

RIG CONDITION ASSESSMENT

DEEPWATER HORIZON

Prepared for

TRANSOCEAN USA, INC.

Houston, Texas

By

MODUSPEC USA, INC.

Dates: 01 – 12 April 2010

EXHIBIT #	88
WIT:	

CONFIDENTIAL

MODUSI 01 0 000001

1.0 TABLE OF CONTENTS

		Page
1.0	TABLE OF CONTENTS	2
2.0	INTRODUCTION.....	6
2.1	Rig Data	6
2.2	Survey Workscope.....	6
2.3	Applicable Standards	7
3.0	EXECUTIVE SUMMARY	8
3.2	Conclusion.....	8
3.3	End-of-Inspection Meeting Document	9
4.0	ASSESSMENT FINDINGS.....	10
4.1	Hull and Structure.....	10
RST STRU	Handrails/Walkways	10
RST PIPE	Vents Lines and Checks.....	11
WTD WTDR	Manual Watertight Doors/Hatches	11
RST STRU	Drill Floor	11
RST STRU	Cables/Cable Trays.....	12
4.2	Navigation/DP/Propulsion/Ballast/Bilge.....	12
VI INST	Navigation Equipment.....	12
PROP THR	Thrusters	13
DPS	DP System (A.S.K.)	15
BLST	Ballast Piping and Valves.....	15
BLST CTRU	Ballast Control System.....	16
BILG	Bilge System	16
4.4	Hoisting/Rotating Equipment.....	16
DRHS DWKS	Auxiliary Drawworks/Hoist.....	16
DRHS DWKS	Drawworks Unit	17
DSRT ROT	Rotary Table.....	20
DSRT TD	Top Drive Unit	20
DSRT TDPH	Top Drive Pipe Handler	21
DRHS DERK	Derrick.....	21
DRHS DEAD	Deadline Anchor.....	23
DRHS CROW	Crown Block	23
DRHS TRAV	Traveling Block	23
4.5	Mud/Cement Storage	24
BMS TANK	Bulk Tank Storage.....	24
BMS TANK	Surge Tanks	25
MDS	Mud Pit Agitators, Guns, Valves	25
4.6	Mud Process	26
LPMS	Mud Mixing System	26

LPMS	Mud Handling System	26
LPMS	Mud Processing System.....	26
HPMS MP	Mud Pumps	27
CMT	HP Cement System.....	41
HPMS	HP Mud System.....	41
4.7	Drilling Instrumentation	42
DIST INST	Drilling Instrumentation System.....	42
DIST INST	Drilling Control/Monitoring Systems (VICIS, etc.)	42
4.8	Riser/BOP & Well Control Equipment	43
WCS CONN	Connector: Riser	43
WCS CONN	Connector: Wellhead	43
WCS FJRA	Flex Joint	44
WCS RISE	Riser	44
WCS TJT	Telescopic (Slip) Joint	45
WCS RISA	Marine Riser Adapter	45
RISH RHT	Riser Gimbal / Spider.....	45
WCS TENR	Tensioning Ring	45
RTS HCYL	Riser Tensioners.....	46
RTS CTRU	Riser Recoil System	47
WCS BOPR	BOP Rams (Various)	47
WCS ANNU	BOP Annulars.....	51
WCS BOPS	BOP Stack Frame (General)	52
WCS VLV	Failsafe Valves	52
WCS CTRU	BOP Control Panels.....	54
WCS PMP	BOP Mixing Unit	54
WCS ACUM	Accumulator Bottles, Stack Mounted	55
WCS ACUM	Accumulator Bottles, Surface	55
WCS PMP	BOP Triplex Pumps	55
WCS SSHR	Hose Reels (MUX & Hydraulic)	56
WCS BOPP	BOP Control Pods	57
WCS UMB	BOP MUX Cables	57
WCS SSHR	BOP Pod Hoses (Hydraulic).....	57
BOPH	BOP Cranes/Hoists/Handling/Transport	57
WCS DIVT	Diverter Assembly	58
WCS CTRU	Diverter Control	59
WCS MANI	C&K Manifold and Piping	59
HOSE	Coflexip Type Hoses	60
WCS PIPE	Connectors: Hydraulic Choke & Kill.....	61
4.9	Tubular/Pipe Handling	61
HYD HPU	HPUs (Central or Stand-Alone)	61
PH FGBD	Fingerboard	62
PH PRS	Varco PLS	63
PH WPF	Weatherford Power Frame.....	64
PH RBS	Varco RBS.....	64
PH DPF	Pipe Conveyor.....	64
PH DPF	Pipe Skate.....	65

PH PHM	Iron Roughneck	65
PHL WPB	Stabbing Board	66
4.10	Power Generation	67
ELPG ENG	Main Engines	67
ELPG GEN	Main AC Generators	68
ELPD SWBD	Switchboards	69
ELPD TFMR	Main Transformers	70
ELPD VFD	VFD Systems	71
4.11	Air Systems	71
AIR COMP	High Pressure Air Compressors (>500 psi)	71
AIR COMP	Medium Pressure Air Compressors (40-500 psi)	72
AIR PIPE	Medium Pressure Air System Piping & Valves (40-500 psi)	73
4.12	Cooling Water/Fuel/Lube Oil/Oily Water	73
SEA PIPE	Saltwater Lines/Related Equipment	73
TSF PIPE	Freshwater Lines/Related Equipment	74
DRLW PIPE	Drill Water Lines/Related Equipment	74
FUEL PIPE	Fuel Oil System Piping and Valves	75
LUBE PIPE	Lube Oil System Piping and Valves	75
BILG SEP	Oily Water Treatment System	75
4.13	Lifting Equipment	76
MTHL CRN	Deck Cranes	76
MTHL OCRN	Gantry Cranes (Excluding BOP Cranes)	78
PHL MWIN	Air Hoists - Man Riding	79
PH UWIN	Air Hoists - Non Man Riding	79
MELV	Elevators	80
4.14	Communications/Data Processing	80
COM CTRU	CCTV	80
COMM REQT	Radio Systems	81
COMM SCOM	Satellite Communications	81
COMM	PA, PABX, Talk Back and Telephone Systems	82
COMM ALRM	Alarms	82
VMS	Data Management Monitoring & Control (VMS, PMS, DMS)	83
4.15	Accommodations	83
ACOM GEQT	Galley Refrigeration Equipment	83
ACOM ACM	Living Quarters/Rooms	84
4.16	Rig Utilities	84
HVAC	Ventilation Systems	84
LHTG LTE	Lighting System, non EX	85
POTW WTMK	Watermakers	85
POTW	Potable Water System	86
EVNS SWGE	Sewage Treatment Plant	86
LHTG LTE	Hazardous Area Electrical Equipment	87



