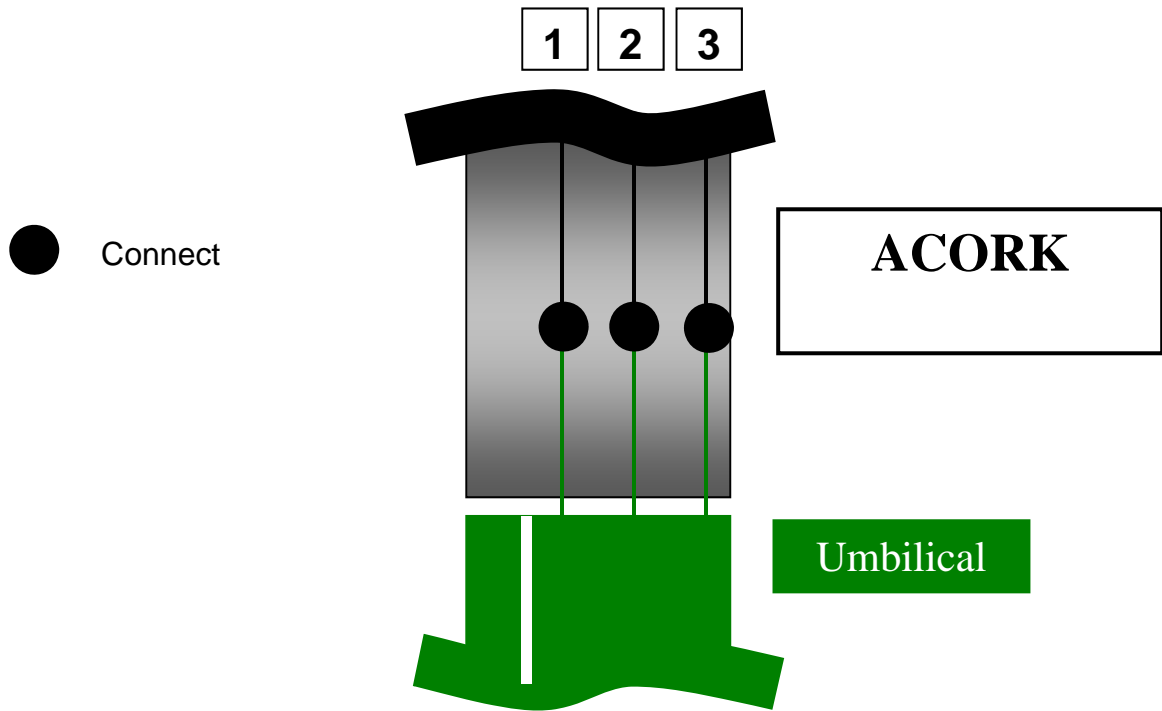
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HIKURANGI ACORK RUNNING GUIDELINES
Pre-Drilled Hole
Rev 3 2018-03-19



HIKURANGI ACORK RUNNING GUIDELINES
Pre-Drilled Hole
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HIKURANGI U1518H **CORK-II** RUNNING GUIDELINES

Rev 2

2018-04-02

Pre-Deployment

1. Prepare the installation plan. Confirm tallies.
2. Locate either a 2 or 3m drill collar sub and makeup to the CORK running tool.
3. Check top plug locking and unlocking. Verify release with RS and with bolts. Pin the release bolts.
4. Paint Site/Hole No. on CORK-II.
5. Locate instrument string handling sheaves.
6. If possible, make-up CORK "Plumb Bob" (the BHA portion consisting of the bullnose and 6-3/4 drill collars) before-hand.
7. Ensure ERS is ready to go and proper cable head is installed.
8. Install 32" Sleeve in VIT.
9. Stage and tally the two swellable packers. Note coupling end and stage that end fwd. Packers are the same.
10. Stage and tally the Quadrant Seal. Coupling end fwd.
11. Stage the 6-3/4 lift subs (5-1/2 FHM) and slips.
12. Stage a 4" rabbit.
13. Stage 4-1/2" elevators, slips, dog collars, and tong dies.
14. Stage the xovers per the well plan where they will be accessible.
15. Stage 4-1/2 steel (1, 2, 3, and 6m) pups where they will be accessible.
16. The Casing string above the upper packer requires a "ported sub" to balance the external/internal pressure. This can simply be a hole drilled in a coupling on of the joints/subs.

