From: Stacia Brooks
Sent: Tue Jul 20 21:20:13 2010
To: Kidd, Gavin N; 'Blue, Mike (Houston)'
Cc: Ed Lewis; Greg Childs; Julie Hoech; Leon Schwartz; Lindsay Skinner; Philip Kuentz; Susan Asel
Subject: Final Report WEST Job 3940 GSF DD II
Importance: Normal
Attachments: image001.png; BOP Final 3940 GSF DD II.pdf; Rec Sum 3940 GSF Dev Driller II rev2.xls

Mr. Kidd:
Attached is an Adobe PDF copy of the Final Report by David Moore and Greg Pennock for the *GSF Development Driller II*, WEST Job #3940. Three hard copies and three CDs will be sent within two business days. Also attached is an Excel copy of the Recommendation Summary and Disposition, Section 3, that will allow work to commence in closing out the recommendations.
Thank you for using WEST to assist in assuring your drilling rig equipment meets those quality standards that will result in improved safety and environmental performance, as well as reduced equipment downtime through comprehensive, expert equipment assessment and testing.

Regards,

Stacia Brooks
DTE Lead Administrator
WEST logo with derrick and Engineering Services text
907 Bains Street
Brookshire, TX 77423
(281) 934-2666
www.westengineer.com


WEST ENGINEERING
SERVICES

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

Mr Gavin Kidd
BP Exploration and Production Inc.
200 WestLake Boulevard
P.O. Box 3092
Houston, TX 77253-3092

12 July 2010

Subject: *GSF Development Driller II*

Reference: Acceptance of Well Control Equipment

Dear Mr Kidd:

Enclosed is the report from our recent assessment of the well control equipment on the *GSF Development Driller II*. Thank you for using WEST Engineering Services to assist in performance of the well control equipment inspection and acceptance testing.

The cooperation received from the personnel aboard the *GSF Development Driller II* was most appreciated. Special thanks go to the subsea engineers. Their assistance allowed the testing and assessment to progress smoothly.

The highlights of this assessment include:

Hydril Ram BOPs: The port upper blind shear ram bonnet was replaced with a factory reconditioned bonnet. All the MPL locks were inspected and the bearings changed in all the locks, and two complete lock assemblies changed for new ones. The ram BOPs were dressed with all new packers and successfully pressure tested to maximum working pressure. The operating chambers were also successfully tested to full working pressure.

Hydril Annular BOPs: Both annular BOPs were disassembled for inspection. A new piston was installed in the lower annular after it failed the operating chamber pressure test. Both annulars were successfully tested to full working pressure, including the operating chambers and the wellbore.

Deadman/Autoshear System: The deadman/autoshear emergency backup system was repaired and made operational then fully tested and witnessed by MMS, both on surface and subsea. During the initial testing it was discovered that the system did not operate as designed. Some modifications were required.

ROV Intervention: The ROV intervention system was fully tested on all the ROV operable BOP functions. The functions were operated with the ROV pump, chart recorded, and witnessed by MMS. However, there were several leaks repaired.

While conducting this assessment, WEST has made comments and recommendations to assist improving operation of well control equipment, improving safety and increasing equipment reliability. In conformance with API and ISO recommendations, WEST will follow up these recommendations to ensure their satisfactory resolution. To expedite this process, WEST has included Section 3 in this report.

Should you have any comments on the contents of this report, please do not hesitate to contact us at WEST Engineering Services. It has been a pleasure to serve BP. Your faith in our service is most appreciated.

Best Regards,

p.p.

Greg Pennock and David Moore

cc: M. Montgomery – WEST WEST Report #3940

Section 1: Executive Summary

Operator:	BP
Rig:	*GSF Development Driller II*
Contractor:	Transocean
Location:	Mississippi Canyon 252 #2 Drill
Water Depth:	5,134 feet
Dates of Assessment:	14 May to 10 June 2010
WEST Representatives:	Greg Pennock and David Moore
WEST In-House Technical Review:	Tom Bishop
WEST In-House Administrative Review:	Stacia L. Brooks

Operator Personnel

Wellsite Leaders:	Mitchell Bullock, Mickey Fruge, Doug Caghron Richard Speyrer, John Sistrunk Dd2wellsiteleader@bp.com (713) 422-5213

Contractor Personnel

Rig Manager:	Mike Blue Mike.blue@deepwater.com
Asset Manager:	Tony Reid Tony.reid@deepwater.com (832) 587-6933
Superintendant:	Dennis Barber superintendant.developmentdriller2@deepwater.com
Chief Engineers:	Adam Wheeler William Childs chiefengineer.DevelopmentDriller2@deepwater.com
Subsea Supervisors:	James Coco Kurt Thwaites subseaengineer.developmentdriller2@deepwater.com
Subsea Engineer:	Jared Minga

Section 2: Executive Summary

WEST joined the *GSF Development Driller II* in the Gulf Of Mexico after the rig had moved from the Atlantis project to Mississippi Canyon in preparation for the *Deepwater Horizon* relief well campaign. The between well maintenance along with extensive pressure and function testing of all the BOP systems was witnessed by WEST and the MMS. Several issues were identified and corrected with the most significant concerning the deadman and EDS systems.

Hydril Deadman, Autoshear, and Emergency Disconnect System

The deadman and autoshear systems were fully function tested and witnessed by MMS. It was discovered during testing that the deadman system was incorrectly installed and would not function as designed. The required modification to the system was made and the deadman successfully tested both on surface and when the BOP was run subsea. See Daily Reports #11, #12, #13, #14, #15, and #23. The EDS system was successfully tested from all operating stations. See Daily Report #14.

Secondary Intervention System

The ROV secondary intervention system was fully function and pressure tested, and the test charts recorded. MMS witnessed all the tests. Although the testing was successful there were several leaks identified that had to be repaired. See Daily Reports #8, #10, and #11.

Annular- BOPs - Hydril GX Upper and Lower 18-3/4" 10,000 psi

The upper and lower Hydril GX annulars were disassembled for inspection. The upper annular components were inspected and found to be in good condition. The annular was rebuilt with a seal kit in the operating chamber and with the original element; as this was "like new," with only 12 closures recorded on it. See Daily Report #2. The lower annular components were inspected and the operating piston was found to be scored. The lower annular was rebuilt with the original piston and was found to leak during operating pressure testing. See Daily Report #2 and #3. The annular was again disassembled and a new operating piston and seal kit installed. The operating chambers were successfully pressure tested after rebuilding, and both annulars were successfully wellbore pressure tested to maximum working pressure on both the 5 7/8" and 6 5/8" pipe used in the well. The annulars were successfully API drift tested after the pressure testing was completed. See Daily Reports #7, #16, and #20.

Ram-BOPs - Hydril 18-3/4"Compact 15,000 psi

The BOP bonnets had been opened, inspected, and closed before WEST arrived onboard. TOI stated that all the ram packers and door seals had been replaced with new ones. The MPL locks had all been inspected and the bearings replaced; the complete MPL nut assemblies had been replaced on the upper pipe ram starboard bonnet and the port SSTV test rams bonnet. The upper port shear ram bonnet was replaced with a factory reconditioned bonnet as there had been a problem removing the MPL lock overhauling nut from the overhauling screw of the bonnet in service. See Daily Report #3. The MPL locks were signature tested and the open/close operating chambers pressure tested. See Daily Report #4. The BOP was fully function tested and pressure tested to maximum working pressure. The BOP was successfully drift tested after the testing was complete. See Daily Reports #15-#20 for BOP pressure testing.

Controls - Hydril MUX Pod, Non- Retrievable

The control system was subjected to normal between wells maintenance with the between wells electrical check list completed by the rig ET and Hydril service representative. See Daily Report #8. The blue pod required three electronics boards to be replaced: the node network processor card in SEM A, solenoid driver card #3 in SEM A, and the utility board in SEM B. See Daily Reports #15, #16, and #17. After the BOP had been run, it was found that the blue pod casing shear ram close solenoid #35 had failed. The BOP had to pulled back to the surface to replace the solenoid. See Daily Reports #23 and #25. The pods were fully function tested from all remote panels and all SEMs before the BOP was re-run. The casing shear ram regulators were replaced on the LMRP and 5,000 psi SPM valves added to the hydraulic circuit were tied into the pod select to match the casing shear supply to the pod selected. See Daily Report #13.

Failsafe Valves - WOM 3-1/16" 15,000 psi

All the failsafe valves were greased and the open/close operating chambers pressure tested. During wellbore testing it was found that three failsafe valves would not close using operator spring force only. See Daily Reports #15 and #16. The lower inner choke, upper inner choke, and inner gas bleed valves had their operators replaced with rebuilt units and were successfully wellbore tested using spring force to close only. All the failsafe valves were tested from the top and bottom to maximum working pressure, and also in the "mid-stroke" position as it is required by WOM.

Riser, Wellhead Connectors, and Choke and Kill Line Retractable Stabs

The Vetco HAR H4 riser connector was greased and inspected, and no anomalies found. The Vetco SHD H4 wellhead connector was removed and replaced with a Cameron HC connector for possible intervention on the *Horizon* BOP. This plan changed however, and the wellhead connector was again changed back to the Vetco SHD H4 connector. Both the choke and kill line retractable stabs on the LMRP were replaced as both were found to be leaking internally when the operating chambers were pressure tested. See Daily Reports #2 and #4.

Choke, Kill, and Conduit Flexible Lines

The moonpool kill line drape hose was replaced along with both the moonpool blue and yellow conduit drape hoses. The moonpool mud boost hose was replaced along with the blue conduit hose on the LMRP. All the hoses in the BOP system now have up-to-date certification.

Choke Manifold

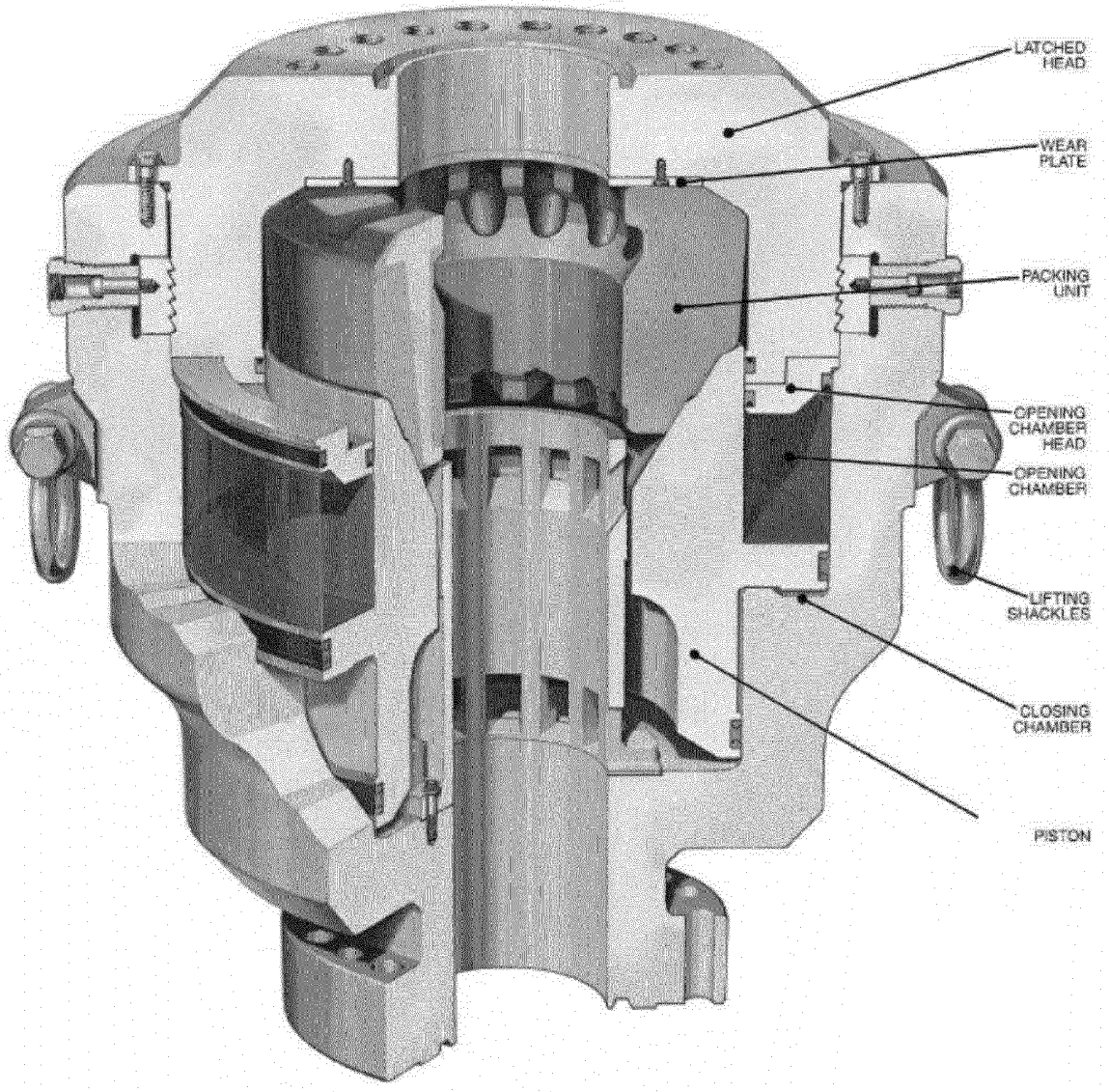
The two auto chokes and two manual chokes were removed from the manifold for inspection. The auto chokes were found to be in "as new" condition, so were replaced on the manifold. Both the manual choke seats were found to be broken and were replaced. The manifold was successfully pressure tested to maximum working pressure. See Daily Report #28.

Attachments:

A. Hydril GX Annular Drawing
B. Hydril Ram BOP Drawing
C. WOM Valve Drawing

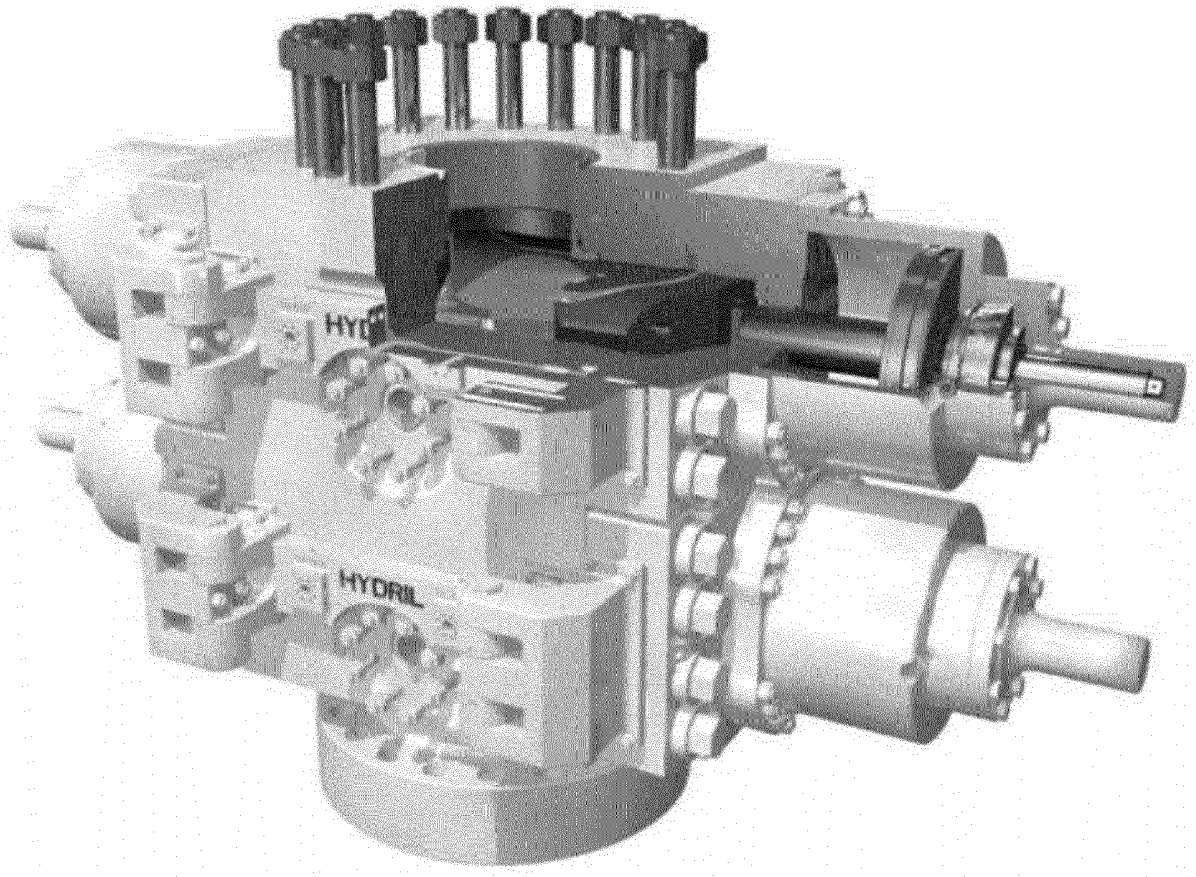
Attachment A

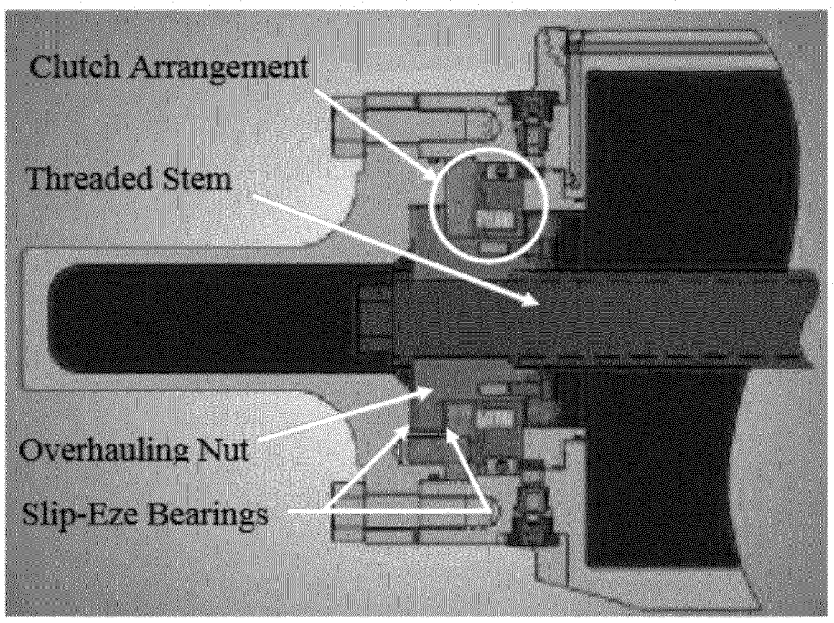
Hydril GX Annular BOP



Attachment B

Hydril Compact Ram BOP
18-3/4" 15,000 psi

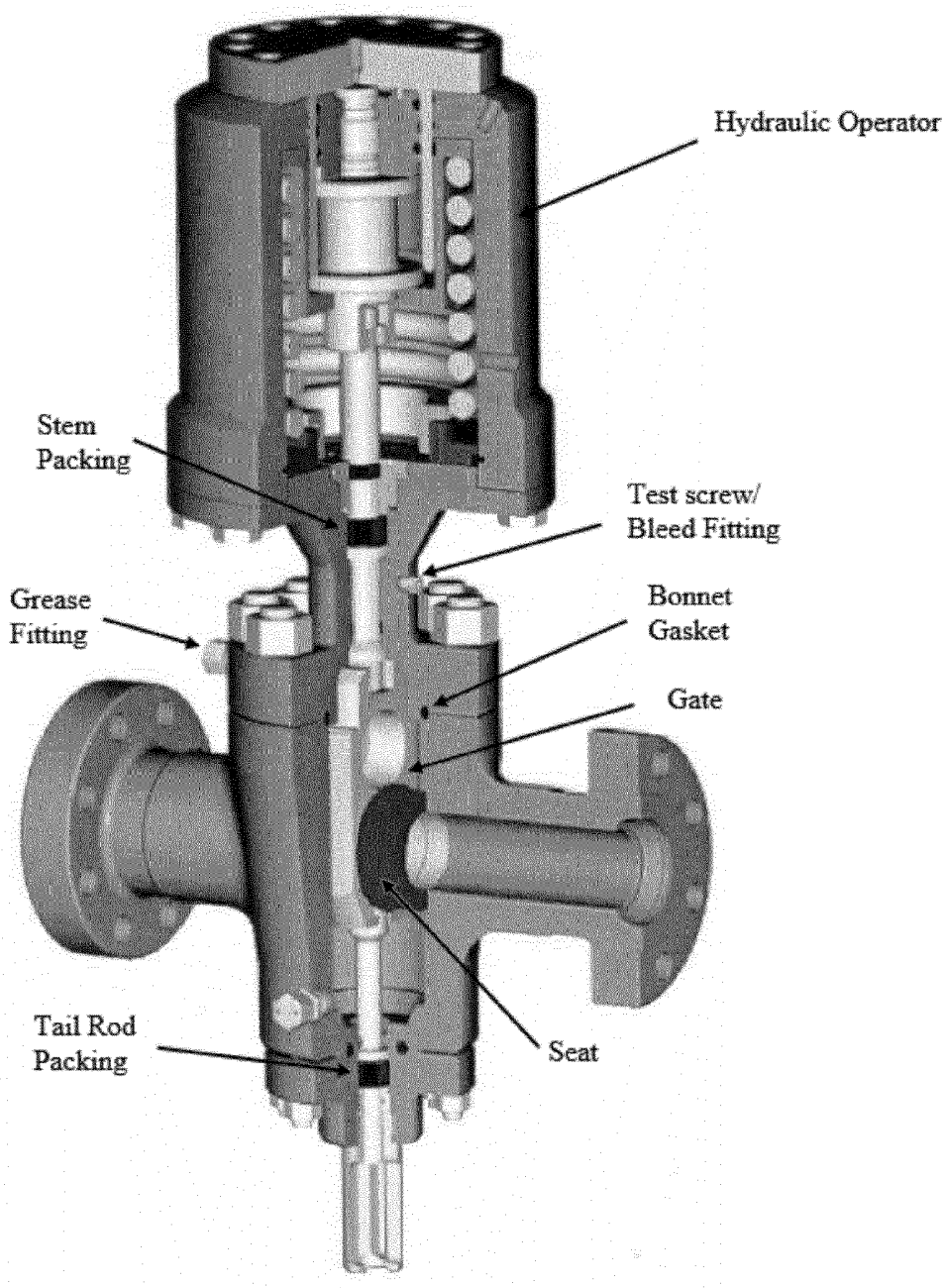




MPL

Attachment C

WOM Hydraulic Magnum Gate Valve



P.O. Box 577
Brookshire, Texas
77423 U.S.A.

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 934-1500
Fax: (281) 934-1600
west@westengineer.com

Section 3: WEST Recommendation Summary and Disposition
GSF Development Driller II, Job #3940; 14 May to 10 June 2010
Prepared for BP

Revision 1

Purpose:
During the assessment process, WEST makes various comments and recommendations aimed towards improving safety and increasing equipment reliability. In conformance with API and ISO standards, WEST follows up on these recommendations to ensure their satisfactory resolution. To expedite this process, WEST maintains this living document that is updated during each assessment. This allows WEST to effectively manage the recommendations so the same issues are not repeated once a satisfactory resolution is in place. Any time the status changes or comments are added, the results should be forwarded to WEST so the master file can be updated. The definitions used for each recommendation priority level are as follows:

Priority I: Critical items that have a significant risk of failure, well control event and/or personnel injury, and must be corrected immediately. Customer will be notified of any Priority I issues by the surveyor's technical supervisor in WEST's main office.

Priority II: Major items that have a significant risk of causing downtime or lowering safety and should be completed within the next six months or three wells. In many cases, these items are critical to long-term equipment reliability.

Priority III: Minor items that relate primarily to regulations, rig management, quality assurance issues and good oilfield practice. As these issues are unrelated to existing equipment condition, they have a low level of risk. These should be completed as soon as time permits.

Item No	Priority	Recommendation	Class	Reference				Comments/Status	Date		
				Job #	Surveyor Initials	ATP	Daily Report		Opened	Closed	Estimated Completion
1	II	The lower annular cap and mandrel were lifted from the lower annular body after releasing the cap latches. The element was lifted to the deck and the upper chamber head and piston also removed and lifted to the deck for inspection. After cleaning, the piston was found to have numerous scores and scratches around the entire periphery of the outside diameter that the open chamber head and cap seals ride on. These scores and scratches were dressed out as far as possible. Transocean should consider replacing the Hydril GX lower annular piston at the earliest opportunity.	BOP-Annular	3940	GP		DR 2	New piston fitted after failed chamber test. Jun-10 GP	May-10	Jun-10	
2	II	Consider obtaining a TAM packer or modified riser running tool for stump testing the annular cap seal of the Hydril GX upper annular BOP. The wellbore seal in the annular cap of the upper annular does not see pressure until the BOP is run and the riser is filled with mud. This hydrostatic differential pressure can be considerable in deep water and the seal is untested before the BOP is run.	BOP-Annular	3940	GP		DR 17		Jun-10		
3	II	While making repairs to the upper shear ram port side MPL, a visual inspection shows the chrome plating, where the cylinder head attaches to the body, is starting to deteriorate. The bad spots were polished before reassembly. It is recommended for this to be monitored for further deterioration.	BOP-Rams	3876	MN		DR 9	Replaced with refurbished bonnet. May-10 MN	Mar-10	May-10	

Item N	Priority	Recommendation	Class	Reference				Comments/Status	Date		
				Job #	Surveyor Initials	ATP	Daily Report		Opened	Closed	Estimated Completion
4	II	During the last well, the rig experienced problems with the lower pipe rams. The rams did not operate properly when going from the close to open position. The times were slow and the gallon counts were high. The BOP had been on bottom for approximately nine months and records indicate that the lower pipe rams had 129 cycles on them. Hydril recommends that the MPL thrust bearings be replaced once a year or after 120 cycles. It is recommended that the manufacturer's recommended maintenance be performed on the ram MPL thrust bearings when they reach 120 cycles.	BOP-Rams	3876	MN		DR 12	Refurbished bonnets fitted. Mar-10 MN	Mar-10	May-10	
5	II	Suggest TOI consider replacing the pressure biased shuttle valves on the open side of the casing shear rams and lower blind shear rams with pilot operated SPM types valves.	Controls	3940	GP		DR 18		Jun-10		
6	II	The blue MUX reel sheave is supported by slings. It is recommended that a beam trolley should be installed like the yellow MUX cable sheave. Reference WEST ITP #128, MUX Controls Between Well Maintenance Checklist.	Controls	3876	MN	ATP 321		The blue MUX reel sheave is supported by slings. A beam trolley should be installed like the yellow MUX cable sheave Mar-10 MN No change. Jun-10 GP	Mar-10		
7	III	Suggest TOI consult Hydril Controls and instigate a feasibility study as to the practicality of the inclusion of ROV observable analogue pressure gauges in the MUX pods to monitor the critical operating pressures within the pod. This should include, but not limited to, annular and manifold read back pressures, pod supply pressure, and subsea accumulator pressure.	Controls	3940	GP		DR 18		Jun-10		
8	III	It is recommended that the rig perform an accumulator volume test per API RP 53. After opening and closing all rams and one annular BOP, the remaining accumulator pressure shall be 1,700 psi for 5,000 psi systems. The accumulator system must meet this requirement without any pump assistance. Reference MMS CFR Title 30, Chapter II, Section 250.442, Paragraph (c), API RP 53, 3rd Edition, Section 13.3.2.	Controls	3876	MN	ATP 512	DR 14		Mar-10		
9	II	Transocean should consider the inclusion of an automatic changeover system for the slip joint packers to automatically energize the lower packer if the top slip joint packer should fail. This is an environmental impact issue with the use of oil based mud.	Mud System	3940	GP		DR 6		Jun-10		
10	II	Verify that where rigid lines are used, target flanges are installed on short radius pipe bends (R/d<10), 90 degree bends, elbows and tees in the direction of flow.	Mud System	3940	GP	ATP 181		90° bends on both kill and choke lines above LMRP stabs and isolation valves are not targeted. Jun-10 GP	Jun-10		
11	II	The remote choke accumulator volumetric capacity, if equipped, shall be able to operate the choke from fully-open to fully-closed and return to fully-open.	Mud System	3940	GP	ATP 405		No/low precharge in choke operating accumulators, no volume to operate choke. Jun-10 GP	May-10		
12	III	It was noted that the diverter flowline seals were not protected from the damaging influence of sunlight and the elements or mechanical damage. It is recommended that the diverter flowline seals are protected from the elements and mechanical damage. At a minimum, grease should be applied to the flowline seals and a protective cover placed over the flowline seals.	Mud System	3940	DM		DR 5	Protection fitted OK. Jun-10 GP	May-10	Jun-10	
13	III	Suggest TOI consider developing a method of testing the moonpool drape hoses and gooseknecks off the critical path. At present, it is only possible to test the hoses and gooseknecks when made up to the slip joint just before landing the BOPs on the wellhead, and the test pressure is limited to the choke and kill line test pressure while running riser.	Mud System	3940	GP		DR 18		Jun-10		
14	II	Verify the telescopic joint packers are pressure tested in accordance with the manufacturer's recommendations.	Operational Management	3940	GP	ATP 348		TJ Packer not tested. Jun-10 GP	Jun-10		

Item N	Priority	Recommendation	Class	Reference				Comments/Status	Date		
				Job #	Surveyor Initials	ATP	Daily Report		Opened	Closed	Estimated Completion
15	II	It is recommended to wellbore pressure test each component as applicable after the secondary system has been activated. This is especially critical concerning the shear rams and will prove the secondary system is capable of securing the well. Reference MMS Safety Alert No. 186.	Operational Management	3876	MN	ATP 205, 522		ROV panels were function tested but not for wellbore testing. Mar-10 MN All ROV panels functioned and chart recorded using ROV pump. Visual on rams, no test. MMS witness. Jun-10 GP	Mar-10	Jun-10	
16	III	Suggest TOI consider obtaining a back-up nitrogen intensifier for charging the subsea accumulators.	Operational Management	3940	GP		DR 19		Jun-10		
17	III	To prevent damage to the choke and kill connectors, ensure LMRP to receiver plate guidance includes close tolerance alignment pins and collars which are engaged prior to the choke and kill connectors coming into contact.	Operational Management	3940	GP	ATP 152, 165		No close tolerance pins used. Jun-10	Jun-10		
18	III	Ensure that safety relief valves have been tested according to an established procedure. The procedure shall include test conditions and equipment, safety and recording experience data. Each relief valve shall be tagged.	Operational Management	3940	GP	ATP 222		Not all tagged. Jun-10 GP	Jun-10		
19	III	Transocean should continue to work with Hydril to expedite the update of the control system drawings. Management of change and up-to-date schematics reflecting modifications to pods etc. were not available for review at the time of survey.	Operational Management	3940	GP	ATP 49			May-10		
20	III	It is recommended that a low pressure chart recorder and gauge be used when performing hydraulic operator tests and signature tests. Test pressure measurements shall be made at no less than 25% or more than 75% of the full pressure span of the gauge. Reference API RP 53, 3rd Edition, Section 18.3.6; API Spec 16A, 3rd Edition, Section 8.2.2 and API Spec 16C, 1st Edition, Section 6.1.2.2.	Operational Management	3876	MN	ATP 45	DR 7	Chart recorder for operating chamber tests and pressure tests is not adequate for low pressure testing. Mar-10 MN Now have low pressure chart recorder in use. Jun-10 GP	Mar-10	Jun-10	
21	III	The certs for the moonpool booster and moon pool conduit blue hose are missing and should be located. Reference API Spec 16C, 1st Edition, Sections 1.2.1 and 9.14.	Operational Management	3876	MN	ATP 184		Missing certs for the moonpool booster and moonpool conduit blue Mar-10 MN	Mar-10		

P.O. Box 577
Brookshire, TX 77423
U.S.A

WEST ENGINEERING SERVICES

Tel: (281) 934 -1500
Fax: (281) 934 -1600
west@westengineer.com

ISO 9001:2008 Certified

ATP Application Rev. 1.2.3.1
5/13/2010
SB/
ATP Database Rev. 18

Company: BP
Subject: Well Control System Acceptance Testing Procedure
Rig Name: *GSF Development Driller II*
Reference: Drill Through Equipment and Related Systems
Rig Type: Semi-Submersible - Gulf of Mexico
Job #3940

Status Codes

C	=	Item Checked and in compliance
X	=	Not in compliance, high risk of downtime
/	=	Not in compliance, low risk of downtime
O	=	Item Not Checked
N/A	=	Item Not Applicable

Inspection Method Codes

T	=	Test
V	=	Visual Inspection
D	=	Documentation Review
I	=	Interview

Note: Items that are found "Not in Compliance" are appropriately addressed in the Summary of Recommendations

References
for
BOP System Acceptance Testing Procedure (ATP)

The latest revision or edition of each of the following will be used as applicable.

BOP and Diverter Systems
API RP 53 *Blowout Prevention Equipment Systems for Drilling Operations*

API RP 64 *Diverter Systems Equipment and Operations*
API Spec 6A *Wellhead and Christmas Tree Equipment*
API Spec16A *Drill Through Equipment*
API Spec 16C *Choke and Kill Systems*
API Spec 16D *Control Systems for Drilling Well Control Equipment*

Marine Drilling Riser
API RP 16Q *Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems*
API Spec 16R *Marine Drilling Riser Couplings*

Electrical Equipment
API RP 14F *Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Division 1 and Division 2 Locations*
API RP 500 *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2*

Safety
API RP 75 *Development of a Safety and Environmental Management Program for Outer Continental Shelf Operations and Facilities*

Pressure Vessels
API 510 *Pressure Vessel Inspection Code: Maintenance, Inspection, Rating, Repair, and Alteration*
API Spec 576 *Inspection of Pressure-Relieving Devices*

Industry Standards
NACE MR0175 *Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment*
ANSI - American National Standards Institute
IADC *Deepwater Well Control Guidelines*
ISA - Instrument Society of America
NEC - National Electric Code
Well Control when Drilling Deep Wells – publication

Regulatory
U.S. Minerals Management Service, Code of Federal Regulations, Title 30 Chapter II Part 250
Coast Guard/DOT CFR 46 Chapter I
Section 61.10-5
CNOSPB - Canada-Nova Scotia Offshore Petroleum Board Regulations

Australian Petroleum (Submerged Lands) Acts {AP(SL)A} – Schedule, Specific Requirements

Norwegian Petroleum Directorate Guidelines

Additional

RigLORE
Manufacturer's Engineering or Technical Bulletins
WEST ITPs (Inspection and Test Procedure)

WEST Information Systems

ITPs

- Base documents for WEST
- Contain equipment information not included in manufacturers' published information
- Highlight information for surveyors to reference from ATP
- Supports anomalies and EBs

ATPs

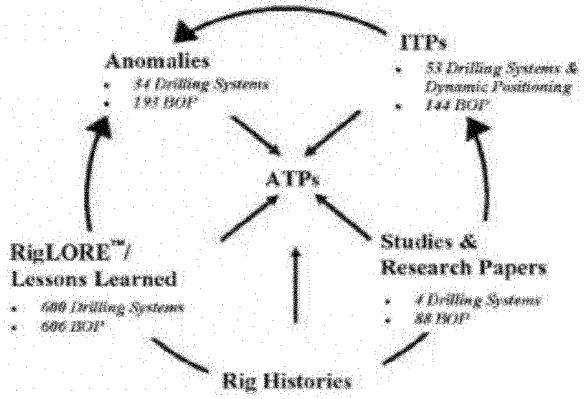
- Auditable document
- Relies heavily on the technical content of the ITPs
- Auditable points *are* extracted from Anomalies and refer to the anomaly number for additional supporting information
- Also refers to manufacturers' information in manuals or in RigLore

Anomalies

- Records equipment failures due to manufacturers' defects
- Reference ITPs and manufacturers' documents

RigLore

- A collection of Engineering Bulletins, Product Alerts, Safety Alerts, Product Information Bulletins, IADC and regulatory documents that are used for reference



Arrow signifies "supports". The ATPs are the center of the WEST Information Systems and are supported by the Anomalies, ITPs and RigLore.