HVAC	HVAC Systems	88
4.17	Safety and Fire Fighting	89
SURV RAFT	Life Rafts	89
SURV BOAT	Lifeboats	89
ELP GEN	Standby Generator System.....	90
WTD WTDR	Hydraulically Operated Watertight Doors & Hatches.....	91
FDS ALRM	Fire Detection System.....	91
FFS	Fixed Fire Suppression System.....	91
FFS	Fixed Foam Fire Fighting System.....	92
FFS PMP	Fire Pumps	93
FFS PIPE	Fire Main Lines & Related Equipment	93
GDS ALRM	Gas Detection System.....	93

2.0 INTRODUCTION**2.1 Rig Data**

Vessel: DEEPWATER HORIZON

Owner: Transocean USA, Inc.

Type: Semi-submersible RBS-8D

Built: Hyundai, South Korea

Class: 5th Generation DP

Classification: ABS

Performance: Water depth ft 8,000
Drilling depth ft 30,000

Location: Gulf of Mexico

Inspection dates: 01 – 14 April 2010

ModuSpec References: AS/VM/KM/JK/JR/PSI/jaf/PSK/ADS/jaf – US2147.1

2.2 Survey Workscope

In accordance with the instructions received, we attended on board the DEEPWATER HORIZON to complete a condition assessment of the primary assets of the rig including drilling equipment, mud system, well control equipment, marine equipment, hull, structure, power plant, electrical equipment and safety equipment.

Additionally for these rigs utilizing the Transocean RMS system, this assessment was to determine the present state of maintenance by reviewing tasks, histories and Operation Event Reports (OER) on the assets inspected, with particular emphasis on downtime risk equipment.

The ultimate goal of the assessment was to determine the current condition of the rig's assets. The audit was conducted in good faith, but the inspection of individual items of equipment was subjected to time and operational constraints imposed by the time of the assessment.

This report, prepared by ModuSpec, is confidential. It has been prepared on behalf of the client mentioned on the cover page ("the client") and is issued pursuant to an agreement between ModuSpec and the client. It has been produced according to the scope of work and is only suitable for use in connection therewith.

All measures and decisions based on this analysis and these findings are the sole responsibility of the client.

ModuSpec does not accept:

- *any liability for the identification, indication or elimination of dangers and non-compliances (in the broadest sense of the word), nor for any damage caused by any of these;*
- *any obligation to report all facts or circumstances established during the visit. This obligation comes completely under the authority and responsibility of the client*
- *any liability for the client's obligations resulting from (legal) rules and/or statutes;*
- *any liability or responsibility whatsoever in respect of or reliance upon this report by any third party.*

The execution of improvements recommended by ModuSpec does not indemnify the client against any legal or contractual obligations and offers no safeguard against the elimination of dangers or damages resulting from the client's products, services, company assets, et cetera.

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without prior permission, in writing, of ModuSpec, except for restricted use within the client's organization.

2.3

Applicable Standards

The criteria that have been used as reference during this assessment are internationally recognized standards, local legislative requirements, customer's safety and operating standards, the original equipment manufacturer's maintenance and operating specifications and accepted oilfield operating and safety practices.



3.0 EXECUTIVE SUMMARY

3.2 Conclusion

In accordance with the instructions received, we attended on board the DEEPWATER HORIZON to complete a rig condition assessment of the primary drilling equipment, mud system, well control equipment, marine equipment, hull, structure, power plant, electrical equipment and safety equipment.

14 April 2010

ModuSpec USA, Inc.
17171 Park Row, Suite 120
Houston, Texas 77084

Tel No.: 281.398.3998
Fax No.: 281.398.8694
E-mail: usa@moduspec.com
Website: www.moduspec.com



3.3

End-of-Inspection Meeting Document

Rig name:	DEEPWATER HORIZON
Owner:	Transocean USA, Inc.
Location:	Gulf of Mexico
Customer:	Transocean USA, Inc.
Inspection dates:	01 – 12 April 2010
Date of meeting:	11 April 2010
Order No.:	US2147.1

	Name	Title	Signature
Customer Representative(s):	Jerry Levine	TO Team Leader	
Rig Staff:			
	Jimmy Harrell	OIM	
	David Hackney	Master	
	Stephen Bertone	Chief Engineer	
	Stanley Carden	Elect Spvr	
	Allen Windham	Mech Spvr	
	Owen McWorter	Sr Sub Sea	
ModuSpec Surveyor(s):			
	Alan D Schneider	Surveyor	
	Kris Millsap	Surveyor	
	John Kingsland	Surveyor	
	JR Kilcrease	Surveyor	

Note: The original signed end-of-inspection meeting document is kept on file in the ModuSpec office. A copy can be provided upon request.