Deployment

17. Drift with 4" rabbit.
18. Run the 6-3/4" bullnose, drill collars, and Xover to 4-1/2" per the plan.
19. Unwrap, pickup, and make-up Packer #1.

HIKURANGI U1518H **CORK-II** RUNNING GUIDELINES

Rev 2

2018-04-02

20. Pickup and makeup Quadrant Seal.
21. Unwrap, pickup, and makeup Packer #2.
22. Run the 4-1/2" casing per the installation plan. Drill a hole in one of the 4-1/2 collars for a pressure balance above/below packers.
23. Spread the drill pipe stabber.
24. Place the CORK-II on the skate and position in the pipe stabber with the top extended onto the rig floor far enough to engage the CORK running tool.
25. Pick up the CORK running tool and engage the CORK-II.
26. Paint the lifting lugs and the CORK running tool slots so as to be more visible to the VIT.
27. Pick up the CORK-II with the block.
28. Make up the CORK-II to the top of the 4-1/2" casing string.
29. Pull the bushings. CORK-II wellhead is 30 in. diameter.

RIH with the CORK-II

30. Open moonpool doors.
31. RIH 1-2 stands with the CORK-II on drill string. Pause for VIT check.
32. Deploy VIT and run down and up over CORK-II to check clearance.
33. RIH with CORK-II and VIT.
34. Before reentering, record weight.
35. Reenter the borehole.
36. Lower CORK-II. Monitor weight. Chase w/ VIT. Do not land.
37. Park CORK-II just above wellhead.
38. Run instrument string and latch-in top plug with ERS/logging line.
39. Pull ERS and logging line.
40. Land CORK-II.

Drill String Release

41. Set 5,000 to 10,000 lb on top of the Cork wellhead.

HIKURANGI U1518H **CORK-II** RUNNING GUIDELINES

Rev 2

2018-04-02

42. Apply minimal right hand torque to the Cork running tool and hold it.
43. Pick up the drill string until the Cork running tool comes free.
44. Visually inspect the installation. Allow a minute or two for a good recording.
45. POOH with the VIT.
46. POOH with the drill string.
47. Break subs off CORK Running Tool.

HIKURANGI U1519B ACORK RUNNING GUIDELINES

Pre-Drilled Hole

2018-04-20 Update

Pre-Deployment

1. Prepare CORK tally and installation plan.
2. Verify 10-3/4 casing and pup space-out for installation.
3. Strap the two 10-3/4" screens (12-3/4 OD). The screens are identical.
4. Verify (or set) the DTU950 underreamer arms to 14-3/4".
5. Make-up the ACORK Mock Hanger OJ5332 to the HRT Running Tool and stinger subs.
6. Mount the Platform/Funnel Guide just above the Mock Hanger, to act as a guide for both the ROV Platform and the Top Funnel. Tighten the (3) set screws.
7. Install the lower casing section (has upper flange) on the Mock Hanger.
8. Stage the casing hanger frame to the moonpool (will hang off 10-3/4).
9. Torque the 10-3/4 Cup Sub and make-up to drill pipe pup.
10. Pressure-test all ACORK lines. Verify identification (signs and hook-ups), and valve handle orientation.
11. Paint Site/Hole No. on CORK and both funnels.
12. Install 32" Guide Sleeve in VIT.
13. Ready the Pressure Meter Data Logger Package for deployment.

Umbilical/Moonpool

14. Stage the Flatpack 3x1/4" umbilical reel/stand. Untighten the bolts on the split bearings and makeup to 1560 in-lb (130 ft-lb).
15. Weld the stand to the floor. Recommend weld (2) full sides of each leg. Do not just tack – if the casing parts the umbilical will pull the reel/stand toward the moonpool.
16. Hang banana sheave in the moonpool, as near as possible to the center of the moonpool. Run umbilical thru and tie-off.

