

May 2, 2010

Version #6

Capping Procedure  
Deepwater Enterprise

***Pre-Deployment Activities:***

1. Recover compatts from relief well location.
2. Deploy compatts at the Macondo well per Enterprise requirements.
3. Perform DP calibration, box in the DP system.
4. Perform check of DP system.
5. Install double resilient AX Gasket in the HC connector and use solids pins to hold the gasket in the HC connector. (Confirm temp & oil compatibility)
6. Remove Hydrate Gasket from the HC connector if equipped.
7. Prepare Glycol / Seawater Mixture for hydrate prevention in the choke and kill lines.
8. Inspect 500 T manual DP elevators and the LMRP hook, they may be used for the Horizon LMRP recovery.
9. Deploy Enterprise Seafloor ADCP. A second ADCP is being shipped to the rig. Need to check Simops for acoustic frequencies management plan.
10. ROV ADCP being shipped to the rig, prefer both ROVs to have ADCPs.
11. ROV boat standby for cutting Ops. SimOps plan for ROV boat.
12. Two Diamond Wire Saws (on ROV vessel) are on the rig to be used to cut DP/Casing stub proud of the Horizon stack when the LMRP is pulled.
13. Chop saw to be available to be used to cut AFT DP if we have to emergency disconnect from the Horizon LMRP.
14. Have ROV methanol skid ready to deploy (ROV boat)
15. Rig to have all supplies onboard to minimize workboats along side when the LMRP is pulled and the stack latched onto the Horizon stack.
16. Circulate and condition the 16.4 ppg mud. This mud may need to be used to bullhead kill the well after shutting in the well to prevent broaching or if we have a small connector leak.
17. Need \_\_\_ drums of Seal Tite to pump down the choke line to attempt to seal a connector leak. Have man available on rig.
18. Develop Enterprise Ingress / Egress lanes from the safe area to the Horizon BOP stack.
19. Conduct Crew Engagement session before starting operations.

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20. Review Bullhead Kill procedure before starting operations. Developed by another team.
21. Prepare Enterprise BOP space out plan taking into account water depth at BOP deployment site (off location) and water depth on the way to and at the Macondo well.
22. Ensure Horizon LMRP is pre-slung by ROV Vessel prior to moving on location. Review sling design and hook-up procedure.
23. ROV panel functions for both BOP stacks.
24. Stack up dimensional drawing's/weights etc on rig & onshore.
25. Sequence drawing of BOP functions.
26. Secure loose wires etc on BOPs. Look at LMRP recovery slings and whether should be removed or ROV secured.
27. Install blank nose pin on fill-up joint (3rd riser joint run).
28. Have ROV plugs for 4in valves.
29. Procure electronic slope indicator for DP (Check with BP Subsea Eng).
30. Test regulated pressure for hotline at 3000 psi. Confirm pressure integrity of hotline before running.

***Running BOP / Riser:***

1. The BOP and riser will be run as per the DEN TSTPs with the following changes:
  - a. First riser Joint will be a diverter joint - 20 x 8" hole with 90deg phasing.
  - b. Second riser joint (20 x 8" holes with 90 deg phasing) will be a diverter joint with a blank nose pin as the first barrier.
  - c. Third riser joint will be the riser fill up joint with a blank nose pin. The riser joint will have a ROV operated 2x4in ball-valve in the open position. Note - ensure ROV operators are familiar with valve operation prior to splashing joint. Have diagram and ROV friendly handles on the valves (monkey's fist).
  - d. Install ROV fill-up valves in moonpool. Manually open/close valve to verify operation.
  - e. Hot lines to be run on the DP and the riser - need to determine if we can do this?
2. Continue running riser to required depth. Install slip joint and choke, kill, boost, rigid conduit, and remaining surface connections per TSTP utilizing BLAT tool. Bottom of BOP HC connect should be space out so the BOP can be stabbed on the Horizon HC male connection.

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- a. Before the final choke and kill line pressure test (after goosenecks are rigged up), pump glycol / seawater mixture down lines to prevent hydrate in the choke and kill lines.
- b. Verify AX gasket is in place in connector
3. Close 2x4in fill up valves on riser. Line up riser on TT.