4.0 ASSESSMENT FINDINGS**4.1 Hull and Structure****Marine Integrity**

On visual inspection, the rig appeared to be in fair condition for marine integrity. The ballast system was found to be in fair condition due to having several saltwater and freshwater pipes severely corroded and problems with valves. The hydraulic unit relays for the ballast system in all four columns were heating up when closing or opening the ballast valves. The history revealed that the relays had been giving trouble for some time and that the crew had been replacing them often. The relay panels and all relays were in need of replacement. The sea water pipes were found to be in bad condition as well. In review of the history reports and past inspections, it was noted that the ballast pipes and seawater pipes were in need of being replaced. The watertight doors appeared to be in fair condition. The rig had two of the hydraulic doors out of service and not working correctly on the 28-½ meter deck level and also on the 24 meter deck level; these had to be manually opened and closed. The starboard forward elevator was out of service and had been sent for repairs. The escape routes below the rig on all four columns were in bad condition and in need of repairs or replacement. The hull was in a good condition. The above mentioned deficiencies should be addressed at the earliest opportunity, as these are issues that directly affect the stability of the rig.

Of additional concern was the condition of the deck cranes with respect to the age and wear of major components, such as slewing bearings and the hydraulic motors. The deck cranes had been causing issues due to the components' deficiencies, such as excessive downtime. This becomes a limiting factor on load lifts and can contribute to excessive time in loading and offloading operations.

RST STRU Handrails/Walkways

Upon assessment of the handrails and walkways around the rig, they were in good condition. The rig crew members had kept them repaired and painted. The walkways going down the forward and aft columns of the rig were in bad condition due to being in the water most of the time when on location. One walkway in the moonpool located near the BOP crane was in need of repair to the underside. The platform was corroded and in need of protective coating. Two of the underside braces were corroded and in need of being replaced.

The walkways and handrails were in good condition.

Recommendations:

- Replace the ladders and walkways on the lower part of all four columns of the rig as needed.
- Repair the platform walkway in the moonpool as needed and apply protective coating/paint.

RST PIPE**Vent Lines and Checks**

Upon inspection of the vents and checks, they were in good condition; however, it was noted that one vent for the sludge oil tank did not have a containment area around the vent. Oil was accumulating around the top part of the vent and, therefore, starting to drip off of the vent. The vent was located on the port forward side of the rig and on the outside of the handrail.

The fuel vents were installed with containment areas around them, and all were in good condition. In review of the history on the vents and checks, it was noted that the PMs were performed on regular bases.

The vents and checks were in good condition.

Recommendation:

- Install a containment area around the sludge tank vent (located on the port forward side of the rig) as needed.

WTD WTDR**Manual Watertight Doors/Hatches**

The manual watertight doors were in good condition and operated well. The gaskets were in good condition, and the dogs (locks) were in good order and adjusted as needed. In review of the history, the PMs were showing to be completed on regular bases and up to date.

The manual watertight hatches were in fair condition. The main hatch for the welding area needed the gasket replaced due to age. The gasket was hard, and this would not let the gasket seal correctly when closed. The hand winch for raising the hatch cover was in bad condition. The safety cover that goes over the teeth of the winch was missing, and the teeth on the gears were severely worn. The teeth on the winch for the sack room hatch cover were worn to the point of needing to be replaced as well.

The watertight hatch covers for the vents on the port and starboard side of the rig located behind the cranes were in bad condition. The gaskets were dry and cracked due to age. The hatch covers were corroded and would not let the hatch cover seal when closed.

The manual watertight doors and hatches were in fair condition.

Recommendations:

- Replace the gaskets as needed on the hatches.
- Repair or replace the hand-operated winches for the hatches as needed.
- Repair or replace the hatch covers on the vents located on the starboard and port sides of the rig.

RST STRU**Drill Floor**

The drill floor was visually inspected. The structure was in good condition. The area was free from any major damage, and no structural defects were noted. The work areas were fitted with studded non-slip matting, and this was in good condition. The area was kept clean during the course of the survey, and the housekeeping was good.

We interviewed the crew, and they had no issues with the rig floor. It was deemed as being adequate. At the time of the survey, the rig floor was in good condition.

RST STRU Cables/Cable Trays

The cables and cable trays were visually inspected throughout the vessel over the course of the assessment. For the most part, all were in good condition with the exception of two areas where the cable trays were in poor condition at the back of galley next to the lifeboat deck and outside the mud lab door.

With the exception of one transit in the mud pit room, the condition of the cable transits around the rig was good.

We inspected the high voltage eleven KV cables and cable trays around the rig, and all were well protected from being damaged.

In the machinery spaces, all cable trays and cables were in satisfactory condition, with no corrosion noted. None of the cable trays were overpacked or damaged, and no redundant cables were noted.

We also inspected the various third-party installations, and all were noted to be in acceptable condition.

This equipment was in good condition.

Recommendation:

- Replace the corroded cable trays located at the back of galley next to lifeboat deck and outside the mud lab door.

4.2 Navigation/DP/Propulsion/Ballast/Bilge

VI INST Navigation Equipment

The navigation lights and controller were visually inspected and found in good condition. All lamps were functional, and the alarm test was functional.

The top battery lights were working, but several of the ten-mile obstruction lights were not working at the time of this assessment. The controller and sound signaling device were found to be functional as well. The system batteries and charger were found in good condition, with records showing the batteries were replaced in 2008.

The helideck lighting, consisting of orange and blue, was visually inspected and found to be in good condition. All fixtures were operating, and the cabling and shades were secure.

The radar units aboard were found to be in relatively new condition, and all had been replaced at one time or another from the original. All repeaters were operational at the time of this assessment.

The air and electric whistles were seen to function correctly, as well as the foghorn. The magnetic compasses sited on the bridge top and on the wings were operational.

A review of maintenance records and interviews with the rig crew raised no other issues.

The equipment was in fair condition.

Recommendations:

- Aircraft warning lights were not working on the starboard side of the derrick.
- Several ten-mile lights were not working at the time of this assessment.

PROP THR

Thrusters

The rig was equipped with eight thrusters.

Thruster No. 2 was out of service because the motor was bad and in need of replacement. All of the thrusters were getting water into the oil of the gear units because the seals were leaking. This had been going on for some time and will continue to get worse over time.

