



TOTAL

Total E&P USA, Inc.

**Matterhorn
Mississippi Canyon Block 243
Well A5**

OCS-G-19931

AFE # Pending

**Slickline Intervention Procedure
(Shift Sliding Sleeve)**

Ref: TEPUS/OPE/DWW 010/2007 P

Revision 0 - January, 2007

Reviewed by: GSR _____ **Date:** _____

Reviewed by: Field operations _____ **Date:** _____

Reviewed by: Well Performance _____ **Date:** _____

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**Matterhorn
Viosca Knoll Block 823, Well A-1
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HISTORY

The well was originally completed in June of 2004.

During Original Completion (6/1/04 – 6/26/04)

- ❖ Perforating and frac pack operations were performed with some minor problems
 - Some minor weight losses were noticed while tripping through the 10-3/4" x 9-5/8" crossover at +/- 6157' with various BHA's.
 - Fluid losses to formation encountered post frac.
 - The MSV shifting tool and Spectra Scan logging tools were lost in hole after frac packing the Middle 'A' Sand. They were subsequently fished from the well.
 - Difficulties snapping into Comp II GP packer at 8614' MD on clean out trip after perforating the Upper 'A' Sand
- ❖ Ran completion and tested all equipment while RIH – OK.
 - MMSUV – closed
 - MMSLV – open
 - AFV - closed
 - Upper MSV-O - closed
 - RFV - closed
 - Lower MSV-O -closed
- ❖ RU SLU to drift tubing prior to landing the tubing hanger:
 - Three attempts were made before discovering a 4' pup joint in the tubing hanger handling assembly was damaged
 - The pup joint was replaced and the tubing was successfully drifted.
- ❖ Land tubing hanger – OK.
- ❖ RU SLU and RIH w/ 'X" selective test tool.
 - Required two attempts to successfully set test tool in 'X' profile at 8233' SLM.
- ❖ Nipple up and test tree – OK.
- ❖ Pressure up on LS to 5000 psi to open AFV and RFV.
 - Positive indication that AFV opened by a 503 psi decrease in pressure at the upper gauge.
 - No indication that the RFV opened with no change in pressure at the lower gauge.
 - Two additional attempts made to open the RFV by pressuring up to 6500 psi on the LS were made with no success.
- ❖ RU SLU and RIH to recover 'X' selective test tool.
 - Required three attempts to recover test tool from the 'X' profile at 8233' SLM.
- ❖ RIH w/ 'BO' shifting tool and shift open the lower MSV-O and flow test well (Lower Zone...Middle A Sand) - OK.
- ❖ RIH to set 'PXN' plug and prong in 'X' profile at 8292' SLM.
 - Made seven attempts without success.

From 7/29/04 To 7/31/04

- ❖ RIH w/ 'BO' shifting tool and shift closed the lower MSV-O and pressure test (Upper Zone...Upper A Sand) - OK.

- ❖ RIH and shift MMSUV open and flow test well - OK.
- ❖ RIH and shift MMSUV closed and pressure test - OK.
- ❖ RIH w/ 'BO' shifting tool and shift open the lower MSV-O and flow test well (Lower Zone...Middle A Sand) – OK.

From 10/13/04 To 10/28/04

- ❖ Set 'PX' plug and prong in 'X' profile at 5986' SLM below GLM #4.
- ❖ Recover GL dummy and install a circulating valve in GLM #4.
- ❖ Unload tubing and annulus with N₂ by pumping own the 1.9" SS.
- ❖ Recover circulating valve from GLM #4 and install GLV.
- ❖ Recover GL dummies and install GLVs in GLMs #3, #2 & #1.
- ❖ Pull 'PX' prong and plug from 'X' profile at 5986' SLM below GLM #4.
- ❖ Install a 1.437" injection valve on 1.9" SS.
- ❖ Turned over to production from the Lower Zone (Middle 'A' Sand) (10/28/04).

Production was interrupted on the Matterhorn platform from September 2004 through June of 2005 due to Hurricane Ivan and from September of 2005 through August of 2006 due to Hurricane Katrina.

OBJECTIVE

Mobilize and run slickline to perform open the upper zone (upper A Sand) to production to provide for commingled production from the Upper A Sand and Middle A Sand.