### ***Horizon LMRP Recovery***

1. Monitor Weather, Current and Plume forecast to ensure appropriate window for pulling LMRP and BOP installation.
2. LMRP is pre-rigged for a single point lift (2 part or 4 part sling - verify) with the DP on the AFT side.
3. Install inverted manual 6-5/8" DP elevators with slinging arrangement and slack off to moon pool. Install electronic slope indicator on DP (slope indicator on DP on rig fabricated DP bracket) to check for verticality while pulling Horizon LMRP.
  - a. Install closed TIW at bottom of DP.
  - b. Have ROV operator verify slinging arrangement in moonpool
  - c. Have adequate loop (tied off) in the hotline for connecting to DWH stab
4. TIH with 6-5/8" 34ppf FH DP with DP elevators rigged for a single lift - provided by the lifting team. Hot line to be attached to DP to function Horizon LMRP HC connector.
  - a. Topfill DP while RIH with SW.
  - b. Have DP screwed into TD for lifting LMRP
5. ROV to perform visual on Horizon wellhead connector to confirm indicator rod is in the latched position. Fly Horizon BOP stack & wellhead seafloor scan for video reference.
6. Conduct pre-job meeting on pulling Horizon LMRP.
7. Move rig to near well center "hold" point and check space out of BOP stack and DP with respect to Horizon LMRP.
  - a. Confirm DEN & DWH BOP elevations with ROVs
8. Move out and make space out adjustments if required.
9. Make final approach and place 6-5/8" DP near D-ring on lifting kit.
  - a. Space out at surface so that the Horizon LMRP will be placed across from the non perforated area of the riser diverter joint after pulling LMRP.
10. ROV to attach pre-rigged sling onto 6-5/8" DP lifting rigging.

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- a. May have to lay out single after attaching to LMRP lifting sling
  - b. Have ROV monitor for clash while picking up slack
11. Move rig over LMRP and check slope indicators for vertical pull.
12. Pick up 295,000 lbs over string weight, 50,000lb overpull. (LMRP weights: 245,000 lbs buoyed and 282,000 air weight).
13. Position one ROV to watch the Horizon LMRP connector and the second ROV to install Hot line stabs into Horizon LMRP ROV stab.
  - a. ROV release hotline stab loop from DP
14. Install hot line stabs into primary and secondary Horizon LMRP connector control panel ports. After the hot line is stabbed, the ROV needs to clear area of LMRP and monitor activities.
  - a. Secondary pressure source will be the subsea accumulator at the Horizon stack.
  - b. Third pressure source will be the ROV pump
15. Activate LMRP connector disconnect with a max of 3000 psi. CMC should stroke indicating unlatch. Confirm unlatch with ROV.
16. Move rig to place the Horizon LMRP out of the hydrocarbon flow stream / plume per egress plan.
  - a. PU one stand on the 6-5/8" DP to clear LMRP from BOP HC mandrel if req'd for clash issues.
17. ROV to disconnect hot stabs from control panel. ROV to monitor Horizon LMRP. If Horizon LMRP is clashing with the riser, the Horizon LMRP will be placed on the seafloor.
18. Have 2nd ROV check:
  - a. DP protruding from BOP
  - b. Check if AX gasket was removed with LMRP
  - c. Check the condition of the HC connector
  - d. Check BOP/Seafloor conditions
19. Have ROV vessel cut DP if sticking above stack.

***Install Enterprise BOP and Well Shut In:***

1. Evaluate hydrocarbon flow to determine BOP separation / standoff for stabbing onto Horizon BOP stack.
  - a. Monitor riser on TT throughout following ops to verify no leak through riser plugs
2. Move BOP over well center while monitoring with ROVs.

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3. Stab BOP onto HC mandrel while monitoring with ROVs.
4. Slack off 50,000 lbs weight. Close and lock HC connector.
  - a. Check indicator rod with ROV to ensure full travel (3000 psi lock pressure).
  - b. Move ROV to safe area
5. Pull test connector to 50,000 lbs overpull.
  - a. Confirm indicator rods on DEN & DWH with ROV
6. Set up riser tensioners per procedure for EDS
7. Fly stack and confirm position (if visibility allows)
8. Shut in the well in the following sequence:
  - a. Close Casing Shear Ram (confirm gallon count \_\_\_ )
  - b. Close Lower Blind Shear Ram (confirm gallon count \_\_\_ )
  - c. Close Upper Blind Shear Ram (confirm gallon count \_\_\_ )
9. Monitor shut in pressure via BOP pressure gauges.
10. Monitor well and seafloor area with ROV and HC & Wellhead connector.
11. Be prepared to start pumping KWM through choke/kill lines to well

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