Thruster No. 8 was leaking hydraulic oil around the inside shaft. The unit had the oil seal rubber out of place and was raised up on the shaft. The hoses for all of the thrusters were showing signs of age and beginning to get dry cracked and hard. In review of the history, it was noted that the oil samples were showing water in the gear oil.

Thruster No. 3 was showing to have more water in the sample than the others. The PMs were up to date on the units; however, thruster No. 2 was out of service, and the PMs were delayed due to this nature. On interviews with crew members, it was noted that the thruster had been performing well and that the rig had no major issues other than the thruster No. 2 motor going out.

The units were showing signs of wear and in need of being overhauled in the near future. The cooling heat exchanger units were in bad condition due to age and had to be cleaned more often than normal. The water pipes of the cooling units were leaking at the flange connections on all of the units. The cooling pumps were in good condition and were running normally.

The thrusters were in fair condition.

Recommendations:

- Replace the hydraulic seal on the shaft for thruster No. 8.
- Replace all cracked and hard hydraulic hoses on the thruster as needed.
- Replace the motor on thruster No. 2.
- Replace all shaft seals on all eight thrusters at the earliest opportunity.

Electrical Section for the Thrusters

Apart from thruster No. 2 AC, which was down and waiting to be replaced due to a flashover in the motor winding, the other seven AC motors were visually inspected over the course of the assessment. All were observed both running and stopped. There were no unusual vibrations while on load, and all pressures and temperatures for bearings, cooling air and

winding temperature were verified at VMS and found commensurate with the current load. No alarms were found inhibited.

The motors were found with all cable entries intact, the connection boxes in good condition and proper earth bonding installed. Apart from the junction boxes on motor No. 2 due to water ingress, they were in poor condition.

A review of maintenance indicated that the annual procedures were being carried out and that the insulation resistance readings recorded were commensurate with spot readings obtained while intrusively inspecting the drives. The rig crew had no issues with this equipment. The rig crew informed us that thruster No. 2 AC motor would be replaced at the next SPS. All of the motors were in the 44K–58K range.

It was also reported to us that the cooling unit for thruster No 3. was not working and that parts were on order to the repair the system.

Recommendations:

- Replace thruster No. 2 AC motor as planned.
- Replace the two main junction boxes on the AC motors.
- Replace the cooling unit for thruster No. 3 as planned.

VFD Drives for the Thrusters

The motor drives were all visually inspected while running on load. All metering was observed to be functioning, cooling fans were running smoothly and no alarms or status indicators were active or inhibited. All VFD compartments were equipped with proper safety equipment, including a body hook and gloves.

As thruster No. 2 was down, we conducted an intrusive inspection of the drives. Cabinets were found in good condition, with all door hardware intact. The leakage alarms at the cooler package were found in good condition. There was no evidence of heating on the bus connections of the thruster stacks in the converters or connections of the DC link or the chokes. All motor connections at the rear of the converter modules were found secure, with no evidence of overheating. All ABB local control panels were visually inspected and found in good condition as well.

A review of maintenance and interviews with the rig crew raised no issues with this equipment.

DPS DP System (A.S.K.)**Information on DP system as follows:****DP System**

Class III Kongsberg-Simrad Dynamic Positioning System in accordance with ABS DPS-3 requirements and recommendations.

The system consisted of a triple redundant dynamic positioning system and should accept inputs from Hipap Acoustic Positioning System, four different GPS (DGPS) based on correction signal inputs from different sources, three gyrocompass, three vertical reference units and three wind sensors, as well as from operator input. The Power Management System was interfaced with the Integrated Alarm & Control System.

Position Reference

Kongsberg-Simrad Hipap & DGPS

Integrated Alarm & Control System

Kongsberg-Simrad IACS operated as the System Control & Data acquisition system for the MODU. The IACS would perform several different functions including: Power Management System, Machinery Monitoring & Control, Manual Thruster control and Autopilot, Dynamic Positioning Control, Ballast & Bunker Monitoring & Control, Bulk Storage System Monitoring & Control, Safety System (Fire, Gas, WT Doors, HVAC Control, etc.).

The DP system was in good condition and in good working order. Upon interviews with crew members, it was noted that they had not had any issues with the system and that it had been working normally in the past. In review of the history, it was noted that no major issues were on record. The system was under operation during the assessment and was performing normally. No problems or issues were noted. No recommendations were noted.

The DP System was in good condition.

BLST Ballast Piping and Valves

The ballast piping and valves were in fair condition. The HPU units for the system valves were causing some problems. The sensor relays in all four units were heating up, and the relays were burning. The crew members stated that this had been giving them problems for some time. The HPU units had some small leaks around the hose connections and the pumps.

The piping was in fair condition. In thruster room No. 8, the saltwater pipes were leaking at the pumps, and the rig crew had replaced some of the pipes. The ballast pumps were showing signs of wear due to age, and the seals were leaking on the pumps in thruster room No. 8. On review of the history, the PMs were up to date and being completed on regular bases.

The ballast piping and valves were in fair condition.

Recommendations:

- Replace the ballast pumps in thruster room No. 8.
- Replace all worn and leaking ballast pipes as needed.

BLST CTRU**Ballast Control System**

The ballast control system on the bridge was in good condition and working well. The HPU units located in each column were in fair condition. The relays for the HPU unit valve controls were heating up and causing issues. The relay panels on all four HPU ballast control units were having the same issues. The major concern of the relays going out would be a flooding problem or safety issues of the watertight integrity of the rig.

The ballast system was in fair condition.

Recommendations:

- Replace all four HPU relay panels and all relays for the system.
- Replace the ballast pumps in thruster room No. 8 as needed.
- Repair all hydraulic leaks on the four HPU units as needed.