EXECUTIVE SUMMARY

- ❖ Mobilize equipment (SLU) to Matterhorn Platform
- ❖ Shift Sliding Sleeve open in Upper Zone.
 - R/U SLU
 - Make gauge ring run to ~ 8,300' MD
 - RIH with 'B' shifting tool to 8,225' MD
 - Open MMSUV @ 8,225' MD
 - Place well in test separator for 12 hours
 - R/D SLU
- ❖ De-mobilize equipment

The following procedure is intended as a guideline that should be followed as long as well conditions safely allow. In case of an emergency or well control situation the TOTAL representative in charge should take the appropriate action to ensure a safe and controlled environment. After such action has been taken, the representative should promptly inform TOTAL of the situation as indicated below.

These procedures along with TOTAL Well Control Procedures, Environmental, Safety and Health policies and MMS regulations should be adhered to at all times. Any planned deviation or changes to the program should be reviewed with the Completion Team Leader prior to implementation.

WELL INFORMATION

Field Name	Viosca Knoll Block 823	
Well Name	Matterhorn A-5	OCS-G 19931
RKB to THF		43.69'
Water Depth		2,816'
Drilling Rig RKB-MWL		73'
Completion Rig RKB-MWL		151'
THF Elevation		87' above MWL
Riser	10 3/4" – 9.404" Drift	0' – 2,889' MD
Drive Pipe	36", 1 1/2" WT, X-65, XLC-S	2,879' – 2,958' MD
Drive Pipe	36", 1" WT, X-56, XLC-S	2,958' – 3,159' MD
Casing	26" 3/4" WT, X-56, XLC-S	2,880' – 3,993' MD
Casing	20" 0.812" WT, X-56, XLF	2,876' – 3,417' MD
Casing	20" 0.625" WT, X-56, XLF-RB	3,417' – 5,058' MD
Casing	13 3/8", 88.2 ppf, P110, HD-L	2,878' – 7,041' MD
Casing	10 3/4", 65.7 ppf, Q-125, ANJO	2,877' – 6,077' MD
Casing	9-5/8", 53.5 ppf, Q-125, HD-L	6,077' – 7,202' MD
Casing	9-5/8", 53.5 ppf, L-80, HD-L	7,202' – 9,510' MD
	Long String Detail	
TR-SCSSV	4 1/2", 13 Cr, TRM-4P-DS w/ 3.813" ID	6,029' MD
Maximum Hole Angle	70 degrees	6,013' MD
'X' Nipple	3.813" ID	8,182' MD
'X' Nipple	2.750" ID	8, 223' MD
MMSUV	2.750"	8,225' MD
'X' Nipple	2.750" ID	8, 271' MD
MMSLV	2.750"	8,272' MD
'XN' Nipple	2.635" ID	8, 271' MD
Upper A Sand Perforations	6,561' – 6,614' TVD	8,533' – 8,603' MD
Deviation thru Perfs	~ 63 degrees	
Middle A Sand Perforations	6,716' – 6,741' TVD	8,833' – 8,866' MD
Deviation thru Perfs	~ 55 degrees	
PBTD	9,510' MD	
SITP	1,425 psi	
Packer Fluid	9.0 ppg inhibited CaCl	
Reservoir Pressure (Upper A Sand)	Est 2,072 psi	
Reservoir Pressure (Middle A Sand)	Est 2,370 psi	
BHT	121 degrees F	

OPERATIONAL & SAFETY ISSUES

Health and Safety

Safety is the foremost priority of everyone involved with these operations; safety will not be compromised for efficiency. Contractors were selected on the basis of their safety record in addition to their operational and technical expertise.

Some additional safety-related points:

- All personnel have the responsibility to immediately correct any unsafe act or operation. Any person can halt operations and is expected to do so if an unsafe act is being performed.
- At the beginning of each day, a meeting with all personnel will be held to review the previous day's activities and discuss the operations that will take place during the next 24 hours. Unsafe acts will be reviewed, and special precautions for the next day's activities will be communicated.
- Operations/safety meetings will be held with the appropriate Company and Service Company personnel prior to conducting special operations (perforating, stimulations, flow testing, etc). Personnel and job functions for each operation will be reviewed and discussed.
- Work permit system will be in place during SIMOPS operations.
- SIMOPS plan will be implemented during all completions works.
- Material Safety Data Sheets (MSDS) for all chemicals used will be available at the wellsite.
- Special care must be taken during flow-back operations. All flow lines will be properly secured, and all escape routes will be kept clear of obstacles.
- In addition to providing technical support for the completion and testing operations, the well completion engineers will assist the onsite supervisors to ensure operations are performed safely and efficiently. Deviations from the completion program will be reviewed by the onsite supervisors, well completions engineers, and production superintendent as appropriate.
- All personnel must wear the required Personnel Protective Equipment for each phase of the operations.
- Review any potential SIMOPS Operation with the Production Supervisor on the platform
- **The below list of Company Rules should be reviewed prior to beginning well servicing operations. All well servicing operations must comply with the below listed Company Rules.**