Table of Contents

Note to Surveyors: Please note that the references listed with two letters and two numbers (I.e., MC31) are referencing the WEST Failure Database.

Table I: Equipment List & 3 - 5 Year Survey Status

Equipment Type	Manufacturer and Model	Data	Documented Date of Last Repair	Documented Date of Last Major Survey/Replacement
BOP – Annular				
Upper Annular	Hydril GX	Packer part number 3127398Rev3B Packer serial number 80NBR04090942DX Date of packer manufacture 4-09 Packer elastomer type - Nitrile Date packer in service 3-10 Number of cycles 0	May-10, Seal kit fitted in piston, element re-used as like new. New piston March 10.	Feb-06
Lower Annular	Hydril GX	Packer part number 3127398Rev3B Packer serial number 80NBR01000194DX Date of packer manufacture 1-10 Packer elastomer type - Nitrile Date packer in service 3-10 Number of cycles 0	May-10 Piston replaced with new, new seal kit, element re-used as like new.	Feb-06
BOP – Rams				
Rams	Hydril			Feb-06
Size & Pressure Rating		18-3/4" 15K		
Number of Cavities		6		
Pipe Ram #1	UPR		Bonnets 2-2006. New MPL fitted to Stbd bonnet May 10	
Pipe Ram #2	LPR		Bonnets 3-10 Factory overhaul	
Test Ram #3 (SSTV Rams)	SSTV Rams		Bonnets 6-09 Rig Overhaul. New MPL fitted to port bonnet May 10	
Upper Shear Type		pipe details 6-5/8" FH XTM 69 - 5-7/8" XTM 57 shear pressure 3,000 psi	Bonnets Jun-09, port bonnet replaced with refurbished unit May 2010	Feb-06

Equipment Type	Manufacturer and Model	Data	Documented Date of Last Repair	Documented Date of Last Major Survey/Replacement
Lower Shear Type		pipe details 6-5/8" FH XTM 69 - 5-7/8" XTM 57 shear pressure 3,000 psi	Bonnets Feb-06	Feb-06
Casing Shears		pipe details 16" 97 lb P110 - 13-5/8" 88.2 lb Q125 - 11-7/8" 71.8 lb Q125 - 9-7/8" 62.8 lb C110 shear pressure 4,000 psi	Bonnets Feb-06	Feb-06
Lock Type(s)	Hydril MPL		Mar-10	Feb-06
Controls				
Type (Hydraulic or MUX)	Hydril MUX			
Stack – Hard Piped or Hose	Hard pipe and hose			
Secondary Intervention Systems currently Installed	deadman/autoshear/AMF functions	ROV X Acoustic _____	Closes the upper and lower shear rams, blocks all BOP functions, retracts the choke and kill stabs, retracts the BOP section pod stingers and unlocks the riser connector. Raises the drawworks, closes the riser tensioner olmstead valves.	Feb-06
		EH Backup____ AMF _____ Autoshear X Deadman X		
ROV Operable Functions Currently installed		ROV Pump capabilities		Feb-06
		Max GPM - .75 GPM Fluid reservoir capacity. This item not checked.	LMRP - Connector unlock and flush BOP - Connector unlock and flush, ACC Rov cut, Auto shear cut, upper BSR close, lower BSR close, Upper pipe ram close, Wellhead conn POCV cut.	
		Max Pump PSI Not checked		

Equipment Type	Manufacturer and Model	Data	Documented Date of Last Repair	Documented Date of Last Major Survey/Replacement
Connectors				
LMRP Connector	Vetco HAR H4	dog gap if applicable .020 to .022 unlock pressure & Date ___Not Checked	Jun-09	Jun-09
Mandrel	Hydril	VX profile		Feb-06
Wellhead Connector	Vetco SHD H4 15,000 psi	dog gap if applicable Not checked unlock pressure & Date	Installed rebuilt connector May-10	
Choke & Kill Hydraulic stabs	Hydril Hydraulic Stab	unlock pressure & Date N/A	Jun-09	Jun-09
Mud System				
Choke Manifold	WOM			Feb-06
Valves	WOM		30% rebuilt since put in service	Feb-06
Manual Choke	WOM		Jul-09 New seats May 10	Feb-06
Hydraulic Choke	WOM		Nov-08 Inspected OK May 10	Feb-06
Diverter	Vetco KFDS CSO		Jul-09	Feb-06
Diverter System Valves	Piper D163420311BD1			Feb-06
Valves				
Lower Inner Kill Valve	WOM		Jul-08	Feb-06
Lower Outer Kill Valve	WOM		Mar-10	Feb-06
Upper Inner Kill Valve	WOM		Jul-08	Feb-06
Upper Outer Kill Valve	WOM		Mar-10	Feb-06
Lower Inner Choke Valve	WOM		Jun-08 Rebuilt operator fitted May 10 - not new spring.	Feb-06
Lower Outer Choke Valve	WOM		Jul-09	Feb-06
Upper Inner Choke Valve	WOM		Jun-08 Rebuilt operator fitted May 10 - not new spring.	Feb-06
Upper Outer Choke Valve	WOM		Jul-09	Feb-06
Inner Annular Bleed Valve	WOM		Feb-09 New operator fitted May 10 - new spring.	Feb-06
Outer Annular Bleed Valve	WOM		Feb-09	Feb-06
Choke Isolation Valve	WOM		Mar-10	Feb-06
Kill Isolation Valve	WOM		Mar-10	Feb-06

Equipment Type	Manufacturer and Model	Data	Documented Date of Last Repair	Documented Date of Last Major Survey/Replacement
Riser Boost Valve	WOM		Jul-09	Feb-06
Riser System				
Riser	Kvaerner/Clip			New riser string Jul-08
Size & Length		75 ft		
Load Rating				
Number of Aux. Lines		5		
Upper Flex Joint	Oil States Diverter II			Feb-06
Telescopic Joint, Stroke	Vetco			Jan-09
Riser Tensioners, No., Size	12 each 113.5 MT			Feb-06
Flex Joint (LMRP)	Oil States 5K Subsea			Feb-06
Motion Compensator				
Motion Compensator	N/A Compensating Draworks			

Table II – Flexible Hoses

Check high pressure auxiliary line hoses for current inspection certificates, including full internal and external inspections, as per original equipment manufacturer's specifications. Record this and serial number, dates of manufacture and last survey in the table below. The certificates should be on the rig or readily available. Reference API RP 53 Sections 18.10.3 and 18.13.2, and MMS Title 30 Chapter II, Section 250.446, Paragraph (a). Manufacturer recommended testing intervals can be found in WEST ITP #56.

HP Hose	Manufacturer	Length (ft)	WP	ID	S/N	Cert. Date	Date of Last Internal Insp.	Date of Last Rig Test
BOP Choke	N/A - Hard pipe		15K	3"				5-2010
BOP Kill	N/A - Hard Pipe		15K	3"				5-2010
BOP Conduit Yellow	Technip Coflexip	14.83'	5K	2"	47AO78201	2-2007	2-2007	Installed 1st July 2009
BOP Conduit Blue	Technip Coflexip	14.85'	5K	2"	49A292-601	2-1-2009	2-1-2009	Fitted 31st May 2010.
Moonpool Choke	Technip Coflexip	120.88'	15K	3"	43A514204B	6-12-2008	6-12-2008	Installed 16th June 2009
Moonpool Kill	Technip Coflexip	120.88'	15K	3"	47A169 201A	10-2006	10-2006	Fitted 28th May 2010.
Moonpool Booster	Technip Coflexip	120.88'	5K	4"	46A360-202	17-12-2007	?	Fitted 28th May 2010.

HP Hose	Manufacturer	Length (ft)	WP	ID	S/N	Cert. Date	Date of Last Internal Insp.	Date of Last Rig Test
Moonpool Conduit B	Technip Coflexip	120.72'	5K	2"	47A169-203A	7-8-2008	7-8-2008	Fitted 28th May 2010.
Moonpool Conduit Y	Technip Coflexip	120.88'	5K	2"	48A472-203	14-2-2009	14-2-2009	Fitted 28th May 2010.
Spare Hoses								
BOP Choke	N/A - Hard Pipe		15K	3"				
BOP Kill	N/A - Hard Pipe		15K	3"				
BOP Conduit	Technip Coflexip	14.83'	5K	2"	9610701	3-2008	3-2008	
Moonpool C, K or B	Technip Coflexip	120.88'	15K	3"	43A514204A	8-2003	8-2003	
Moonpool Conduit	Technip Coflexip	120.88'	5K	2"	46A360-203	9-2008	9-2008	
Moonpool Booster	Technip Coflexip	120.88'	5K	4"	43A514205	9-2006	9-2006	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
1	**Section E.1: Operational Management**	*WEST ITP #91, Operational Management				
2	**E.1.1: Entry/Exit Meetings**	*OPERATIONAL MANAGEMENT HISTORY				
3	An entry meeting shall be held with the customer and contractor personnel on the rig prior to the start of the assessment. The meeting should include the following:			C	I	
4	1) List the personnel in the meeting and provide email addresses (contact information) for the OIM and Rig Manager, Subsea Engineer and Rig Maintenance Supervisor;			C	I	
5	2) Discuss the distribution of daily reports and other assessment information. Determine the schedule for delivery of daily reports and the list of recipients. After verification of distribution and authorization, ensure that the WEST client contact receives copies of the dailies.			C	I	
6	3) This ATP, the workscope for the assessment and safety issues shall be discussed.			C	I	
7	4) Discuss the objectives of the well and identify any special issues that should be addressed (e.g., temperature, pressure, etc.).			C	I	No special requirements identified.
8	5) Discuss closing out of recommendations from previous assessments, if any.			C	I	
9	6) Discuss the Priority Matrix for WEST recommendations, including definitions for the Priorities, Consequences and Probabilities.	*WEST Recommendation Summary and Disposition		C	I	
10	7) Discuss anomalies that concern DTE equipment on this rig and determine the status of the anomaly.			N/A		No anomalies identified.
11	8) Discuss reporting of equipment design problems/failures using Product Performance Reports, PPRs.	*WEST ITP #84, Product Performance Reports		C	I	
12	At completion of the assessment, an exit meeting shall be held with customer and contractor personnel on the rig. The meeting should include the following:			O		
13	1) Personnel in the meeting:			O		

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
14	2) Discuss and provide a preliminary copy of the completed ATP and/or a list of outstanding workscope from the assessment.			C	D	
15	3) Discuss and provide an updated, preliminary copy of the Recommendation Summary and Disposition.			C	I	
16	4) Ensure that the WEST client contact receives preliminary copies of the ATP and Recommendation Summary and Disposition.			C	D	
17	**E.1.1.1: Safety**					
18	The surveyor shall participate in contractor's JSA (Job Safety Analysis) with the appropriate personnel prior to commencement of every new phase of inspection or testing.	*IADC Safety Alert 03-06		C	D	
19	Verify that JSAs include procedures to vent all pressure from any piece of equipment that is to be worked on before work commences.			C	D	
20	**E.1.1.2: Documentation**					
21	Review the anomalies applicable to the equipment. Update the closure status of each anomaly in the spreadsheet provided.		O Mar-10	N/A		No anomalies list.
22	**E.1.2: Written Requirements**					
23	WEST ITPs (Inspection and Test Procedures) are referred to as required, but are not included as part of this procedure. The latest revision ITP should always be used and should be secondary to regulations.			C	V	MMS.
24	Regulatory requirements are inserted as appropriate. Sometimes specific regulatory requirements are different than API requirements. The intent is to comply with the applicable regulation, thus API requirements are of secondary importance if regulations have a specific requirement.			C	V	
25	**E.1.3: Planned Preventive Maintenance**	*WEST ITP #3, Preventive Maintenance Plan Review				
26	Verify drawings showing ram space-out and bore of the BOP stack.	*API RP 53, 3rd Edition, Section 18.13.1	C Mar-10	C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
27	Verify a drawing of the choke manifold showing the pressure rating of the components is on the rig and maintained up to date.		**C Mar-10**	**C**	**V**	Schematic on control panel screen.
28	The planned maintenance system on each rig should identify the equipment, specify tasks and specify time intervals between tasks. Records of the maintenance or repairs performed should be filed on the rig or be readily available. Review and comment.	*API RP 53, 3rd Edition, Section 18.12.1; WEST ITP #3, Preventive Maintenance Plan Review *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	**C Mar-10**	**C**	**V**	
29	Verify that a procedure is in place to inspect all threaded fasteners in the load path of the BOP/Connectors/Riser system. The system should also verify that all fasteners are 35 Rockwell "C" (Rc) maximum. Fasteners in the riser string should be inspected annually; throughbore and side outlet fasteners should be inspected during the 3-5 year survey.	*MI05; WEST ITP #175, Hydrogen Embrittlement	**O Mar-10**	**O**		
30	Review the Major Survey status and update Table I. Add any equipment that has been added or changed.	*API RP 53, 3rd Edition, Section 18.12.1 *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	**C Mar-10**	**C**	**D/V**	
31	Review a Major Survey status and update Table I. Note that per API RP 53, a Major Survey must be conducted every 3-5 years. To satisfy the requirements of a Major Survey, the equipment should be completely disassembled and inspected in accordance with manufacturer requirements, including a dimensional inspection of critical areas and surface finishes and replacement of elastomeric components. The documentation is to be confirmed prior to any work or testing on the equipment.	*ITP #10 Major Survey, and CAR 09-0302-001.	**C Mar-10**	**C**	**I**	
32	Verify that each piece of pressure control equipment has an existing data package available for review. The data package should contain NACE, manufacturing, and API certifications.	*ITP #155, Databook Review.	**C Mar-10**	**C**	**D**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
33	**E.1.4: Operations & Maintenance Manuals**					
34	Manufacturers' installation, operation and maintenance manuals should be available on the rig for all the BOP equipment installed on the rig.	*MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a) *API RP 53, 3rd Edition, Section 18.11.1; WEST ITP #103, O&M Manual Requirements	**C Mar-10**	**C**	**V**	Hydril manuals require updating to reflect changes in the system.
35	Operation manuals covering all aspects of significance to safety, including procedures, organizational matters and areas of responsibilities, shall be available on the rig. Furthermore, a system must be in place which assures that the OEM's (original equipment manufacturer's) operations/maintenance manuals, product alerts and engineering bulletins are available offshore and put into practice.	*API RP 53, 3rd Edition, Sections 18.11.1 and 18.12.2	**C Mar-10**	**C**	**I**	
36	Manufacturers' installation, operation, and maintenance manuals should be available for all the BOP equipment being assessed.		**C Mar-10**	**C**	**V**	
37	Manufacturers' EBs and Product Alerts: A system must be in place that assures that the OEMs' (original equipment manufacturers') product alerts and engineering bulletins are available and properly considered for implementation and closed as appropriately.	*MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a) *API RP 53, 3rd Edition, Section 18.12.2	**C Mar-10**	**C**	**V**	
38	**E.1.5: Replacement Parts**					
39	After the stack has been latched to the wellhead and successfully tested, perform a review of critical preventive maintenance records, spare parts and operational procedures.	*WEST ITP #3, Preventive Maintenance Plan Review	**O Mar-10**	**O**		
40	Verify suppliers of spare parts are original equipment manufacturers, OEM. Comment on stocking levels and storage techniques.	*API RP 53, 3rd Edition, Section 18.11.3 *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	**C Mar-10**	**C**	**I**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
41	Verify that a physical inventory of contractually required critical rubber goods is conducted as early as possible in the survey.	*Reference CAR 07-10	C Mar-10	C	V	
42	**E.1.6: Quality Management**					
43	Discuss predictive testing detailed in WEST ITP #88 with the operator and the contractor on the rig. At a minimum, perform the benchmark testing to obtain the minimum pressure to operate the rams open and closed and operate the locks, if so equipped.	*WEST ITP #88, Ram Locking Systems - Predictive Testing, Design Verification and Maintenance	/ Mar-10	C	T	Benchmark tests done on rams, all less than 200 psi.
44	Calibration of gauges and chart recorders should be current and each gauge and recorder tagged. Chart recorders should have a maximum four hour rotation. All pressure gauges should be calibrated to an accuracy of 1% of full scale at least every three years. This applies to gauges on the BOP control system, choke and kill manifold and motion compensation equipment.	*MMS CFR Title 30, Chapter II, Section 250.442, Paragraph (c) *API RP 53, 3rd Edition, Sections 13.3.8 and 13.9.3.g; API Spec 16A, 3rd Edition, Section 8.2.2	C Mar-10	C	V/D	
45	Test pressure measurements shall be made at no less than 25% or more than 75% of the full pressure span of the gauge. *{Mar-10 Chart recorder for operating chamber tests and pressure tests is not adequate for low pressure testing.}*	*API RP 53, 3rd Edition, Section 18.3.6; API Spec 16A, 3rd Edition, Section 8.2.2; API Spec 16C, 1st Edition, Section 6.1.2.2	/ Mar-10	C	V	0-1,000 psi chart recorder now in use.
46	Pressure gauges shall have a minimum face diameter of 4.0 inches.	*API Spec 16A, 3rd Edition, Section 8.2.2	C Mar-10	C	V	
47	Verify that wellbore wetted rubber goods are in as new condition. Verify manufacturer's data is recorded on all rubber goods and the documentation stored in the proper location.	*API RP 53, 3rd Edition, Section 18.12.1	C Mar-10	C	I	All new packers.
48	Verify that any "equipment malfunctions or failures" are being reported in writing to the equipment manufacturer as stated in API Spec 16A, 3rd Edition. Review reporting system.	*API RP 53, 3rd Edition, Sections 18.3.7 and 18.13.3; API Spec 16A, 3rd Edition, Annex F; WEST ITP #57, Equipment Repairs - Welding	C Mar-10	C	I	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
49	Verify that a Management of Change system is in place to ensure that changes to equipment, systems and software are analyzed for potential problems and their effects on associated equipment and systems. The system should also ensure that all information on the rig (drawings, control system schematics, data books, maintenance procedures, etc.) is updated accordingly.	*API RP 75, 3rd Edition, Section 4.1; API RP 53, 3rd Edition, Section 18.13.1	C Mar-10	/	I	Hydril manuals require updating to reflect changes in the system. Updated hydraulic schematics, although in the process of being updated, were not available for review at the time of the survey.
50	Verify that weld repairs on drill through equipment are not performed on the rig.	*MI06; API RP 53, 3rd Edition, Section 18.11.7	C Mar-10	C	I	
51	**Section E.2: BOP Stack Inspection**					
52	All drill through equipment bores should be drift tested to ensure full bore tools will pass without obstruction. Drift testing should be completed after all wellbore testing is complete to verify the rams and annulars have fully opened. Per API Spec 16A, Section 8.5.8.4, the annular must return to full bore within 30 minutes after piston has been opened.	*API Spec 16A, Section 8.5.8.4	O Mar-10	C	T	Drift test completed without issues. Done again after BOP pulled and repaired.
53	**E.2.1: End Connections and Side Outlets**					
54	Targets on the subsea valves, choke manifold and high-pressure piping will be disassembled for visual inspection. Lead targets should have a positive retention mode, a counterbore, and be drilled to reduce the tendency of wellbore pressure forcing the lead out of its retention mode. Quiet zone targets are acceptable. Record findings.	*WEST ITP #75, Target Flanges	O Mar-10	C	I	No lead targets in any target flanges.
55	Hydraulic torqueing equipment and a thread lubricant with a known coefficient of friction (suggested to contain molybdenum disulfide, e.g. NSW-503) shall be supplied.	*API RP 53, 3rd Edition, Section 18.11.4 *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	C Mar-10	C	V	
56	Bolt preloading procedures for drill through connections and side outlets shall be reviewed. Note: Close to 90% of the effects of embedment relaxation Noted in API RP 53 can be counteracted by re-torqueing any newly made up connection after a full working pressure test.	*API RP 53, 3rd Edition, Section 18.11.2 *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	C Mar-10	C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
57	Connections broken in the last six months will be re-tightened to prove preload accuracy.	*MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a) *API RP 53, 3rd Edition, Section 18.11.2	C Mar-10	C	V	
58	Hardened washers are recommended for use under the nuts on the clamp connections.	*API RP 53, 3rd Edition, Sections 17.11.2 and 18.11.2 *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	N/A Mar-10	N/A		
59	When assembling AX, BX, and CX flanges and hubs, they will achieve face-to-face contact with the specified torque or the connection will be disassembled to determine the cause.	*WEST ITP #4, Connection Inspection and Installation	C Mar-10	C	V	
60	Ensure all bonnet bolts and flanges are torqued in accordance with good oilfield practice.	*WEST ITP #187, Fastener Assembly and Torque	C Mar-10	C	V	
61	A193 Grade B-7 studs and A194 Grade 2H nuts shall be used on all API flanged end connections, including studded.	*API Spec 6A, 19th Edition, Section 10.3 and Table 49 - PSL 1; API Spec 16A, 3rd Edition, Section 5.3.3	C Mar-10	C	I	
62	If the rig has a history of side outlet washouts, or if major equipment such as BOPs or frame attachment components have been replaced, measure movement between the stack frame and choke and kill lines. If movement over .070 inch is found, it shall be reduced to assure excessive external bending loads are not transmitted to the choke and kill outlets. Record final movement.	*WEST ITP #50, Measuring BOP Stack Framework Movement; WEST ITP #4, Connection Inspection and Installation	C Mar-10	C	I	No history of side outlet washouts.
63	Ensure all tubular stack frame members have relief holes to prevent collapse caused by hydrostatic pressure when subsea.	*MF02	N/A Mar-10	N/A		No tubular members.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
64	**E.2.2: Ram BOPs**	*RAM BOP HISTORY				
65	Verify that the hang-off point is located so that, if it is necessary to shear the drill pipe, there is adequate room between the hang-off ram and the shear ram to leave an adequate fishing neck and not shear in the upset of the pipe. Drill pipe on the rig to be used in the program should be checked for actual tool joint length and compared to the available space. If hanging-off on VBRs, verify hang-off capacity for size pipe in use.	*MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a) *MR44	**C Mar-10**	**C**	**I**	
66	For the drill pipe in use, verify that the rams used for hangoff can accommodate the external upset diameter below the tool joint. In a hangoff situation, there could be interference with the rams causing difficulty in sealing. If interference is suspected, the BOP manufacturer should be consulted to determine sealing capabilities or modifications required.	*MR41	**C Mar-10**	**C**	**I**	
67	Verify that the blind/shear rams installed in the BOP stack (both surface and subsea stacks) are capable of shearing the drill pipe in the hole under maximum anticipated surface pressures. Update Table I with pipe details and shear pressure required.	*MMS CFR Title 30, Chapter II, Section 250.416, paragraph (e)	**C Mar-10**	**C**	**I**	
68	Review any shear test results and procedure used for shearing drill pipe. Verify hydrostatic head, wellbore pressure beneath the annular and a factor of safety are included in the shear pressure analysis.	*API RP 53, 3rd Edition, Section 18.5.6; API Spec 16A, 3rd Edition, Annex C.2.3; WEST ITP #58, Shear Testing; WEST ITP #68, Effects of Wellbore Pressure on Closing Rams; SR53	**C Mar-10**	**C**	**I**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
69	Record and compare the weight, grade and impact strength of the drill pipe in use.	*API RP 53, 3rd Edition, Sections 17.5.6 and 18.5.6; API Spec 16A, 3rd Edition, Annex C.2.3; WEST ITP #58, Shear Testing; WEST ITP #68, Effects of Wellbore Pressure on Closing Rams; SR53	C Mar-10	C	D	5-7/8" 32.2 ppf S135, shear @ 1,950 psi 6-5/8" 39.9 ppf S135, shear @ 1,780 psi 6-5/8" 56.5 ppf S135, shear @ 2,866 psi
70	Check general condition of ram cavities. Visually inspect each cavity upper sealing area for or any scratches. Note: A poor surface finish at the top of the cavity reduces its effective life.	*API RP 53, 3rd Edition, Section 18.10.1; WEST ITP #16, Ram Preventers - General; IADC DeepWater Well Control Guidelines, Section 3.7.2.1 *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	C Mar-10	O		The bonnets were opened and inspected before WEST arrived onboard.
71	Verify procedures are in place to check and record ram cavity dimensions at least annually. Compare ram cavity wear measurements to OEM's recommended maximum tolerance.	*WEST ITP #16, Ram Preventers - General; IADC DeepWater Well Control Guidelines, Section 3.7.2.1	C Mar-10	C	I	
72	The rig should have available a calibrated ID + OD Micrometer for measuring ram blocks and ram cavities.	*API RP 53, 3rd Edition, Section 18.10.3 *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	C Mar-10	C	V	
73	Ram shaft and packing plus bonnet sealing surfaces and bolts shall be inspected.	*API RP 53, 3rd Edition, Section 18.10.1 *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	C Mar-10	C	I	The bonnets were opened and inspected before WEST arrived onboard.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
74	MPI Ram Block for cracks in the area in contact with the ram shaft.	*MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a) *API RP 53, 3rd Edition, Section 18.10.3; WEST ITP #16, Ram Preventers - General	O Mar-10	O		The bonnets were opened and inspected before WEST arrived onboard.
75	MPI ram shaft to ram connection button or foot.	*API RP 53, 3rd Edition, Section 18.10.3; WEST ITP #16, Ram Preventers - General *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	C Mar-10	O		The bonnets were opened and inspected before WEST arrived onboard.
76	**E.2.2.1: Hydril BOPs**					
77	Check clearance between upper seat seal and BOP body. On 10K and 15K BOPs, an even clearance of .011" is desirable. This clearance should at no time be greater than .019".	*Hydril Operator's Manual	O Mar-10	O		The bonnets were opened and inspected before WEST arrived onboard.
78	Compare ram cavity measurements to Hydril's recommended maximum. The gap between the ram block and upper seal seat should not exceed 0.063' for shear rams, 0.087" for fixed bore pipe rams and 0.078" for variable rams.	*Hydril Operator's Manual	C Mar-10	O		The bonnets were opened and inspected before WEST arrived onboard.
79	Verify if O-ring is installed or if filler ring is in place. It is not necessary to remove the upper seal seats to specifically remove the O-rings.	*WEST ITP #19, Hydril Ram Preventer	C Mar-10	O		The bonnets were opened and inspected before WEST arrived onboard.
80	Inspect the surface of the piston rod for pits, dings, or gouges. Marks less than .005" may be polished out.	*WEST ITP #19, Hydril Ram Preventer		O		The bonnets were opened and inspected before WEST arrived onboard.
81	Check the ram guide pins or rods in the 18-34" 15K BOP for the proper torque of 75 ft-lbs at least annually and/or every time the bonnets are open for changing packers. A thread locking compound such as Loctite may be used.	*WEST ITP #19, Hydril Ram Preventer; Hydril EB 98001		O		The bonnets were opened and inspected before WEST arrived onboard.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
82	Inspect shear ram Lateral T seal. Record part number and revision of seal in use. Ensure the correct Lateral T seal compatible with the temperature and the drilling fluids in use is installed.	*WEST ITP #19, Hydril Ram Preventer; Hydril EB 96005		O		The bonnets were opened and inspected before WEST arrived onboard.
83	Check the Hydril Variable Rams for proper retention of extrusion plates. The loss of lower extrusion plates has been noted.	*WEST ITP #19, Hydril Ram Preventer		O		The bonnets were opened and inspected before WEST arrived onboard.
84	Determine minimum operating pressure required to close and open rams. This should be in the 100-200 psi range. Rams should operate smoothly. Rams should be operated open and close, as functioning affects opposite bearings. If a pressure greater than 200 psi is required to open or close the ram, the locks should be disassembled for inspection. Record findings.	*WEST ITP #19, Hydril Ram Preventer		C	V, T	
85	Verify and record part number and revision level of MPL bearings and nuts installed. Hydril's recent recommendation is to replace the bearings every 12-18 months. Record dates last changed. *{Mar-10 P/N 310 2733 Rev 1.}*	*Hydril EB 99013A	C Mar-10	C	I	
86	Ensure procedures are in place so that Hydril BOPs equipped with 22 inch MPL operators are not operated without the ram blocks installed.	*HR35; Hydril PNI 01-001	C Mar-10	C	I	
87	The original 18-3/4" 15K bonnet seal carrier external pressure limit is 660 psi. Verify that Hydril PNI 03-003 is available on the rig. An upgraded bonnet seal carrier, resistant to collapse due to hydrostatic differential down to 10,000 ft water depth, is available. If the upgrade is not being considered, verify applicable procedures are in place that address the external pressure limitations of the original design.	*HR48; Hydril PNI 03-003	C Mar-10	C	V/I	
88	Verify the lower wear plate has been upgraded in accordance with Hydril Engineering Bulletin 98002.	*Hydril EB 98002	C Mar-10	C	I	
89	Verify that the upper shear ram block used with 19" and 22" operators are the six blade bolt type. There is no difference in the lower rams. The 4 blade bolt type upper ram is still acceptable for 15.5" and smaller operators.	*Hydril EB 04-001, Rev A1	C Mar-10	C	I	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
90	If the shear rams are equipped with alignment pins, measure the diameter of the pins on the upper blade carrier and the holes on the lower carrier. Clearance between the guide pin and the hole should not exceed 0.012" for 18-3/4" 10K rams and 0.046" for 18-3/4" 15K rams. Consult reference material for other size BOPs.	*Hydril Ram BOP Inspection Manual 9407, Table 4-1	N/A Mar-10	N/A		
91	Any time the MPL clutch is replaced, the MPL should be tested in accordance with Hydril EB 05-009 to help protect against infant mortality. Additionally, the test should also be completed at three to five year intervals to avoid failures due to wear or when locking difficulties are experienced.	*Hydril EB 05-009	C Mar-10	C	I	
92	Verify rod seal and retaining plate are for external pressure configuration. The rod seal is PN 3144589 and the retaining plate is PN 3144542.	*Hydril EB 07-006 Nov. 2007	C Mar-10	C	I	
93	Check the MPL assembly procedure. The MPL outer thrust bearing should be thinly lubricated and set on the overhauling nut. Improper installation may result in improper performance of the MPL.	*Hydril EB 06-003 Dec. 2006	/ Mar-10	C	I	
94	**E.2.3: Annular BOPs**	*ANNULAR HISTORY				
95	Verify that the annulars were disassembled for complete inspection of possible trapped swarf and/or milling damage after the last milling operation. If the annulars were not disassembled for inspection, they should be now unless client approval has been given for accepting them as is. □ Client approval:	*WEST ITP #65, Swarf and BOPs	C Mar-10	C	V	New lower annular piston, seal kits both annulars.
96	Verify that any surge bottles installed in the close side hydraulic line are as close to the preventer as possible and are precharged to manufacturer's specifications or 500 psi plus hydrostatic pressure of proposed water depth.	*MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a) *API RP 53, 3rd Edition, Sections 13.3.7, 18.5.12 and 18.3.8; WEST ITP #12, Annular Preventer - General	C Mar-10	C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
97	Record all available information on the annular packers/elements in Table I. Verify packer is within shelf life of manufacturer.	*API RP 53, 3rd Edition, Sections 18.5.10 and 18.5.10.1 *Australian Petroleum Submerged Lands Acts Part V, 505 (1)	C Mar-10	C	D	
98	The annular element shall be visually inspected and shall be in good condition.	*API Spec 16A, Section 8.5.8.4	C Mar-10	C	V	As new.
99	**E.2.3.1: Hydril GX Annulars**	*WEST ITP #4, Hydril Type GX Annular				
100	Verify the appropriate 18-3/4" 10K annular packer is installed for stripping the drill pipe in use. In some cases, old stock packers have not been modified to allow stripping 6-5/8" drill pipe. The new part number is 3127398 Rev. B1.	*Hydril EB #01-006, Rev A1		C	D	Rev B3 packers.
101	Verify that high interflow shuttle valves are used on the open and closed ports.	*HA08	C Mar-10	C	I	
102	Check while functioning the annulars if any water hammering, vibration and/or loose connections are associated with the hydraulic plumbing on the surge bottles. To prevent water hammering, line size must be properly sized to reduce flow rate preventing the bottle from dumping too quickly. Flow restrictors may be used.	*Hydril EB #05-001, Jan. 2005	C Mar-10	C	V	
103	**E.2.4: Connectors**	*WEST ITP #31, Wellhead and Riser Connectors - General				
104	Ensure resilient gaskets are not used during BOP stack stump tests (unless approved by operator). Resilient gaskets may mask defects in the groove.	*CONNECTOR HISTORY	C Mar-10	C	V	
105	Indicating flags easily visible to the subsea camera and/or the ROV will be on all connectors including the LMRP connector, and wellhead connector, and as appropriate, choke/kill connectors.	*WEST ITP #21, Wellhead and Riser Connectors - General	C Mar-10	C	V	
106	The secondary unlocking function on both the wellhead and LMRP connectors should be independent of the primary unlocking function.	*WEST ITP #21, Wellhead and Riser Connectors - General	C Mar-10	C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
107	If testing for backdriving has not been successfully accomplished, a pilot operated check valve (POCV) should be used on the lock side of the wellhead connector. An ROV operated bypass ball valve should be installed around the POCV and clearly marked.	*WEST ITP #39, Backdriving - Hydraulic Connectors	**C Mar-10**	**C**	**V**	POCV on wellhead connector with ROV cut tube. No POCV on riser connector.
108	Ensure that an upside-down J-tube has been installed in the test port of the test stump. This will act as a mud excluder to prevent the test hose becoming plugged and trapping test pressure in the stack.		**C Mar-10**	**N/A**		All tests done from top of choke and kill lines.
109	**E.2.4.1: LMRP Connector**					
110	Disconnect the LMRP to inspect the sealing components between the LMRP and the BOP. Change the choke and kill packing and connector gasket.		**C Mar-10**	**C**	**V**	
111	**E.2.4.1.1: Vetco HAR H-4 Connectors**	*WEST ITP #24, Vetco - H-4 Connectors; Vetco OSP 335				
112	Pressure test gasket retainer extend/retract chambers: 1,500 psi/5 min. Visually inspect the gasket retainer pins for damage.		**N/A Mar-10**	**N/A**		No retainers fitted.
113	Visually inspect VX ring groove condition prior to using/ pressure testing. Verify surface finish of the stainless steel ring groove to be 32 RMS or better.			**C**	**V**	No indications, VGC.
114	Record the gap between the dog segments and the upper wear band on the Vetco connector in Table I. This should performed at least yearly, sooner if problems are found during testing. The gap should be measured with the connector in the unlatched position after cleaning. If the recorded gap is incorrect, it may be cycled again and the gap rechecked in the latched position. As a last resort, it may be necessary to remove the dogs and compare the dog measurement to the cavity measurement to determine the actual gap. The allowable gap is .014" to .039".	*WEST ITP #24, Vetco - H-4 Connectors	**C Mar-10**	**C**	**T**	0.019 - 0.023"