BILG**Bilge System**

The bilge system was in fair condition. The system had some issues with priming. The pumps were not holding the prime at times, and the crew would use the priming units that were on the rig to re-prime the pumps. The alarms for the system were in good working order, and all were tested during the assessment. The relays in the same panel of the ballast system were heating up and causing the same issues as the ballast system. On review of the history, it was noted that all PMs were up to date and being completed on regular bases. On interviews with crew members, it was noted that the problems they were having was with the relays on the control units. In the bilge of the thrusters rooms, the system would not pull all of the water at times, and they would have to prime the pumps.

The bilge system was in fair condition.

Recommendations:

- Repair the problem of the pumps losing prime. Check and replace the pump impellers or replace the pumps.
- Replace the relays and panel as needed for the bilge system.

4.4**Hoisting/Rotating Equipment****DRHS DWKS****Auxiliary Drawworks/Hoist**

Hitec 1000 Capacity 300 MT

The rig was equipped with an auxiliary drawworks mounted on the roof of the BOP house. This was used for handling casing in the moonpool area. The equipment was not in operation at the time of the survey. A visual inspection was carried out. Generally, the equipment was in good condition, with the exception of a disconnected level wind hydraulic cylinder and corrosion present on the drawworks air receiver. We were informed that the level wind cylinder was disconnected due to a hydraulic leak and that a new cylinder had been ordered.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the auxiliary drawworks. At the time of the survey, the auxiliary drawworks was in good condition.

Recommendations:

- Install level wind hydraulic cylinder when it arrives.
- Remove corrosion from air receiver and paint.

DRHS DWKS Drawworks Unit

National Oilwell ADH-1000 Hitec

The rig was equipped with an active heave drawworks. This was observed in operation while drilling and tripping. It was noted that, during operations, the AC motors were vibrating. This is a common fault on active heave drawworks, usually being attributed to alignment or encoder feedback issues where the motors were not running in synchronization.

During a slip and cut operation, the lebus grooves were inspected and found in good condition. The gear inspection covers were also pulled, and both bull gears were inspected. These were also found in good condition.

We were informed by the maintenance supervisor that NOV had attended the rig several times to try to resolve the issue of the AC motor vibration. The last attempt they made resulted in a reduction of vibration, but left them with leaking oil seals. At the time of the survey, the motors were still vibrating and, as a result, the motor duct work had cracked.

We were informed by the rig crew that NOV had aligned the motors using the teeth contact method. Normal alignment methods could not be used in the alignment of these motors, as the main drive bull gear was enclosed by a gear case cover. After the motors were aligned, it was discovered that the motor drive shaft was no longer center in the gear case cover. This gear casing misalignment caused the shaft seals to also be off center, thus preventing a full contact of the seal in the gear casing, which caused oil leakage at the seal.

It was not known whether NOV had a fix for this issue either by redesigning the seal assemblies or by modifying the gear case covers to enable the seal to be installed centrally on the motor shaft.

The main shaft seals were also leaking oil to a lesser extent, which possibly could be rectified by packing the shaft seal cavity with grease. It was also noted that the air supply ductwork on motor No. 2 on the driller's side had cracked due to the vibration of the electric motor. We recommend that the installation of a flexible coupling be considered to be installed in the ductwork adjacent to the electric motor.

Drawworks brakes

Svendborg

The braking system consisted of two air-cooled brake discs, each fitted with four Svendborg brake callipers. These were held on by spring pressure and released with hydraulic pressure.

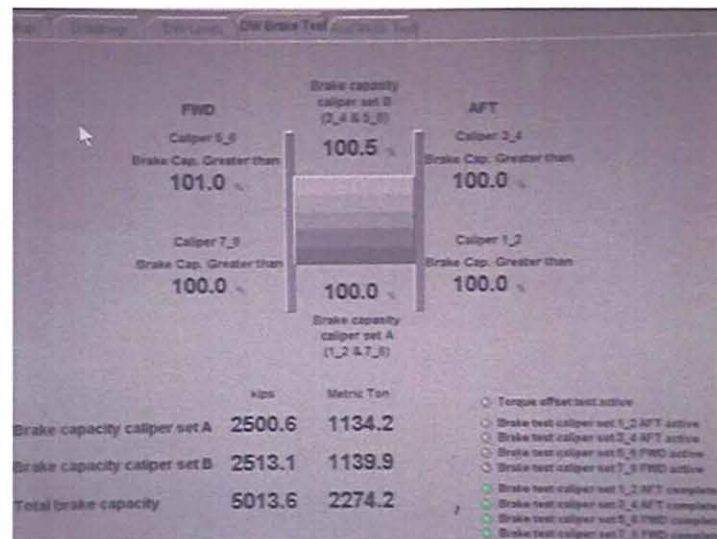
We were informed by the rig crew that the air gap (0.090") on the driller's side brake disc exceeded the OEM running specification of 0.040"– 0.060" with a maximum of 0.118" to allow for distortion of the disc. While we do not consider this to be a major issue, the clearance should be monitored and recorded in RMS.

During the course of reviewing the PM records for the drawworks, it was noted that the brake discs spring had not been changed out in the last year as per the NOV maintenance schedule listed below.

YEARLY		Checked	Recorded
F1	Replace all disc springs		
F2	Visually inspect critical components		
F3	Check bolt torques		

The NPT records were checked for this equipment, and five hours of NPT was recorded last year. Scheduled PM was being carried out on this equipment, with the exception of replacing the disc springs in the brake calipers.

A brake capacity test was carried out during the survey with the following results:



The brake test was completed successfully, and all readings were at one-hundred percent or above. We interviewed the crew, and they had issues with oil leaks and motor vibration on the drawworks. At the time of the survey, the drawworks was in fair condition.

Recommendations:

- Replace all brake disc springs as recommended by NOV.
- Repair leaking main shaft oil seals.
- Motor shafts oil seals were leaking. Investigate whether a redesigned seal is available from NOV.
- The drive motor had vibration. Recheck motor alignment/encoder feedback issues.
- Repair cracked motor ductwork; consider fitting flex couplings in ductwork.