Company Rules are available for download on the Intranet at:

http://mp-web.hq.ad.ep.corp.local/mp/fpl/newSF_new/Referentiel/Well Operation/Well operations_policy.htm

CR FPP 132 – Barriers for Well Servicing Operations

CR FPP 160 – Well Control Equipment

CR FPP 165 – Pressure and Function Tests of Well Control Equipment

Environmental

Environmental concerns are equal in priority to safety and operations. Everyone involved with these operations has the responsibility to work in an environmentally sound manner. Throughout this procedure, specific environmental issues are will be applied.

Some additional environment-related points:

- Special care shall be taken during displacement of all well-bore fluids. All fluids and spacers must be captured and shipped for proper disposal and/or storage.
- Special care must also be taken during well flow-back operations.
- All equipment should be surveyed for NORM prior to running in the well and upon retrieval from the well.

Emergency Operations

In general, interruption of work will be decided by the onsite Wellworks Supervisor, Production Superintendent or the Well Operations Supervisor, depending on the incident. These incidents include, but are not limited to:

- Changes in weather
- Mechanical problems with surface equipment
- Changes in Well flow characteristics

Personnel should make the interruption on duty without any discussion for the following:

- Surface equipment leak sufficient to cause harm to personnel or equipment or cause a release of hydrocarbons
- Unsafe condition with potential to cause harm to personnel or equipment
- Fire

All key service company and supervisory personnel will be familiar with the ESD procedures and required actions.

Hurricane Emergency Operations

Phase 1: Hurricane within 1000 miles (usually 96 - 72 hours) of the facility:

- ❖ No activity shall be undertaken without consideration of the impact of a storm on the ability to complete the activity or to place the activity in a safe shutdown mode prior to a phase 3 condition or until the current condition has been downgraded.
- ❖ Non-essential personnel (those that will not impact current operations) will be evacuated.

Phase 2: Hurricane's leading edge is in the GoM (usually within 72 - 48 hours of the facility):

- ❖ Personnel and equipment will not be mobilized to the facility during a phase 2 condition.
- ❖ Preparations will be implemented that will allow current operations to be suspended and the facility to be placed in a safe shutdown mode and fully secured within a 12 hour period prior to a phase 3 condition or until the current condition has been downgraded.

Phase 3: Hurricane within 500 miles (usually 48 - 36 hours) of the facility:

- ❖ Evacuation of personnel from the facility will be executed per Total's Hurricane Evacuation procedure.

Phase 4: Recovery – post storm

- ❖ Total's OIM will determine the condition of the facility and when personnel may return to work.
- ❖ Total will contact the contractors to have their personnel return to shorebase.

GENERAL PROCEDURE:

A Copy of this procedure must be provided to each Crew Manager and discussed in detail with all personnel. Copies of the Existing and Proposed Schematics and Casing Summary sheet should be posted in the completion unit.

Bullet Indicator Definitions

- Action Point
- ✓ Check and Report
- Informational Note

Operations Guidelines

- Provide and review a copy of the procedure with each Completion Unit Crew Manager and crew.
- Post a copy of the procedure, schematics and drawings in the dog house and/or completion unit.
- Post a copy of the Emergency Contact Numbers in the dog house/completion unit (with the current well name and directions to location).
- Review any potential SIMOPS (simultaneous operations) with the Operations Superintendent prior to proceeding.
- Conduct a JSA at the beginning of each work day and review the current operations of the procedure with all personnel prior to beginning daily operations.
- Conduct a JSA with all personnel prior to beginning any specialized operations (slick line, coiled tubing, etc).