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
115	Older style HAR connectors require a transfer barrier (water over oil reservoir) for the secondary unlock chambers. The older style was built with the cylinders and heads on top. The latest HAR connector has the cylinders on the bottom, just like the standard E connector, and does not require the transfer barrier. If a XFR Barrier is installed, verify the oil level is adequate.		**N/A Mar-10**	**N/A**		
116	After all wellbore testing is complete, perform the predictive unlocking test. Record the date and pressure in Table I. The unlocking pressure should be checked against ABB Vetco allowables.	*Vetco OSP 335		**C**	**T**	+/- 600psi -done during ROV unlock test. G118
117	Lubricate the connector off the stump by pumping through each of the two button head grease fittings until grease is evident between the dog segments. Completely cycle the connector lock and unlock 5 to 6 times to distribute the grease. Remove any excess grease when in the locked position. Acceptable lubricants are Alco Jet Lube #73 or equivalent Almagard 3752, Lubriplate 630AA and Lubriplate 930AA.	*Vetco OSP 335		**C**	**V**	Lubriplate 630AA used.
118	Verify that all dogs properly retract by locking off the stump or mandrel and checking the dogs after unlocking. Failure to properly retract requires cleaning at a minimum and/or measuring of dog to window gap.			**C**	**V**	
119	The VX-2 gasket should have relief grooves in the flange face to prevent a hydraulic lock.	*Vetco PA #FSA07008, Apr. 2007	**C Mar-10**	**C**	**I**	
120	Verify the correct 2nd generation VX gasket (VX-2) is in use or that relief grooves have been added to the horizontal surfaces of the outer flange of the VX gasket.	*Vetco Gray Product Advisory FSAA070008	**C Mar-10**	**C**	**V**	
121	**E.2.4.1.2: Vetco Test Stumps**					
122	Visually inspect VX ring groove condition prior to using/pressure testing.			**C**	**V**	Cameron test stump for HC connector - back to Vetco, groove OK.
123	Verify the existing gasket prep will allow the use of the VT gasket.		**O Mar-10**	**N/A**		

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
124	For test stumps that are equipped with replaceable J-slot tool joint inserts, ensure the test joint or drill pipe is open and never plugged. The J-slots are not meant to retain the full wellbore pressure loads. Ensure that the bypass outlet is not plugged.			N/A		
125	Verify spare parts for the test stumps include: 1 set static seals, tubing/fittings as needed and 1 each of any special component or sub-assembly that could cause downtime (J-slot parts).		C Mar-10	C	I	
126	**E.2.4.2: Wellhead Connector**					
127	If applicable, determine what steps are being taken to prevent hydrate difficulties during the drilling campaign. Potential remedies include:		C Mar-10	C	I	No hydrate issues in this location.
128	a) Installation of an inverted cone to divert hydrates away from the connector. This shield would normally be installed on the OD of the 18-3/4" high-pressure housing.		N/A Mar-10	N/A		
129	b) A seal installed on the lower portion of the connector to prevent the entry of hydrates.		N/A Mar-10	N/A		
130	c) Glycol injection ports.		C Mar-10	C	T	ROV injection.
131	Will the existing gasket prep allow the use of the VT gasket?		O Mar-10	C	V	
132	Verify the orientation of the wellhead connector tubing hanger alignment slot per operator requirements, if applicable.		O Mar-10	N/A		Orientation not required.
133	**E.2.4.2.1: Vetco Super HD H-4 Connectors**	*WEST ITP #24, Vetco - H-4 Connectors; Vetco Gray Equipment Service Manual				
134	Pressure test gasket retainer extend/retract chambers: 1,500 psi/5 min. Visually inspect the gasket retainer pins for damage.		N/A Mar-10	N/A		Replaced with Cameron HC wellhead connector - and then back to Vetco. No retainer pins fitted.
135	Visually inspect VX ring groove condition prior to using/ pressure testing. Verify surface finish of the stainless steel ring groove to be 32 RMS or better.			C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
136	Record the gap between the dog segments and the upper wear band on the Vetco connector in Table I. This should performed at least yearly, sooner if problems are found during testing. The gap should be measured with the connector in the unlatched position after cleaning. If the recorded gap is incorrect, it may be cycled again and the gap rechecked in the latched position. As a last resort, it may be necessary to remove the dogs and compare the dog measurement to the cavity measurement to determine the actual gap. The allowable gaps are: Vetco HD H-4 and Super HD H-4 - .005" to .030"	*WEST ITP #24, Vetco - H-4 Connectors	**O Mar-10**	**O**		
137	After all wellbore testing is complete, perform the predictive unlocking test. The unlocking pressure should be checked against ABB Vetco allowables. Record the date and pressure in Table I.	*Vetco OSP 6192		**C**	**T**	600 psi done during ROV function test.
138	If operational requirements include locking the connector on the wellhead with pressure greater than 1,500 psi, verify procedures are in place to reduce locking pressure to 1,500 psi after initial lock.			**C**	**I**	
139	Lubricate the connector off the stump with Jet Lube Kopr-Kote by pumping through each of the four grease fittings until grease is evident between the dog segments. Completely cycle the connector lock and unlock 5 to 6 times to distribute the grease. Remove any excess grease when in the locked position.	*Vetco OSP 6192		**C**	**V**	Used Kopr Kote Extreme - but Kopr Kote confirmed this is compatible.
140	Verify that all dogs properly retract by locking off the stump or mandrel and checking the dogs after unlocking. Failure to properly retract requires cleaning, at a minimum, and/or measuring of dog to window gap.			**C**	**V**	
141	For maximum protection from hydrates forming within the H-4 wellhead connector, check if the hydrate seal is installed before deployment and that access ports are plumbed for flushing the cam ring cavity by ROV intervention.	*Vetco EB #H051195, Jun. 2005; Vetco EB #H990750, May 1999	**C Mar-10**	**C**	**V**	No hydrate seal but have glycol injection port.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
142	Check if the VX wellhead gasket type is adequate for the current operations. The 2nd generation of VX gaskets addresses the demand for improved sealing performance for drilling and production equipment in deepwater environments.	*Vetco EB #H051329, Aug. 2005; Vetco EB #H032202, Mar. 2003	C Mar-10	C	I	
143	The VX-2 gasket should have relief grooves in the flange face to prevent a hydraulic lock	*Vetco PA #FSA07008, Apr. 2007	C Mar-10	C	I	
144	Verify the correct 2nd generation VX gasket (VX-2) is in use or that relief grooves have been added to the horizontal surfaces of the outer flange of the VX gasket.	*Vetco Gray Product Advisory FSAA070008	C Mar-10	C	I	
145	**E.2.4.2.2: Vetco Test Stumps**					
146	Visually inspect VX ring groove condition prior to using/pressure testing.			C	V	
147	For test stumps that are equipped with replaceable J-slot tool joint inserts, ensure the test joint or drill pipe is open and never plugged. The J-slots are not meant to retain the full wellbore pressure loads. Ensure that the bypass outlet is not plugged			N/A		
148	Verify spare parts for the test stumps include: 1 set static seals, tubing/fittings as needed and 1 each of any special component or sub-assembly that could cause downtime (J-slot parts).		C Mar-10	C	I	
149	**E.2.5: Choke and Kill Connectors**					
150	Check sealing surfaces for galling and washouts.		C Mar-10	C	V	Both renewed as leaking internally.
151	Replace packing. Check condition of seal grooves.		C Mar-10	C	V	
152	To prevent damage to the choke and kill connectors, ensure LMRP to receiver plate guidance includes close tolerance alignment pins and collars which are engaged prior to the choke and kill connectors coming into contact.		C Mar-10	/	V	No close tolerance pins used.
153	Verify choke and kill stab gland nuts are properly engaged.		C Mar-10	C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
154	**E.2.5.1: Cameron Choke and Kill Mini Connector**	*WEST ITP #25, Cameron Mini Collet Connectors; Cameron O&M Manuals				
155	Check the mechanical installation. Installation and alignment often result in equipment failures.		**N/A Mar-10**	**N/A**		
156	Verify connectors are properly greased. Mystik Blue or Mystik JT6 grease, from Cato Oil and Grease Company, are preferred. Other grease with a confirmed coefficient of friction of .10 to .15 may be used.	*Cameron EB #842M, Rev B1; CO23		**N/A**		
157	Thoroughly wash, visually inspect for damaged or worn parts and repair or replace as necessary, clean and inspect AX gasket sealing surface.			**N/A**		
158	Perform predictive test. When locked with 1,500 psi, verify the connectors unlock at 900 psi or less. Record the date and pressure in Table I.			**N/A**		
159	If the connector has been disassembled, perform an unlocking test. Any unusual noises could be an indication that the collet fingers have been installed out of sequence. It is imperative that the segments be kept in sequence. Check the collet fingers for damage and/or excess corrosion.			**N/A**		
160	Pressure test all operating chambers to 3,000 psi for 5 minutes.			**N/A**		
161	Vent lock pressure and perform an unloaded backdriving test, Note any movement.			**N/A**		
162	Verify connectors will unlock with secondary release if installed.			**N/A**		
163	Ensure manual release rods are intact and not damaged.			**N/A**		
164	Inspect the override stop pins. Ensure that the shear pins are intact.			**N/A**		
165	To prevent damage to the choke and kill connectors, ensure LMRP to receiver plate guidance includes close tolerance alignment pins and collars which are engaged prior to the choke and kill connectors coming into contact.			/	V	No close tolerance pins used.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
166	Some rigs have machined a relief groove into the connector bottom hub to prevent hydrostatic lock. While not addressed specifically in Cameron EB 848M, this is seen as a good practice.	*Cameron EB #848M	N/A Mar-10	N/A		
167	**E.2.6: Valves**	*WEST ITP #26, Subsea Gate Valves - General; *VALVE HISTORY				
168	WEST considers the requirement contained in IADC Deepwater Well Control Guidelines, Section 3.7.2.6 to disassemble and inspect the failsafe valves annually to be excessive. These valves should be disassembled and inspected on a maximum 24 month schedule. Record dates in Table 1.			C	I	
169	Document the location and designation of the lowermost valve block. The lowest choke inlet should not be below the lowermost ram. Verify procedures are in place, governing the use of outlets located below the lowermost ram. a. US Waters: Verify the choke line outlets are above the lowermost ram. A kill line outlet may be installed below the lowermost rams. b. International Waters: "The placement and limitations of an outlet below the lower ram should be evaluated. It should only be used as a kill line for monitoring pressures, and never used as a choke line except as a means of total last resort."	*MMS CFR Title 30, Chapter II, Section 250.443, Paragraph (d) *IADC Deepwater Well Control Guidelines, Section 3.1.4	C Mar-10	C	V	
170	Verify procedures are in place to vent the valve body cavity prior to any disassembly. This applies to any valve regardless of manufacturer. CAUTION: Heavy grease typically used in the valve can cause a false indication of no pressure in the cavity.	*Cameron PA #1816056 and PA #44	C Mar-10	C	I	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
171	If the valves in use would normally require a close assist circuit, this requirement may be waived if the following criteria are met: 1. The valves must have positive close pressure applied, not just spring closure. The exception is that positive close pressure will not be required if the valve is a wellbore pressure assist close valve and rig procedures are in place to verify spring condition be proven between wells. 2. The rig has an EDS system that applies closing pressure to the valves in the event of an EDS. 3. The rig has a secondary intervention system such as a deadman that applies close pressure to the valves in the event of riser failure or unintentional disconnect. 4. It is not a regulatory requirement.		C Mar-10	C	V	
172	The BOP stack shall have a kill line connection below the lower pipe ram to provide a pressure monitoring line during well control circulation.		C Mar-10	C	V	
173	**E.2.6.1: WOM Failsafe Valves**					
174	During testing, verify that the stem packing has been tested by body testing the valve with the gate half open.	*WEST ITP #43, WOM Magnum Gate Valves		C	T	
175	Unseat or remove the grease fitting (test screw) prior to pressure testing. Monitor the test screw port for leakage during wellbore testing to ensure the valve is achieving an upstream seal.	*WEST ITP #43, WOM Magnum Gate Valves		O		
176	Ensure an appropriate lubricant/filler grease is used for the expected valve service. Magnaseal is currently recommended by WOM.	*WEST ITP #43, WOM Magnum Gate Valves		C	I	
177	Verify the revised seat retainer backup rings are available in spare parts for all magnum subsea valves.	*WOM SV #0008		C	I	
178	Verify the new Inconel retainer snap rings, PNs BY-1314 and BY-1319, are being installed as part of the normal maintenance process. Old style retainer rings in the warehouse should be discarded and replaced with the new style.	*WOM SV #0006		O		

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
179	Verify latest available spring is installed. The current spring is uncoated.	*MK04		O		
180	**E.2.7: Choke and Kill Lines and Hoses**	*HOSES HISTORY				
181	Verify that where rigid lines are used, target flanges are installed on short radius pipe bends (R/d<10), 90 degree bends, elbows and tees in the direction of flow.	*API RP 53, 3rd Edition, Section 11.3.i.1	C Mar-10	/	V	90° bends on both kill and choke lines above LMRP stabs and isolation valves are not targeted.
182	Check the manufacturer's written specification for the minimum bend radii (MBR) at the rated working pressure to ensure that the choke and kill flexible lines meet the manufacturer's recommendation.	*API RP 53, 3rd Edition, Section 11.i.2; API Spec 16C, 1st Edition, Section 9.14.8	C Mar-10	C	V	
183	Verify the auxiliary lines flex loops or hoses on the LMRP will not interfere with any other components during movement of the flex joint in any direction. For DP rigs, consider marking the upper annular cap to monitor for any rotation. In the case of Cameron D annulars, consider installing anti-rotation device(s).	*CA07	C Mar-10	C	V	
184	Verify the manufacturer of choke and kill flexible hoses and record the applicable data in Table II of this ATP. *{Mar-10 Missing certs for the moonpool booster and moonpool conduit blue.}*	*API Spec 16C, 1st Edition, Sections 1.2.1 and 9.14	/ Mar-10	C	D	
185	Visually inspect choke and kill hoses: -Outer jacket properly attached at both end fittings. -Any outer jacket damages not detrimental to underlying layers. -End terminations.	*API RP 53, 3rd Edition, Section 18.10.2 *MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a)	C Mar-10	C	V	Look OK but no certs/history as of 22/05/10.
186	If the auxiliary lines on the LMRP are flexible loops made of bent rigid pipe, verify that procedures are in place to prevent debris accumulating in the bends, including circulating through an open valve prior to test.	*CAR 03-02	O Mar-10	C	I	
187	Verify that moonpool drape hoses have safety slings properly installed.	*IADC Safety Alert 00-24	C Mar-10	C	V	
188	Ensure that end connections on hoses are flanged. Threaded pipe connections are not permitted for choke line service.		C Mar-10	C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
189	**E.2.8: BOP Handling System**	*HANDLING SYSTEM HISTORY				
190	Check mechanical, electrical and wire rope condition.		**C Mar-10**	**C**	**V**	
191	Verify safe procedures are in place for changing wellhead and riser connector gaskets.	*IADC Safety Alert 99-26	**C Mar-10**	**C**	**V**	
192	Verify the crane load test documentation is available onboard and review. Verify test dates within an acceptable annual period.	*API RP 7L, 1st Edition, Section 5.4	**O Mar-10**	**O**		
193	**E.2.8.1: Gantry Crane**					
194	Review manufacturer's documentation and third party inspection reports. Verify all is available and in order.		**O Mar-10**	**C**	**I**	
195	Check mechanical and electrical installation.		**O Mar-10**	**C**	**V**	
196	Witness performance tests for full set of operations.		**O Mar-10**	**C**	**V**	
197	Inspect condition of wire rope, installation date and certificate number:□ Fwd. Hoist Wire Date Installed Certificate No.□ □ Aft Hoist Wire Date Installed Certificate No.□		**O Mar-10**	**C**	**D**	BOP Main: Cert# 59370 Rope#Q399391 34mm x 120m Fitted Date 06 Oct 09, Cert# 65519 Rope# Q425921 34mm x 120m Fitted 13 July 09. BOP Utility Fwd. Rope# Q398531 24mm x 108m Fitted 03 Feb 09 Aft Rope# Q398531 24mm x 108m Fitted 03 Feb 09
198	Check spare parts against manufacturer's recommended list.		**O Mar-10**	**C**	**I**	
199	**Section E.3: BOP Control System**	*CONTROL SYSTEM HISTORY				
200	**E.3.1: Documentation & Procedures**	*WEST ITP #48, Subsea Control Systems				
201	Obtain and report history of hot line supply, pod hose and pilot line failures.	*API RP 53, 3rd Edition, Section 18.13.3	**O Mar-10**	**C**	**I**	Only hotline - no reported failures.
202	Verify the rig is equipped with written emergency disconnect procedures, which account for various tubulars being in the BOP bore, peculiarities in the BOP and control equipment, and characteristics of position keeping or mooring equipment.	*API RP 16Q, 1st Edition, Section 4.4.4.2	**C Mar-10**	**C**	**V**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
203	Verify measures have been implemented to lock out any LMRP disconnect (hydraulic or electro-hydraulic) so that the LMRP can be disconnected only as the result of a deliberate act. Measures can include the use of electronic exclusion switches and bolted covers. Any computer based LMRP disconnect function (EDS) should also be equipped with an effective lock-out.	*MMS NTL No. 2000-G07 dated February 22, 2000; API Spec 16D, 2nd Edition, Section 4.3.2.3	**C Mar-10**	**C**	**I/V**	
204	The MMS considers a backup BOP actuation system (such as an ROV) to be an essential component of a deepwater drilling system and, therefore, expects OCS operators to have reliable backup systems for actuating the BOP in the event that the marine riser is damaged or accidentally disconnected.	*MMS Safety Alert No. 186	**C Mar-10**	**C**	**T**	ROV backup.
205	Performing a wellbore test after actuating the BOP (using the backup system) best proves the reliability of the function. (Even if not in MMS waters, this should still be considered.)	*MMS Safety Alert No. 186		**C**	**V**	No wellbore test performed but visual OK. MMS onboard and satisfied.
206	**E.3.2: Pumping & Storage Equipment**					
207	The combined output of all pumps should be capable of charging the entire accumulator system from precharge pressure to maximum rated control system working pressure within 15 minutes.	*API Spec 16D, 2nd Edition, Section 5.1.2.1.b	**O Mar-10**	**O**		
208	Visually inspect the accumulator bottles and related control system piping for significant loss of wall thickness from external corrosion.		**C Mar-10**	**C**	**V**	
209	Check that strainers on control unit are of size recommended by manufacturer.		**C Mar-10**	**C**	**V**	
210	Isolation and bleed-down valves should be provided on each accumulator bank for checking precharge pressure or draining accumulators back to the reservoir.	*MMS CFR Title 30, Chapter II, Section 250.442, Paragraph (c) *API RP 53, 3rd Edition, Section 13.3.8	**C Mar-10**	**C**	**V**	
211	Accumulator system should be arranged such that the loss of an individual accumulator and/or bank should not result in more than 25% of accumulator system capacity.	*API Spec 16D, 2nd Edition, Section 5.3.3	**C Mar-10**	**C**	**V**	48 x 15 gallon acc's.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
212	Ensure subsea accumulators have isolation and dumping capabilities.	*MMS CFR Title 30, Chapter II, Section 250.442, Paragraph (c) *API RP 53, 3rd Edition, Section 13.3.4	**C Mar-10**	**C**	**V**	
213	Report condition of control fluid, including brand name and percentage of mix fluid, pH, cleanliness, bacteria content, and National Aerospace Standard (NAS) cleanliness standard.	*WEST ITP #93, Procedure for Testing the BOP Control System Fluid		**C**	**I/V**	Monthly samples sent for analysis. 3% Stack Magic fluid mix. No NAS record or testing eqpmnt onboard.
214	Obtain a sample of control system function fluid from downstream of the pod as soon as possible after retrieving the stack for independent third party fluid analysis. A minimum of eight ounces is required. Return fluid sample to WEST for analysis.	*WEST ITP #93, Procedure for Testing the BOP Control System Fluid		**O**		
215	Verify the usable control system fluid reservoir capacity is at least equal to the total accumulator storage capacity. Neat fluid and glycol tanks should also have sufficient capacity. Verify necessary alarms, vents and cleanout ports.	*API Spec 16D, 2nd Edition, Section 4.2.4.3.1; API RP 53, 3rd Edition, Section 13.6.2	**O Mar-10**	**C**	**V**	1,400 gallon mix tank.
216	Each pump system should be protected from over-pressurization by a minimum of two devices to limit the pump discharge pressure, usually a pressure limit switch and a pressure relief valve. Check both systems and comment.	*API RP 16D, 2nd Edition, Section 5.1.2.3; API RP 53, 3rd Edition, Section 13.4.4; API RP 64, 2nd Edition, Section 5.8.5.2	**C Mar-10**	**C**	**V**	Relief valve set at 5500 psi. Pressure switches on / off.
217	Function accumulator charging pumps (triplex and air) independently to determine effective operation. Report the pressure switch setting of the pumps. Report relief valve setting.			**C**	**V**	Relief v/v's @ 5500. No air pumps fitted. 2 x quintuplex electric pumps. Pump #1 - 4,200 - 4,900 psi Pump #2 - 4,300 - 5000 psi
218	**E.3.3: Pressure Vessels and Pressure Relieving Devices**					
219	Verify that all pressure vessels, including hydraulic accumulators, are inspected according to an established procedure.		**C Mar-10**	**C**	**I**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
220	Verify that the period between internal inspections does not exceed one half of the estimated remaining life of the vessel, based on corrosion rate or 10 years, whichever is less. Internal field inspections of new vessels are not required, as long as a manufacturer's data report assuring that the vessels are satisfactory for their intended service is available.	*API RP 510, Sections 6.1 and 6.4; WEST ITP #60, Pressure Vessels and Pressure Relieving Devices	**C Mar-10**	**C**	**I**	
221	Verify that each pressure vessel is examined or tested every 5 years. Special purpose vessels shall be tested at intervals coinciding with the Certificate of Inspection renewal interval, not to exceed twice in 5 years with no interval to exceed 3 years. Pressure vessels, which cannot be internally examined, must be hydrostatically tested to 1.25 x the working pressure, twice in 5 years with no interval to exceed 3 years. Pressure vessels found with defects, internal or external, must be hydrostatically tested to 1.5 x the working pressure. Note: For specific details, refer to the quoted reference document.	*Coast Guard/DOT CFR Title 46 Chapter I Section 61.10-5; WEST ITP #60, Pressure Vessels and Pressure Relieving Devices	**C Mar-10**	**C**	**I**	Ongoing.
222	Ensure that safety relief valves have been tested according to an established procedure. The procedure shall include test conditions and equipment, safety and recording experience data. Each relief valve shall be tagged. This ITP addresses documentation		**C Mar-10**	**/**	**V**	Not all tagged.
223	Ensure that safety relief valves have been tested according to an established procedure. The test interval shall be twice in 5 years, with no interval more than 3 years.	*CG/DOT CFR Title 46 Chapter I Section 61.10-5 (i); WEST ITP #60, Pressure Vessels & Pressure Relieving Devices; API RP 576, 2nd Edition *WEST ITP #60, Pressure Vessels and Pressure Relieving Devices	**C Mar-10**	**C**	**V**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
224	**E.3.4: Regulators**					
225	Verify all regulators supplied by rig air, and without a secondary source of pneumatic supply, are equipped with manual overrides or, alternately, other devices provided to ensure capability of hydraulic operations if rig air is lost.	*API RP 53, 3rd Edition, Section 18.3.8	C Mar-10	C	V	
226	Verify that pod-mounted manifold regulator pilot line surge bottles are precharged to manufacturer's recommended pressure, plus seawater hydrostatic.	*API Spec 16D, 2nd Edition, Section 4.3.3		C	V	
227	Verify regulators operate smoothly throughout their entire range.		C Mar-10	C	V	
228	**E.3.5: Reaction Times**					
229	Verify that the control system for a subsea BOP stack is capable of closing each ram BOP in 45 seconds or less and each annular in 60 seconds or less.	*API Spec 16D, 2nd Edition, Section 5.2.1; WEST ITP #12, Annular Preventer - General; API RP 53, 3rd Edition, Section 13.3.5	C Mar-10	C	T	
230	**E.3.6: BOP Stack Hosing**					
231	Identify potential single point failures that could cause the loss of redundancy and/or independent systems due to hose and shuttle valve placement. Address if it is practical to modify or replace hose with hard piping for improved reliability.	*API RP 53, 3rd Edition, Section 13.1	O Mar-10	C	V	Much of the stack is hard piped.
232	Verify that all hoses for or on the BOP stack have been pressure tested to 1.5 x maximum system pressure.	*WEST ITP #1, BOP Stack Hoses	C Mar-10	C	I	Before fitment.
233	Verify all hoses are routed to prevent excessive bending or friction points on outer cover.	*WEST ITP #1, BOP Stack Hoses	C Mar-10	C	V	
234	Check the quality plan for BOP stack hose fabrication procedures as well as for renewing existing hoses.	*WEST ITP #1, BOP Stack Hoses	O Mar-10	C	I	Parker Polyflex hose used.
235	Ensure that all hose fittings without backup nuts have been installed with the hose in a relaxed state.	*MC78	C Mar-10	C	V	
236	**E.3.7: Control Panels**					
237	Verify that the electrical control units are being supplied with electrical power from an uninterruptible power supply.	*API RP 53, 3rd Edition, Section 14.4.1	C Mar-10	C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
238	Verify that there is at least one operable remote BOP control station in addition to the one on the drilling floor.	*MMS CFR Title 30, Chapter II, Section 250.443, Paragraph b	C Mar-10	C	V	
239	Check to ensure the control station is in a readily accessible location away from the drill floor.	*MMS CFR Title 30, Chapter II, Section 250.443, Paragraph b	C Mar-10	C	V	
240	Remote BOP control panels shall be capable of applying 3,000 psi to the close side of the shear rams.		C Mar-10	C	V	
241	Check remote panels to ensure pressure readings coincide with main BOP control skid gauges.	*MMS CFR Title 30, Chapter II, Section 250.442, Paragraph C *API RP 53, 3rd Edition, Section 13.5.1	C Mar-10	C	V	
242	Verify BOP schematic on the panel accurately depicts ram/valve layout.	*API Spec 16D, 2nd Edition, Sections 5.2.7 and 5.2.8	C Mar-10	C	V	
243	Verify the lamp test function. Ensure all bulbs are operational and should be luminous enough to easily be seen in ambient lighting conditions.		N/A Mar-10	N/A		Touch screen.
244	Ensure the enable button is connected to all functions. Verify no functions operate without first depressing the enable push-button.	*API Spec 16D, 2nd Edition, Section 4.3.3.1	C Mar-10	C	T	
245	Function test each function on the panel and record any defects: open to block, close to block, open to close, close to open. Verify memory circuit is operational.		C Mar-10	C	T	
246	Verify circuits retain memory in the event of momentary primary power interruptions.	*API RP 53, 3rd Edition, Section 14.4	C Mar-10	C	T	
247	Check proper operation of the flowmeter readout and reset. Verify low flow functions are accurately recorded then comment.	*API Spec 16D, 2nd Edition, Sections 5.2.7.e and 5.2.8.e	C Mar-10	C	T	
248	Verify control panel is protected by circuit breaker in each main power connection.		O Mar-10	C	I	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
249	**E.3.8: Alarms**					
250	Verify that all remote control stations are fully operational. This means that all installed visual indicators, pressure gauges and audible alarms should function as designed. Note any discrepancies for each panel.	*API Spec 16D, 2nd Edition, Sections 5.2.7 and 5.2.8	**C Mar-10**	**C**	**T**	
251	**E.3.9: Reel Structure and Drive**					
252	Inspect all reel drive motors and ensure the following:					
253	a. Motor lubricant levels are as per manufacturer's recommendations			**C**	**I**	
254	b. Motor and chain are aligned with main sprocket			**C**	**I**	
255	c. Jacking bolts are installed at motor			**N/A**		
256	d. Sprocket teeth are in good condition			**C**	**I**	
257	e. Chain is properly tensioned, lubricated and a proper guard is installed			**C**	**I**	
258	f. Sprocket set screws are tight			**C**	**I**	
259	g. Reel manual locks engage into reel properly			**C**	**I**	
260	h. Brakes are adequate for expected service			**C**	**I**	
261	Visually inspect reel mounting welds.			**C**	**V**	
262	Visually inspect drum, shaft, bearings and keepers.			**C**	**V**	
263	Verify air line filter/separator and lubricator are functional.			**C**	**V**	
264	Check for hydraulic and air leaks.			**C**	**V**	
265	Verify that the level wind, if installed, is operational and adequate to spool cable or hose without damage.		**C Mar-10**	**C**	**V**	
266	Verify the operator has a good view of moonpool operations from the control station.		**C Mar-10**	**C**	**V**	
267	**E.3.10: Secondary Intervention Systems**	*ROV PANELS				
268	Record the type of secondary intervention systems installed. Record in Table I.	*WEST ITP #169, Secondary Intervention	**C Mar-10**	**C**	**V**	
269	Note any known system limitations, interlocks with other systems and means of redundancy, if any. Such limitations could be water depth and battery life.		**O Mar-10**	**C**	**I**	No batteries, hydraulic system.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
270	Identify any failures of the system, such as inadvertent activation or failure to function.		O Mar-10	C	I	None reported.
271	If a deadman type system is installed, state if it will also fulfill the requirements of an Autoshear system.	*WEST ITP #169, Secondary Intervention	C Mar-10	C	I	Yes.
272	A procedure for arming, disarming, and resetting the EHBS or deadman system should be available and posted on all locations it can be operated from.		C Mar-10	C	V	
273	Function test the deadman or EHBS.		O Mar-10	C	T	Surface + subsea.
274	Function test the EDS.		C Mar-10	C	T	
275	**E.3.10.1: ROV (Remote Operated Vehicles)**					
276	Verify that, for a multi-function system, an operating panel is mounted on the BOP stack in an accessible location and clearly labeled for identification by the ROV television cameras. Record all functions available in Table I. Provide pictures of the panels.	*MMS Conditions of Approval Effective 01-Dec-2000 *API Spec 16D, 2nd Edition, Section 5.8.1	C Mar-10	C	V/T	
277	Verify that any blind subs or dummy plugs used are ported to allow venting.		O Mar-10	C	I/V	No dummy plugs used in ROV stabs.
278	Record ROV pumping information in Table I.		O Mar-10	C	T	2 gpm pump.
279	Verify that procedures require the appropriate hot stabs to be maintained on the ROV during routine surveillance in the event they are needed.		C Mar-10	C	I	
280	State the time required to close the shear ram using only the ROV pump. Determine if the ROV can maintain required closing pressure on the shear ram operator while simultaneously engaging the ram locking device.		O Mar-10	C	T	MPL locks automatic.
281	Check if ROV has means to vent pressure. ROVs without a pressure vent blow the o-rings off the stab when pulled from the receptacle and the ROV must be retrieved to the surface to install new o-rings before operating another function.		O Mar-10	C	I	
282	**E.3.10.2: Automatic Intervention**	WEST ITP #169, Secondary Intervention				
283	Record all functions that are included in the Deadman/Autoshear/AMF system in Table I.			C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
284	Specify if the system is software controlled (electronic) and/or hydraulically controlled.		C Mar-10	C	I/V	Hydraulic system for autoshear & deadman.
285	**E.3.11: Control System - General**					
286	If problems have been encountered with hose or tube fittings loosening while in use, the problem may be inadequate support brackets. Verify tubing and hoses are properly supported in accordance with NASA Specification KSC-SPEC-Z-0008C.	*NASA Specification KSC-SPEC-Z-0008C	C Mar-10	C	I	No problems reported.
287	If the control system has a hydraulic conduit, the flexible hydraulic hose in the moonpool, including end connections, should be flame retardant.	*API RP 53, 3rd Edition, Section 13.9.2	C Mar-10	C	V	Coflexip armoured hoses.
288	Verify access to fluid storage reservoirs is controlled in a manner that will allow access by authorized personnel only.		C Mar-10	C	V	
289	Verify that procedures require that potable water taken on from work boats is analyzed for contamination.		O Mar-10	C	I/V	All potable mix system water UV treated and filtered. Use rig made water majority of time.
290	**Multiplex Controls**					
291	Flow restrictors should be installed in the function lines between the pods and shuttle valves on control systems having a conduit or accumulator supply pressure greater than 3,000 psi.	*Anomaly M-C-23	O Mar-10	O		
292	Shuttle valves on control systems using a supply pressure greater than 3,000 psi should be of the dampened variety. If the shuttle valves are Gilmore Mark III valves, they can be easily converted to a dampened shuttle valve. To obtain the conversion kit, which includes the new shuttle and end caps and all necessary seals, order by part number XXXXX.3RK	*WEST ITP #174, Rev 2, Gilmore Shuttle Valves	O Mar-10	O		
293	Verify that when the primary power source is lost, electrical power (excluding the pumps) is supplied from one or more uninterruptible power supplies, with backup battery capabilities to operate the controls for at least two hours. Verify all UPS alarms are properly issued.	*API Spec 16D, 2nd Edition, Section 5.4.3; WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	I	As per Hydril procedure, 2 hr test.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
294	If applicable, Meggar test all solenoids to solenoid valve housing with a Meggar and at a voltage specified by the manufacturer. If no voltage is specified, use a 250 Vdc Meggar. Note: Any readings below 100 MegaOhms should be verified acceptable by comparison to an established baseline reading or compared with a new solenoid coil.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		O		Take solenoid current readings but don't megga coils. #35 solenoid, casing rams close changed out blue pod.
295	Check the insulation resistance for all pressure transducers with a volt-ohm meter. Measure the resistance between one conductor and the shell or sub plate, with the other conductor open circuited. All readings shall exceed 100 MegaOhms.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		O		Calibration check only.
296	Verify that all solenoid/shear valves activate and deactivate properly. This test should also include operation from the backup E-H (Electro-Hydraulic), if equipped.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	I	
297	Verify that all functions in the auto EDS (electronic disconnect sequence) operate properly and fire at the correct time.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	T	
298	Verify that the "Deadman" function, if equipped, will operate if there is a concurrent loss of the BOP control electrical power and the hydraulic power to both pods.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	T	MMS witness.
299	Verify the electrical and mechanical integrity of all cables, connectors, and winches.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	I	
300	Verify the electrical and mechanical integrity of the subsea vessels, the subsea terminations, and the umbilical cable.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	I	
301	Verify the electrical integrity of the Driller's Panel, the Toolpusher's Panel, and, if necessary, the CCU (central control unit). This integrity check should also include proper operation of the purge systems incorporated in the hazardous areas, i.e., the Driller's Panel.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	I/D	
302	Verify the optical integrity of all fiber optic cables, slip rings, and connectors where applicable.			C	I	System monitors itself, fiber optic surface links only.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
303	Insure proper calibration of all regulator transducers and other analog devices.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	I/D	
304	Verify that the data logging system for the MUX control system is operational during surface tests and all subsea operations.	*WEST ITP #126, BOP Control System Data Logging		C	I	
305	ROV intervention for the LMRP connector should include the ability to unlatch mini connectors when disconnecting the LMRP.			N/A		No mini connectors, can retract all stabs with separate function.
306	Check the proper operation of the ERA and ESA.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	I	
307	If Gilmore pilot operated check valves, PNs 25100 and 25101, are in use, verify they have been upgraded in accordance with Gilmore PIB #100-0401-001.	*Gilmore PIB #100-0401-001		C	I	
308	Function test the stack with the MUX control system from all operator stations.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		C	T	All stations, all SEMs tested.
309	Replace all pod pilot and manifold filters. Surface filters at HPU should also be replaced.		C Mar-10	C	I	
310	Verify there are no crushed or damaged hoses on the BOP stack.		C Mar-10	C	V	None noted.
311	If multiple solenoid valve exhaust ports are tied together, an ultrasonic leak detector should be obtained to aid in determining which specific solenoid valve is leaking.		O Mar-10	N/A		All separate vents.
312	Verify no sea water ingress into Blue and Yellow pod compensating chambers.		C Mar-10	C	I	
313	Vacuum test Blue and Yellow compensating chambers and fill with DC 200.		C Mar-10	C	I/V	Blue done after #35 solenoid replaced.
314	A test stand for solenoid valves, regulators and SPMs should be obtained and used for each valve disassembled and to test a percentage of valves between wells.		O Mar-10	C	I	
315	Test criteria for solenoid valves should include capacitance testing and pull in drop out voltage requirements.		C Mar-10	C	I	Measure fire ramp up current.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
316	When a solenoid valve leaks, the volume of leakage is very small and hard to detect. Before running the stack, the solenoid valves should be tested in the deactivated position to detect any low volume leaks. To accomplish this, the valves should be placed in the vent position and supply pressure isolated. A gauge should be installed and observed to verify the trapped supply pressure does not leak off.		**O Mar-10**	**O**		
317	**E.3.11.1: MUX Cables and Connections**					
318	Verify that the slip ring contact assemblies are of a non-oxidizing material suitable for the surrounding atmosphere. Manufacturer documentation is to be reviewed to confirm approved for climate.	*API Spec 16D, 2nd Edition, Section 5.4.7.3	**C Mar-10**	**C**	**I**	
319	Verify slip rings located in hazardous locations, as defined in API RP 500 and IEC 529, are certified as suitable for service in the hazardous location in which they are installed..	*API Spec 16D, 2nd Edition, Section 5.4.7.3	**C Mar-10**	**C**	**I**	
320	Visually inspect the MUX cable for armor damage.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		**C**	**I/V**	
321	Determine if moonpool sheaves are adequate to handle MUX cables without damaging them. *{Mar-10 The blue MUX reel sheave is supported by slings. A beam trolley should be installed like the yellow MUX cable sheave.}*	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		/	**I/V**	MUX cable sheaves and hotline have to be manually rigged up when running/pulling BOP, need hydraulic extending arms.
322	Meggar the MUX umbilical cable using 500 Vdc. Umbilical should not be mated to the flanged electrical receptacle (FCR) nor connected to the slip ring assembly (SRA). All Meggar readings should be greater than 100 Meg Ohms.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		**C**	**D**	Last meggar test March 2010, not done during this survey but no issues.
323	Check that the electrical plug (CCP) back shell and PBOF cables are filled with manufacturer specified oil and or topped off with sufficient dielectric oil (i.e., DC 200 silicon oil).	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist		**C**	**I**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
324	**E.3.11.2: Hydril Multiplex Controls**					
325	Ensure that all Hydril SEM solenoid controller cards are the upgraded Revision G1 cards or newer if mismatch problems have been experienced. Upgraded retainers should be installed to hold the cards in place. The retainers with a cork backing take a permanent set over time and will no longer hold the cards securely in place. Typical symptoms include erratic operation and numerous card failures.	*HC93	**O Mar-10**	**C**	**I**	
326	Verify the solenoid mandrels have been inspected for cracked welds. Over time, the DC200 precharge can leak out. Symptoms include an unexplained, possibly sudden, increase in the solenoid failure rate due to water or control fluid ingress.	*HC113	**O Mar-10**	**O**		
327	Verify that the solenoid valve chamber is full of dielectric oil, if required, and that the pressure-compensated bladder is set up properly. Verify procedures are in place to check the DC 200 precharge in the solenoid coil housing.	*WEST ITP #128, MUX Controls Between Well Maintenance Checklist; Hydril PNI #02-004		**C**	**I**	
328	Determine the reliability of the pod flowmeters. If repeated failures have occurred, modifications may be required depending on the mode of failure.	*HC114	**C Mar-10**	**C**	**I**	
329	Verify the springs in Hydril SPM valves have been upgraded in accordance with Hydril PNI #02-001 Rev A1.	*Hydril PNI #02-001 Rev A1	**C Mar-10**	**C**	**I**	
330	Opening of the one atmosphere housing assembly in the EH (Electrohydraulic) section should be done using the Hydril procedure to safely vent any trapped pressure	*Hydril EB #05-005, Sep. 2005	**O Mar-10**	**C**	**I**	
331	A problem exists where spare parts (boards, hard drives, and flash memory products) could have possibly been delivered without the proper software loaded. Check rig stock for any part numbers possibly affected as stated in EB	*Hydril EB #05-006, Sep. 2005	**O Mar-10**	**C**	**I**	No recent issues, all cards received have worked.
332	Ensure Hydril recommended procedure is onboard for activating the alternate MUX pod in the event of a prolonged loss of pod communications during operation occurs.	*Hydril EB #05-008, Oct. 2005	**O Mar-10**	**O**		