HIKURANGI U1519B **ACORK** RUNNING GUIDELINES

Pre-Drilled Hole

2018-04-20 Update

17. Install metal grating over moonpool door gap to provide a safe working platform. There is additional grating and 3x3 angle to cover the mouse hole (safety issue identified on previous expedition).
18. Rig-up work table for moonpool area.
- ~~19. If there is space available, stage ROV platform near moonpool. Have bolt kit ready.~~
20. Stage the following in or near the moonpool:
 - a. Fittings,
 - b. Smart-ties (plastic banding) with Installation Tool and snips.
 - c. Rope/Cable-ties (for tying off umbilical),
 - d. Cutting wheel and end cutters for umbilical,
 - e. Tools for dressing hydraulic lines.
 - f. Duct tape.
 - g. Wrenches, tubing cutters, miscellaneous tools for tubing hook-up.
21. As a backup: string cutting torch into moonpool for heating the umbilical jacket for stripping. Get hot work permit.
22. Radios between drill floor and moonpool are highly recommended.

Deployment

ACORK

23. Pickup ACORK Mock Hanger with stinger subs. Make up to drill pipe/knobbies (to be racked back) and pickup.
24. Swing ACORK thru split stabber.
25. Pull bushings.
26. Pickup the ACORK with eyebolts/slings.
27. Lower ACORK into rotary and set on floor. Secure stabber and tuggers..
28. Lower Mock Hanger/HRT and bolt-up flange to ACORK.
29. Pickup Mock Hanger/ACORK assembly and rack back.
30. Replace bushings.

HIKURANGI U1519B ACORK RUNNING GUIDELINES

Pre-Drilled Hole

2018-04-20 Update

ACORK Assembly

Casing: 10-3/4 J55 40.5# ~4500 ft-lb torque. Tack weld all connections.

10-3/4 Screens: Set directly on the riser skate. Do NOT set on racker. Each screen has a corresponding hydraulic diagram.

Umbilical: Feed over sheave. During running, place Smart Tie every 1m to secure. Tape over connections.

31. Run casing per ODL casing tally.
32. Pickup 10-3/4 Screen #1 (6.5 ft. screened section) and make-up.
33. Make-up next casing joint.
34. Lower Screen to moonpool.
35. Plumb Screen #1 and umbilical per diagram.
36. Pickup/make-up casing joints per tally. Attach umbilical as casing string is lowered.
37. Pickup 10-3/4 Screen #2 (24 ft. screen section) and make-up.
38. Pickup/make-up next casing joint.
39. Lower Screen to moonpool.
40. Plumb Screen #2 and umbilical per diagram.
41. Pickup/make-up casing joints per tally.
42. Tie off umbilical.
43. Lift Base Adapter with eyebolts/slings and makeup to casing.
44. Pickup 10-3/4 string with elevator and rig slings.
45. Pull bushings and bowl. ACORK wellhead is 30 in. diameter.
46. Lower 10-3/4 string to moonpool and hang off on casing frame.
47. Replace bushings and place in slips.

ACORK Drill-In BHA

HIKURANGI U1519B ACORK RUNNING GUIDELINES

Pre-Drilled Hole

2018-04-20 Update

48. Run Drill-in BHA per sheet.
49. Flow test motor and underreamer in moonpool.
50. Trip in on drill pipe.
51. Run 10-3/4 cup sub in stinger, Can be made up to drill pipe pup for handling.
52. Make-up Mock Hanger / ACORK to top of stinger.
53. Lower ACORK to rig floor.
54. Weld (4) guides from underneath Mock Hanger to gussets above upper flange, to act as guide for ROV Platform.
55. Install Pressure Recorder. Cable tie in 2-4 places to hold it down. Ties need to be accessible from ROV (i.e., can be cut from the front of CORK).

Run ACORK

56. Pull bushings and bowl.
57. Lower ACORK assembly to moonpool.
58. Bolt ACORK flange to Base Adapter.
59. Pickup ACORK string.
60. Run umbilical and plumb to ACORK per diagram. Weld cover plate below base Adapter. Secure.
61. On pressure valves (lower rack);
 - a. Turn all (3) valves to "ZONE" (handles pointing down).
 - b. Open all (3) purge valves (on top of "T" going to pressure logger).
 - c. Remove cap on data logger comm port.
62. On sample valves (upper rack), open all valves to "OPEN" position (vertical).
63. Open moonpool doors.
64. Lower ACORK into water. Replace bushings.