Electrical Section for the Drawworks

The AC motors associated to the drawworks drilling traction duties were visually inspected, and those operational were checked for high temperature and bearing noise. No anomalies were noted in this respect. The main AC motors were externally inspected and were noted to be in good condition. These were observed while running. No abnormal noise or temperatures were noted at the time of our survey.

Megger insulation readings were taken on all drawworks AC motors from the VFD drives in the switch rooms with the shunt bars removed, and the megger tester on a 500-volt range held for one minute. It must be noted that the motors had not been in operation for twelve hours prior to the megger testing. Drawworks No. 5 had a low reading of less than two meg ohms, which is Transocean standard.

We also noted that parts had been removed from the drawworks No. 3 VFD bay. It was later reported to us that the parts had been removed to repair the top drive VFD bay.

This section of the report was good.

Recommendations:

- Investigate the low megger reading on drawworks No. 5.
- Replace the missing buss assembly on drawworks No. 3 as planned, which was used for the top drive VFD.

Drawworks AC Motors	Phase A to Ground	Phase B to Ground	Phase C to Ground
1	19.7 MΩ	20.70 MΩ	20.90 MΩ
2	3.68 MΩ	3.73 MΩ	3.77 MΩ
3	9.20 MΩ	9.21 MΩ	9.15 MΩ
4	4.12 MΩ	4.20 MΩ	4.35 MΩ
5	1.59 MΩ	N/A	N/A
6	6.60 MΩ	6.80 MΩ	6.89 MΩ
Aux	2.9 MΩ	3.00 MΩ	3.00 MΩ

DSRT ROT Rotary Table

Varco RST 60 ½ hydraulic 4 motor

At the time of the survey, the rotary table was not operational. The table power skid controls had been removed from the rig and shipped to town for repair.

The NPT records were checked for this equipment, which had been down for more than one year. Scheduled PM was not being carried out on this equipment. We interviewed the crew, and they were waiting on the power skid to be returned to the rig. At the time of the survey, the rotary was in bad condition.

Recommendation:

- Investigate the issue with the power skid and why it has not been returned to the rig after one year.

DSRT TD Top Drive Unit

Varco TDS8 750 ton

The rig was equipped with a Varco TDS8. This model had an integrated swivel. At the time of the survey, the rig was drilling. The top drive was functioning normally, with no leaks or unusual noises present.

The limitation on the top drive was that, while the hoisting system was rated for 1000 tons, the top drive was only rated for 750 tons. This required the unit to be removed from the load path when high hook loads were expected, as when running riser or long casing runs. A carousel system was installed in the derrick. This was fitted with guide rails. When required, the top drive was lowered onto the carousel guide rails, disconnected from the hook and swung out to one side.

We recommend that, as an improvement opportunity, the top drive be replaced to a unit with a 1000-ton capacity, making it unnecessary to disconnect the top drive during high hook load conditions.

It was also noted that the blower hose was poorly secured and that the clamp required repositioning. Hadco, a third-party inspection company, carried out an annual structural survey on the top drive in February 2010.

The NPT records were checked for the top drive, and ten hours of downtime was recorded against this equipment.

Due to operational difficulties in accessing this equipment, there were five overdue PMs outstanding on this equipment. We interviewed the crew, and they had no issues with the top drive. At the time of the survey, the top drive was in good condition.

Recommendations:

- As an improvement opportunity, consider replacing the 750-ton capacity top drive to a 1000-ton unit.
- Reposition the clamp on the blower.

DSRT TDPH**Top Drive Pipe Handler**

Varco PH100

The pipe handler was observed during breaking out and making up connections. It operated normally with no leakage present. The IBOP was also checked during operation, and no defects were noted.

Hadco, a third-party inspection company, carried out an annual structural survey on the top drive in February 2010. The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the pipe handler. At the time of the survey, the pipe handler was in good condition.

DRHS DERK**Derrick**

Dreco capacity 2,000,000 lbs.

A derrick inspection was carried out. Structurally, the derrick was in good condition. The complete derrick, with the exception of the water table, was galvanized. The derrick was accessed by vertical ladders. These ladders were in sections with a resting platform between each section. All ladders were fitted with safety cages, and Salar fall arrester wires were fitted to all ladders.

The derrick had a central seven sheave central crown cluster, two fast line sheaves and two dead line sheaves. As mentioned earlier, the main section of the derrick was galvanized, but the top section had been painted. On this top section or water table, the paint coating was breaking down, and corrosion was present on much of the structure. While not structurally weakened at present, corrosion in this upper area should be addressed before it becomes more advanced and causes serious damage to the derrick.

Much of the deck grating at the crown level was corroded badly and required replacement as soon as possible.

It was noted that one horizontal beam had sustained damage below the monkeyboard level. This had been caused by stands of pipe falling across the derrick. This beam should be replaced.

The port forward air winch wire was found rubbing on a steel plate on the lower derrick level. The plate should either be removed or a guide roller installed.

Crown bumper wood had now rotted out, and only the steel mesh was holding what was left of the wood in place. The timber should be replaced as soon as possible. Consideration should be given to installing neoprene blocks as a replacement to the wooden bumper blocks.

Below the monkeyboard level, two horizontal beams had wood bolted to their sides as some sort of beam protection device. This wood is now rotted and is a potential dropped object. The wood has little value and should be removed.

Under the crown block assembly, various pad eyes were attached to the main beams. These were fitted with shackles and attached to snatch blocks. While the snatch blocks were all correctly fitted with safety lines, the cotter pins retaining the shackles were undersized and, in some cases, R snap pins were used instead of cotter pins tied up with lock wire. All of these undersized retaining and non-standard pins should be replaced to the correctly sized cotter pins as soon as possible.

It was noted that two bolts were either loose or tight in the derrick girt. These were located port side of the derrick below the monkeyboard level adjacent the derrick access ladder. Various safety slings were also corroding out throughout the derrick, and these required replacing.