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
333	Pressure gauges in hydraulic systems equipped with block and bleed assemblies may not accurately display system pressure and a potentially dangerous situation may exist if the block and bleed valves are not in their normal operating state. Check if assemblies have the "Pressure Gauge Block Valve" fully open and the "Pressure Gauge Bleed Valve" fully closed.	*Hydril EB #06-002, Jan. 2007	O Mar-10	N/A		
334	Verify the resistor value in the water monitor circuit of the Subsea Utility board (Hydril PN AA5160000800). A possible incorrect value resistor in the water monitor circuit may not detect water ingress and also may not provide the ability to detect impurities in the associated solenoid housing DC200 fluid.	*Hydril EB #07-002, Apr. 2007	O Mar-10	C	I	New utility board fitted Blue SEM B.
335	Verify the MUX pod has a pod wedge extend circuit relief valve or procedures are in place to ensure pressure is not trapped in the pod wedge circuit upon retrieval	*Hydril PNI #07-003, Sep. 2007	O Mar-10	O		
336	Check if rig has a Hydril Solenoid Assembly Test Set PN 3136197 to test MUX pod solenoid valves.	*Hydril PNI #05-006, Jul. 2007	O Mar-10	C	I	
337	If the SEM is to be opened check if BERG Jumpers are installed. BERG Jumpers have shown a tendency to vibrate loose during normal operations and generate faults with momentary solenoid dropouts. Hydril has determined that having jumper pins wire wrapped and soldered is better than leaving BERG Jumpers' installed.	*Hydril PNI #05-007, Feb. 2005	O Mar-10	C	I	
338	Check if the new SEM card retainer replacement kits have been installed in the backplane of the SEM PCB retainer subsystem for the 1st Generation pods. Horizontal board retainers and the horizontal rails have been updated with the improved positive pressure kit PN 3142670 on the SEM boards ensuring that they are completely seated	*Hydril PNI #07-001, May 2007	O Mar-10	C	I	Not as per PNI 07-001 photos, but the board retainers have been upgraded.
339	Check if the new style pin penetrators are in use on the Hydril MUX pods. The new style penetrator (kit PN 3140654) provides a greater operating depth rating, operational benefits, and easier maintenance.	*Hydril PNI #07-002, Apr. 2007	C Mar-10	C	I	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
340	**Section E.4: Marine Riser System**	*RISER HISTORY				
341	**E.4.1: Documentation, Procedures and Inspections**	*WEST ITP #29, Riser - General; API Spec 16Q, 1st Edition				
342	Verify the results of the riser system design analysis are appended to the riser operating manual	*API Spec 16Q, 1st Edition, Section 3.3.3	O Mar-10	C	I	
343	Verify equipment specific procedures, such as verifying correct makeup of joints, are included in the running procedures.	*API Spec 16Q, 1st Edition, Section 4.3.2	O Mar-10	C	V	
344	Riser handling tools: Verify handling tools have a 25% factor of safety above the maximum hook load. This is required to install the riser and BOP.		O Mar-10	C	I	
345	Verify riser is periodically inspected including wall thickness. The riser should be re-rated based upon reduced wall thickness.	*API Spec 16F, 1st Edition, Section 12.2.1	O Mar-10	C	I	
346	**E.4.2: Telescopic Joint**					
347	"The inner barrel telescopes into the outer barrel and should be bolted or pinned to the outer barrel when handling." When stacks are handled with the telescopic joint extended, verify load capacity. Review inspection frequencies and techniques to ensure the telescopic joint is used within its operating limits.	*API Spec 16Q, 1st Edition, Section 4.6.2	C Mar-10	C	I	
348	Verify the telescopic joint packers are pressure tested in accordance with the manufacturer's recommendations.	*API RP 64, 2nd Edition, Section 7.6.2	C Mar-10	O		TJ Packer not tested.
349	On DP rigs, procedures are in place to track rotation of the fluid bearing when the vessel heading is changed. The fluid bearing will not follow the rig degree for degree. If residual torque remains in the riser when the wellhead connector is unlocked, the stack may rotate on the wellhead and damage the gasket-sealing surface.		O Mar-10	C	I	DP keeps log of rotation, subsea informed whenever heading changed.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
350	Verify that locking pressure is maintained on the locking dogs at all times when in the stowed position, or that some other failsafe device is used to prevent the dogs from inadvertently unlocking.		O Mar-10	C	I	
351	Verify that the telescoping joint is equipped with redundant sealing systems (two separate packers).	*API Spec 16F, 1st Edition, Section 11.2.1	C Mar-10	C	V	No automatic packer changeover system however.
352	Ensure safety slings are installed while the ring is stowed, even if a hydraulic lock-out is used.		O Mar-10	C	I	Bolts prevent dogs from unlocking, mechanical lock.
353	**E.4.3: Drilling Riser**	*WEST ITP #29, Riser - General; API Spec 16Q, 1st Edition, RP for O&M of Drilling Riser Systems				
354	Check the riser bore for keyseating and record.	*API Spec 16Q, 1st Edition, Section 4.8.1; WEST ITP #42, Allowable BOP Vertical BOP Keyseating	O Mar-10	C	V	None noted.
355	Verify that hydraulic running tools have a position indicator that clearly shows when the tool is locked and unlocked.		O Mar-10	C	V	
356	Choke and kill packing should be inspected between each well and verified to be in "as new" condition. Contractor to provide quantity of each auxiliary line seal on board. Remove the auxiliary line seals from 10% of the riser and inspect the seal preps.	*API Spec 16Q, 1st Edition, Sections 4.3.2 and 4.8; WEST ITP #29, Riser - General	C Mar-10	C	V	Top seal of the 2 in each female box changed out.
357	Ensure that a sufficient supply of choke and kill packing is on board for the anticipated water depth.	*WEST ITP #29, Riser - General	C Mar-10	C	I	
358	Verify there is an adequate number of riser, pups, and spare joints available for the anticipated water depth.	*WEST ITP #29, Riser - General	C Mar-10	C	V	
359	Visually inspect each riser joint to assure that no lifting eyes or other obstacles are present which will hang up on the diverter housing when running or pulling the riser.	*WEST ITP #29, Riser - General	O Mar-10	C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
360	Inspect riser buoyancy, if used, to ensure that it is not damaged, is securely attached and the thrust collars are properly installed. Ensure guidance is sufficient to prevent damage when going through the rotary.	*WEST ITP #29, Riser - General	C Mar-10	C	V	
361	Inspect the buoyancy for broken pieces that could fall during handling. Verify that procedures are in place to take broken buoyancy out of service.	*IADC Safety Alert #99-30	C Mar-10	C	V	
362	Ensure that the main line seals are properly installed and in good condition.	*WEST ITP #29, Riser - General	C Mar-10	C	V	Top seal of the 2 in each female box changed out.
363	Verify that protectors are provided for the pin end (and box end if specified by the manufacturer) couplings of each riser joint. Visually inspect the box and pin protectors to ensure they properly protect the sealing surfaces. Ensure that the protectors are installed, as applicable, when riser is being handled.	*API Spec 16Q, 1st Edition, Section 4.7.1; WEST ITP #29, Riser - General	C Mar-10	C	V	
364	Review the riser handling technique and verify it complies with good oilfield practices and the manufacturer's recommendations.	*API Spec 16Q, 1st Edition, Section 4.7.1	O Mar-10	C	I	Stored vertically, picked up using elevator into elevators/running tool.
365	Verify that the rig has storage racks and cradles, and these are being used to restrain and support the riser joints during stored periods.	*API Spec 16Q, 1st Edition, Section 4.7.2	N/A Mar-10	N/A		Vertical storage.
366	Verify that the rig storage racks do not hinder access to the pin and/or box protectors or covers for maintenance and inspection.	*API Spec 16Q, 1st Edition, Section 4.7.2.d	C Mar-10	C	V	
367	New riser should have NDE inspections performed in the weld heat affected zones prior to the first well. Cracks have been found on new riser joints from more than one manufacturer. In all cases, the manufacturer's QA inspection process failed to identify the cracks.	*DI21; VI23	O Mar-10	N/A		No new riser in service, all used.
368	Crossover joints should be used on riser strings of mixed manufacture. Verify that parts from the different manufacturers are not being mixed.	*VI03	N/A Mar-10	N/A		

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
369	Ensure that a sufficient supply of choke and kill packing is on board for 100% of the riser to be used in the well plus a 50% reserve of spare seals.	*WEST ITP #29, Riser - General; CAR 07-10	O Mar-10	C	I	
370	**E.4.3.1: Kvaerner/Clip Drilling Riser**					
371	The NC50 box thread on top of the running tool should never be used to lift the riser. The connection is to be used for lifting the tool only. Elevators are to be used on the NC50 tool joint to lift the riser joints. The maximum rated capacity is 1,420,000 lb.	*Kvaerner O&M Manual	C Mar-10	C	I	
372	The wedge lock screws (if equipped) in the running tool should be torqued to 150 ft-lbs and remain torqued at all times. Tightening should be performed in a crossing pattern.	*Kvaerner O&M Manual	O Mar-10	N/A		
373	Riser joints should be stored with a minimum of three supports spaced evenly over their length. A "V" shaped support is preferable. Verify that none of the auxiliary lines are in contact with the riser joint supports and that no other loads are placed on top of the auxiliary lines.	*Kvaerner O&M Manual	N/A Mar-10	N/A		Stored vertically.
374	After cleaning, the box and pin ends of the riser should be thoroughly greased using Chemola GLX-900.	*Kvaerner O&M Manual		C	V	Riser.
375	Verify there is no damage to the conductor pipe, auxiliary lines, auxiliary line supports or the lifting collar. Repair or replace as necessary.	*Kvaerner O&M Manual		C	V	Riser.
376	Verify flotation modules and their attachments are in good shape. Repair or replace as necessary.	*Kvaerner O&M Manual		C	V	Riser.
377	Check the following areas for damage and repair as necessary: Box - nose where wedge lock contacts, seal area on ID, locking surfaces; Pin - seals, wedge lock assemblies. In the unlocked position, the wedge lock screw should be approximately .13" below the wedge housing.	*Kvaerner O&M Manual		C	I	Riser.
378	If any signs of deterioration are found in the breech lock connection, non-destructive inspection should be performed using dye penetrate, wet mangaflux or ultrasonics.	*Kvaerner O&M Manual	O Mar-10	C	I	Riser.
379	The riser joints should never be moved or stored without the box and pin end protectors being in place.	*Kvaerner O&M Manual		C	V	Riser.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
380	Verify that the special tool, PN J35500SR, required to cut the main seals and remove them from the pin for replacement is readily available. Striking force using this tool should be kept to the minimum required to cut the seal and not damage the seal grooves.	*Kvaerner O&M Manual	O Mar-10	O		Riser.
381	Some Kvaerner CLIP riser hydraulic line replaceable pins were nitrided for surface hardness, which causes accelerated corrosion rates. These pins should be replaced with stainless steel pins overlaid with Colmonoy #5.	*MI07	O Mar-10	C	V/I	All stainless.
382	**E.4.3.1.1: Kvaerner/Clip Riser Spider and Gimbal**					
383	Spider - Inspect support arms, hydraulic cylinders, shafts, pins, complete hydraulic system, control panel and hoses for damage. Repair as necessary.	*Kvaerner O&M Manual		C	V	
384	Gimbal - Inspect gimbal rubber for deterioration or cracking. Replace as necessary.	*Kvaerner O&M Manual		C	V	
385	Verify that the spider split is 90 degrees out of phase with the gimbal split when they are in operation.	*Kvaerner O&M Manual	O Mar-10	C	V	Riser.
386	Verify all of the support arms stroke fully and visually inspect the hoses for damage or kinks. Repair as necessary. The spider support arms should be left in the extended position to protect the hydraulic system.	*Kvaerner O&M Manual		C	V	Riser.
387	Pressure test the spider hydraulic system to 1,500 psi for a minimum of 10 minutes. Acceptance is no leaks.	*Kvaerner O&M Manual		C	V	Not tested but no leaks or issues noted.
388	**E.4.4: Auxiliary Lines**					
389	To avoid the potential for plugged auxiliary lines, verify that the I.D. of the auxiliary lines are cleaned thoroughly on those riser joints that have been out of service for more than one well.	*CAR 03-02	O Mar-10	C	I	
390	To prevent accidental mismatching of the choke and kill and auxiliary lines when the riser is deployed, verify that the coupling is oriented asymmetrically around the riser support ring.	*API Spec 16Q, 1st Edition, Section 2.12.3.e	O Mar-10	C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
391	Choke and kill pins should be visually inspected. An acceptable surface finish is 32 RMS or better.	*API Spec 16Q, 1st Edition, Section 4.2.a	C Mar-10	C	V	Inspected while running.
392	For riser joints that have not been installed in the string previously or have been refurbished since last time in service, verify choke, kill, and auxiliary lines are in the correct positions on the riser joints and there are no upsets or obstructions that could interfere with proper makeup.		O Mar-10	C	V	
393	**E.4.5: Flex Joint, Keyseating and Rig Positioning Equipment (Flex Joint and Ball Joint)**					
394	Check throughbores flex joint, LMRP and BOP stack for keyseating and document any defects found.	*WEST ITP #42, Allowable BOP Vertical BORE Keyseating	C Mar-10	C	V	
395	Verify bulls-eyes are on adjustable mounts to allow for leveling. Verify bulls-eyes are "zeroed" prior to running the stack.	*API Spec 16Q, 1st Edition, Section 4.4.2	C Mar-10	C	V	
396	Verify that the marine riser system is suitably instrumented and monitored to ensure safe and reliable performance.	*API Spec 16Q, 1st Edition, Section 4.4.2	C Mar-10	C	V	
397	Verify bulls-eyes and other positioning systems are calibrated. Contractor should provide a procedure.	*API Spec 16Q, 1st Edition, Section 4.4.2	C Mar-10	C	V	
398	**Section E.5: Mud Flow Network**					
399	**E.5.1: Choke and Kill Manifold**	*CHOKE MANIFOLD HISTORY				
400	Verify the rig's drawings of the manifold are correct.		C Mar-10	C	V	Schematic on operating screen.
401	Chokes that do not pressure test or at least hold back-pressure should be disassembled for visual inspection and repair. Chokes are not required to seal full pressure, but failure to hold test or at least hold back-pressure is an indication of a serious internal problem. Pump through the chokes and check they are regulating at various values.			C	V	Both manual chokes seats replaced, auto chokes OK.
402	The pump system shall have a storage reservoir with a volume at least ten times the capacity of the hydraulic drilling choke control system, excluding the reservoir. The reservoir volume need not exceed 10 gallons.	*API Spec 16C, 1st Edition, Section 9.16.1	O Mar-10	C	V	10 gallon +

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
403	If equipped with accumulators, the pump volumetric capacity shall be sufficient to close the choke within 20 seconds.	*API Spec 16C, 1st Edition, Sections 9.16.2 and 9.16.3	O Mar-10	O		
404	With accumulators isolated, the pump volumetric capacity shall be sufficient to close the choke within 30 seconds.	*API Spec 16C, 1st Edition, Sections 9.16.2 and 9.16.3		O		
405	The remote choke accumulator volumetric capacity, if equipped, shall be able to operate the choke from fully-open to fully-closed and return to fully-open.	*API Spec 16C, 1st Edition, Section 9.16.6		/	T	No / low precharge in accumulators on choke operating panel
406	Verify choke and kill manifold valves can be tested from the correct direction. The first valve on the manifold, coming from the choke and kill lines, should be tested from the wellbore side. Visual inspection of chokes and targets shall be prior to pressure testing.	*API RP 53, 3rd Edition, Section 18.3.2.1	O Mar-10	C	V	
407	Verify that the remote choke actuation backup system is operating correctly. There shall be a backup operating system to open or close the drilling choke when there is a loss a primary power. The rated working pressure of the backup system shall be equal to or greater than the primary hydraulic pump. Function test the system.	*API Spec 16C, 1st Edition, Section 9.16.7; API RP 53, 3rd Edition, Section 9.2.1.K		C	T	
408	Verify there is an operating manual from the manufacturers of the remote choke systems and chokes available for each model installed. This manual should include: operation and installation instructions, physical data, seals information, maintenance and testing information, disassembly and assembly information, parts information and storage information. Review wellbore wetted choke parts and comment.	*API Spec 16C, 1st Edition, Section 9.17	O Mar-10	C	V	
409	**E.5.2: Diverter**	*DIVERTER HISTORY				
410	Record the following:		O Mar-10			
411	a. part number : H118543-H885		O Mar-10	C	D	
412	b. serial number : 41595		O Mar-10	C	D	
413	c. date of manufacture : 2003		O Mar-10	C	D	
414	d. elastomer type : Nitrile		O Mar-10	C	D	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
415	e. date in service : 2003		O Mar-10	C	D	
416	f. number of cycles		O Mar-10	O		
417	Vent lines should be 10" ID offshore, 6" or larger for onshore.		C Mar-10	C	D	
418	The diverter valves should be sequenced such that the vent line valve is fully open prior to closure of the sealing element. Function test the diverter system interlocks preventing the wellbore from being closed in.		O Mar-10	C	T	
419	Verify that actuators fitted to diverter valves are sized to open the valve with the rated working pressure of the diverter system applied across the valve.		O Mar-10	C	I	
420	Verify flow line seals and packer is in good condition.		O Mar-10	C	V	
421	Function test the diverter system interlocks preventing the wellbore from being closed in. The control system should be selectively sequenced, so when the diverter is closed, the shaker valve closes and overboard valve(s) open.	*API RP 53, 3rd Edition, Section 5.2.3		C	T	
422	Verify diverter valves used in the diverter vent line(s) or in the flow line to the shale shaker are full-opening, have at least the same opening as the line in which they are installed.	*API RP 64, 2nd Edition, Section 5.6.1 and 5.6.2		C	V	
423	Verify that the primary diverter closing system is capable of operating the vent line and flow line valves and closing the annular packing element on pipe in use or open hole within 30 seconds of actuation, if the packing element has a nominal bore of 20" or less. For elements of more than 20" nominal bore, the diverter control system should be capable of operating the vent line and flow line valve and closing on pipe in use within 45 seconds.	*API Spec 16D, 2nd Edition, Section 5.5.2; API RP 64, 2nd Edition, Section 5.8.2		C	T	
424	Verify the pump system(s) is capable of recharging the primary diverter control system accumulators to full system design pressure within five minutes or less, after one complete diverter mode operation of the diverter control system.	*API Spec 16D, 2nd Edition, Section 5.5.4		C	I	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
425	Verify the diverter control system has sufficient accumulator capacity to provide the usa le hydraulic fluid volume (with pumps inoperative) required to operate all of the divert mode functions plus 50% reserve.	*API RP 64, 2nd Edition, Section 5.8.1	O Mar-10	C	V	12 x 15 gallon accumulators.
426	Verify an alternate means is employed to permit sequencing the diverter system should the primary closing system become inoperative. Examples include a separate pump system or separate isolated accumulator capacity.	*API Spec 16D, 2nd Edition, Section 5.5.5	O Mar-10	C	V	12 x 15 gallon accumulators.
427	Verify diverter system is equipped with remote-controlled valves in the flow and vent lines that can be operated from at least one remote-control station in addition to the one on the drill floor.	*API RP 64, 2nd Edition, Section 5.8 *MMS CFR Title 30, Chapter II, Section 250.431, Paragraph c	C Mar-10	C	V/D	
428	Verify no manual or butterfly valve is installed in any part of the diverter system.	*MMS CFR Title 30, Chapter II, Section 250.431, Paragraph (d)	O Mar-10	C	V	
429	Verify all right-angle and sharp turns are targeted.	*MMS CFR Title 30, Chapter II, Section 250.431, Paragraph (e) *API RP 64, 2nd Edition, Section 5.7.2	O Mar-10	C	V	
430	Verify the entire diverter system is firmly anchored and supported to prevent whipping and vibration.	*MMS CFR Title 30, Chapter II, Section 250.431, Paragraph (f) *API RP 64, 2nd Edition, Section 5.7.3	C Mar-10	C	V	
431	If diverter system operating pressure can be increased above the maximum recommended diverter operating pressure, a relief valve should be installed to protect the diverter.	*API Spec 16D, 2nd Edition, Section 5.5.6	O Mar-10	C	V	
432	If applicable, the diverter system should have an interlock system to prevent insert packer closure unless the insert packer is installed and the insert packer lock-down dogs are energized.	*API Spec 16D, 2nd Edition, Section 5.5.6	O Mar-10	N/A		

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
433	Ensure all diverter system components have a rated working pressure of at least 200 psi.	*API RP 64, 2nd Edition, Section 5.1	O Mar-10	C	D	500 psi rated.
434	Some diverter systems have a "test mode" used primarily for testing the diverter system. If left in the test mode, the diverter system will not function as required in a well control situation. Verify there is a written policy or procedure in place that will prevent improper operation of the control system. Also, verify that up-to-date manuals are available.	*IADC Safety Alert 03-43; API RP 53, 3rd Edition, Sections 18.4.2.c and 18.11.1	O Mar-10	N/A		
435	An air storage or nitrogen backup system shall be provided with the capability to operate all of the pneumatic functions at least twice in the event of loss of rig air pressure.	*API Spec 16D, 2nd Edition, Section 5.5.6		C	V	
436	Verify valves on the choke manifold are not moving without having been operated (creeping).		O Mar-10	C	V	
437	**E.5.2.1: Vetco KFDS - CSO Diverter**					
438	Verify the recommended lubricants for the Type KFDS diverter are available and used: operating fluid should be Houghton Safe 273 or equivalent; seals and sealing surfaces, medium weight high grade machine oil; fasteners/threads, Never-Seez or equivalent; spherical surface on ID of diverter head, Moly lube or equivalent.	*Vetco Gray Equipment Service Manual	O Mar-10	C	I	Stack magic @3% operating fluid.
439	Verify testing and use comply with the Type KFDS diverter ratings: Pressure rating, up to the rating of the diverter support housing (500 psi) but not to exceed 1,000 psi on 5" pipe or 500 psi on open hole; Diverter operating pressure, 1,500 psi; Tensile rating, up to 2 million pounds; Operating pressures in psi for various casing sizes are 7" - 1200, 7-5/8" - 1100, 8-5/8" - 1000, 9-5/8" - 900, 10-3/4" - 800, 11-3/4" - 650, 13-3/8" - 500; Open/close lines are to be 1-1/2" hose, volume to open is 15 gallons and to close is 31 gallons; Closure range is 21-1/4" (full bore) to open hole.	*Vetco Gray Equipment Service Manual	O Mar-10	C	V	
440	Verify diverter is locked in the housing with 1,500 psi applied to the locking dogs. This pressure is to be maintained at all times during operation.	*Vetco Gray Equipment Service Manual		C	V	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
441	Closing pressure for drill pipe or collars 8" and smaller should be 1,500 psi. Casing requires lower pressures; verify chart of required pressures is available. As soon as casing has passed through the diverter, the pressure should be set back to 1,500 psi.	*Vetco Gray Equipment Service Manual		C	V	
442	Verify flow line seals are energized with 250 to 350 psi. During operation, energize pressure up to 750 psi may be required to maintain seal integrity. If the energizing pressure of 250 to 350 psi is locked in by the control system, no regulation of the pressure is necessary.	*Vetco Gray Equipment Service Manual		C	V	
443	Operating system pressure test: Apply 500 psi to open port and check for leaks. Repair if necessary, increase pressure to 1,500 psi in 500 psi increments, hold for 5 minutes. Acceptance is no leaks. Apply 500 psi to the close port and check for leaks. Repair if necessary. Increase the pressure to 1,500 psi in 500 psi increments, hold for 15 minutes. Acceptance is no leaks.	*Vetco Gray Equipment Service Manual	O Mar-10	C	I	
444	Verify spare parts for the CSO diverter include: 1 set static seals, 2 sets dynamic seals, 3 sets external seals, 3 sets special seals, full set of socket set screws, 2 each socket head cap screws where less than 10 are used, 4 each socket head cap screws where more than 10 are used, hose/fittings as needed, and 1 each of any special component or sub-assembly that could cause downtime.	*Vetco Gray Equipment Service Manual	O Mar-10	O		
445	Verify the design of the split retainer ring on the flow line seals has been revised to incorporate the latest design changes. The new part number is A20043-228.	*Vetco Product Announcement #VD 01	O Mar-10	O		
446	Check if HT-3 handling tool stop plate PN 721962 has been replaced with latest revision or procedures are in place to prevent damaging the plate when pressure testing the CSO diverter.	*Vetco FSA #070005, Mar. 2007	O Mar-10	O		
447	**E.5.3: Mud-Gas Separator**	*MUD-GAS SEPARATOR HISTORY				
448	Record location and pressure setting of alarms on the degasser. Function test all.		O Mar-10	C	V	Driller console - alarm setting depends on mud weight.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
449	Record location and span of pressure gauges on the poorboy degasser. Comment on the communication between the poorboy degasser pressures and the driller. Is there a remote readout?		O Mar-10	C	V	0-30 psi gauge. Readouts on choke operating panel and at cyber chairs.
450	Review and record rig procedures to bypass the poorboy degassers and vent fluids if pressures rise to an unacceptable level. Record pressure at which this occurs.	*API RP 53, 3rd Edition, Section 15.9	O Mar-10	C	D	Depends on mud weight.
451	Check mud-gas separator interior and vent lines for erosion and obstructions.	*API RP 53, 3rd Edition, Section 15.9	O Mar-10	C	V	
452	Record and comment on the design of the mud-gas separator. Identify liquid level and vent line size and length.	*WEST ITP #79, Mud Gas Separator; "Well Control When Drilling With Oil-Based Mud" by Turner, E.B; API RP 53, 3rd Edition, Section 15.9	O Mar-10	C	D	20' liquid seal, gas discharge line 12" dia x 167' long.
453	Provide a sketch of the mud-gas separator.	*MUD-GAS SEPARATOR DRAWING	C Mar-10	C	D	
454	Verify an access port is available for internal inspection of the degasser. After proper safety precautions are completed, internally examine the degasser.	*WEST ITP #79, Mud Gas Separator; "Well Control When Drilling With Oil-Based Mud" by Turner, E.B; API RP 53, 3rd Edition, Section 15.9	O Mar-10	C	V	Clean inside, no wall thickness measurements available for review.
455	**E.5.4: Kelly Cocks, Safety Valves and High-pressure Piping**					
456	Verify the lower kelly valves, kelly, kelly cock, drill pipe safety valves, inside BOPs and top drive safety valves are tested with water pressure applied from below to a low-pressure of 200 to 300 psi then to the rated working pressure.	*API RP 53, 3rd Edition, Section 18.3.2.2		C	I	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
457	Visually inspect the high-pressure pipe work on the rig and note its condition. Note that piping out of sight or hidden by bulkheads is especially susceptible to corrosion. Record the date of the last wall thickness major survey.	*API RP 53, 3rd Edition, Section 18.10.3; WEST ITP #7, Determination of Pipe Wall Thickness and Working Pressure by Ultrasonic Testing	O Mar-10	O		
458	If piping system is over five years old, provide copies of minimum wall thickness calculations with report. State if not available.	*API RP 53, 3rd Edition, Section 18.10.3; WEST ITP #7, Determination of Pipe Wall Thickness and Working Pressure by Ultrasonic Testing	O Mar-10	O		
459	**Section E.6: Motion Compensation System**	*MOTION COMPENSATION HISTORY				
460	**E.6.1: Riser Tensioners**					
461	Verify pressure vessels and pressure relieving devices are in compliance with acceptable inspection frequencies.	*WEST ITP #60, Pressure Vessels & Pressure Relieving Devices	C Mar-10	C	D	
462	Extend tensioners and pressure to maximum working pressure and verify there are no leaks. While extended, inspect surface finish of rods for defects.	*API Spec 16Q, 1st Edition, Section 4.6.1	O Mar-10	C	T	Not to maximum wp, but 80% max. No leaks evident at time of test.
463	Verify fluid levels and proper lubrication per manufacturer.	*API Spec 16Q, 1st Edition, Section 4.6.1	O Mar-10	C	V	Visual check of sight glasses only.
464	Review the riser tension program used for this location and comment. Consider the case where tensioners are down to cut and slip.	*API RP 16Q, 1st Edition, Section 2.4.3.f	O Mar-10	C	I	
465	Verify that information regarding the amount of riser tension required for various mud weights is available on the rig. Posting of this information in an easily readable format would be beneficial.	*API RP 16Q, 1st Edition, Section 3.2.4	C Mar-10	C	D	
466	Verify the Effective Riser Tension is defined and added to riser tension calculations.	*WEST ITP #66, Riser Tensioner Efficiency Calculations	O Mar-10	C	D	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
467	**NOV In Line Riser Tensioner**					
468	Ensure the ball valves on top of the tensioners are in the open position. NOV advises that these ball valves are needed only for maintenance, not for operation. If left in the closed position serious damage and personnel injury could occur.	*NOV PIB D1176-74475542 Apr 2009	**N/A Mar-10**	**N/A**		
469	**E.6.2: High-pressure Air System (Compressor, Piping/Valves, and APVs)**					
470	Verify grounding terminals (or some other means) are utilized on the APVs and high-pressure piping if they are insulated by use of plastic clamps or rubber gaskets.	*WEST Safety Memo #1	**O Mar-10**	**C**	**V**	
471	Review the HP (high-pressure) air compressor installation and comment. If rig air is used to supply the HP compressors, document the type of oil used in the rig air compressors. Are filters used to exclude petroleum based lubricants from the HP compressor supply?	*WEST Safety Memo #1	**O Mar-10**	**C**	**V**	3 x Compaire H series, 300 bar normally aspirated. Hours : #1, 1122, #2, 1206, #3, 1887. #1 is on long term isolation awaiting parts.
472	If the system allows for the possible introduction of petroleum based lubricants, ensure a system is in place to periodically monitor the condensate for contamination. Condensate samples can be obtained at the HP compressor final stage or HP air dryer.		**O Mar-10**	**N/A**		
473	Verify the drain/bleed valve on the APVs are at the lowest possible point. This is especially critical on APVs mounted vertically.		**O Mar-10**	**C**	**V**	
474	Verify pressure relief valve discharges are located and anchored to prevent a hazardous condition due to a sudden discharge or piping movement.	*API RP 54, 3rd Edition, Section 9.13.2	**O Mar-10**	**C**	**V**	
475	Ensure the APV vessels are rated at the same or higher pressure rating as the motion compensator.		**O Mar-10**	**C**	**V**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
476	**Section E.7: Well Control Equipment Testing**					
477	**E.7.1: Wellbore Pressure Testing**					
478	Initial stump tests on rams, annulars and valves will be to low-pressure (200 to 300 psi) and maximum working pressure. Test durations are 5 minutes for low-pressure testing and 10 minutes for high-pressure testing. All low-pressure testing will be conducted prior to high-pressure testing. Do not go to a higher pressure and bleed down to the low pressure. The drilling program should be consulted and used if any conflicts in testing procedure exist. Annulars may be tested to 70% of working pressure.	*API RP 53, 3rd Edition, Sections 18.3.2.1 and 18.3.2.2; WEST ITP #11, General Pressure Testing Requirements	**C Mar-10**	**C**	**T**	5 minute high pressure test as per TOI procedure.
479	Verify that wellbore pressure test records are witnessed, dated and signed.	*API Spec 16A, 3rd Edition, Section 8.5.8.5	**C Mar-10**	**C**	**V**	
480	Verify rig has an approved procedure for recording wellbore and function tests. All test results should be recorded in Tables III and IV.	*API RP 53, 3rd Edition, Section 18.3	**C Mar-10**	**C**	**V**	
481	Verify that VBRs (variable bore rams) are against the largest and smallest sizes of pipe in use on the well (excluding drill collars and bottom hole tools). This is recommended that testing be done on the stump prior to drilling operations.	*MMS CFR Title 30, Chapter II, Section 250.449, Paragraph (f) *API Spec 16A, 3rd Edition, Section 8.5.8.7.3; API RP 53, 3rd Edition, Section 18.5.5	**C Mar-10**	**C**	**T**	5-7/8" and 6-5/8" test joints used.
482	Annulars should be wellbore pressure tested against the smallest pipe to be used in the drilling program.	*API RP 53, 3rd Edition, Section 18.5.3	**C Mar-10**	**C**	**T**	5-7/8"
483	Visually check weep holes or bleeder valves for leakage during wellbore and operating chamber pressure testing of BOP.	*MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a) *API RP 53, 3rd Edition, Section 18.10.1; WEST ITP #16, Ram Preventers - General	**C Mar-10**	**C**	**V**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
484	Verify that no solid plugs are installed in the weep holes.	*MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a) *API RP 53, 3rd Edition, Section 18.10.1; WEST ITP #16, Ram Preventers - General	**C Mar-10**	**C**	**V**	
485	For ram preventers, verify that there is no sealant in place and that the secondary packing has not been energized. Check injection port to ensure it is free of sealant.	*MMS CFR Title 30, Chapter II, Section 250.446, Paragraph (a) *API RP 53, 3rd Edition, Section 18.10.1; WEST ITP #16, Ram Preventers - General	**O Mar-10**	**C**	**V/I**	
486	Add Fluorescein dye or similar color tracer prior to wellbore testing.		**C Mar-10**	**O**		None onboard.
487	**E.7.2: Hydraulic Operating Chamber Testing, BOP Testing Pump**					
488	Verify if uncharted operating chamber tests are performed between wells. This can be accomplished by increasing manifold pressure and observing the chambers for a specified period.	*API RP 53, 3rd Edition, Section 18.2.4	**N/A Mar-10**	**N/A**		
489	Verify a charted pressure test has been performed on operating chambers to maximum working pressure with the possible exception of annular close. The acceptance criteria for pressure testing operating chambers and wellbore shall be no leaks and test duration should be 5 minutes. Formal, charted tests should be performed every 6 to 12 months, depending on rig policy.	*API RP 53, 3rd Edition, Sections 18.2.4 and 18.3.2.4; IADC Deepwater Well Control Guidelines, Section 3.7.2.1; WEST ITP #11, General Pressure Testing Requirements	**C Mar-10**	**C**	**V/T**	