HIKURANGI U1519B ACORK RUNNING GUIDELINES

Pre-Drilled Hole

2018-04-20 Update

65. Wait (10) minutes for air to purge from lines.
66. Raise ACORK and close moonpool doors.
67. On pressure valves, close all (3) purge valves.
68. On sample valves (upper rack), close all valves (horizontal).
69. Secure all valves with rubber bands.
70. Take photos of all bays.
71. RIH w/ ACORK to below keel.
72. RIH w/ VIT configure w/ 32" guide sleeve. Verify clearance over ACORK assembly. Verify underreamer space-out w/ ACORK.
73. RIH w/ ACORK and VIT.
74. Reenter hole.
75. Park VIT above ACORK wellhead.
76. Activate mud motor and underreamer, engage heave compensator, and RIH till ACORK lands (or is 4-5m above wellhead - heave dependent).
77. POOH w/ VIT.

ROV/Submersible Platform Deployment

- ~~78. Assemble the ROV/Submersible Platform around the drill string on top of the moonpool doors.~~
- ~~79. Using a rope, raise the platform with tuggers to clear lower guidehorn lip.~~
- ~~80. Open the moonpool doors, lower the platform, and cut loose.~~
- ~~81. RIH with VIT.~~
- ~~82. Verify platform is in place.~~
- ~~83. POOH w/ VIT.~~

Run Reentry (Top) Funnel

HIKURANGI U1519B ACORK RUNNING GUIDELINES

Pre-Drilled Hole

2018-04-20 Update

84. Assemble the reentry funnel around the drill string on top of the moonpool doors.
85. Run rope from tie-off point, thru pad eyes on funnel, to hoist.
86. Open moonpool doors, lower the funnel, and cut the rope.
87. Deploy VIT.
88. RIH w/ VIT.
89. Verify reentry funnel landed.