The wind speed indicator above the crown was also noted to be inoperative.

Standing water was present in the lower diagonal sections of the derrick. These areas should be cleaned out and the drain holes unplugged. At various levels in the derrick, pieces of the plastic coating from the drill line had collected; this also required cleaning out. Two block hang-off lines were used: one short and the other long. Both were poorly secured with soft line. The soft line should be replaced with wire slings. We were informed by the rig crew that the shorter line was no longer used. If this is the case, it should be removed.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the derrick. At the time of the survey, the derrick was in fair condition.

Recommendations:

- Check two bolts that are not flush with derrick girt and secure, if necessary.
- Replace the corroded safety slings throughout the derrick, including the slings on derrick fingers.
- Remove plate or fit guide roller on port forward rig floor tugger wire that is cutting through the steel plate on first level of derrick.
- Replace corroded grating at crown.
- Replace rotted bumper wood at crown.
- Remove wood from two horizontal beams below monkeyboard level, as it is a potential dropped object.
- Replace damaged horizontal beam below monkeyboard level.
- Replace undersized cotter pins on shackles under crown assembly.
- Secure block hang-off lines with wire slings instead of soft line.
- Address the corrosion on top painted section of derrick.
- Repair/replace wind speed indicator above crown.
- Remove plastic drill line coating debris throughout derrick.
- Clean out lower section of diagonal beams in derrick to remove standing water and debris.
- Remove short block hang-off line, if no longer required.

DRHS DEAD Deadline Anchor

NOV Rotating Deadline Anchor

The deadline anchor was visually inspected and found in good condition. The anchor had been inspected by Hadco in December 2009. At this time, the retaining bolts had also been removed and checked for structural defects.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the dead line anchor. At the time of the survey, the dead line anchor was in good condition.

DRHS CROW Crown Block

Dreco 1000

Seven sheave cluster, plus dual in-line sheaves on fastline and dead line

The crown sheaves were inspected while drilling and operated smoothly with no unusual noises or vibrations.

It was noted that, while grease manifolds were installed on the dead line sheave support structure, they were covered with grease. The grease does not appear to be reaching the fast line or main cluster sheaves. No grease was being extruded from the fast line sheaves; only black dust was present around seal areas. On inspection of the grease lines, several were found damaged, with grease leaking from the damaged hoses.

The access to all of the sheaves at the crown was good. Also, the snatch blocks under the crown were readily accessible. We recommend that the grease manifold and lines be removed and that grease fittings be installed directly onto the sheaves. We also recommend that each of the sheaves is greased directly and on a regular basis.

The crown sheaves were checked with a sheave gauge and found in tolerance. The crown was disassembled, inspected and refitted in 2007. Hadco performed an NDT inspection in December 2009. The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the crown.

At the time of the survey, the crown was in fair condition.

Recommendation:

- Fit grease fittings directly to crown main shafts and snatch blocks under the rig floor; grease lines and manifolds.

DRHS TRAV Traveling Block

Shaffer 1000 ton

The travelling block was observed while tripping and drilling, and no defects were noted.

The block was last disassembled, inspected and rebuilt in 2007. Hadco performed a 365 NDT inspection in February 2010.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the travelling block. At the time of the survey, the travelling block was in good condition.

Varco Rotating Hook Adapter 1000 Ton

The rig was equipped with a Varco rotating hook adaptor, and this was used to connect the travelling block to the hook. It was normally used when the top drive was racked back during running riser and heavy strings of casing.

Hadco had carried out an NDT inspection in February 2010, and no defects were noted. During the survey, the hook was connected to the top drive, and so we were unable to verify whether the rotating assembly was functional.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the rotating hook assembly.

At the time of the survey, the rotating hook assembly was in good condition.

4.5**Mud/Cement Storage****BMS TANK****Bulk Tank Storage**

The main bulk tanks were located on the four columns, with two tanks installed on each column. Each column bulk tank had a storage capacity of 2,725 cubic feet. The cement was stored on the starboard side of the rig, and the barite was stored on the port side of the rig. There were four, capacity 1,030 cubic feet, day tank bulk storage tanks: two barite and two cement. These were located in the Halliburton cement room. All shipping valves could be controlled from the bridge. There was also a control station in the sack storage room. Load cells were installed on all bulk storage tanks.

Rock catchers were installed at each loading, and these were cleaned on a regular basis. A wall thickness survey was due on all bulk tanks. It was noted that none of the bulk tanks was stencilled with "SWP."

The load cells on the column tanks, as well as the hose fittings, were corroding. We recommend that the corrosion be addressed before it becomes further advanced. Replace the corroded hoses and wrap the hoses with Denso tape.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they said that the bulk tank storage system worked well and that they had no major issues shipping bulk material. The crew stated they would like to have a camera system installed to monitor the overboard vent lines in order to prevent any overboard discharge of bulk materials.

At the time of the survey, the bulk tank storage was in good condition.

Recommendations:

- Install a CCTV camera to monitor the vent overboard discharge lines.
- Carry out wall thickness checks on the bulk air tanks.
- Stencil all bulk tanks with "SWP."
- Replace corroded hoses on column tank load cell hoses.
- Remove corrosion from column load cells.

BMS TANK**Surge Tanks**

Two surge tanks were installed in the sack room, and an additional third-party surge tank was installed in the Halliburton cement room. The rig's surge tanks were due a wall thickness survey. Stencil "SWP" on surge tanks.

Recommendations:

- Carry out wall thickness checks on surge tanks.
- Stencil "SWP" on all surge tanks.

MDS**Mud Pit Agitators, Guns, Valves**

Brandt MA-20 and Brandt MA-25

The rig was equipped with five Brandt MA-20 twenty horsepower mud agitators installed in mud tank Nos. 1, 2, 3 and 4 pits and one in the slug tank. The twelve Brandt MA-25 twenty-five horsepower mud agitators were installed in tank Nos. 5, 6, 7, 8, 9 and 10 tanks (two in each tank).