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
490	All charted operating chamber tests results should be recorded in Table V.	*API RP 53, 3rd Edition, Sections 18.2.4 and 18.3.2.4; IADC Deepwater Well Control Guidelines, Section 3.7.2.1; WEST ITP #11, General Pressure Testing Requirements	**C Mar-10**	**C**	**V**	
491	**E.7.3: Rams**					
492	Rams will be wellbore pressure tested with the locking system engaged and the operating pressures on the ram vented to zero. In the case of variable bore rams, this procedure to be followed on all size pipe tested.	*API RP 53, 3rd Edition, Section 18.5.9	**C Mar-10**	**C**	**T**	
493	**E.7.4: Annulars**					
494	The annular element shall be visually inspected and shall be in good condition. Drift test the annular as per API Spec 16A, section 8.5.8.4 in order to ensure ability to pass full bore tool, at least 2 inches longer than any cavity that intersects the bore, but no less than 12 inches. It must return to full bore within 30 minutes after piston has been opened.	*API Spec 16A, 3rd Edition, Section 8.5.8.4; IADC Deepwater Well Control Guidelines, p. 3-27, Section 3.7.2.2; WEST ITP #12, Annular Preventer - General; CA06	**C Mar-10**	**C**	**T**	Drift test OK.
495	Visually check annular weepholes for leakage during wellbore testing.		**C Mar-10**	**C**	**V**	
496	**E.7.5: Connectors (LMRP and Wellhead)**					
497	Unloaded backdriving test: As a minimum, lock both connectors with 1,500 psi and vent the locking pressure. Record any movement of the indicator rod. □ Wellhead connector: □ □ LMRP connector: □	*WEST ITP #39, Backdriving - Hydraulic Connectors	**O Mar-10**	**O**		Declined to do backdrive test.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
498	Function test LMRP, wellhead and choke and kill line connectors. Record the unlocking pressure requirements and verify to manufacturers allowable. Rig owner is to verify this acceptance criteria as in PM system.	*API RP 53, 3rd Edition, Section 18.2.4	C Mar-10	C	T	Wellhead connector unlock@ 600 psi.
499	Pressure test the POCV circuit, if so equipped.		O Mar-10	C	T	
500	**E.7.6: Stack Valves and Lines**					
501	Function test all failsafe valves verifying correct position. Verify spring returns the gate to the closed position prior to wellbore tests. Do not use operating pressure to close valves.	*MMS CFR 30 section 250.446 (a) *API RP 53, 3rd Edition, Section 18.2.4	C Mar-10	C	T	3 x failsafes failed to spring close.
502	The choke and kill valves will be tested from the top in addition to wellbore testing. State if accomplished prior to running stack. Is this an existing rig procedure?		C Mar-10	C	T	
503	**E.7.7: Function Testing**					
504	Review the rig's function test procedure. Ensure a policy is in place requiring that a competent person visually verify each function. This person should always be positioned close enough to the equipment to easily verify proper functioning or use sight aids (binoculars or equivalent).	*API RP 53, 3rd Edition, Section 18.3.1	O Mar-10	C	I	
505	Function test the shearing blind rams before pipe is installed in the bore. With pipe installed in the bore, close pipe rams and annulars with 1,500 psi starting from the bottom of the BOP and visually check down the bore to verify the correct rams function. Check all hoses, connections and pod valves for leaks. Do not close shear rams with pipe in the bore.	*API RP 53, 3rd Edition, Section 18.3.1	C Mar-10	C	T	All SEMS, both pods, both operating stations.
506	If failsafe valves are not equipped with indicator/tail rods, valve position should be verified by filling the kill and choke lines with water and opening the valves one at a time, observing where the water exits inside the stack bore.		O Mar-10	C	V	Tailrods.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
507	**E.7.8: Accumulator Unit**					
508	Perform the accumulator volume test per API RP 53. After opening and closing all rams and one annular BOP, the remaining accumulator pressure shall be 1,200 psi for 3,000 psi systems and 1,700 psi for 5,000 psi systems. Accumulator system must meet this requirement without any pump assistance.	*MMS CFR Title 30, Chapter II, Section 250.442, Paragraph (c), *API RP 53, 3rd Edition, Section 13.3.2	**O Mar-10**	**O**		
509	Verify that a backup to the primary accumulator-charging system is automatic, supplied by a power source independent from the power source to the primary accumulator-charging system, and possesses sufficient capability to close all BOP components and hold them closed.	*MMS CFR Title 30, Chapter II, Section 250.443, Paragraph (a)	**O Mar-10**	**C**	**I**	One quintuplex pump on emergency generator board.
510	Record the pump up time to maximum working pressure of control system after volume test. Maximum allowable is 15 minutes. Minutes:_____ Seconds:_____	*API RP 53, 3rd Edition, Sections 13.4.1 or 14.3.1	**O Mar-10**	**O**		
511	**E.7.9: Pods**					
512	Ensure all packer seals are in new condition and retainers are tight.	*API RP 53, 3rd Edition, Section 19.10		**C**	**V**	
513	Verify an equipment specific function test procedure that includes all operable functions is available and used.	*API RP 53, 3rd Edition, Section 18.3.1	**C Mar-10**	**C**	**V**	
514	Function test the stack with each pod, recording times and volumes.	*API RP 53, 3rd Edition, Section 18.3.1		**C**	**T**	Both pods, all SEMs and operating stations tested OK.
515	Prior to running the stack, pressure test all functions, open and close, from both pods for 30 minutes at maximum operating pressure. Blue X Yellow X	*API RP 53, 3rd Edition, Section 13.9.1		**C**	**T**	Both pods tested, leaks found addressed.

ID	Assessment Point	Reference	Previous Status	Current Status	Inspection Method	Comments
516	**E.7.10: Secondary Intervention, Emergency Acoustic Control**					
517	The hot stabs must be tested during the stump test to ensure no operability problems exist.	*API RP 53, 3rd Edition, Section 18.3.1; WEST ITP #169, Secondary Intervention; MMS NTL	**C Mar-10**	**C**	**T**	MMS witness.
518	Wellbore pressure test each component as applicable after the secondary system has been activated. This is especially critical concerning the shear rams and will prove the secondary system is capable of securing the well.			**C**	**T**	Not pressure tested but visual, correct volume and function pressure test. All with MMS witness.
519	**Section E.8: HPHT and Sour Gas Considerations**					
520	Verify the maximum acceptable hardness for all preventer and valve bodies and spools in H2S service is in accordance with NACE Standard MR0175 (22 RC or 237 BHN). Note: If sour gas is expected, also check repairs are in compliance with NACE as well as internal wellbore wetted parts.	*API RP 53, 3rd Edition, Section 20.2.3	**O Mar-10**	**C**	**D/I**	
521	Verify wellbore wetted components suitable for use in H2S service (if required).	*WEST ITP #49, H2S Service; API RP 53, 3rd Edition, Section 20	**C Mar-10**	**C**	**I**	
522	Verify material selection for choke and kill lines meets NACE MR0175 for H2S Service (as required).		**O Mar-10**	**C**	**D**	
523	Glycol injection on choke and kill manifold. Record injection rate, location of injection and equipment used to inject the glycol. Verify if all chokes will be fed with glycol.		**O Mar-10**	**N/A**		No glycol injection on choke manifold.

Table III – Wellbore Pressure Testing

Item	Pipe Size(s)	Low Pressure Test		High Pressure Test		Comments
		Pressure	Time	Pressure	Time	
Upper Shear Rams		250-300psi	5 mins	15,000 psi	5 mins	Rams/annulars tested on 5-7/8" and 6-5/8" pipe
Lower Shear Rams		250-300psi	5 mins	15,000 psi	5 mins	
Upper pipe Rams, 5-1/2"-7-5/8"		250-300psi	5 mins	15,000 psi	5 mins	
Lower Pipe Rams, 4-1/2" - 7"		250-300psi	5 mins	15,000 psi	5 mins	
SSTV Test Rams, 4-1/2"-7"		250-300psi	5 mins	15,000 psi	5 mins	
Lower Annular		250-300psi	5 mins	10,000 psi	5 mins	
Upper Annular		250-300psi	5 mins	10,000 psi	5 mins	
Lower inner choke		250-300psi	5 mins	15,000 psi	5 mins	All valves in 1/2 open position during shell test
Lower outer choke		250-300psi	5 mins	15,000 psi	5 mins	
Upper inner choke		250-300psi	5 mins	15,000 psi	5 mins	
Upper outer choke		250-300psi	5 mins	15,000 psi	5 mins	
Lower inner kill		250-300psi	5 mins	15,000 psi	5 mins	
Lower outer kill		250-300psi	5 mins	15,000 psi	5 mins	
Upper inner kill		250-300psi	5 mins	15,000 psi	5 mins	
Upper outer kill		250-300psi	5 mins	15,000 psi	5 mins	
Upper Annular Inner bleed valve		250-300psi	5 mins	15,000 psi	5 mins	
Upper Annular Outer bleed valve		250-300psi	5 mins	15,000 psi	5 mins	
Choke isolation valve. This test ensures the pressure integrity of the Choke connection.						Not tested
Kill isolation valve. This test ensures the pressure integrity of the Kill connection.						Not tested

Table IV – Pressure Testing
Kill & Choke Valves from the Top

Item	Low Pressure Test		High Pressure Test		Comments
	Pressure	Time	Pressure	Time	
Lower inner kill	250 psi	5 mins	15,000 psi	5 mins	
Lower outer kill	250 psi	5 mins	15,000 psi	5 mins	
Upper inner kill	250 psi	5 mins	15,000 psi	5 mins	
Upper outer kill	250 psi	5 mins	15,000 psi	5 mins	
Lower inner choke	250 psi	5 mins	15,000 psi	5 mins	
Lower outer choke	250 psi	5 mins	15,000 psi	5 mins	
Upper inner choke	250 psi	5 mins	15,000 psi	5 mins	
Upper outer choke	250 psi	5 mins	15,000 psi	5 mins	
Choke isolation valve					Not tested.
Kill isolation valve					Not tested.

Table V – Hydraulic Operating Chamber Pressure Testing

Item	Open/Unlock Chamber		Close/Lock Chamber		Comment and Date
	Pressure	Time	Pressure	Time	
Wellhead connector Primary	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Wellhead connector Secondary	250 /3,000 psi	5/5 mins			Good Test May-2010
Upper shear rams	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Lower shear rams	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Casing shear rams	250 /3,000 psi	5/5 mins	250 /4,000 psi	5/5 mins	Good Test May-2010
Upper pipe rams	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Lower pipe rams	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
SSTV	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
LMRP connector Primary	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
LMRP connector Secondary	250 /3,000 psi	5/5 mins			Good Test May-2010
C&K female retractable connector	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Pod lock, yellow pod	N/A	N/A	N/A	N/A	N/A
Pod lock, blue pod	N/A	N/A	N/A	N/A	N/A
Lower Annular	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Upper Annular	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Lower inner choke	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Lower outer choke	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Upper inner choke	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Upper outer choke	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010

Item	Open/Unlock Chamber		Close/Lock Chamber		Comment and Date
	Pressure	Time	Pressure	Time	
Lower inner kill	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Lower outer kill	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Upper inner kill	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Upper outer kill	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Inner annular bleed	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Outer annular bleed	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Choke isolation valve	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Kill isolation valve	250 /3,000 psi	5/5 mins	250 /3,000 psi	5/5 mins	Good Test May-2010
Item	**Retract**		**Extend**		**Comments**
Riser and BOP stack stinger, yellow pod.					Did not test.
Riser and BOP stack stinger, blue pod.					Did not test.
Item	**Energize**		**De-energize**		**Comments**
Riser and BOP stack stinger, yellow pod.					Did not test.
Riser and BOP stack stinger, blue pod.					Did not test.

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 14 May 2010

Copy: Leon Schwartz – WEST

From: Greg Pennock –WEST Engineering Services gn

FORM WES-OP-001 09/2009 REV

Daily Report #1 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- WEST transferred from the *GSF Development Driller III* to the *GSF Development Driller II* to survey the BOP onboard.
- Attended Transocean rig induction and rig orientation tour.
- Completed BP 6 in 1 training program.
- Completed fit test for emergency breathing apparatus.
- Met with Transocean subsea supervisor and discussed the work scope and work completed so far.
- The Hydril GX upper annular was in the process of being disassembled, when WEST arrived onboard, for inspection, seals replacement, and element change out.
- A problem had been identified with the port side upper shear ram MPL overhauling nut, it had proved impossible to remove the overhauling nut from the overhauling screw. The decision had been made to change out the offending bonnet, so preparations were being made to remove the port side upper shear bonnet from the BOP.

Recommendations:
None.

Projected Workscope:

- Continue inspection and rebuild Hydril GX upper annular.
- Torque all bonnet bolts – apart from upper shear port bonnet.
- Prepare to replace port upper shear ram bonnet.

Best Regards,

Greg Pennock
WEST BOP Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP, Date: 15 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor.

From: Greg Pennock –WEST Engineering Services gn

FORM WES-OP-001 09/2009 REV

Daily Report #2 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The upper annular piston, upper chamber head, and body were inspected and found to be in good serviceable condition. The seals on the piston and upper chamber head were renewed with seals from seal kit part # 3117930 Rev A4, and the piston and upper chamber head reassembled in the upper annular body. The element removed from the upper annular was inspected and re-installed as it was in as new condition, with only 12 closures recorded on it. The upper annular cap and flex joint assembly was not installed at this point as the rig movement was deemed excessive.
- All the BOP bonnet bolts, except the port upper shear ram, were torqued to 2,000 ft/lbs. The bonnets had all been opened before WEST's arrival onboard, the cavities cleaned and inspected, and all the ram packers replaced with new.
- The port upper shear ram bonnet was removed from the BOP and landed on the deck.
- The LMRP mounted choke/kill line female stab assemblies were operator chamber pressure tested and both were found to be leaking internally from the unlock to the lock side. The lock side operating chambers were successfully pressure tested to 3,000 psi, however. See Attachment A.
- The status of the moon pool choke/kill Coflexip drape hoses was reviewed; Transocean has yet to produce records of internal inspection or periodic pressure tests for the hoses at the time of writing.
- The BOP mounted WOM failsafe valves were greased with Magna Seal Plus valve sealant.
- The lower annular cap and mandrel were lifted from the lower annular body after releasing the cap latches. The element was lifted to the deck and the upper chamber head and piston also removed and lifted to the deck for inspection. After cleaning, the piston was found to have numerous scores and scratches around the entire periphery of the outside diameter that the open chamber head and cap seals ride on. These scores and scratches were dressed out as far as possible. See Figure 2.1 below.
- All the seals in the lower annular were replaced with seals from seal kit part # 3117930 Rev A4, and the piston, upper chamber head, and element installed in the body. The original element was re-used as it was in as new condition with only 12 closures recorded on it.
- The rig ET replaced the oil filled pressure balanced (PBOF) cable to the BOP mounted pressure/temperature sensor as the original cable was found to be damaged. The other PBOF cables in the system were pressure tested, this is ongoing.

Recommendations:

1. Transocean should consider replacing the Hydril GX lower annular piston at the earliest opportunity.

Discussion:

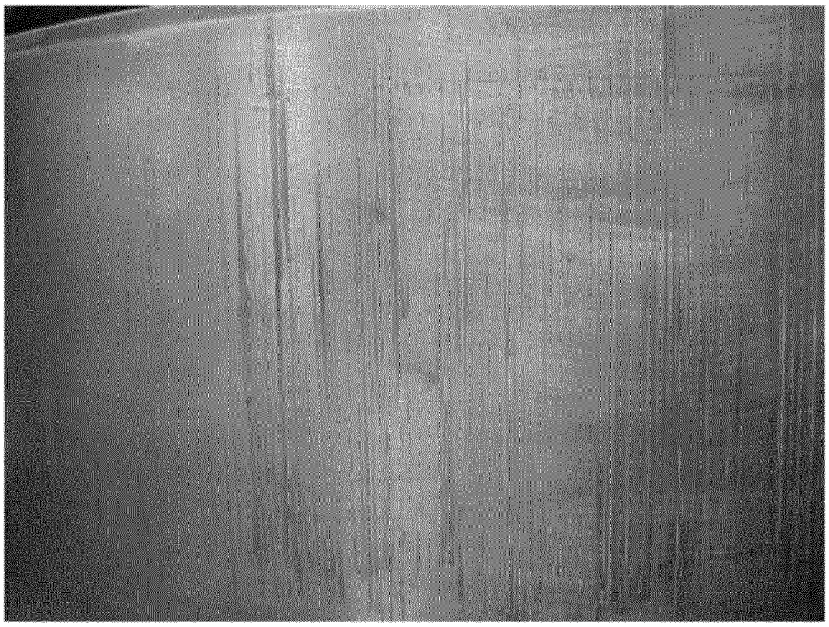


Figure 2.1 shows the outside diameter of the lower annular piston. The scoring and scratches shown are typical and extend around the full periphery of the piston; these scores were dressed out as far as possible. The open/close operating chambers will be pressure tested after re-assembly to 3,000 psi as per Transocean

Projected Workscope:

- Complete the re-assembly of the Hydril GX upper and lower annulars.
- Break in new MPL overhauling nuts on the port SSTV test ram and starboard upper pipe ram bonnets.
- Perform signature tests on all BOP bonnets.
- Install new port upper shear ram bonnet.
- Pressure test both upper and lower annular operating chambers to 3,000 psi as per Transocean procedure.
- Prepare to replace port upper shear ram bonnet, and replace same.

Comments/Corrections:
Transocean should investigate the availability of a replacement Hydril GX annular piston incase of any problems during operator and well bore testing of the lower annular. The availability of parts or complete replacements for the choke and kill female stab assemblies should also be investigated.

Attachments:
- Attachment A: Diagram of female choke/kill stab assembly.

Best Regards,

Greg Pennock
WEST BOP Surveyor

Attachment A

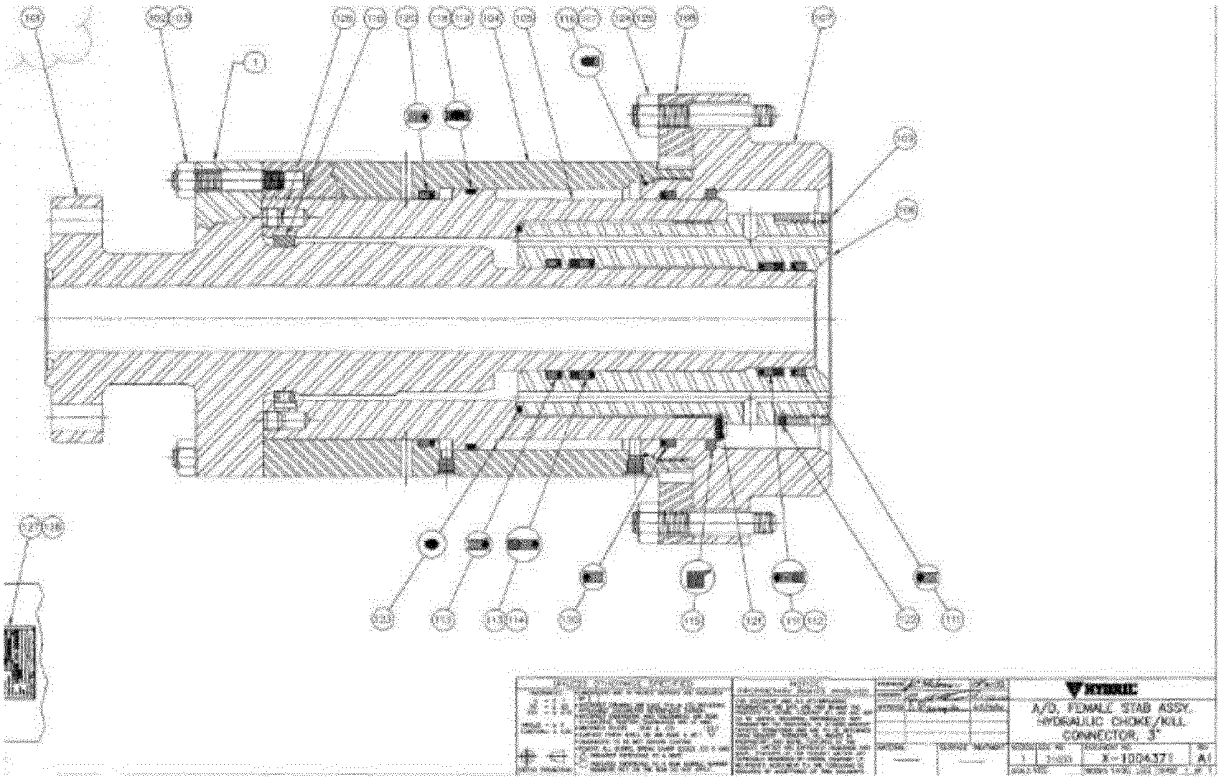


Diagram of the LMRP female choke/kill stab assembly. Both the stabs on the LMRP are leaking internally from the retract to the extend side operating chambers.

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP, Date: 16 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor, David Moore - WEST

From: Greg Pennock –WEST Engineering Services gn

FORM WES-OP-001 09/2009 REV

Daily Report #3 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The newly reconditioned port upper shear ram bonnet was mounted on the BOP. New hinge to body 'O' rings were installed and the ram block mounted on the ram shaft after renewing all the ram packers. The bonnet was closed and the bonnet bolts installed and torqued to 2,000 ft/lbs.
- Operating chamber pressure tests were successfully performed on the upper blind shear rams open/close chambers and lower blind shear rams open/close chambers to 3,000 psi for five minutes.
- A 5" pup joint was picked up and lowered into the BOP and the upper pipe rams, lower pipe rams and SSTV test rams open and close operating chambers were successfully pressure tested to 3,000 psi for five minutes.
- An operating pressure test was attempted on the open side of the Hydril GX lower annular, but a leak was noted of approximately 100 psi per minute when the 3,000 psi test pressure was applied. The leak was seen to be going into the well bore indicating the piston to upper chamber head seals were leaking.
- WEST transferred to the *GSF Development Driller III* to witness a subsea dead man test.

Recommendations:
None.

Discussion:
The lower annular piston failed to pressure test and will require replacement. This is no doubt due to the scoring around the periphery of the piston highlighted in WEST Daily Report #2.

Projected Workscope:

- Replace lower annular piston when replacement arrives onboard.
- Break in new MPL overhauling nuts on the port SSTV test ram and starboard upper pipe ram bonnets.
- Perform signature tests on all BOP bonnets MPL locks.
- Pressure test casing shear ram operating chambers.
- Replace choke/kill LMRP female stab connectors.
- Install Cameron HC connector on the BOP and plumb in same.

Best Regards,

Greg Pennock
WEST BOP Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 17 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services
pm

FORM WES-OP-001 09/2009 REV

Daily Report #4 — *GSF Development Driller II*
WEST Job #3940

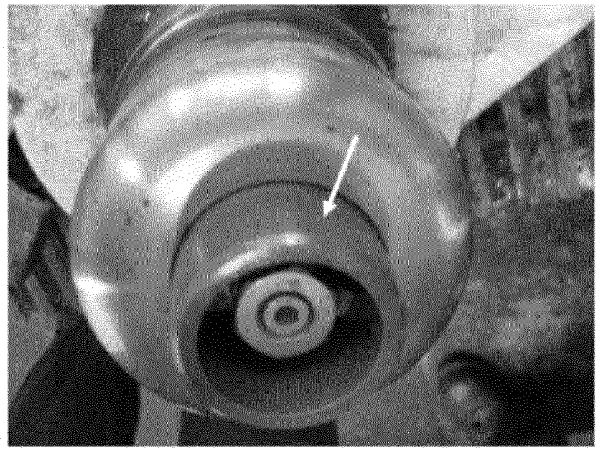
Workscope Accomplished:

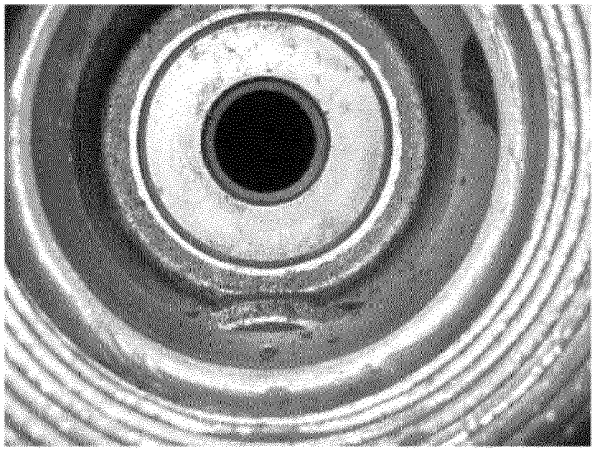
- WEST attended the BP six in one training.
- The casing shear ram operators (open and close) were successfully pressure tested to 4,000 psi for five minutes. Both tests were chart and witnessed by WEST.
- The choke side and kill side connectors on the LMRP both failed a pressure test on the retract side of the connector. Both connectors were replaced with rebuilt connector. The connectors have not been pressure tested.
- Signature and break-in tests were performed on SSTV MPL, middle ram MPL, upper ram MPL and both blind shear rams. All tests witnessed by WEST were successful.
- The two auto chokes and both manual chokes on the choke and kill manifold were disassembled for inspection.
- The kill side and choke side auto chokes gates and seats were found to be excellent condition and were replaced in the choke and kill manifold after renewing the body 'O' rings and back up rings. See Figures 4.01 – 4.04 below.
- The manual chokes, once removed, were both found to have severely damaged seats. There was one spare seat in the rig store, which was replaced, part # SW4233, in the choke side manual choke body. The rig has ordered a further seat to replace the kill side hot shot. See Figures 4.05 & 4.06 below. The gates were found to be in serviceable condition.
- Re-assembly work on the LMRP pipework removed for the choke/kill connector replacement is ongoing.
- The rig ET attempted to calibrate one of the two blue pod hydrostatic head reference transducers. This transducer was proving problematic and Hydril shore base intervention was checking the software and system to try to identify the problem. This is ongoing.
- The BOP was skidded to the lift elevator and secured to enable removal of the Vetco SHD H4 wellhead connector and installation of the Cameron HC connector, guide funnel and deflector plate on the BOP.

Recommendations:

None.

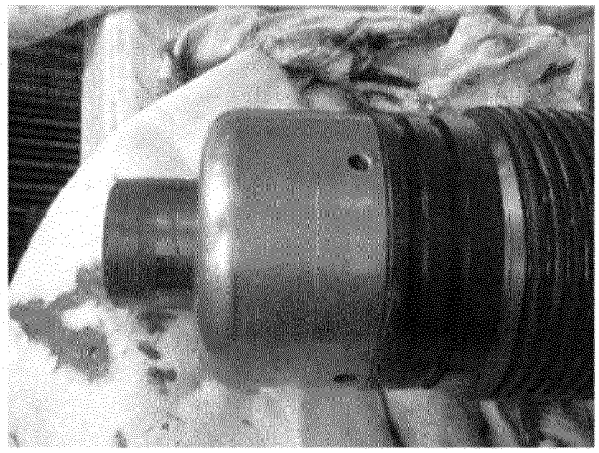
Discussion:

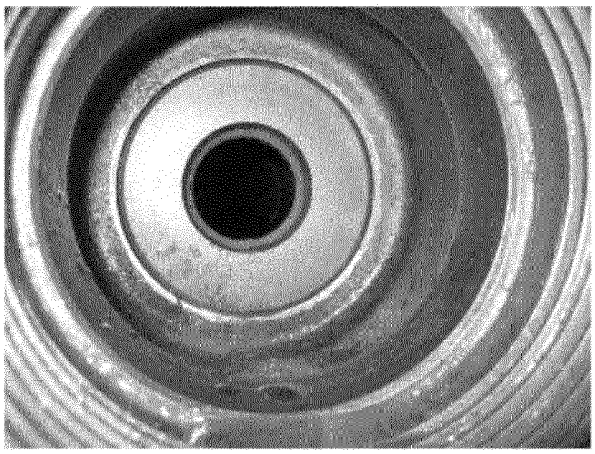


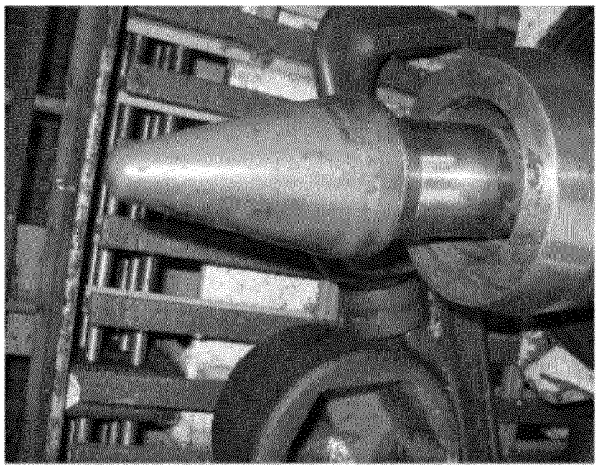


Figures 4.01 and 04.02: Above shows the kill side auto choke gate (arrowed) and seat, both were found to be in excellent condition so the auto choke was re-assembled with new body 'O' rings and back up rings.

Figures 4.03 and 4.04: Below show the choke side auto choke gate and seat, both were found in excellent condition so were re-assembled with new body 'O' rings and back up rings.







Figures 4.05 and 4.06: Show the manual choke. Both kill and choke side manual chokes were in similar condition, with the gates in serviceable condition, but the seats severely damaged, and requiring replacement. Only one replacement seat was available onboard, another seat will be hot shot to the rig to complete the assembly of the manual chokes.

Projected Workscope:

- Replace lower annular piston when replacement arrives onboard.
- Replace choke/kill LMRP pipework removed for connector replacement.
- Rebuild kill side manual choke when parts arrive onboard.
- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure
- Install Cameron HC connector, guide funnel and deflector plate on the BOP and plumb in same.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP, Date: 18 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #5 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The Vetco wellhead connector was removed from the BOP stack. See Discussion.
- Began pressure testing the failsafe valve operators Open and close ports. See Discussion.
- Visually inspected the diverter on deck. See Discussion.
- The lock, unlock, secondary unlock and gasket retainer operating chambers of the Cameron HC connector were successfully pressure tested as per Transocean procedures.
- The kill side manual choke seat was replaced in the choke manifold. The kill side manual choke was then rebuilt.
- The Vetco HAR H4 riser connector was inspected internally and found to be in excellent condition, with no indications visible on the VT seal profile. The dog gap to wear ring was measured and found to be 0.019" minimum and 0.023" maximum well within the allowable 0.014" – 0.039" gap.
- The choke and kill pipe work flanges on the LMRP, which were removed for stab connector replacements, were torqued to 470 ft-lbs after installation of new BX 154 ring gaskets.
- The LMRP Blue and Yellow conduit hose flanges were torqued to 325 ft-lbs after the installation of new BX 152 ring gaskets.
- The Cameron HC connector was skidded under the BOP, aligned, and the flange studs installed. A new BX 163 gasket was installed in the ring groove, and the BOP lowered to mate with the connector. The nuts were installed on the flange studs and partially torqued to allow the BOP to be skidded to its park position above the test stump.
- The LMRP was picked up with the overhead crane and the BOP released from the lift jack. The BOP was skidded port and then forward, under the suspended LMRP, to the park position above the test stump.