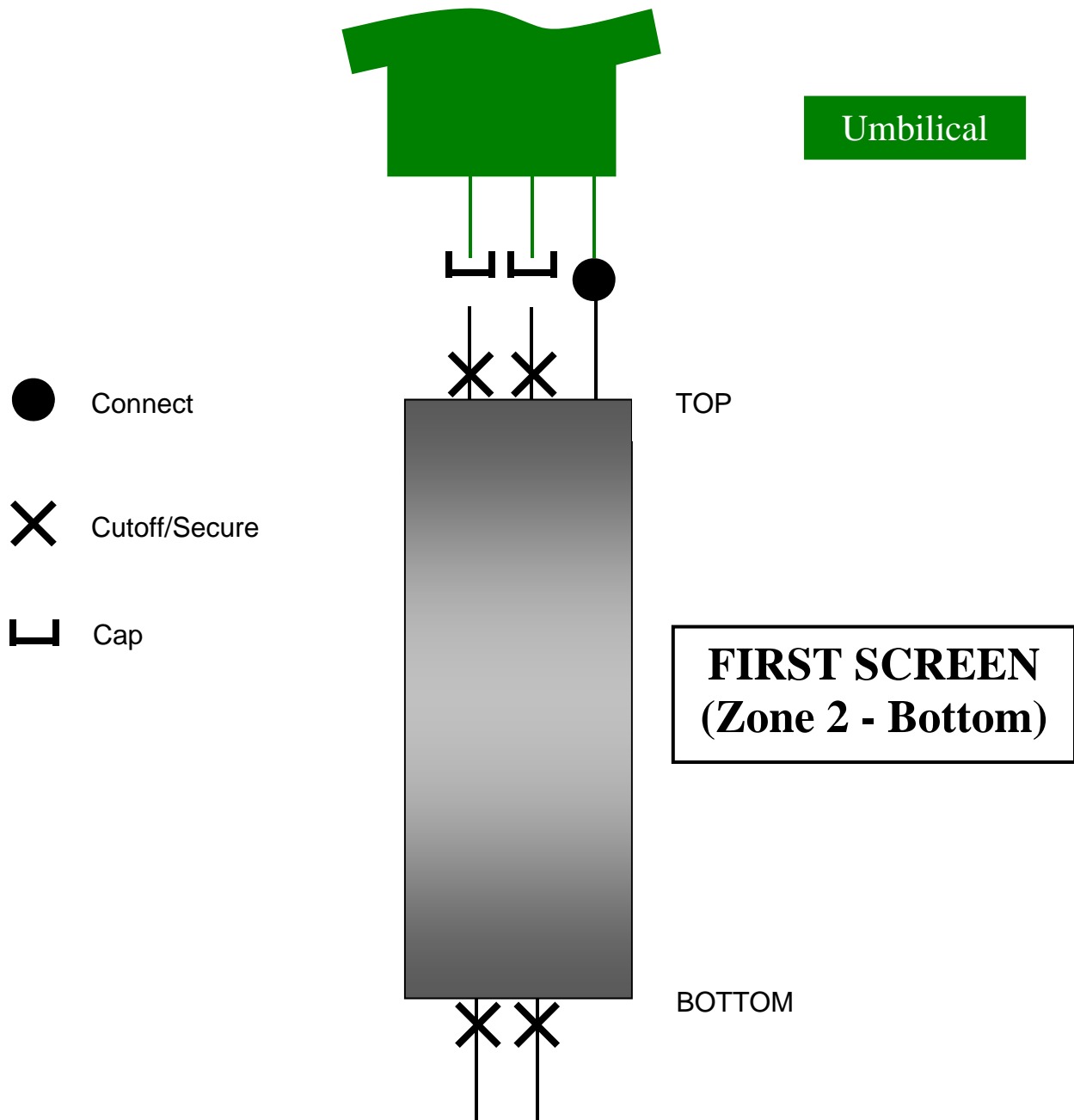
Land ACORK and Drill String Release

90. Record weight of ACORK assembly.
91. Lower string and land ACORK.
92. Pull-up 5-10K to verify latch.
93. Drop HRT go-devil.
94. After landing, pressure 600-800 psi to release.
95. Pull up 4-5m. Verify weight.
96. Pressure above 1,200 psi to shift go-devil piston (POOH dry).
97. POOH w/ drill string to just above ACORK.
98. Verify/video record installation with VIT.
99. POOH w/ VIT.
100. POOH w/ drill string.