Pressure Testing Guidelines

- ✓ Report all pressures and responses at any monitoring points on morning report
- ✓ Report all pressure tests as a single entry on the morning report
- All pressure tests shall be charted with charts sent to the well files in Houston. Copies of the test charts should be provided to the on-site representative of the equipment manufacturer.
- The volume of test fluid pumped shall be monitored, logged, and reported.
- A pressure test is considered satisfactory if recorded pressure is stabilized for 10 minutes at the pressure test value with a pressure drop of less than 5%, limited to 300 psi.
- A copy of all service company daily job logs shall be sent to the Houston office to be included in the wells files upon completion of well work.

Reporting Guidelines

- ✓ Report Anomalies and Stop Cards to the Completion Superintendent on a daily basis.
- ✓ Report all completion operations, i.e., perforating, TR-SCSSV tests, etc, into the appropriate section of Wellview.
- ✓ Report the testing of any completion system component as a separate line entry in the time log in Wellview.

Pre-Job Preparation by Production Personnel:

1. Inspect and test Surface Shut-down System, vessel and system controls.
2. Identify instrument flange or connection point for surface data acquisition equipment on test separator.
 - Pressure / Temperature transducer has a ½" NPT Male Connection
3. Operate, test and grease if needed all valves and ensure actuators function on tree.
4. Operate and grease if needed casing valve(s).
 - ✓ Note any problems.
5. Inspect the SCSSV control panel. Function test panel and SCSSV.
 - Monitor control line pressure to ensure that SCSSV maintains control line pressure.
6. Disconnect primary SCSSV control panel system. Install and function test a remote SCSSV hydraulic control panel which is to be supplied by SLB SLU.
 - Monitor control line pressure to ensure that SCSSV maintains control line pressure.
7. Review load capacity and boom of crane for equipment lifts from boat and for lubricator and C/T injector support.
 - Inspect crane for potential problems.
8. Check all SITP and SICP's.
 - ✓ Communicate this on all daily operations reports.
9. Clearly identify (with the Production Superintendent) the A-8 production tree.
10. Survey A-8 production tree to ensure that flange bolts on top connection are serviceable. If flange bolts are corroded notify Houston office so that new bolts can be sent out and arrangements made to remove old bolts.
11. Identify instrument flange or connection point for data acquisition equipment on test separator.
 - Pressure / Temperature transducer has a ½" NPT Male Connection
12. Locate the fusible lockout cap for the actuated master valve.
13. Check that all slings are in good condition and properly secured to the load.
14. Have an ample supply of absorbent pads on locations during all operations.
15. Use Absorbent rolls for all SLU operations to catch all effluent when running in and out of the hole.
16. Test each piece of equipment for NORM upon lifting it onto the main deck of the platform.
17. IR testing of fluids destined to be released overboard should be performed every hour during cleanout or flow back operations.
18. A maximum threshold of 40 mg/liter must be observed during IR testing. If this limit is exceeded the release of fluids overboard must be stopped immediately and the situation evaluated and corrected prior to resuming disposal of fluids overboard.
19. Samples for gravimetric testing (EPA) must not exceed four samples in a 24 hour period.

Mobilization / Demobilization Operations

- Coordinate with Production and Logistics / Dispatcher on transporting the SLU equipment out to Matterhorn on the production crew boat and / or other vessel.
- Coordinate equipment transportation with Logistics / Dispatcher to give service companies time to get all equipment to the dock in a timely manner for transportation offshore to Matterhorn.
- Mobilize and locate SLU and equipment on the main deck.
- Mobilize certified crane operator to coincide with the arrival of the equipment at the PLATFORM to support operations.
- All 3rd party rental equipment used by vendors will be transported out with their equipment. Third party costs must be captured in the daily costs.
- Demobilize SLU upon the completion of operations.