Recommendations:

1. It was also noted that the diverter flowline seals were not protected from the damaging influence of sunlight and the elements or mechanical damage. It is recommended that the diverter flowline seals are protected from the elements and mechanical damage. At a minimum grease should be applied to the flowline seals and a protective cover placed over the flowline seals.

Discussion:

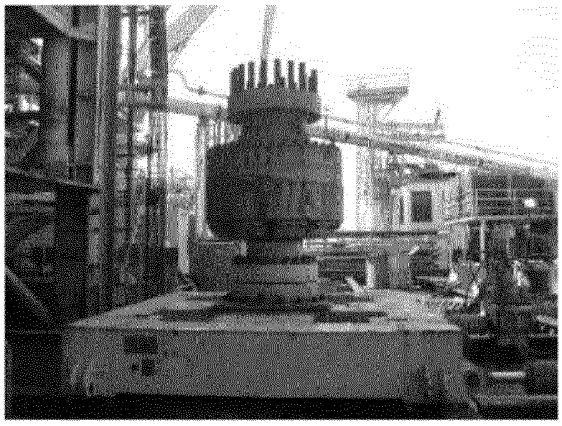


Figure 5.1: Vetco wellhead connector removed from the BOP stack.

The BOP stack was positioned onto the BOP carrier. Once positioned on the carrier the nuts connecting the wellhead connector to the bottom ram body were broken out. The wellhead connector was then removed from under the BOP stack. See Figure 5.1. The rebuilt Cameron HC connector lock port was pressure tested to 250 psi for five minutes and 3,000 psi for five minutes as per TOI maintenance procedure. The unlock port was pressure tested to 250 psi for five minutes and 3,000 psi for five minutes as per TOI maintenance procedure. All tests were successful, charted and witnessed by WEST. The rebuilt Cameron HC connector had P/N 615735-0C-Rev06 stamped onto the body. The connector indicator rod was measured while the connector was unlocked off the stump with 3,000 psi; the measurement was recorded at 6-3/4". The connector indicator rod was measured while the connector was locked off the stump with 3,000 psi; the measurement was recorded at 3/8". Once the connector is successfully pressure tested the connector will be installed on the BOP stack. The choke and kill side stab operators (extend and retract) were pressure tested to 250 psi for five minutes and 3,000 psi for five minutes. The choke and kill isolation valve operators (open and close) were pressure tested to 250 psi for five minutes and 3,000 psi for five minutes. The inner and outer annular bleed valve operators (open and close) were pressure tested to 250 psi for five minutes and 3,000 psi for five minutes. The diverter was visually inspected. The diverter was stored on deck in a purposely built rack. It was noted that no keyseating was observed. The diverter element and flowline seals were observed to be in very good condition. See Figure 5.2. It was also noted that the diverter flowline seals were not protected from the damaging influence of sunlight and the elements or mechanical damage. See Figure 5.3. It is recommended that the diverter flowline seals are protected from the elements and mechanical damage. At a minimum grease should be applied to the flowline seals and a protective cover placed over the flowline seals.

Figure 5.2: Diverter element.

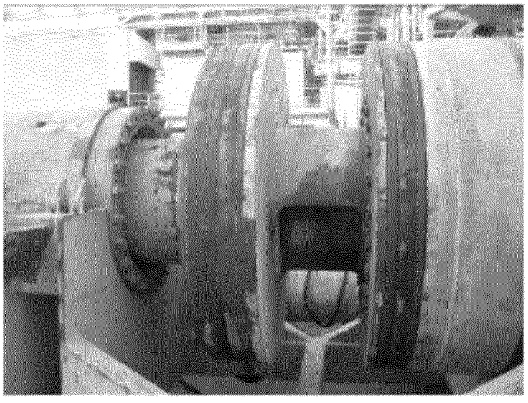


Figure 5.3: Diverter flowline seals.

Projected Workscope:

- Replace lower annular piston when replacement arrives onboard.
- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Install Cameron HC connector, guide funnel and deflector plate on the BOP and plumb in same.
- Complete torquing of Cameron HC connector to BOP flange studs.
- Complete pressure testing operating chambers of BOP failsafe valves.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 19 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #6 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The wellhead connector was changed out with a Cameron HC connector. The nuts were torqued to 8,522 ft/lbs using Moly as the lubricant.
- The subsea engineer began to test the ROV ports on the LMRP ROV panel. See Discussion.
- The blue and yellow HP casing shear ram 5,000 psi to 4,000 psi regulators were replaced with new regulators.
- The lower Hydril GX annular was disassembled in preparation for piston change out. All parts were cleaned ready for inspection.
- The operating chambers of the WOM lower inner and outer kill, upper inner and outer kill, lower inner and outer choke and upper inner and outer choke failsafe valves were successfully pressure tested to 250 psi for five minutes and 3,000 psi for five minutes as per Transocean procedure.
- The LMRP riser connector primary and secondary unlatch shuttle valves were removed for inspection as they were found to be still leaking after being repaired. See discussion below.
- The Vetco HAR H4 riser connector was lubricated with Lubriplate 630AA grease. The connector was not functioned at this time to distribute the grease, as the unlatch shuttle valves were removed for repair.
- A damaged hydraulic fitting was replaced on the riser tensioner load ring on the slip joint lock dogs circuit.
- The riser tensioner system high pressure air was built up to pressure test the riser tensioners, this is ongoing.

Recommendations:

1. Transocean should consider the inclusion of an automatic changeover system for the slip joint packers, to automatically energise the lower packer if the top slip joint packer should fail. This is an environmental impact issue with the use of oil based mud.

Discussion:

The hot stab was plugged into the flush port on the LMRP ROV panel and flushed for approximately three minutes. Fluid was seen coming out of the riser connector. This test proved the riser connector flush ports are clear. The hot stab was then plugged into the stab retract port. One GPM was flowed through the port until 3,000 psi was obtained. Pressure was held for five minutes. This test proved the choke/kill stab retract, pod stab retract and the hot stab retract circuit piping from the ROV panel to the function was not leaking. The hot stab was plugged into the riser connector unlock port on the LMRP ROV panel. Once 3,000 psi was applied to the circuit a leak on the chart was observed. After troubleshooting the leak it was determined that the riser connector multi-input shuttle valve was leaking. The shuttle valve was removed from the stack and taken into the subsea shop to be repaired. Once taken apart corrosion was evident in the valve. The valve body was replaced and new O-rings installed and the shuttle valve was installed back on the LMRP. The shuttle valves were re-tested and found to be still leaking. They were again removed from the LMRP and taken to the workshop for further investigation. If the upper slip joint packer should fail in service, or the air supply hose to the upper packer fail, a considerable volume of mud could be lost to the sea from the slip joint unless the lower hydraulic packer was energized automatically. Presently the system relies on manual changeover which could take some time to initiate. There are a number of systems now on the market to fulfill the automatic changeover operation.

Projected Workscope:

- Replace lower annular piston when replacement arrives onboard.
- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure
- Install Cameron HC connector deflector plate on the BOP and plumb in connector.
- Pressure up riser tensioner system and inspect for leaks.

Comments/Corrections:

One of the three high pressure air compressors for the riser tensioner system is on long term isolation awaiting parts. The delivery time of the parts required to repair the compressor is unknown. These parts should be expedited to repair the compressor and give a full complement of high pressure air compressors for the riser tensioner system.
WEST is still waiting for certification and inspection records to review for the moon pool Coflexip choke, kill, boost and conduit drape hoses.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 20 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #7 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The blue and yellow rigid conduit valve packages were flushed using the 1" hotline.
- The spider/gimbal was visually inspected and found to be in good condition.
- The rebuilt shuttle valves were installed back on the LMRP, they have not been tested.
- The lower annular piston arrived onboard the rig today. The piston was visually inspected and was in good condition. A new seal kit was installed. The seal kit was, P/N 3117930-B1. The annular was reassembled with the original element as it was in 'as new' condition with only 12 closures on it.
- The annular cap was installed on the lower annular and the head pull down bolts tightened to 300 ft-lbs. The radial head latch dogs were then engaged and progressively torqued to 350 ft-lbs.
- The lower annular open and close operating chambers were successfully pressure tested to 250 psi for five minutes and 3,000 psi for five minutes. A 6-5/8" pup joint was installed in the annular for the close operating chamber test.
- The rebuilt shuttle valves for the ROV riser connector unlatch were pressure tested and a leak was still evident. The leak was traced to the secondary unlatch shuttle which was removed to the workshop for investigation. Upon inspection it was found that the new supply port body section of the shuttle had been incorrectly machined and was not allowing the shuttle inside to seat and seal. This body section was replaced and the shuttle valve successfully bench tested.
- The rebuilt and tested shuttle was replaced in the riser connector unlatch circuit and the ROV unlatch function successfully pressure tested to 250 psi for five minutes and 3,000 psi for five minutes.
- The rig ET was working on the between wells electrical checklist, pressure testing the pressure balanced oil filled cables (PBOF) on the pods to 250 psi and 4,500 psi five/five minutes.
- A Blue pod SEM 'A' 'communication error' alarm was activated and the cause of this alarm was being investigated.
- WEST continued with ATP line items, the riser tensioner system was pressured up for integrity testing and the auto choke control panel surveyed. See discussion below.

Recommendations:
None.

Discussion:
During the survey of the auto choke operating panel, anomalies were found. The pre charge in the system accumulators was found to be low and two system pressure gauges were found to be out calibration. The relief valve in the nitrogen backup system was also found to be malfunctioning. These issues will be rectified and the auto choke panel re-surveyed.

Projected Workscope:
- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure
- Install Cameron HC connector deflector plate on the BOP and plumb in connector.
- Pressure up riser tensioner system and inspect for leaks - ongoing.
- Investigate and rectify Blue SEM A comms. error.
- Complete electrical between wells checklist.
- Stack up BOP and prepare for wellbore pressure testing, and function testing.

Comments/Corrections:
Transocean has yet to supply certification and test records for the moon pool Coflexip drape hoses.

Best Regards,
Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP, Date: 21 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #8 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The rig ET was working on the between wells electrical checklist, pressure testing the pressure balanced oil filled cables (PBOF) on the pods to 250 psi and 4,500 psi five/five minutes.
- A Blue pod SEM A communication error alarm was activated and the cause of this alarm was being investigated. WEST was informed today that a Hydril service technician will be onboard the rig tomorrow to investigate the error.
- The riser tensioner system was pressured up for integrity testing.
- TIC has began to run hard piping to the wellhead connector latch, unlatch, secondary unlatch and flush ports.
- The seals were replaced on both LMRP hot stabs.
- The gantry crane was connected to the LMRP in preparation to lift the LMRP and latch onto the BOP. After a safety briefing and all required documentation, the LMRP was lifted onto the LMRP, once the weight of the LMRP was landed on the BOP the LMRP was latched onto the BOP mandrel with 1,500 psi.
- The BOP deflector plates were test fitted, marked up, and removed to the welders shop for trimming and wellhead connector operating pipe work penetrations to be cut. The four deflector plate sections were then lifted up to the BOP framework and bolted in place.
- A new 5,000 – 4,000 psi step down regulator for the casing shear ram auto shear hydraulic circuit was fitted to the BOP and plumbed in.
- The ROV intervention system for the upper blind shear rams, lower blind shear rams, and casing shear rams was function tested and pressure tests on the systems attempted. The casing shear ram close circuit was successfully pressure tested to 3,000 psi for five minutes. Leaks were encountered on the upper and lower blind shear ram circuits however, the leak tracing is ongoing.
- WEST continues with ATP line items.

Recommendations:

None.

Projected Workscope:

- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Plumb in Cameron HC wellhead connector.
- Pressure up riser tensioner system and inspect for leaks - ongoing.
- Investigate and rectify Blue SEM A communication error.
- Complete electrical between wells checklist.
- Prepare for wellbore pressure testing, and function testing of BOP.
- Investigate and rectify leaks on ROV upper and lower blind shear ram close circuits.

Comments/Corrections:

WEST created a list of required documentation and information, which will be distributed to the Transocean subsea / engineering departments for review.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 22 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #9 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- A Blue pod SEM A communication error alarm was activated and the cause of this alarm was being investigated. The Hydril service technician arrived onboard the rig today. The suspected faulty electronics processor card in SEM A was swapped with the same card in SEM B and the system reactivated and monitored. No communication error alarms were activated upon reactivation.
- The riser tensioner system was pressured up for integrity testing, this is ongoing.
- TIC continues to run hard piping to the Cameron HC wellhead connector latch, unlatch, secondary unlatch and flush ports.
- The ROV intervention system shuttle valves for the upper blind shear rams and lower blind shear rams were disassembled for inspection. Repair kits were fitted to both the shuttle valves and the valves re-mounted on the BOP. The valves were not tested at this stage.
- The autoshear ARM shuttle valve was noted to be leaking. The shuttle valve was removed from the stack and repaired.
- Jumper hoses were made for the Cameron wellhead connector lock and unlock functions to enable BOP pressure testing to progress without having to wait for TIC to complete the permanent hard pipe installation.
- Tubing runs were prepared on the LMRP to function the 5,000 psi SPM valves that are to be installed in the 5,000 psi to 4,000 psi casing shear ram step down regulator circuits. The management of change paperwork was prepared for this installation but was not available for review by WEST at the time of writing.
- The ROV crew prepared hoses and test equipment to function test the ROV operable functions on the BOP when testing commences.
- A hole was drilled in the deflector plate fitted to the BOP to accommodate the wellhead connector lock / unlock indicator flag.
- Tubing and pipe work brackets on the LMRP and BOP were checked for tightness.
- A Blue pod SEM B communication error alarm was activated approximately 12 hours after the electronic cards were swapped in the SEMS – this proved that the card put into the blue SEM was the problem.
- WEST performed the accumulator volume calculations using API 16D software. The fluid volume required is 300.2 gallons and the total fluid volume available is 414.4 gallons. The fluid volume

available on the *GSF Development Driller II* is acceptable according to API 16D. See Attachment A.

- WEST continues with ATP line items.

Recommendations:
None.

Projected Workscope:
- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Complete plumbing in Cameron HC wellhead connector.
- Pressure up riser tensioner system and inspect for leaks - ongoing.
- Investigate and rectify Blue SEM B communication error, replace processor card.
- Complete electrical between wells checklist.
- Prepare for wellbore pressure testing, and function testing of BOP.
- Install 5K SPM valves in casing shear circuit, plumb in same.

Comments/Corrections:
The management of change documentation for the installation of the 5K SPM valves in the casing shear system should be made available for review at the earliest opportunity.

Attachments:
A. *GSF Development Driller II* API 16D Accumulator Volume Calculations.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

Attachment A

API CONTROL SYSTEM used for SUBSEA DRILLING BOPS

In accordance With API SPECIFICATION 16D 2nd Edition, July 2004

Project: Development Driller II
Printed: 3/22/2010 10:59:32 AM API 16D Sizing Revision 1.03
File name: DDII.16D
Comments:
WEST Job #3940
Operator - BP
Water Depth - 5133'

Wellbore pressure from MWP excluding annulars (gauge): 15,000 psi
(Used with the closing ratio to calculate RAM operating pressure)

User selected options and overrides
Full API stack, subject to 16D requirements
Accumulators are isolated with check valves
Minimum required stack-mounted functional volume is 10.0 gal

Surface Accumulator bottles (gauge pressures)

Calculation method	B - Real Gas Isothermal	Precharge (operating) 90 F	1,650 psi
Number of bottles	48	Precharge (surface) 90 F	1,650 psi
Gas volume per bottle	13.8 gal	Precharge (max temp) 120 F	1,762 psi
Gas type	Nitrogen	Pressure rating of bottles	6,500 psi

Precharge was selected by the user
Number of bottles was set by the user

Stack-mounted Accumulator bottles (gauge pressures)

Calculation method	B - Real Gas Isothermal	Precharge (operating) 40 F	3,553 psi
Number of bottles	4	Precharge (surface) 90 F	4,100 psi
Gas volume per bottle	155.0 gal	Precharge (max temp) 120 F	4,426 psi
Gas type	Nitrogen	Pressure rating of bottles	6,500 psi

Precharge was selected by the user
Number of bottles was set by the user

Technical Warnings - NONE

Project: Development Driller II
Printed: 5/22/2010 10:59:32 AM API 16D Sizing Revision 1.03

Fluid Densities and Head Pressures
Pressure is gauge (relative to 1 atm) including air gap and returns elevation

Sea water	8.54 lb/gal	0.444 psi/ft	2,277 psi
Control fluid	8.32 lb/gal	0.432 psi/ft	2,240 psi
Riser fluid	13.00 lb/gal	0.675 psi/ft	3,527 psi

BOP Stack Components	Closing Volume	Opening Volume	Closing Ratio
Upper Annular (Annular 10,000 psi Hydril 18-3/4 GX)	[58.0 gal]	[58.0 gal]	
Riser Connector (Connector 15,000 psi Vetco 18-3/4 HAR H4 Style E x F)	[4.1 gal]	[5.2 gal]	
Lower Annular (Annular 10,000 psi Hydril 18-3/4 GX)	58.0 gal	58.0 gal	
Upper Blind Shear Rams (Shear Ram 15,000 psi Hydril 18.75 Comapact 22" MPL w/ Locks)	[39.2 gal]	[39.5 gal]	14.64
Lower Blind Shear Rams (Shear Ram 15,000 psi Hydril 18.75 Comapact 22" MPL w/ Locks)	[39.2 gal]	[39.5 gal]	14.64
Casing Shear Rams (Shear Ram 15,000 psi Hydril 18 3/4 Compact w/o mpl)	39.3 gal	36.6 gal	14.64
Upper Rams (Ram 15,000 psi Hydril 18-3/4 RAM W/MPL Lock 15-1/2")	19.4 gal	16.7 gal	7.27
Middle Rams (Ram 15,000 psi Hydril 18-3/4 RAM W/MPL Lock 15-1/2")	19.4 gal	16.7 gal	7.27
Lower Rams (Ram 15,000 psi Hydril 18-3/4 RAM W/MPL Lock 15-1/2")	19.4 gal	16.7 gal	7.27
Wellhead Connector (Connector 15,000 psi Cameron 18-3/4 HC)	[20.0 gal]	[25.0 gal]	
Choke Valve (Valve 15,000 psi WOM 3-1/16 Dual Failsafe Magnum)	[0.9 gal]	[1.3 gal]	
Kill Valve (Valve 15,000 psi WOM 3-1/16 Dual Failsafe Magnum)	[0.9 gal]	[1.3 gal]	
Total functional volume requirement (300.2 gal)	155.5 gal	144.7 gal	

Note: volumes in brackets [...] are not included in the FTR.
Subsea, Full API stack
5.2.3.1: Close and open one (the largest) annular, and the smallest four rams

Project: Development Driller II
Printed: 5/22/2010 10:59:32 AM API 16D Sizing Revision 1.03

Minimum Operating Pressures (MOP, gauge, adjusted to subsea condition)

Lower Annular (Annular 10,000 psi Hydril 18-3/4 GX)	1,500 psi
Upper Rams (Ram 15,000 psi Hydril 18-3/4 RAM W/MPL Lock 15-1/2")	2,063 psi
Middle Rams (Ram 15,000 psi Hydril 18-3/4 RAM W/MPL Lock 15-1/2")	2,063 psi
Lower Rams (Ram 15,000 psi Hydril 18-3/4 RAM W/MPL Lock 15-1/2")	2,063 psi
Choke Valve (Valve 15,000 psi WOM 3-1/16 Dual Failsafe Magnum)	0 psi
Kill Valve (Valve 15,000 psi WOM 3-1/16 Dual Failsafe Magnum)	0 psi
Maximum value = MOP requirement	2,063 psi

Project: Development Driller II
Printed: 5/22/2010 10:59:33 AM API 16D Sizing Revision 1.03

Summary Data

General Data

Functional Volume Req	300.2 gal
Wellbore Pres (gauge)	15,000 psi

Static Pressures

Sea Water Static Pres	*2,292 psi*
Control Fluid Static Pres	*2,255 psi*
Riser Fluid Static Pres	*3,542 psi*

Surface Accumulator Conditions (absolute)		**Subsea Accumulator Conditions (absolute)**	
Charged Pressure P1	*5,015 psi*	*Charged Pressure P1*	*7,255 psi*
Min Operating Pres P2	*2,115 psi*	*Min Operating Pres P2*	*4,355 psi*
Operating Pchg P0 (90 F)	*1,665 psi*	*Operating Pchg P0 (40 F)*	*3,568 psi*
Surface Pchg (90 F)	*1,665 psi*	*Surface Pchg (90 F)*	*4,115 psi*
High Temp Pchg (120 F)	*1,777 psi*	*High Temp Pchg (120 F)*	*4,441 psi*
Empty Pressure P3	*1,665 psi*	*Empty Pressure P3*	*3,568 psi*
Number of Bottles	*48*	*Number of Bottles*	*4*
Available Fluid	*270.1 gal*	*Available Fluid*	*144.2 gal*
Total Available Fluid	*414.4 gal*		

Technical Notes

Stack items included in the FVR:
- Lower Annular (open) (close)
- Upper Rams (open) (close)
- Lower Rams (open) (close)
- Middle Rams (open) (close)
- Casing Shear Rams (open) (close)

Wellbore pressure is set by the Middle Rams
Min oper pressure is limited by the Middle Rams to 2,063 psi (gauge)
Subsea accumulator VEp = 0.233 VEv = 0.265
Subsea contribution to total FVR...
- Pressure Limited: 156.0 gal
- Volume Limited: 135.7 gal

Surface accumulator VEp = 0.408 VEv = 0.436
Surface bank is pressure limited

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP, Date: 23 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #10 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- A Blue pod SEM A communication error alarm was activated and the cause of this alarm was being investigated. The suspected faulty electronics node network processor card in SEM A was swapped with the same card in SEM B and the system reactivated and monitored. No communication error alarms were activated upon reactivation. A blue pod SEM B communication error alarm was activated approximately 12 hours after the electronic cards were swapped in the SEMS – this proved that the card put into the blue SEM was the problem. The faulty blue pod SEM A NNP card was replaced with a new card. No communications error has been reported since the installation of the new card.
- The riser tensioner system was pressured up for integrity testing, this is ongoing. The system was pressurized to between 281 and 283 kips. The pressures were visually inspected at 07.00.
- TIC continues to run hard piping to the Cameron HC wellhead connector latch, unlatch, secondary unlatch and flush ports. The completed pipe runs were successfully proof tested to 4,500 psi for five minutes and then the welded connections were pickled with acid. The pickling solution was flushed from the pipe work and the pipe work fitted to the wellhead connector.
- WEST was informed by TOI that the Cameron HC wellhead connector does have hydraulic gasket retainers installed and are ROV operated.
- The BOP stack and LMRP ROV panels were function and pressure tested, the tests being performed by the ROV pump and chart recorded. See Discussion below.
- The tubing runs required for operation of the 4,000 psi casing shear ram isolation SPM valves was completed.
- WEST continues with ATP line items.

Recommendations:

None.

Discussion:
The BOP stack ROV panels were function and pressure tested. A hose was run from the ROV pump to the BOP stack ROV panel hot stab. The output of the ROV pump was calibrated at approximately 1.7 GPM. The written TOI procedure used was DDII ROV Panel Operation Test Procedure (Surface), ref. RSP 008.

The ROV hot stab was plugged into the wellhead connector unlatch port and pressurized to 3,000 psi. The test was successful, charted and witnessed by WEST, TOI and MMS.
The ROV hot stab was plugged into the casing shear ram close port and pressurized to 3,000 psi. The test was successful, charted and witnessed by WEST, TOI and MMS.
The ROV hot stab was plugged into the lower blind shear ram close port and pressurized to 3,000 psi. The test was successful, charted and witnessed by WEST, TOI and MMS.
The ROV hot stab was plugged into the upper blind shear ram close port and pressurized to 3,000 psi . The test was successful, charted and witnessed by WEST, TOI and MMS.
The ROV hot stab was plugged into the riser connector unlock (primary and secondary unlock tied together) port and pressurized to 3,000 psi. The test was successful, charted and witnessed by WEST, TOI and MMS. The ROV hot stab was plugged into the 'all stabs retract' port and pressurized to 3,000 psi. A pressure drop was noted and leak tracing revealed a leaking 1/4" shuttle valve in the yellow pod wedge retract circuit. This was removed from the pod and a repair kit, part # 20-505226 fitted. The shuttle valve was replaced and a re-test attempted. Again a pressure drop was noted and traced to another 1/4" shuttle valve in the circuit, which was removed, repaired, and replaced A re-test revealed another leak from a 1/4" shuttle, which was repaired. The test was again repeated and another pressure drop noted. Leak tracing is ongoing at the time of writing. Once the ROV panel tests are completed a signed off copy will be made available.

Projected Workscope:
- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure
- Pressure up riser tensioner system and monitor for leaks - ongoing.
- Complete electrical between wells checklist.
- Prepare for wellbore pressure testing, and function testing, including dead man and EDS, of the BOP.
- Install 5,000 psi SPM valves in casing shear circuit, plumb in same.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation for the installation of the 5,000 psi SPM valves in the casing shear system should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 24 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #11 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The LMRP ROV panel 'all stabs retract' function pressure test was attempted and a leak noted at 3,000 psi. This leak was traced to the ½" shuttle valve on the choke retractable female stab. The shuttle valve was removed and stripped down for inspection and repair. A total of three shuttle valves were removed and repaired in the system.
- The LMRP ROV panel 'all stabs retract' function was successfully pressure tested to 3,000 psi for five minutes, the tests being performed by the ROV pump and chart recorded. TOI, MMS and WEST witnessed the test.
- The 5,000 to 4,000 casing shear ram step down regulator outputs were verified at 4,000 psi.
- While performing a dead man autoshear retest it was determined that the 1" SPM valve on the lower blind shear ram time delay circuit was leaking and in need of a repair kit. The repair kit was installed, and the SPM valve remounted on the BOP. The SPM valve will be tested when the autoshear function is activated.
- Another attempt was made to perform a dead man autoshear test and a further problem was found in the system.
- Pressure gauges and hotlines were rigged up and each component of the dead man autoshear circuit tested individually to troubleshoot the problem. After extensive testing it was determined that the spring loaded accumulator which forms part of the lower blind shear ram time delay circuit was causing the problems encountered. This accumulator was removed from the BOP for inspection and repair. This is ongoing.
- WEST will continue with ATP (Acceptance Testing Procedure) line items.

Recommendations:

None .

Discussion:

For the dead man/ auto shear to initiate, the sequence relies on the loss of pilot supply pressure to the auto shear activate valve. A Dead man condition (loss of hydraulic and electrical power) or an auto shear condition (separation of LMRP) will result in the loss of the pilot supply pressure to the auto shear activate valve, activating the sequence of casing shear rams close and, after a +/- 20 second delay from the delay circuit, the lower blind shear rams close.

Projected Workscope:

- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure
- Pressure up riser tensioner system and monitor for leaks - ongoing.
- Complete electrical between wells checklist.
- Prepare for wellbore pressure testing, and function testing, including dead man and EDS, of the BOP.
- Install 5,000 SPM valves in casing shear circuit, plumb in same.

Comments/Corrections:

A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available.
The management of change documentation for the installation of the 5,000 SPM valves in the casing shear system should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP, Date: 25 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #12 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The time delay circuit spring loaded accumulator, which was suspected as being the cause of the dead man/ autoshear system problem was stripped down for inspection. No anomalies were found with the accumulator so it was rebuilt and re-installed in the BOP auto shear time delay circuit.
- The upper annular open shuttle valve was removed and a new repair kit installed. Once the repair kit was installed, the shuttle valve was re-installed on the upper annular.
- The LMRP choke and kills isolation valves close shuttle valve was removed from the LMRP and a new repair kit installed. Once the repair kit was installed, the shuttle valve was re-installed on the LMRP.
- The blue pod 5,000 to 3,000 supply regulator was removed from the stack and a repair kit, part #AF650-RK, installed. Once the repair kit was installed, the regulator was re-instated on the LMRP.
- The newly fabricated pipe work sections for the casing shear ram 5,000 SPM isolation valve installation were successfully proof pressure tested to 7,500 psi.
- Further troubleshooting of the auto shear system was carried out and after simulating various scenarios with hotlines to the control valves in the system, it was found that the pilot operated check valve (POCV) attached to the arm side of the auto shear arm/disarm valve was passing fluid and not keeping a positive pressure on the 'arm' side of the valve. The POCV was removed from the system for inspection. This is ongoing. See discussion below.
- The kill line moon pool drape hose was prepared for change out with a new hose.
- The spare, used 1-1/2" 5,000 – 3,000 psi Hydril regulator in the subsea workshop, part #AJ 715, serial # 140876, was stripped down and a repair kit, part # AF650-RK fitted. The regulator was prepared for possible change out of the 5,000-3,000 psi regulator in the auto shear system.
- WEST continues with ATP (Acceptance Testing Procedure) line items.

Recommendations:

None.

Discussion:

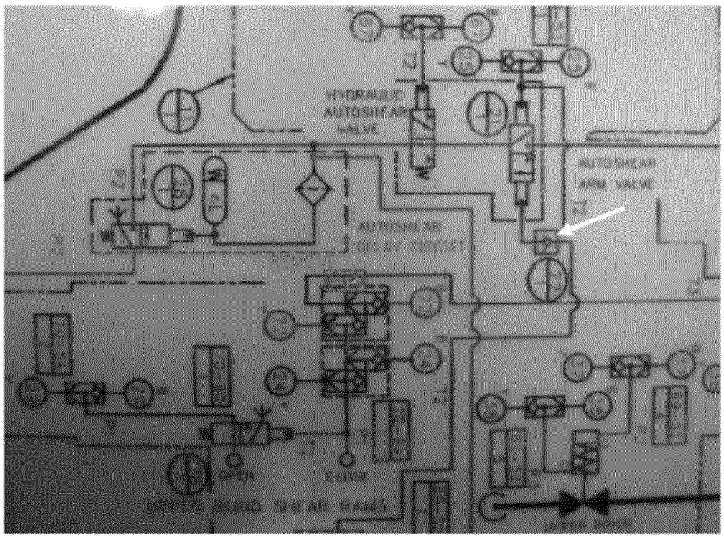


Figure 12.01: shows part of the auto shear circuit hydraulic schematic. The arrow indicates the POCV which is included in the circuit to keep a positive 'arm' pressure on the autoshear arm valve, when the pilot pressure to the 'arm' side of the valve is lost, i.e. in a dead man/auto shear situation. From testing with hotlines to the pilot side of the 'arm' valve it was proved that if the POCV should leak and release the positive 'arm' pressure to the valve, the arm valve will begin to close and 'chatter', thus preventing correct operation of the auto shear system.

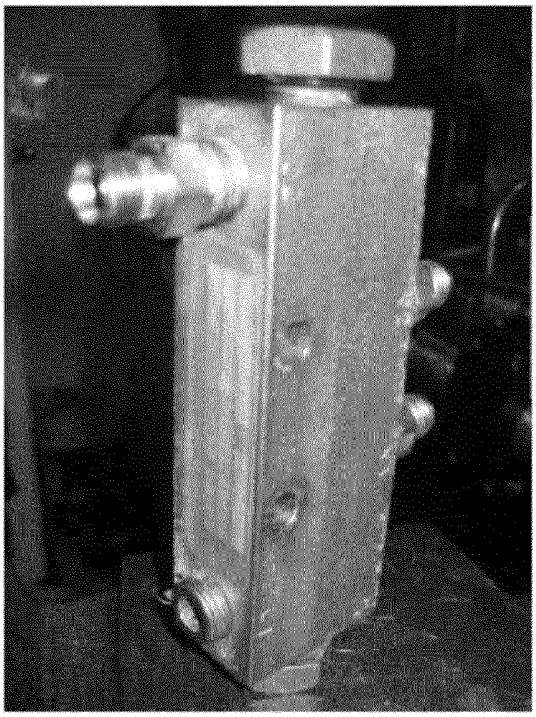


Figure12.02: shows the suspected leaking POCV removed from the auto shear hydraulic circuit. This valve will be replaced.

Projected Workscope:

- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure
- Complete electrical between wells checklist.
- Prepare for wellbore pressure testing, and function testing, including dead man and EDS, of the BOP.
- Install 5K SPM valves in casing shear circuit, complete proof testing of pipe work, passify / pickle welded joints and plumb in same.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available.
The management of change documentation for the installation of the 5K SPM valves in the casing shear system should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 26 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #13 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The pilot operated check valve (POCV) removed from the arm side of the auto shear arm/disarm valve was inspected and found to be leaking. A spare POCV or repair kit was unavailable onboard the rig so an alternative source was investigated. WEST was informed today that the POCV has been sourced and is scheduled to arrive on the rig tomorrow morning (5-27-10).
- Further troubleshooting of the system was carried out with the POCV simulated with a needle valve. Problems were encountered with pilot pressure bleed off from the pilot valves in the system, but it was not clear if this was in fact a problem or as a result of having the pods isolated for installation of the new casing shear regulator isolation SPM valves and associated pipework. The decision was made to suspend further testing until the SPM's and pipework are installed and the pods can be fully energized.
- A leaking 1" SPM in the blue pod was rectified. The SPM had come loose from its mounting block and the O-ring had blown out. The SPM valve was removed from the mounting block and the o-ring replaced.
- The two each blue and yellow rigid conduit line 5,000 psi W.P., 1-1/2" SPM valves were mounted on the LMRP. The SPM valves were mounted in the blue and yellow 4,000 psi supply lines to the pods downstream of the 5,000 to 4,000 casing shear ram regulators. The SPM valves were installed to ensure the casing shear rams does not receive 4,000 psi from both pods simultaneously, in effect a pod select for the casing shear rams, as both 5,000 – 4,000 regulators, being fed directly from the blue and yellow conduit supplies respectively, are live all the time.
- The moonpool Coflexip hose part numbers were recorded in the WEST ATP.
- The new kill line Coflexip moon pool drape hose was prepared for installation and hung in the moonpool.
- Troubleshooting of the deadman/autoshear system was continued as the SPM valve installation was complete and the pods could be fired up hydraulically. The problem with the pilot pressure in the dead man system not bleeding off to fire the dead man sequence as expected was further investigated. After tracing lines and consulting drawings, it was discovered that there was possibly a fundamental design flaw in the Hydril hydraulic circuit which prevented the dead man system from functioning as designed. This is being further investigated and is ongoing.
- WEST will continue with ATP (Acceptance Testing Procedure) line items.

Discussion:
The suspected Hydril design problem with the dead man hydraulic circuit is under investigation, and further testing, to establish a solution. A detailed report on the findings of this investigation will be produced, in due course, when the results are known.