HIKURANGI U1519B ACORK RUNNING GUIDELINES

Pre-Drilled Hole

2018-04-20 Update

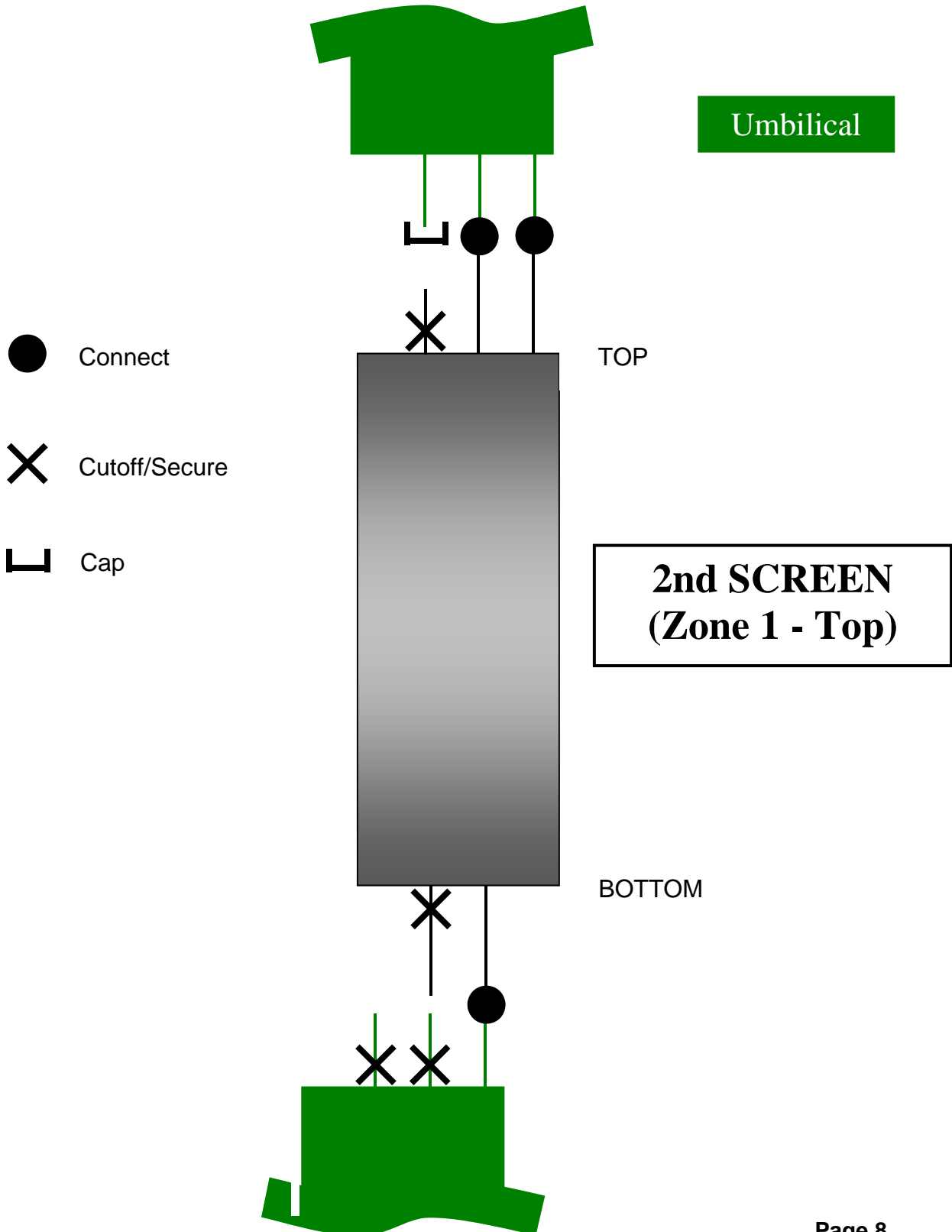


NOTE: Screens were manufactured with the sample line as #3 (versus #1 as requested). Umbilical is hooked up right to left and lines are crossed at the CORK to match up Zone 1 (Upper) and Zone 2 (Lower).

HIKURANGI U1519B ACORK RUNNING GUIDELINES

Pre-Drilled Hole

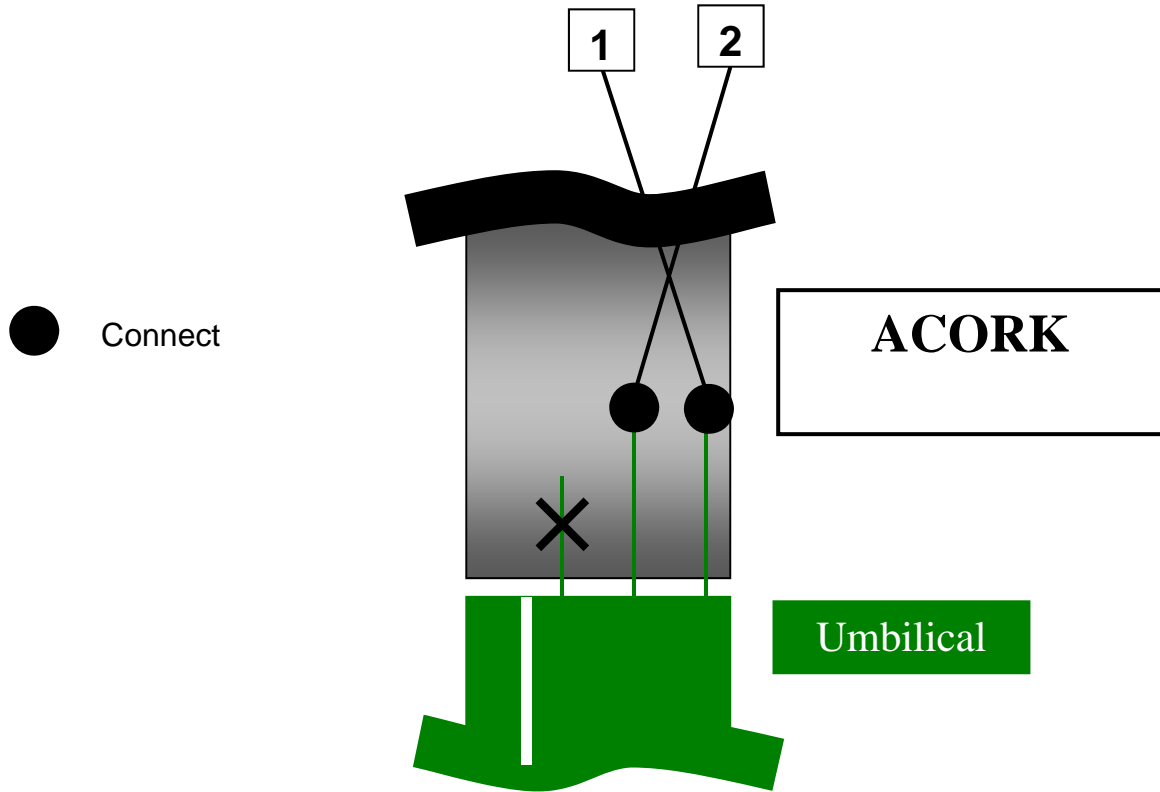
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HIKURANGI U1519B ACORK RUNNING GUIDELINES