Slickline Operations

1. RU SLB's 0.092" & 0.108" slickline unit on the top deck.
 - Review load capacity & boom position of crane for equipment lifts and for lubricator support.
 - Verify that the choke and wing valve are closed.
 - ✓ Record and report SITP and SICP
 - Shut in crown valve and actuated master valve on tree run and count the number of turns on the manual valves.
2. Inspect and function test the remote SCSSV hydraulic control panel.
 - Remote system to be supplied by SLB.
 - Monitor control line pressure to ensure that SCSSV maintains control line pressure.
 - ✓ Record and report SITP and SICP
3. Perform well hand over from Production personnel to Well Works personnel using Well Hand Over Form per CR FP EPO 521 Rev 00 06/07/05.
4. ND the FMC flanged tree cap adapter.
5. NU a 10M Adapter flange x Bowen lubricator adapter (to be supplied by SLB).
 - Ensure to have extra ring gaskets on location.
6. RU SLB's 3-¹/₁₆" , 10M BOP and 3" lubricator.
 - BOP requirements:** (from top down)
 - Hydraulic stuffing box.
 - 3", 10M lubricator.
 - 3", 10M IN-Situ Sub.
 - 3", 10M remotely operated wireline BOP
 - 3-¹/₁₆" , 10M Crossover
7. Rig up lubricator and tool string with a 2.741" Slotted Tubing Gauge and 1 ¾" x 2' sample bailer.
 - Review completion schematic (Attachment A) for potential hazards and locations of completion equipment.
 - Have a tool string schematic with lengths and OD prior to running in the well.

8. Stab lubricator on BOPs. Pick up tool string to top of lubricator.
9. Pressure test the BOPs and lubricator with glycol to 250 psi low and 5000 psi high.
 - Bleed off pressure in lubricator to 200 psi over SITP after a successful test.
 - ✓ Record pressure test in daily report
 - Run caution tape from wire line unit to lubricator to highlight the wire line work area.
 - Note: Any additional runs will be pressure tested to 500 psi over tubing shut in pressure.
 - Chart all tests as per TOTAL and MMS specifications.
 - ✓ Record pressures on a 4 hour chart.
 - ✓ Document the results in the daily report and platform well files.
 - A pressure test is considered satisfactory if recorded pressure is stabilized for 10 minutes at the pressure test value.
10. Open the actuated upper master valve
11. Install a Fusible lockout on the actuated upper master valve & engage the safety system pilot.
 - Bleed off pilot pressure to test the lock-out.
12. Install the threaded lock-out safety cap on the actuated upper master valve to ensure a positive mechanical lock out of the device.
13. Pressure up on the TR-SCSSV control line to 10,000 psig and isolate it from the ESD system.
 - Run a control line and pressure gauge to the slickline cabin.
 - Ensure operator can visibly monitor control line pressure while tools are in the hole.
14. Open the crown valve.
15. Run in well with gauge sample bailer to 'XN' nipple @ 8,287' MD.
 - Count number of turns to open manual master and swab valve and record in daily report.
 - ✓ Note fluid level and record on daily report.
 - ✓ Record slickline depth in daily report.
 - ✓ Record slack off and pick up weights on tool string while running in the hole.
 - If obstruction is found work sample bailer to recover a sample. Sample should be kept and sent in for analysis.
 - Have a tool string schematic with lengths and OD prior to running in the well.
16. Make up toolstring with 3 ½" 'B' shifting tool and anti-blow up tool.
17. Test Lubricator & BOP to 500 psi over shut in tubing pressure.
18. Run in well with 3 ½" 'B' shifting to MMSUV @ 8,225' MD.
19. Shift open MMSUV @ 8,225' MD and observe changes in tubing pressure.
 - Observe changes in tubing pressure and record in daily report.
 - ✓ Note fluid level while POOH and record on daily report.
 - ✓ Record slickline depth in daily report.
20. Pull out of hole and lay down lubricator and tool string.
21. Place night cap on tree and standby for flow test.

Flow Test

22. Perform well hand over from Well Works personnel to Production personnel using Well Hand Over Form per CR FP EPO 521 Rev 00 06/07/05.
23. Place well in test separator for 12 hour flow test to evaluate commingled production from Upper and Middle A sands.
24. Perform well hand over from Production personnel to Well Works personnel using Well Hand Over Form per CR FP EPO 521 Rev 00 06/07/05.

Note: If production results are undesirable SLU should be prepared to rig back up on the well to close MMSUV @ 8,225' to return well to previous production status.

Demobilization

25. Rig down SLU equipment.
 - Close manual valves on run of tree.
 - Remove fusible lockout cap on Actuated Master valve and return SCSSV to ESD system
26. Remove the adapter flange from the tree and install the tree cap.
 - Check and confirm the tree's Manual Valves and the actuated master valve are closed.
 - New seal rings will be used.
27. Perform well hand over from Well Works personnel to Production personnel using Well Hand Over Form per CR FP EPO 521 Rev 00 06/07/05.
28. Return operations to OIM.