Projected Workscope:
- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Complete electrical between wells checklist.
- Prepare for wellbore pressure testing, and function testing, including dead man and EDS, of the BOP.
- Further investigate dead man hydraulic circuit problem and instigate a solution.
- Complete fitment of Kill line moon pool drape hose.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation for the installation of the 5,000 SPM valves in the casing shear system should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 27 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #14 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The installation of the kill moon pool Coflexip drape hose was completed, but was not pressure tested.
- Another 160 gallon subsea accumulator pre charge was bled down from the subsea pre charge of 4,100 psi to 1,500 psi surface pre charge to increase the usable fluid volume available for function testing the BOP. Two of the four 160 gallon accumulators are now at surface pre charge pressure.
- It was noted that the diverter flowline seals are protected with grease and the seals are also protected with tape. This will be marked completed on the recommendation summary.
- Housekeeping was performed around the BOP to remove all tools and equipment used during the casing shear SPM installation and dead man system troubleshooting.
- The problem with the dead man hydraulic circuit was further investigated and a solution to the problem was implemented. See discussion below.
- The pilot operated check valve (POCV) removed from the arm side of the auto shear arm/disarm valve was inspected and found to be leaking. A spare POCV or repair kit was unavailable onboard the rig so an alternative source was investigated. The spare POCVs were received on the rig this morning. One POCV was installed on the hydraulic auto shear valve arm side and the other was installed on the casing shear arm/disarm valve disarm side.
- The wellhead connector test stump AX gasket prep was cleaned and a new AX gasket was installed. The test stump was raised into the Cameron HC wellhead connector and locked with 1,500 psi in preparation to stump test. Once the test stump was raised and locked into the wellhead connector the indicator rod was measured at 5/8".
- The EDS was performed from the driller's panel and the control room panel. See Discussion below.
- The LMRP was lifted off the BOP and the riser connector VX ring gasket replaced. The choke/kill line stab connector seals were inspected and the LMRP re-landed on the BOP and locked in position.
- A leak was found from the inner gas bleed valve close shuttle valve which was venting from the Yellow pod SPM valve. This shuttle valve was removed for repair. This is ongoing.
- WEST will continue with ATP (Acceptance Testing Procedure) line items.

Recommendations:
None .

Discussion:
The problem with the dead man hydraulic circuit was further investigated and it was confirmed that the blue and yellow pods were configured as per the Hydril drawings onboard, confirming that there had been no rig modifications in the past. Both the pods were configured the same, and a review of the drawings revealed that due to the check valve setup in the hotline supply circuit, the accumulators included in this circuit, and the position of the pressure sensing take off from the hotline supply, it would be impossible for the pressure in the pressure sensing line to vent and actuate the dead man system shear ram close sequence, in the event that pressure was lost in the hotline hose. The system would not recognize this pressure loss, rendering the system inoperable incase of catastrophic failure of the riser system and total loss of all electrical and hydraulic communication for which it is designed.

It was recognized that the removal of the 1/4" shuttle valve which tied the dead man system pressure sensing line into the hotline supply, below the check valve in the hotline supply, would solve the problem as the hotline pressure is also sensed in the sensing input from the blue and yellow conduit supply lines. See Attachments A & B.

This modification would make the *GSF Development Driller II* pod hydraulics the same as the *GSF Development Driller III* pods which have been proved to function as designed during recent subsea dead man function testing, after the BOP was run on relief well #1.

The required removal of the hotline tie in shuttle valves was carried out, and the tubing runs modified to suit the modified arrangement, in both pods.

The system was then tested and, although the hydraulic auto shear valves had to be hot lined in the arm position, as the new pilot operated check valves (POCV) required were not onboard at this stage, proved to function successfully on both blue and yellow pods.

The system will be re-tested, on both pods, once the POCV have been replaced on both the hydraulic auto shear valves.

The mud gas separator inspection hatch was removed. WEST performed a visual internal inspection. The mud gas separator was relatively clean. No recent wall thickness inspection reports were obtained. See Figures 14.1 and 14.2 below.

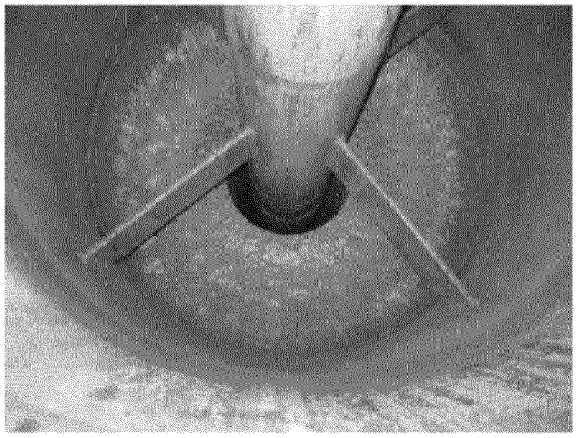


Figure 14.01: Internal inspection of the mud gas separator.

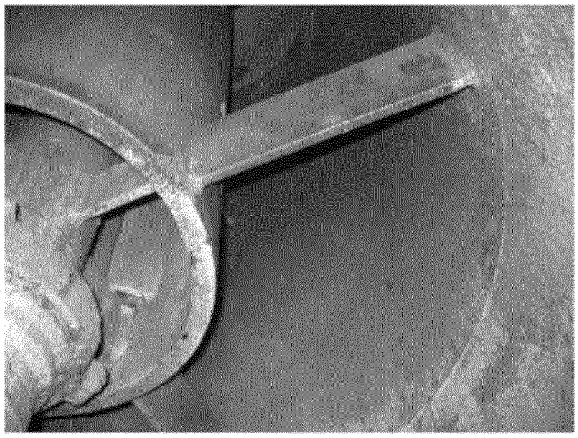


Figure 14.02: Mud gas separator internals.

The EDS was successfully performed from the driller's panel and control room panel. A drill pipe and casing shear ram EDS was successfully dry fired from the driller's panel using yellow pod SEM A and blue pod SEM B. The drill pipe and casing shear ram EDS was also dry fired from the control room using yellow pod SEM B and blue pod SEM A. The drill pipe and casing shear hydraulic EDS was successfully performed from the driller's panel using blue pod SEM A. The BOP stack was aligned in the drilling mode. Once the EDS was initiated all functions on the MMI screen went to block. The drawworks raised 32.3', the RARS (Riser Activate Recoil System) was seen to initiate from the cyber base screens and the lower blind shear rams were closed. The riser connector was verified to be unlocked. The full drill pipe EDS sequence was timed at 32 seconds. The riser connector was confirmed to be unlocked by lifting the LMRP with the gantry crane. The LMRP was then lowered back onto the BOP. The riser connector was locked onto the BOP and the BOP stack functions were aligned in the drilling mode. The casing shear EDS was then initiated. All functions on the MMI screen went to the block position. The drawworks raised 32.4', the RARS (Riser Activate Recoil System) was seen to initiate from the cyber base screens and the casing shear rams were closed. The riser connector was verified to be unlocked. The full casing shear EDS sequence was timed at 33 seconds. The riser connector was confirmed to be unlocked by lifting the LMRP with the gantry crane.

Projected Workscope:

- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Complete electrical between wells checklist.
- Prepare the BOP for wellbore pressure testing, and function testing, including dead man.
- Pressure test, to full working pressure, the newly fitted kill line moon pool drape hose.

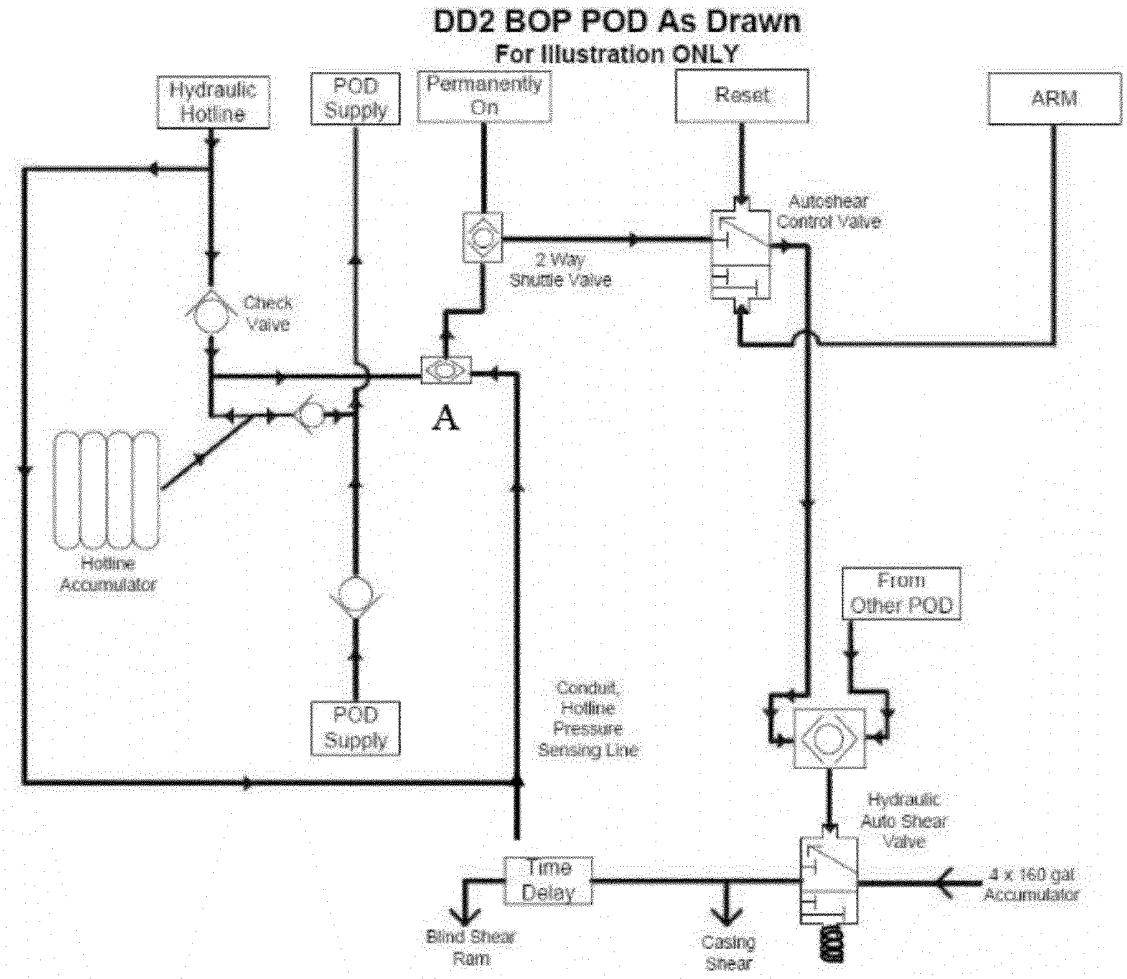
Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation for the installation of the 5,000 SPM valves in the casing shear system should be made available for review at the earliest opportunity. The management of change documentation for the modification of the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Attachments:
A. Attachment A & B: schematics of pod hydraulic modifications for the dead man system.

Best Regards,

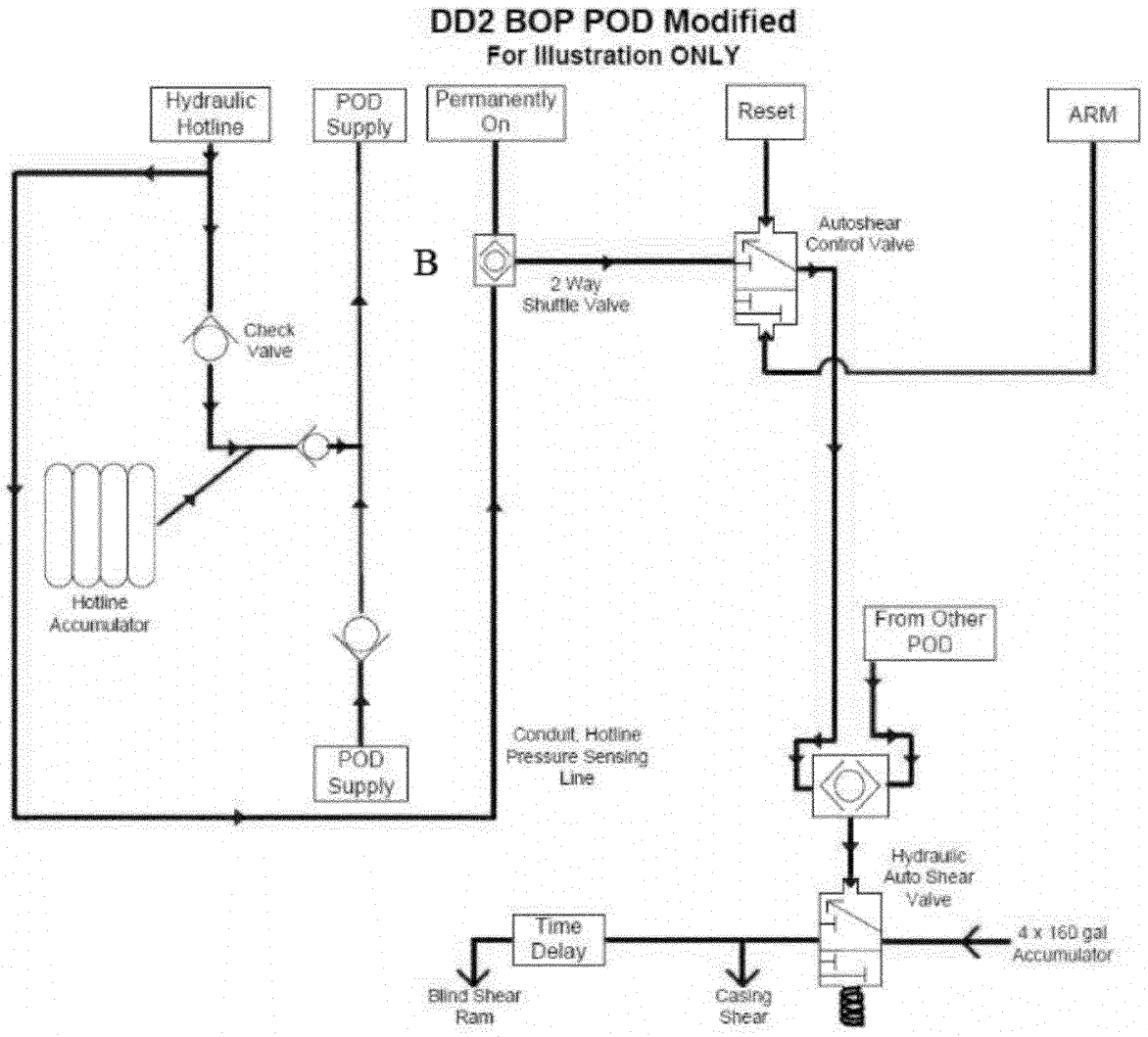
Greg Pennock
David Moore
WEST BOP Surveyors

Attachment A



Attachment A shows the as built hydraulic schematic of the pods. Because of the position of the hotline pressure sensing take off below the check valve in the hotline supply, to shuttle valve A it would be impossible for the pilot pressure to the hydraulic auto shear valve to bleed off, due to the check valves in the system, accumulators etc, and activate the dead man sequence in case of a catastrophic failure of the riser system and loss of all hydraulic and electrical supplies.

Attachment B



Attachment B shows the hydraulic schematic after removal of shuttle valve A and attachment of the pressure sensing line directly into shuttle valve B. This will allow the system to operate as designed. The system was proved to function correctly after this modification.

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 28 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #15 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The inner gas bleed close 1/2" shuttle valve was removed from the LMRP and a repair kit fitted. The repaired shuttle valve was then reinstated on the LMRP.
- The 5,000 psi – 3,000 psi blue pod supply 1-1/2" regulator was replaced with a rebuilt regulator and adjusted to give 3000 psi output.
- A dead man test was performed using the yellow pod SEM B. The hydraulic and electrical supply was cut to the pods and the casing shear rams observed to close, followed by the lower blind shear rams after the time delay circuit had functioned.
- Power and hydraulics were restored to the MUX system and the casing rams and blind shear rams opened and noted to take the correct fluid volume to open.
- The blue pod was selected and a Sentry 7 dead man test performed. With the Sentry 7 activated the casing shear rams do not close; only the lower blind shear rams. The system was activated by cutting electrical and hydraulic supply to the BOP and the lower blind shear rams observed to close.
- Power and hydraulics were restored to the MUX system and the lower blind shear rams opened and noted to take the correct fluid volume to open.
- All dead man tests were witnessed by MMS, BP & WEST.
- Preparations were made for stump testing the BOP.
- The lower blind shear rams, upper blind shear rams and the casing shear rams were function tested from the driller's panel and toolpusher's panel. The blue and yellow pods were utilized along with all SEMs. The function times and fluid volumes were recorded.
- The half-open tool was installed on the WOM BOP failsafe valves in preparation to test.
- The BOP wellbore pressure testing began. See Discussion.
- A problem developed with the blue pod SEM A solenoid driver board #3. This was identified by the MUX system self diagnostics and will be replaced in due course.
- WEST continues with ATP (Acceptance Testing Procedure) line items.

Recommendations:

None.

Discussion:
Wellbore pressure testing has commenced. The low pressure chart recorder used was a 0-1,000 psi, S/N 12546 and the calibration due date was 11-14-11. The high pressure chart recorder used was a 0-25,000 psi, S/N 33494-2 and the calibration due date was 2-18-11.

Test #1 – Closed the upper blind shear rams with 1,500 psi and then put in the block position. All failsafe valves were put in the half-open position by using the WOM half-open tool attached to the tail rods. The low pressure was 250 psi for five minutes and the high pressure was 15,000 psi for five minutes. Both tests were charted and successful and witnessed by TOI, MMS and WEST.

Test #2 – Upper blind shear rams (UBSR) remained closed and in the block position. The test hose was rigged up on the top of the kill line and the lower inner and outer kill failsafe valves opened. The lower outer (LOC) and upper outer choke (UOC) failsafe valves were put in the open position and then to block to allow the valves to close using the close spring force only. The upper (UIC) and lower inner choke (LIC) failsafe valves were opened. The UBSR, LOC and UOC were successfully pressure tested and chart recorded to 300 psi for five minutes low pressure and 15,000 psi for five minutes high pressure. TOI, MMS & WEST witnessed the test.

Test #3 – The UBSR remained closed and blocked, the LOC and UOC were pressured open and the LIC and UIC put to the block position to close using the close spring force only. A low pressure test was attempted against the UBSR, LIC and UIC but no pressure was built up with the test pump running at 3.5 gallons per minute. Investigation found that test fluid was coming from the choke line at the top of the BOP. The LIC and LOC were inspected and found to be only half closed from observing the tail rods on each valve. Further tests on the valves were performed to try to get them to close on the close springs only but were unsuccessful. The indication is that the close springs have broken in the LIC and UIC and will require replacement. Further test #3 testing was abandoned at this time as the test will be performed after the LIC and UIC fail safe has been rebuilt.

Test #4 – The UBSR were opened and the lower blind shear rams (LBSR) closed and put in the block position. The test line was transferred to the choke line at the top of the BOP, and the failsafe valves lined up to test the upper outer kill (UOK) and lower outer kill (LOK) failsafe valves, closing on the close springs only. The LBSR, UOK and LOK were successfully pressure tested and chart recorded to 300 psi for five minutes and 15,000 psi for five minutes. TOI, MMS & WEST witnessed the test.

Projected Workscope:
- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Complete electrical between wells checklist.
- Complete the BOP wellbore pressure testing, and function testing.
- Replace Blue SEM A board #3.
- Repair UIC and LIC failsafe valve operators.
- Change out SSTV rams to shear/blind rams.
- Install dual block failsafe valves on outlet below lower pipe rams below.
- Reposition temperature / pressure transducer on BOP.
- Pressure test, to full working pressure, the newly fitted kill line moon pool drape hose.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available.
The management of change documentation for the installation of the 5,000 SPM valves in the casing shear system should be made available for review at the earliest opportunity.
The management of change documentation for the modification of the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP, Date: 29 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services L.A.

FORM WES-OP-001 09/2009 REV

Daily Report #16 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The BOP wellbore pressure testing was continued. See Discussion.
- The 5-7/8" test joint was lowered into the BOP, and the shear rams and auto shear system locked out on the MUX control panel. After testing the rams and annulars on the 5-7/8" test joint, it was removed from the BOP, and the 6-5/8" test joint installed.
- The mud boost valve close, 1/2" shuttle valve was identified as leaking, this will be repaired in due course.
- The solenoid driver board #3 was replaced in blue SEM A. The SEM dome was replaced and successfully checked for pressure integrity with 4,500 psi applied, with an Enerpac pump, across the SEM dome seals.
- Function testing of the BOP commenced with tests of all pipe rams, annulars, and failsafe valves starting at the toolpushers panel located on the bridge. A problem was found when functioning the upper outer choke (UOC) failsafe on blue SEM A, the solenoid ramp up current drawn was low (190Ma, not the 360Ma expected) and the function was operating very slowly. The UOC solenoid is driven from driver board #3 so it was suspected the board just installed in the SEM was faulty. Further investigations were ongoing.
- Another fault developed on blue SEM B with an erroneous water ingress alarm. This was diagnosed as the utility board (temperature / water ingress) which will be replaced when the SEM dome is removed for driver board #3 replacement. Due to scattered showers forecast during the night, the decision was made to postpone the removal of the SEM dome until favorable weather is forecast.
- The two failsafe valve operators, that had been rebuilt by the mechanical department onboard were prepared for pressure testing.
- WEST continue with ATP (Acceptance Testing Procedure) line items.

Recommendations:

None.

Discussion:

Test #4 – The lower blind shear rams (LBSR) were left closed and in the block position (block = closing pressure bled to zero).

The test line was attached to the choke line at the top of the BOP, and the failsafe valves lined up to test the upper inner kill (UIK) and lower inner kill (LIK) failsafe valves, closing on the close springs only. The LBSR, UIK and LIK were successfully pressure tested and chart recorded to 300 psi for five minutes and 15,000 psi for five minutes. TOI and WEST witnessed the test.

Test #5 – The 5-7/8" test joint was lowered into the BOP and the 4-1/2"–7" SSTV (Sub Sea Test Valve) rams closed and put into the block position. The upper annular was closed on the test joint with 1,600 psi operating pressure and the inner gas bleed valve closed using the close spring force only. The outer gas bleed (OGB) valve was opened. A low pressure test was attempted against the upper annular and inner gas bleed (IGB) valve but pressure was unable to be built up. The IGB valve was then pressured close and another test attempted – a low pressure test was achieved. The IGB valve was then opened and allowed to close using the spring only and re-tested – no test, and test fluid seen coming from the open choke line at the top of the BOP.

The IGB valve was then opened and the OGB valve allowed to close using the close spring force only. A low pressure test was attempted and a slight drop off noticed which did not significantly improve after two 'bump ups'. The pressure was then bled off and the upper annular functioned open and close two times to condition the element rubber. A re-test was attempted and still an unsatisfactory low pressure test was achieved. The test lines were checked for leaks and it was found there was a steady drip from the test unit bleed off line, indicating the bleed off valves were leaking. The autoclave bleed valves on the test unit were disassembled and repair kits installed. The test unit was pressure tested and the bleed off valves found not to be leaking. Pressure testing continued.

Test #6- The upper annular was closed with 1,500 psi operating pressure. A 5-7/8" test joint was used. The upper annular and OGB valve were successfully pressure tested and chart recorded to 250 psi for five minutes and 10,000 psi for five minutes. TOI, MMS and WEST witnessed the test.

Test #7- The upper annular was opened and the lower annular was closed with 1,500 psi operating pressure. The lower annular was successfully pressure tested and chart recorded to 250 psi for five minutes and 10,000 psi for five minutes. TOI, MMS & WEST witnessed the test.

Test #8- The upper 5-1/2" x 7-5/8" HVR (Hydril Variable Rams) were closed with 1,500 psi. Once closed the rams were placed in the block position. The rams were placed in the block position to remove closing pressure; this was done to verify the MPL were holding the rams closed during wellbore pressure testing. The upper HVR was successfully pressure tested and chart recorded to 250 psi for five minutes and 15,000 psi for five minutes. A 5-7/8" test joint was used. TOI, MMS and WEST witnessed the test.

Test #9- The lower 4-1/2" x 7" HVR (Hydril Variable Rams) was closed with 1,500 psi. Once closed the rams were placed in the block position. The upper HVR was successfully pressure tested and chart recorded to 250 psi for five minutes and 15,000 psi for five minutes. A 5-7/8" test joint was used. TOI, MMS & WEST witnessed the test.

The SSTV was opened and the 5-7/8" test joint was removed from the bore of the stack and a 6-5/8" test joint was inserted into the bore of the stack.

Test #10- The upper annular was closed with 1,500 psi operating pressure. A 6-5/8" test joint was used. The upper annular was successfully pressure tested and chart recorded to 250 psi for five minutes and 10,000 psi for five minutes. A 6-5/8" test joint was used. TOI, MMS & WEST witnessed the test.

Test #11- The lower annular was closed with 1,500 psi operating pressure. A 6-5/8" test joint was used. The lower annular was successfully pressure tested and chart recorded to 250 psi for five minutes and 10,000 psi for five minutes. A 6-5/8" test joint was used. TOI, MMS & WEST witnessed the test.

Test # 12 The 5-1/2" to 7-5/8" variable bore upper pipe rams (UPR) were closed on the 6-5/8" test joint and put in the block position. The test hose was rigged up to pressure down the kill line and the UPR were successfully tested and chart recorded to 250 psi for five minutes and 15,000 psi for five minutes. TOI and WEST witnessed the test.

Test # 13 The 4-1/2" to 7" variable bore lower pipe rams (LPR) were closed on the 6-5/8" test joint and put in the block position. T he test hose was rigged up to pressure down the kill line and the LPR were successfully tested and chart recorded to 250 psi for five minutes and 15,000 psi for five minutes. TOI and WEST witnessed the test.

Projected Workscope:

- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure
- Complete the BOP wellbore pressure testing, and function testing.
- Perform soak test on closed rams/annulars on both pods and monitor control system for leaks.
- Replace blue SEM A board #3 and utility board SEM B.
- Repair UIC and LIC and inner gas bleed failsafe valve operators.
- Repair leaking shuttle valves on LMRP.
- Repair faults noted on auto choke operating panel, re-test same.
- Pressure test to full working pressure the newly fitted kill line and conduit line moon pool drape hose.

Comments/Corrections:

A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation for the installation of the 5,000 psi SPM valves in the casing shear system should be made available for review at the earliest opportunity. The management of change documentation for the modification of the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock
David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 30 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock, David Moore –WEST Engineering Services L.A.

FORM WES-OP-001 09/2009 REV

Daily Report #17 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The BOP wellbore pressure testing was suspended until after the failsafe valve operator repairs and wellhead connector changeout.
- The pipe rams, annulars and failsafe valves were function tested from both the bridge/toolpushers panel and the drill floor panel, with both pods and all SEMS. Function fluid volumes and times were recorded.
- During the function testing of the blue pod, a problem was noted with the upper outer choke function responding slowly and not receiving the required solenoid ramp up current on blue pod SEM A. The problem was diagnosed as the newly installed #3 solenoid driver card in SEM A being faulty. The utility card in blue SEM B was also giving erroneous readouts.
- As the weather forecast was favorable, the blue SEM dome was again pulled and the #3 driver solenoid card replaced with a card taken from the spare pod onboard. The utility card was replaced with a new card from the warehouse.
- The SEM dome was replaced and secured. The dome seals were once again successfully pressure tested to 4,500 psi using an Enerpac pump.
- The pipe rams, annulars and failsafe valves were successfully functioned with the blue pod from both SEMs on both the drillers and toolpushers/bridge panels.
- The 6-5/8" test joint was removed from the BOP, and the test hose and water fill hose rigged down. The Cameron HC wellhead connector was unlatched from the test stump and the stump lowered down and clear of the connector. The BOP was prepared for skidding to the BOP elevator for wellhead connector change out back to the Vetco SHD H4 connector.
- All but four each Cameron HC wellhead connector nuts were all removed in preparation to change out the existing wellhead connector to the Vetco SHD H4 connector. The BOP will then be skidded to the elevator and the connector changed out.

- The primary and secondary unlock operating chambers of the Vetco SHD H4 connector were pressure tested to 3,000 psi for five minutes. The lock operating chamber was pressure tested to 3,000 psi for five minutes. All tests were successful, charted and witnessed by TOI and WEST.
- The two rebuilt failsafe operators were successfully pressure tested on both open and close operating chambers to 3,000 psi for five minutes. The lower inner choke failsafe valve operator was removed due to a broken actuator spring. A rebuilt operator was installed. Once the inner gas bleed valve operator and the upper inner choke failsafe valve operators are replaced the bonnet gaskets will be wellbore pressure tested.
- The BOP stack was skidded from the set back position to the elevator in the moon pool for wellhead connector change out.
- WEST continue with ATP (Acceptance Testing Procedure) line items.

Recommendations:

1. Recommend TOI consider obtaining a TAM packer, or modified riser running tool, for stump testing the annular cap seal of the Hydril GX upper annular BOP. The wellbore seal in the annular cap of the upper annular does not see pressure until the BOP is run, and the riser is filled with mud. This hydrostatic differential pressure can be considerable in deep water and the seal is untested before the BOP is run.

Discussion:

When the upper annular is wellbore pressure tested, the annular cap wellbore seal sees no pressure until the BOP is run and the riser is filled with mud. The seals see the differential pressure between sea water and the drilling mud, and in deep water this can be significant. It is not possible to test this seal at present. One method of testing this seal is with the use of a TAM packer. The seal could be tested before the BOP is run to verify its pressure integrity.

If the seal were to leak subsea, the only option would be to retrieve the LMRP to surface to affect a repair. See Figure 17.01 and 17.02 below.

A TAM Packer being used to test the upper annular cap seal.

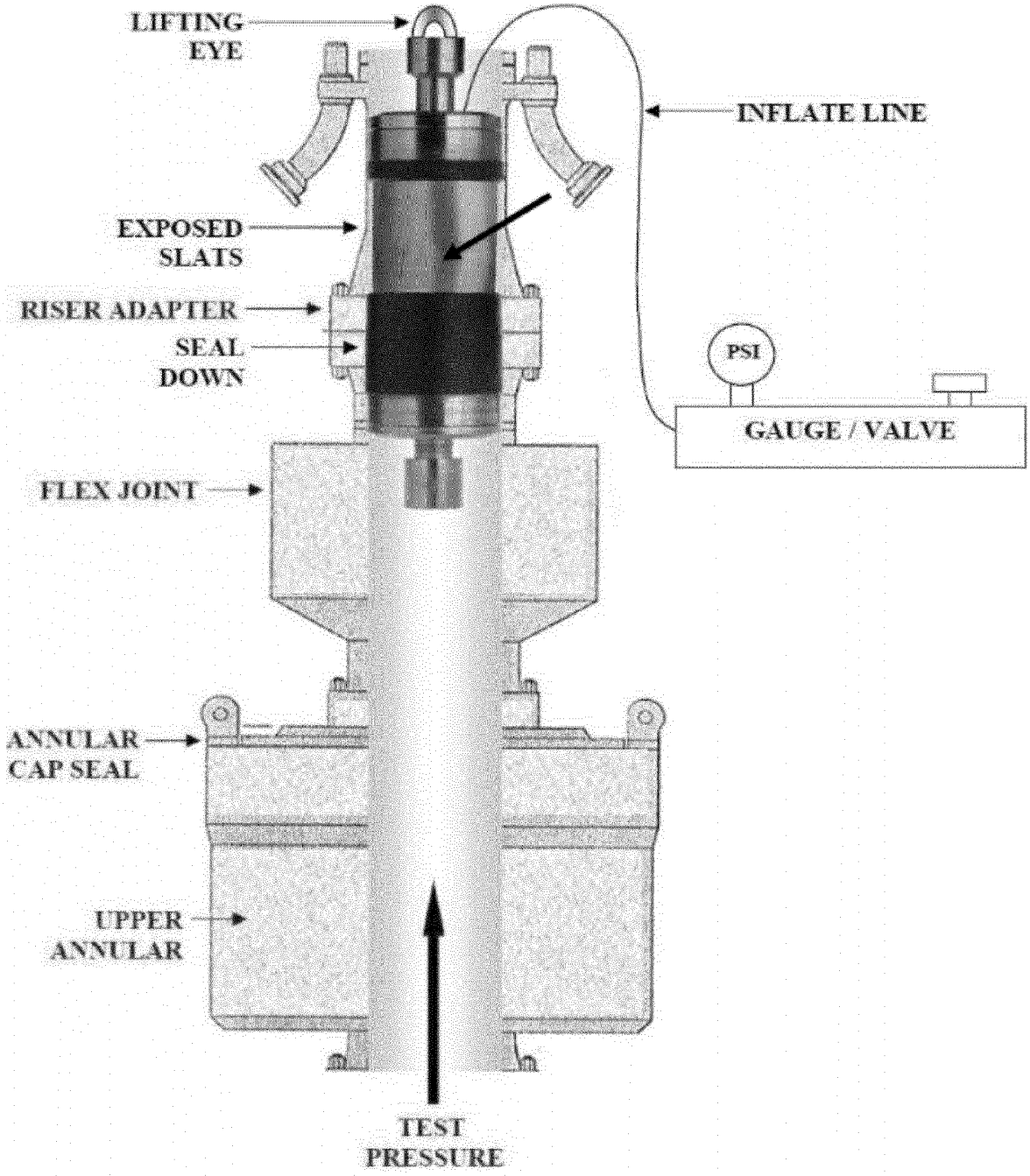


Figure 17.01: Upper annular cap seal, also see Figure 17.02, being tested using a TAM packer before the BOP is run. This is one method of testing this seal during stump testing. The flex joint and flange connection to the upper annular are also tested using this method.