Pre-Drilled Hole

2018-04-20 Update



HIKURANGI U1519B **CORK-II** RUNNING GUIDELINES

2018-04-17

Pre-Deployment

1. Prepare the installation plan. Confirm tallies.
2. Locate either a 2 or 3m drill collar sub and makeup to the CORK running tool.
3. Paint Site/Hole No. on CORK-II.
4. Locate instrument string handling sheaves.
5. Ensure ERS is ready to go and proper cable head is installed.
6. Install 32" Sleeve in VIT.
7. Stage the 6-3/4 lift subs (5-1/2 FH or FHM) and slips.
8. Stage a 4" rabbit.
9. Stage 4-1/2" elevators, slips, dog collars, and ~~tong dies~~.
10. Stage the 6-3/4 bullnose and the 6-3/4 collar to 4-1/2 xover where they will be accessible.
11. Stage 4-1/2 steel (1, 2, 3, and 6m) pups where they will be accessible.

Deployment

12. Drift with 4" rabbit.
13. Run the 6-3/4" bullnose, drill collars, and xover to 4-1/2" per the plan.
14. Run the 4-1/2" casing per the installation plan.
15. Spread the drill pipe stabber.
16. Place the CORK-II on the skate and position in the pipe stabber with the top extended onto the rig floor far enough to engage the CORK running tool.
17. Pick up the CORK running tool and engage the CORK-II.
18. Paint the lifting lugs and the CORK running tool slots so as to be more visible to the VIT.
19. Pick up the CORK-II with the block.
20. Make up the CORK-II to the top of the 4-1/2" casing string.
21. Pull the bushings. CORK-II wellhead is 30 in. diameter.

HIKURANGI U1519B CORK-II RUNNING GUIDELINES

2018-04-17

RIH with the CORK-II

22. Open moonpool doors.
23. RIH with CORK-II and VIT.
24. Before reentering, record weight.
25. Reenter the borehole.
26. Lower CORK-II. Monitor weight. Chase w/ VIT. Do not land.
27. Park CORK-II just above wellhead. Note height for logging engineer.
28. Run instrument string and top plug with ERS/logging line.
29. Pull ERS and logging line.
30. Land CORK-II.

Drill String Release

31. Set 5,000 to 10,000 lb on top of the Cork wellhead.
32. Apply minimal right hand torque to the Cork running tool and hold it.
33. Pick up the drill string until the Cork running tool comes free.
34. Visually inspect the installation. Allow a minute or two for a good recording.
35. POOH with the VIT.
36. POOH with the drill string.
37. Break subs off CORK Running Tool.






375 Bridge Plug Running
2018-04-19

OBJECTIVE: Set a TAMPLUG Inflatable Bridge Plug in 10-3/4" Casing (10.05" ID) at depth of TBD, release off, and pull out of hole.

EQUIPMENT ON LOCATION:

ITEM	QTY	TYPE	PART NUMBER	DESCRIPTION
10	2	S	506-TP-12017304	5-1/16" TAMPLUG, Non-Safelok, w/ 550-SE-11 Element, SLATS UP, Rotate Release Sub, Gauge Ring 425-TJ-27C, Solid Guide Plug (425-PW-76), Circ Ports Closed, 3-1/2" IF Box
				Shear Wires - Open 1,016 psi (11080102), Close 1,446 psi (11080105)
20	2	R	475-HR-11908000	4-3/4" Hydraulic Release Running Tool w/ Release Sub, 10 pins for 3,450 psi (345 psi/pin) for No-Ball Release
				Blank Benoil Burst Disk Installed, 3-1/2" IF Box x Pin
30	2	R	475-FS-01	4-3/4" Fill Sub for 1-7/8" Ball (188-SB-13), 3-1/2" IF Box x Pin
40	2	S	188-SB-11	1-7/8" Steel Ball
50	2	R	PUP	4' Pup Joint Handling Sub, 3-1/2" IF Box x Pin
60	2	R	XOVER	Crossover, 4-1/2" IF Box x 3-1/2" IF Pin

**375 Bridge Plug Running
2018-04-19**

	DESC	OD (IN.)	LEN (M)	CONN	TORQUE	DRIFT W/ 1-7/8" BALL
TOP				6-5/8 FHM BOX		
OG0912	XOVER	8.5	0.81	4.5 IF PIN	18K	
	XOVER	6.5	0.25	4.5 IF BOX 3.5 IF PIN	18K 9K	
	PUP	4.75	1.71	3.5 IF BOX 3.5 IF PIN	9K 9K	
	FILL SUB	4.75	0.20	3.5 IF BOX 3.5 IF PIN	9K 9K	LANDS IN SEAT
	HYD RELEASE (.35M LEFT IN HOLE IF ACTUATED)	4.75	0.73	3.5 IF BOX 3.5 IF PIN	9K 9K	
	PACKER, INFL (LEFT IN HOLE)	5.06	2.87	3.5 IF BOX	9K	
BTM				BULLNOSE, CLOSED		
			6.57	TOTAL LEN		

PRE-JOB PROCEDURE:

- A. Upon arrival at the rig site, immediately check all tools on location against the shipping documents and check the tool conditions to assure that no damage has occurred during transportation to the rig site.
- B. Insure that all TAM equipment is compatible with other equipment on location, and that all required handling tools are on location.
- C. Discuss job with company personnel and all personnel involved in operation.

375 Bridge Plug Running

2018-04-19

- D. Set mud pump motors in series, to better fine-tune the low pump rates required.
- E. Confirm minimum restriction the 5.06 TAMPlug must pass through.
- F. Drift upper section with 1-7/8" Ball.
- G. Lightly dope pin end only on all connections.
- H. Pressure test lines to 3,500 psi (5,000 preferred).

RUNNING PROCEDURE:

1. Make up the BHA to the work string and pick up.
2. Run in hole at (1) stand per minute 60 fpm. Check that pipe is filling every (10) stands. If not, fill the pipe.
3. Do not rotate the workstring in the hole during run. Right hand rotation could cause the release mechanism to activate. Make sure to slow down and take caution while passing through restrictions.

Note: If rotation is required keep it to a minimum and to 5,000 ft/lbs. The left-hand release thread is torqued to 9,000 ft/lbs.
4. Run in hole to setting depth of TBD, establish and record up and down weight. Circulate 30 bbls water at 2 bpm to clean off ball seat. Caliper and drop 1-7/8" Steel Ball (preferred) down the pipe. Allow time for Ball to fall (~10 minutes per 1000m).
5. With Ball on Seat in the fill sub slowly engage the Pump at a 1/4 to 1/2 bbl/min and pressure up to 500 psi and hold for 1 min. Continue pressuring up in 200 psi increments until opening valve shear is observed at 1,016 psi \pm 15% (836 psi low / 1,168 psi high). Monitor the pressure bleed down until it stabilizes.
6. Pick up 5-10K over string weight on drill pipe. This will indicate that the Bridge Plug Packer is inflating and anchoring inside of the casing. Return to neutral weight.
7. Slowly increase pump pressure in 400 psi increments to closing valve pressure at 1,446 psi +15% (1,663 psi). This will the closing valve and lock pressure inside the element.
8. Bleed off surface pressure and leave valve open and hold for 10 minutes. Perform push/pull test to 5-10K lbs. If weight is maintained this is an indication that the closing valve has shifted and trapped inflation pressure in the element.

375 Bridge Plug Running

2018-04-19

9. Apply 2,000-5,000 lbs. tension to the tool and torque the work string to the right to break the release connection. Rotate 20 turns to the right.
10. Pick up 20 feet with drill pipe to verify release from packer. Can also pump slow rates to verify – if released there will be no build in pressure.
11. POOH with running assembly.

Contingencies:

- A. If the TAMPLUG fails to anchor after applying pressure to Work String.
 - a. Verify the proper pressure has been applied, check the lines and pump. Increase pressure to initiate inflation.
DO NOT EXCEED 2500 psi.
 - b. Allow the bridge plug to stabilize for 30 minutes before checking for anchor again.
- B. If right-hand torque cannot be applied to tool:
 - a. Activate the Hydraulic Release mechanism. Set down 10-20K lbs down on the TAMPLUG. Pressure up to 3,450 psi $\pm 15\%$ (2,932 psi low / 3968 psi high) until a pressure drop is observed indicating the hydraulic release has activated.