Hydril GX Annular BOP

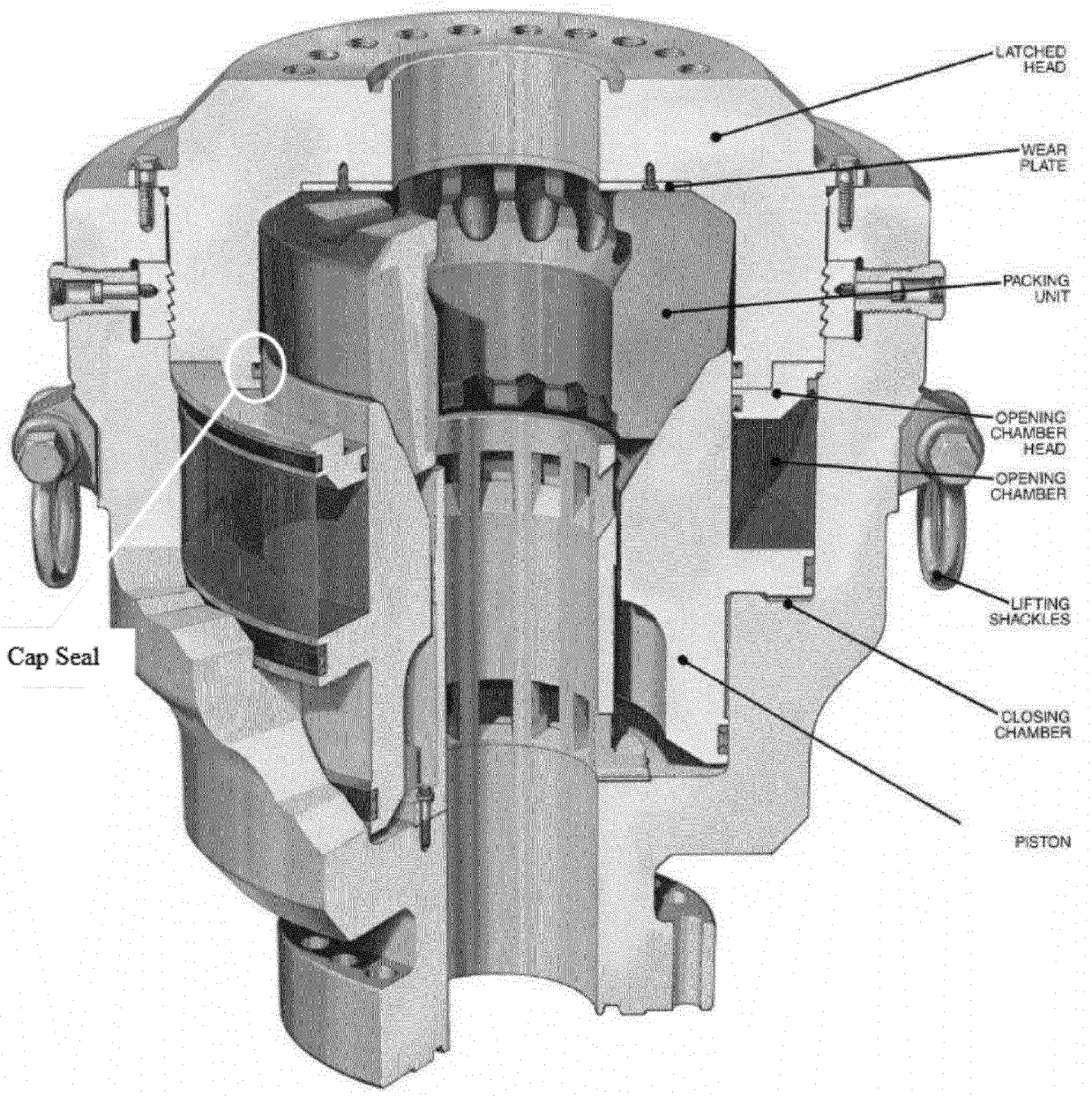


Figure 17.02: The cutaway shows the annular , which uses a TAM packer before the BOP is run for testing.

Projected Workscope:

- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure
- Complete the BOP wellbore pressure testing, and function testing. Pressure test all failsafe valves from the top side.
- Perform soak test on closed rams/annulars on both pods & monitor control system for leaks.

- Repair/replace UIC and inner gas bleed failsafe valve operators.
- Repair leaking shuttle valves on LMRP.
- Repair faults noted on auto choke operating panel, re-test same.
- Pressure test to full working pressure the newly fitted kill line and conduit line moon pool drape hose.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation for the installation of the 5,000 psi SPM valves in the casing shear system should be made available for review at the earliest opportunity. The management of change documentation for the modification of the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock and David Moore
WEST BOP Surveyors

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP, Date: 31 May 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock –WEST Engineering Services gn Page 1 of 4

Daily Report #18 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The BOP was skidded to the BOP elevator and raised up to change out the wellhead connector.
- The Cameron HC connector was broken loose from the BOP and skidded clear. The Vetco SHD H4 was positioned under the BOP, a new BX 164 stainless steel ring gasket installed in the ring groove, and the BOP mated with the connector. The flange nuts were run on and partially torqued.
- The connector cage was installed around the connector and bolted in position on the BOP frame.
- The BOP stack was skidded back to the forward park position, next to the MUX house, and the H4 connector flange studs fully torqued, in stages, in a criss cross pattern, to 8,000 ft/lbs, using Moly lube.
- The upper inner choke failsafe operator was replaced with a rebuilt operator and new bonnet gasket. The bonnet studs were torqued to 675 ft/lbs using Moly lube.
- The blue conduit Coflexip hose on the LMRP was replaced with a new hose, serial #46A514-201. The BX 152 ring gaskets were replaced each end, and the flanges torqued to 230 ft/lbs
- The H4 wellhead connector latch and unlatch operating pipe work was reinstated.
- An operating chamber pressure test was performed on the replacement WOM failsafe operator for the inner gas bleed valve. The open and close chambers were successfully tested and charted to 3,000 psi for five minutes.
- The inner gas bleed operator was removed from the valve and the replacement operator installed with a new bonnet gasket. The bonnet studs were torque to 675 ft/lbs using Moly lube.
- All the 3-1/16" 15,000 psi flanges on the LMRP choke/kill line pipework were torque checked to 450 ft/lbs.
- Nitrogen pre-charge check hoses were rigged up and the BOP mounted accumulator bottles pre-charge checked and adjusted as required – this is ongoing.
- WEST continue with ATP (Acceptance Testing Procedure) line items.

Recommendations:

1. Suggest TOI consider developing a method of testing the moonpool drape hoses and goosenecks off the critical path. At present it is only possible to test the hoses and goosenecks when made up to the slip joint just before landing the BOPs on the wellhead, and the test pressure is limited to the choke/kill line test pressure used while running riser.
2. Suggest TOI consider replacing the pressure biased shuttle valves on the open side of the casing shear rams and lower blind shear rams with pilot operated SPM types valves.
3. Suggest TOI consult Hydril controls and instigate a feasibility study as to the practicality of the inclusion of ROV observable analogue pressure gauges in the MUX pods to monitor the critical operating pressures within the pod. This should include, but not limited to, annular and manifold read back pressures, pod supply pressure, and subsea accumulator pressure.

Discussion:

With reference to recommendation #1, consideration should be given to obtaining a test fixture to attach to the goosenecks in the moon pool to pressure test the gooseneck, Coflexip hose and lines up to the choke and kill manifold valves, and the mud boost system. These tests would have the added benefit of testing the first valves into the manifold from the wellbore side, which at present can only be done by removing the gooseneck and attaching a test flange to the hose, or by testing down the kill or choke line, through the BOP and up the choke or kill line to the manifold valves during a subsea BOP test. The testing of the gooseneck is limited to the test pressure applied during the testing of the goosenecks when they are attached during BOP deployment. With a test fixture, testing could be done up to the maximum rated working pressure of the gooseneck/Coflexip hose, off the critical path.

With reference to recommendation #2, consideration should be given to replacing the pressure biased shuttle valves, used as quick dump valves, on the open side of the casing shear rams and the lower blind shear rams with pilot operated SPM style valves. This is part of the dead man/autoshear system, and the original Hydril drawings show a pilot operated SPM valve used as a quick dump, and this would seem to be the most reliable option of valve styles to use. From discussion with the subsea department onboard, these pressure biased shuttle valves were originally fitted as a temporary fix by Hydril, but have become permanent fixtures. If the pressure biased shuttle should fail, it could prove impossible to open the casing or lower blind shear rams.

With reference to recommendation #3, the Hydril Controls MUX control pod relies solely on electrical pressure transducers to monitor the critical operating pressures within the pod. If any of these transducers were to fail subsea, there is no way of monitoring the pressures within the pod. Analogue gauges on the pod would allow the ROV to monitor critical pressures and ensure the pod was functioning correctly. This could avoid the need to pull the LMRP to effect repairs to the pod. See Figure 18.01, below.

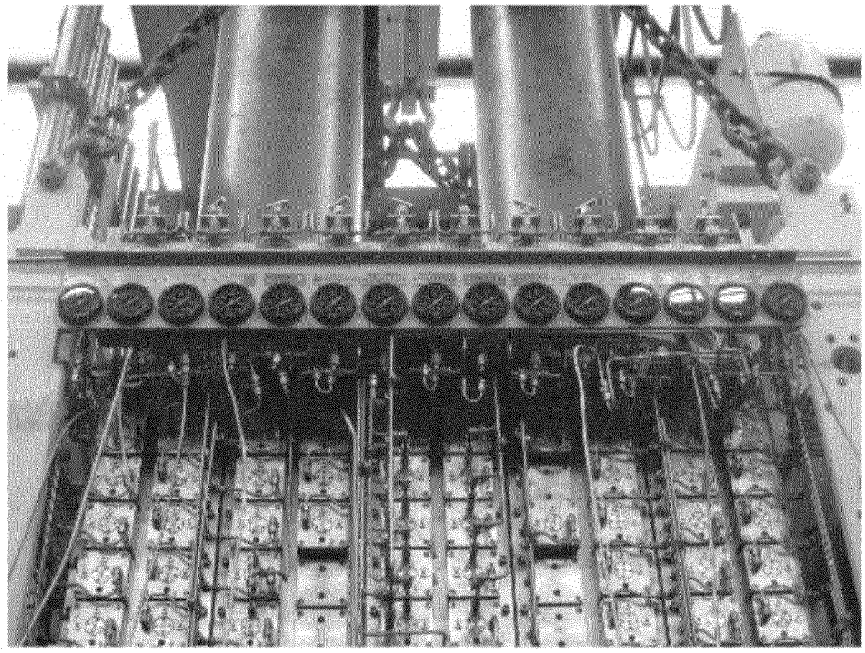


Figure 18.01: This shows a typical MUX pod with ROV observable analogue gauges fitted for all critical functions

Projected **Workscope:**

- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Test ROV wellhead connector release function using ROV pump + chart record.
- Complete the BOP wellbore pressure testing, and function testing. Pressure test all failsafe valves from the top side.
- Perform soak test on closed rams/annulars on both pods and monitor control system for leaks.
- Drift test BOP on completion of soak test, API says 30 minutes for annular to drift after closure.
- Repair leaking shuttle valves on LMRP.
- Re-torque all flanges broken for choke/kill stab changeout, and wellhead connector flange.
- Check and adjust all subsea accumulator pre charges.
- Repair faults noted on auto choke operating panel, re-test same.
- Pressure test to full working pressure the newly fitted Kill line & conduit line moon pool drape hose.
- Run BOPs.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation for the installation of the 5,000 psi SPM valves in the casing shear system should be made available for review at the earliest opportunity. The management of change documentation for the modification of the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock,
WEST BOP Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 1 June 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock –WEST Engineering Services gn

FORM WES-OP-001 09/2009 REV

Daily Report #19 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The ROV pump and chart recorder was rigged up to function and pressure test the wellhead connector unlatch ROV function. The connector took nine minutes 30 seconds to open with the ROV pump. A test of 3,000 psi for five minutes was successfully achieved and the test chart recorded. The test was witnessed by BP, TOI and WEST.
- The Vetco H4 connector was greased with Jetlube Extreme, functioned eight times to distribute the grease, and serviced.
- A new stainless steel gasket was installed on the stump and the stump raised and locked into the H4 wellhead connector with 1,500 psi operating pressure.
- The BOP was filled with water in preparation for testing.
- A lock up of the MUX control system occurred. The system was rebooted and two nodes were adjusted. The system appeared to be functioning normally. This will be closely monitored, but the Hydril ET onboard did not seem to think it was cause for concern. The lock up condition could not be replicated.
- Test #1. The BOP was lined up to test the upper and lower inner choke (UIC, LIC) failsafe valves, closed on the operator closing springs, and the newly installed H4 wellhead connector. After a leak was repaired at the test stump autoclave fitting, the upper blind shear rams (UBSR) were closed and the test line rigged up to the open kill line. The UIC, LIC, H4 wellhead connector and UBSR were successfully tested to 250 psi for five minutes and 15,000 psi for five minutes.
- Test #2. The BOP was lined up to test the UIC and LIC in the mid stroke position against the upper outer choke (UOC) and lower outer choke (LOC) and UBSR. The UIC and LIC were successfully tested in mid stroke position to 250 psi for five minutes and 15,000 psi for five minutes.
- Test #3. The UBSR were opened and the BOP lined up to test the upper outer kill (UOK) and lower outer kill (LOK) from the top side. The UOK and LOK were successfully tested from the top side with 250 psi for five minutes and 15,000 psi for five minutes.
- Test #4. The BOP was lined up to test the upper inner kill (UIK) and lower inner kill (LIK) from the top side. The UIK and LIK were successfully tested from the top side to 250 psi for five minutes and 15,000 psi for five minutes.

- Test #5. The test hose was moved to the choke line at the top of the BOP and the BOP failsafe valves lined up to test the inner gas bleed (IGB), closed on the operator spring, the UIC and LIC from the top side. The initial low pressure test was unsuccessful, so the valves were greased with magna seal, and a successful low pressure test achieved at 250 psi for five minutes. The pressure was raised to 15,000 psi and a successful five minute test achieved.
- Test #6. The BOP failsafe valves were lined up to test the outer gas bleed (OGB), LOC and UOC from the top side. The OGB, LOC and UOC were successfully pressure tested from the top side to 250 psi for five minutes and 15,000 psi for five minutes. The OGB was closed on the operator spring only.
- Test #7. The upper annular and SSTV rams were closed and the IGB valve set in the half open position by installation of the WOM test attachment. The IGB valve was successfully body tested to 250 psi for five minutes and 10,000 psi for five minutes.
- All tests were witnessed by TOI, BP or WEST.
- The subsea accumulator nitrogen pre –charge pressures in the 160 gallon subsea accumulators were brought up to 5,000 feet water subsea pressure of 4,100 psi precharge.
- The BOP was prepared for an operating system soak test – closing the rams and monitoring the system for leaks.
- WEST will continue with ATP (Acceptance Testing Procedure) line items.

Recommendations:

1. Suggest TOI consider obtaining a back up nitrogen intensifier for charging the subsea accumulators.

Discussion:

At present, there is only one nitrogen intensifier onboard for the charging of the subsea accumulators. Not only does this mean the charging of the 160 gallon BOP mounted accumulators is very slow, there is no back up intensifier incase of failure. This could prove costly if downtime is incurred waiting to pre-charge the subsea accumulators prior to a BOP run.

Projected Workscope:

- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Test ROV wellhead connector release function using ROV pump + chart record.
- Complete the BOP wellbore pressure testing, and function testing. Pressure test all failsafe valves from the top side.
- Perform soak test on closed rams/annulars on both pods & monitor control system for leaks.
- Drift test BOP on completion of soak test. (API 30 mins for annular to drift after closure).
- Repair leaking shuttle valves on LMRP.
- Re-torque all flanges broken for choke/kill stab changeout, and wellhead connector flange.
- Check and adjust all subsea accumulator pre charges.
- Repair faults noted on auto choke operating panel, re-test same.
- Pressure test to full working pressure the newly fitted kill line and conduit line moon pool drape hose.
- Run BOPs.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation for the installation of the 5,000 psi SPM valves in the casing shear system should be made available for review at the earliest opportunity. The management of change documentation for the modification of the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock,
WEST BOP Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 2 June 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock –WEST Engineering Services gn

FORM WES-OP-001 09/2009 REV

Daily Report #20 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- Test #8. The mud boost valve was closed and successfully pressure tested to 250 psi for five minutes and 5,000 psi for five minutes.
- The pipe rams and annulars were closed on the test pipe with the blue pod and the operating pressure raised to 2,000 psi on the annulars and rams. The BOP was observed for leaks for 30 minutes and none noted. The controls were then transferred to the yellow pod and again the system was observed for leaks for 30 minutes – none were noted.
- The rams and annulars were then opened and the test pipe lifted clear of the BOP. The API BOP drift was picked up and run into the BOP and fully through the bore of the BOP until it was observed to come through the wellhead connector. The drift was then withdrawn. No hang ups or anomalies were noted during the API drift test.
- All the subsea accumulators were pre-charge checked and adjusted for 5,000' water depth.
- The torque was checked on the H4 wellhead connector to lower BOP flange at 8,000 ft/lbs
- The pods were put into drilling position and again the system monitored for leaks. Two shuttle valves were found to be leaking, #78, upper outer kill close, 1/2", and #32, lower blind shear rams open, 1". These valves were removed and repair kits fitted.
- The bonnet studs of the three replacement failsafe operators were torque checked to 680 ft/lbs.
- Further shuttle valve leaks were found and addressed, the casing shear ram open, 1" the mud boost valve close, 1/2", and the outer gas bleed open, 1/2".
- The test cap was rigged down from the top of the BOP, the stack frame beam above the blue pod re-instated, and final preparations made for skidding and running the BOP.
- The choke/kill line, boost line and conduit lines polypak seals were all replaced in the riser adapter female receptacles.
- BOP skidding operations started at 18.00.
- WEST will continue with ATP (Acceptance Testing Procedure) line items.

Recommendations:
None.

Projected Workscope:
- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Repair faults noted on auto choke operating panel, re-test same.
- Pressure test to full working pressure the newly fitted kill line & conduit line moon pool drape hose.
- Run BOPs.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation and P&ID drawings for the installation of the 5,000 psi SPM valves in the casing shear 4,000 psi hydraulic supply system should be made available for review at the earliest opportunity. The management of change documentation and P&ID drawings for the modification to the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock
WEST BOP Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 3 June 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock –WEST Engineering Services gn

FORM WES-OP-001 09/2009 REV

Daily Report #21 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The BOP was skidded under the rotary table and the double of riser made up. The BOP was lowered down into the water at 01:30 hrs. The BOP was lined up on blue pod SEM B for running.
- The choke/kill lines were successfully pressure tested to 250 psi for five minutes and 15,000 psi for five minutes. The boost line and blue + yellow conduits were successfully pressure tested to 5,000 psi for five minutes.
- The top seal of the two seals in the choke, kill, boost and conduits female connectors was changed as the riser was run. TOI alternate the seal change out from top to bottom each riser run.
- Fifteen joints of riser were run and the choke, kill, boost, and conduits again successfully pressure tested to the same pressures/times as before.
- Forty five joints of riser were run and the choke, kill, boost and conduits again successfully pressure tested to the same pressures/times as before.

Recommendations:

None.

Discussion:

A more efficient pressure testing method was discussed, and will be implemented, using the cement unit to raise the test pressure to the maximum cement unit output of +/- 12,000 psi and then continue up to 15,000 psi with the test pump. While testing the 45 joints of riser it took some 75 minutes to pump up the choke/kill lines to 15,000 psi using the test pump alone.

Projected Workscope:

- Pressure test rebuilt chokes to full working pressure.
- Pressure test choke manifold to full working pressure.
- Repair faults noted on auto choke operating panel, re-test same.
- Pressure test to full working pressure the newly fitted Kill line & conduit line moon pool drape hose.
- Continue run BOP's, testing lines as per program.
- Install goosenecks, test, and land BOP's on the wellhead.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation and P&ID drawings for the installation of the 5,000 SPM valves in the casing shear 4,000 hydraulic supply system should be made available for review at the earliest opportunity. The management of change documentation and P&ID drawings for the modification to the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock,
WEST BOP Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 4 June 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock –WEST Engineering Services
LA

FORM WES-OP-001
09/2009
REV

Daily Report #22— *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The full riser string of 67 joints was run and the choke, kill, boost & conduit lines successfully pressure tested to 250 psi for five minutes and 15,000 psi for ten minutes for the choke/kill lines and 5,000 psi for five minutes for the boost and conduit lines.
- WEST transferred to the *GSF Develompent Driller III* to witness function testing of the BOP.

Recommendations:

None.

Discussion:

The 5,000 psi supply to the BOP test panel on the rig floor was re-instated to speed up the pressure test times on the riser choke and kill lines.

Projected Workscope:

- Pressure test choke manifold to full working pressure.
- Repair faults noted on auto choke operating panel, re-test same.
- Perform subsea dead man test.
- Function/pressure test BOP when landed.

Comments/Corrections:

A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation and P&ID drawings for the installation of the 5,000 psi SPM valves in the casing shear 4,000 psi hydraulic supply system should be made available for review at the earliest opportunity. The management of change documentation and P&ID drawings for the modification to the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock,
WEST BOP Senior Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 5 June 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock –WEST Engineering Services LA

FORM WES-OP-001 09/2009 REV

Daily Report #23— *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- WEST transferred from the *GSF Development Driller III* back to the *GSF Development Driller II.*
- The BOP was landed and latched on the wellhead and the slump and over pull tests successfully completed.
- A low pressure, 1,000 psi, wellhead connector integrity test was successfully completed against the blind shear rams.
- The diverter was installed and successfully function tested, seawater was pumped through the overboard lines and to the mud/gas separator. The mud/gas separator alarm was tested OK.
- A subsea dead man test was successfully performed as per Transocean rig specific procedure DD2-OPS-RSP-01-61 Hydril. The ROV's deployed observed the system operating as expected, with the casing shear rams closing first followed some 15 seconds later by the lower blind shear rams. The complete dead man sequence was completed in +/- 60 seconds. Power and hydraulics were restored to the BOP control system and the casing shear rams opened with a fluid volume of 35.7 gallons, as expected, indicating that they had fully closed. A pressure test to 250 psi was then successfully performed on the lower blind shear rams, proving that they had fully closed and sealed. The dead man test was done while the controls were operating on blue pod SEM B.
- The shear rams and casing ram were then function tested from both pods on all SEM's. It was found that the casing shear rams would not close on the blue pod, on either SEM.
- The diagnostics system in the pods revealed that the casing shear ram close solenoid, number 35, was drawing no current in the blue pod, indicating that the close solenoid in the pod had failed.
- The BOP was prepared for pulling to repair the problem identified.
-

Recommendations:

None.

Projected Workscope:

- Pressure test choke manifold to full working pressure.
- Repair faults noted on auto choke operating panel, re-test same.
- Pull BOP to effect a repair to Blue pod casing shear ram close solenoid.
- Run and function / pressure test BOP when re- landed.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation and P&ID drawings for the installation of the 5,000 psi SPM valves in the casing shear 4,000 psi hydraulic supply system should be made available for review at the earliest opportunity. The management of change documentation and P&ID drawings for the modification to the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock,
WEST BOP Senior Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 6 June 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock –WEST Engineering Services
LA

FORM WES-OP-001
09/2009
REV

Daily Report #24 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The BOP was unlatched from the wellhead and the rig moved to the safe zone.
- The goosenecks and storm loops were rigged down in the moon pool and the riser pulled.
- The BOP was rigged down from the riser and skidded to the forward park position and pinned in position.
- The test cap was installed on the LMRP riser adapter to enable the 5,000 psi pod supply to be hooked up.
- Preparations were made for draining the DC 200 transformer oil in the blue solenoid chamber to investigate the casing shear ram close problem.

Recommendations:

None.

Discussion:

It was reported that the casing shear close solenoid in the blue pod became functional again during the BOP pull. The solenoid was seen to take the correct current and indications were normal. A Hydril engineer is due on the rig in the morning to give the entire MUX system a diagnostic check and to rectify any anomalies found.

Projected Workscope:

- Pressure test choke manifold to full working pressure.
- Repair faults noted on auto choke operating panel, re-test same.
- Effect a repair to blue pod casing shear ram close solenoid.
- Hydril to diagnostic check entire MUX system.
- Run and function / pressure test BOP when re- landed.

Comments/Corrections:
A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation and P&ID drawings for the installation of the 5,000 psi SPM valves in the casing shear 4,000 psi hydraulic supply system should be made available for review at the earliest opportunity. The management of change documentation and P&ID drawings for the modification to the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock,
WEST BOP Senior Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 7 June 2010

Copy: Leon Schwartz – WEST, Transocean Sub Sea Supervisor

From: Greg Pennock –WEST Engineering Services
LA

FORM WES-OP-001 09/2009 REV

Daily Report #25 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The DC 200 transformer oil in the blue pod solenoid chamber was drained to allow access to the casing shear rams close (CSRC) solenoid.
- The CSRC solenoid #35 was inspected and it was found that one of the two electrical connections at the rear of the solenoid was not inserted correctly and was loose on the connection. The wire inside the insulating rubber boot of the connector had moved up inside the boot and was not fully contacting the connection in the solenoid.
- The CSRC solenoid was removed from the solenoid chamber and bench tested and found to be operating normally.
- A new solenoid, part # AA 881, was installed in the solenoid chamber and the electrical connections fully made up to the solenoid after adjusting the wires inside the insulating rubber boots.
- The casing shear rams were successfully function tested on the blue pod, verifying the solenoid installation.
- The solenoid chamber was refilled with DC 200 oil as per Hydril procedure using a vacuum pump.
- The BOP was fully function tested on both pods and all four SEMS, all the function times and volumes were recorded along with all the solenoid ram up currents for each function as the function was fired. No anomalies were noted during function testing.
- WEST, BP, TOI, MMS and the Hydril technician onboard witnessed the function testing.
- The test pipe installed in the BOP for functioning the rams was removed along with the riser adapter test cap.
- The API BOP drift tool was picked up and the BOP was successfully drift tested.
- The BOP was skidded back under the rotary and the double of riser made up to the BOP. The BOP was prepared for running, and run down into the water on the double of riser.
- The test cap was rigged up on the riser and the choke/kill lines successfully pressure tested to 250 psi for five minutes and 11,100 psi for five minutes.
- The riser run continued.

Recommendations:

None.

Discussion:
The BOP MUX control system was fully function tested and the operation of all the solenoids monitored during the testing. No anomalies were found during the testing and all parties witnessing the tests were satisfied the BOP was fit to run back to the wellhead.

Projected Workscope:
- Pressure test choke manifold to full working pressure.
- Repair faults noted on auto choke operating panel, re-test same.
- Run and function/pressure test BOP when re-landed.

Comments/Corrections:
WEST will be crew changing on Tuesday 8 June 2010. A report on the blue SEM NPP card change out is being written by the Hydril service engineer and will be reviewed when it becomes available. The management of change documentation and P&ID drawings for the installation of the 5,000 psi SPM valves in the casing shear 4,000 psi hydraulic supply system should be made available for review at the earliest opportunity. The management of change documentation and P&ID drawings for the modification to the pod dead man hydraulic circuit should be made available for review at the earliest opportunity.

Best Regards,

Greg Pennock,
WEST BOP Senior Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 8 June 2010

Copy: WEST, Transocean Sub Sea Supervisor

From: Chance Hobby –WEST Engineering Services
dm

FORM WES-OP-001
09/2009
REV

Daily Report #26 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- Traveled to Houma, LA.
- Arrived at PHI (Houma) and underwent respirator Fit Testing before checking in for a flight to the *GSF Development Driller II.*
- Flew to *GSF Development Driller II* and completed rig orientation/safety briefing.
- Met with BP representative to discuss workscope.
- Met with TOI subsea personnel.
- The moonpool drape hose goosenecks were installed and the choke/kill lines were successfully pressure tested to 250 psi for five minutes and 11,100 psi for five minutes.
- The rig was positioned over the well and the BOP was landed, latched, and over pulled.
- A successful connector test of 1,000 psi (five minutes) was achieved against the upper shear rams on the yellow pod.

Recommendations:
None.

Projected Workscope:

- Witness function and pressure testing of BOP.

Comments/Corrections:
Greg Pennock departed the *GSF Development Driller II*, Chance Hobby arrived onboard.

Best Regards,

Chance Hobby,
WEST BOP Senior Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 9 June 2010

Copy: WEST, Transocean Sub Sea Supervisor

From: Chance Hobby –WEST Engineering Services
dm

FORM WES-OP-001
09/2009
REV

Daily Report #27— *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- The diverter was installed and functioned tested. Time to close was 38 seconds. The overboard lines were flushed with seawater.
- Subsea began pressure testing the choke manifold while the rig floor rigged up to trip in and test BOPs.
- Choke manifold valve (CMV) # 10 was successfully tested to 250 psi for five minutes and 15,000 psi for five minutes.
- CMV # 5, 9, 12, & 16 were successfully tested to 250 psi for five minutes and 15,000 psi for five minutes.
- An attempt was made to test CMV # 4, 8, & 15 but the test was unsuccessful due to a leak that developed in the CMV # 9 tail rod packing.
- CMV # 9 was disassembled and inspected, no major damage was noted, and the valve was rebuilt using a new gate, new seats, new seals, and new tail rod packing.
- The upper shear, lower shear, and casing shear rams were function tested from the toolpusher's panel on yellow pod/SEM A and also from the driller's panel on blue pod/SEM A.
- The Kelly hose was successfully tested against standpipe valve # 25 to 250 psi for five minutes and 5,500 psi for five minutes. *(BOP test # 1.)*
- The upper IBOP (top drive safety valve) was successfully tested to 250 psi for five minutes and 6,500 psi for five minutes. *(BOP test # 2.)*
- The lower IBOP (top drive safety valve) was successfully tested to 250 psi for five minutes and 6,500 psi for five minutes. *(BOP test # 3.)*
- CMV # 9 was successfully tested to 15,000 psi for five minutes to ensure integrity of the valve before moving into the BOP test. CMV # 9 will be retested to a low pressure and high pressure test once choke manifold testing resumes.
- The BOP was pressure tested from the driller's panel on blue pod/SEM A on 5-7/8" drill pipe, against the BOP test tool.
- The wellhead connection was successfully tested down the kill line, against the upper pipe ram and lower inner choke valve to 250 psi for five minutes and 11,100 psi for five minutes. *(BOP test # 4.)*
- The upper annular was successfully tested down the kill line; against the inner gas bleed, upper inner choke, and lower inner choke to 250 psi for five minutes and 6,500 psi for five minutes. *(BOP test # 5.)*

- The upper annular was successfully tested down the kill line; against the outer gas bleed, upper outer choke, and lower outer choke to 250 psi for five minutes and 6,500 psi for five minutes. A 5-7/8" XTM-57 TIW (s/n 12986T15L) and a 5-7/8" XTM-57 IBOP (s/n 12981T15L) were also successfully tested during the test. *(BOP test # 6.)*
- The lower annular was successfully tested down the choke line; against the upper inner kill and lower inner kill to 250 psi for five minutes and 6,500 psi for five minutes. *(BOP test # 7.)*
- The lower annular was successfully tested down the choke line; against the upper outer kill and lower outer kill to 250 psi for five minutes and 6,500 psi for five minutes. A 5-7/8" XTM-57 TIW (s/n 12985T15L) and a 6-5/8" F.H. TIW (s/n GM18858) were also successfully tested during the test. *(BOP test # 8.)*
- The upper pipe ram was successfully tested down the choke line, against CMV # 1 to 250 psi for five minutes and 6,500 psi for five minutes. *(BOP test # 9.)*
- The upper pipe ram was successfully tested down the kill line, against CMV # 5 to 250psi for five minutes and 6,500 psi for five minutes. A 6-5/8" F.H. TIW (s/n GM18857) was also successfully tested during the test. *(BOP test # 10.)*
- The lower pipe ram was successfully tested down the kill line to 250 psi for five minutes and 6,500 psi for five minutes. *(BOP test # 11.)*
- The BOP was function tested from the toolpusher's panel on yellow pod/SEM A. All function times and gallon counts were recorded and were found to be within API limits with no issues noted.
- An accumulator draw down test was performed, the BOP HPUs were isolated and one annular was functioned closed then open, five rams were functioned closed then open, and all failsafe valves were functioned open then closed. The start accumulator pressure was 5,000 psi; the end pressure was 2,450 psi. The total function gallon count was 246.4 gallons and the pump up time was recorded at four minutes and five seconds.
- The BOP test tool was unseated and the drill pipe was picked up above the BOP.
- The upper blind shear was successfully tested down the kill line to 250 psi for five minutes and 4,100 psi for five minutes. *(BOP test # 12.)*
- The lower blind shear was successfully tested down the kill line to 250 psi for five minutes and 4,100 psi for five minutes. *(BOP test # 13.)*
- Subsea resumed testing the choke manifold while the drill floor pulled the BOP test tool.

Recommendations:
None.

Projected Workscope:
- Review test charts from surface equipment.

Best Regards,

Chance Hobby,
WEST BOP Senior Surveyor

P.O. Box 577
Brookshire, Texas 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001:2008 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

To: Mr. Doug Caughron – BP, Mr. Gavin Kidd – BP
Date: 10 June 2010

Copy: WEST, Transocean Sub Sea Supervisor

From: Chance Hobby –WEST Engineering Services
dm

FORM WES-OP-001 09/2009 REV

Daily Report #28 — *GSF Development Driller II*
WEST Job #3940

Workscope Accomplished:

- An attempt was made to test a 6-5/8" F.H. IBOP (s/n MSM32257), a 5-7/8" XTM-57 rental TIW (s/n DM9086) and a 5-7/8" XTM-57 rental TIW (s/n DM5052), but the test was unsuccessful due to a leak on the TIW test stand. *(BOP test # 14.)*
- The leak was repaired and a successful test was achieved on the 6-5/8" F.H. IBOP (s/n MSM32257), the 5-7/8" XTM-57 rental TIW (s/n DM9086) and the 5-7/8" XTM-57 rental TIW (s/n DM5052) to 250 psi for five minutes and 6,500 psi for five minutes. *(BOP test # 15.)*
- An attempt was made to test a 5-7/8" XTM-57 rental TIW (s/n DM9085) and a 5-7/8" XTM-57 rental TIW (s/n DM5051), but the test was unsuccessful due to a leaking chiksan test line. *(BOP test # 16.)*
- The leak was repaired and a successful test was achieved on the 5-7/8" XTM-57 rental TIW (s/n DM9085) and the 5-7/8" XTM-57 rental TIW (s/n DM5051) to 250psi for 5 minutes and 6,500 psi for five minutes. *(BOP test # 17.)*
- A successful test was made on a 5-7/8" XTM-57 rental TIW (s/n DM9083) and the 5-7/8" XTM-57 rental TIW (s/n DM5050) to 250 psi for five minutes and 6,500 psi for five minutes. *(BOP test # 18.)*
- A successful test was made on a 5-7/8" XTM-57 rental TIW (s/n DM9084) and the 5-7/8" XTM-57 rental TIW (s/n DM5053) to 250 psi for five minutes and 6,500 psi for five minutes. *(BOP test # 19.)*
- Choke manifold valve (CMV) #10 was successfully tested to 250 psi for five minutes and 15,000 psi for five minutes. *(BOP test # 20.)*
- CMV # 5, 9, 12, & 16 were successfully tested to 250 psi for five minutes and 15,000 psi for five minutes. *(BOP test # 21.)*
- CMV # 4, 8, & 15 were successfully tested to 250 psi for five minutes and 15,000psi for five minutes. *(BOP test # 22.)*
- CMV # 2, 3, 7, 14 & 33 were successfully tested to 250 psi for five minutes and 15,000 psi for five minutes. *(BOP test # 23.)*
- CMV # 1, 6, 11, & 13 were successfully tested to 250 psi for five minutes and 15,000 psi for five minutes. *(BOP test # 24.)*
- CMV # 17, 18, 19, & 20 were successfully tested to 250 psi for five minutes and 15,000 psi for five minutes. *(BOP test # 25.)*

- CMV # 19, 20, 21, & 22 were successfully tested to 250 psi for five minutes and 10,000 psi for five minutes. *(BOP test # 26.)*
- CMV # 17, 18, 22, & 23 were successfully tested to 250 psi for five minutes and 10,000 psi for five minutes. *(BOP test # 27.)*
- CMV # 24, 25, 26, 27, & 32 were successfully tested to 250 psi for five minutes and 10,000 psi for five minutes. *(BOP test # 28.)*
- CMV # 27, 28, 29, 30, 31, & 32 were successfully tested to 250 psi for five minutes and 10,000 psi for five minutes. *(BOP test # 29.)*
- The wear bushing was set and the drill floor prepared to drill ahead.

Recommendations:
None.

Projected Workscope:
- Standby/work as directed.

Best Regards,

Chance Hobby,
WEST BOP Senior Surveyor

Document Produced Natively