The agitators were in operation at the time of the survey. All were running, with no unusual noises or vibrations noted. It was noted that the twenty-five horsepower agitators were running hotter than the twenty horsepower units. This appeared to be normal for these agitators, as they were labelled with "Caution Hot Surface" tags on the larger units.

Most of the mud pit valves were manually operated. We observed that, on one valve, the handle was missing and that it was being operated with a pipe wrench.

There were five mud guns installed in the pit room. These were inspected and were found to be seized. We recommend that these be freed off and returned to a serviceable condition.

Additional mud storage tanks were located in the columns. It was not possible to check the condition of these, as they were installed in the column tanks below the liquid level.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the mud agitators, mud guns or valves.

At the time of the survey, this equipment was in fair condition.

Recommendations:

- Refit missing valve handle in mud pits.
- Free off seized mud guns.

4.6**Mud Process****LPMS****Mud Mixing System**

The rig was equipped with Halco 2500 one-hundred twenty-five horsepower electric motor belt-driven pumps. There were three mud mixing pumps. There were also an additional six pumps installed: four for reserve mud and two for brine.

A further two centrifugal pumps were located under the sand traps in the moonpool area. These pumps were witnessed in operation, and no defects were noted. The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the mud mixing system.

At the time of the survey, this equipment was in good condition.

LPMS**Mud Handling System**

There were four mixing/shearing hoppers installed in the sack room. One mixing hopper was dedicated to mixing liquid chemicals that were delivered from the main deck, the second hopper was for sack material and the other two mixing hoppers were located under the two surge tanks. There was also a hopper on the main deck, which was used to mix chemicals delivered in big bags.

A vacuum dust extraction system was also installed at each hopper, and there was a dedicated caustic mixer. A bag compactor was installed in the sack store, and this was witnessed in operation. No defects were noted.

The rig was equipped with a Stewart and Stevenson Hyster electric forklift in the sack store. This equipment was checked and found in good condition. The NPT records were checked for this equipment, and no significant NPT was recorded last year.

Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the mud handling system.

At the time of the survey, this equipment was in good condition.

LPMS**Mud Processing System****Brandt/LCM-2D CS**

The rig was equipped with seven Brandt LCM-2D CS shale shakers. There was also an additional Brandt shale shaker in the No. 8 position. Above this unit was installed a mud cleaning cone unit. The complete shaker was designated as a mud cleaner. The shakers were in operation at the time of the survey. All were working normally, and no defects were noted.

The mud from the return line was delivered into a gumbo box above the shakers. From there, it was distributed to the various shakers as required. The mud flowed over the sand traps and then returned to the mud pits. Cuttings from the shaker were caught in an auger system and delivered to a third-party dryer. The cleaned cuttings were dumped overboard, and any liquid mud recovered from the cuttings dryer was passed to a centrifuge and

returned to the shaker house. The complete system was in operation at the time of the survey, and no defects were noted.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the shale shakers. At the time of the survey, this equipment was in good condition.

Degasser

Burgess 1500, 1000 GPM X 2

The rig was equipped with two Burgess degassers during the course of the survey, and each was inspected. Unit No. 1 was found to be operating normally, but unit No. 2 was shut down due to a faulty degasser pump and motor, which had been removed and sent for repair.

The NPT records were checked for this equipment, and no significant NPT was recorded last year.

Scheduled PM was being carried out on this equipment. We interviewed the crew, and they were waiting on the return of vacuum pump No. 2.

At the time of the survey, this equipment was in bad condition.

Recommendation:

- Replace vacuum pump No. 2.

HPMS MP**Mud Pumps**

Continental Ensco FC-2200

The rig was equipped with four Continental FC-2200 mud pumps. All of the mud pumps were belt driven.

Pump Nos. 1 and 4 machinery space had restricted headroom. On these two pumps, the AC drive motors were mounted directly on the main skid at deck level. The machinery space where pump Nos. 2 and 3 were installed did not have restricted headroom, and these pumps had the AC drive motors mounted on a frame above the power end.

All pumps were equipped with Hydril PASAFE maintenance free pulsation dampers. Retsco relief valves were installed on all pumps. The pumps were fitted with a plate oil cooler and an electric power end lube pump. Pump rod lubrication was with seawater, and the drain discharging overboard.

A visual inspection was performed on all the mud pumps while they were running. No unusual noises or vibrations were noted.

Mud pump No. 1

An internal inspection was carried out on the pump. All bearing readings were taken, and crosshead clearances were recorded (see the spreadsheet below).

All bearing clearances were within tolerances, but the crosshead slides required adjusting to reduce the excessive clearances, with cylinder No. 3 being the highest.

Internally, the pump looked in good condition. No traces of metal were found in the pump crankcase or in the power end oil pump suction strainer.

It was noted that the belt guard did not fully cover the pinion shaft drive hub on the inside, and this exposed rotating hub was a potential hazard to personnel standing on top of the pump whether engaged in pump maintenance or using the pump to access equipment in the surrounding area. There was a danger of loose equipment, e.g., ropes or safety harness lanyards, being caught in this rotating equipment with possible fatal results. We recommend that the belt guard be extended to enclose this exposed rotating piece of equipment.

Crosshead covers had been replaced with Plexiglas sheet, and no major oil leaks were noted. All of the covers and inspection hatches on the pump had been sealed using silicone sealant or RTV. This was proven to be a major cause of pump bearing failure, as pieces of the silicone contaminates the lube oil system and becomes plugged off in various grease lines and oil passageways throughout the pump. The correct OEM gaskets should be installed to prevent contamination of the lube oil system and premature bearing failure. An additional fluid end lubrication pump was fitted, but this was not being used. We were informed by the rig crew that this was not required. If this is the case, it should be removed.

Mud pump No. 2

An internal inspection was carried out on the pump. All of the pump bearings were checked and were within tolerances.

The cross head lower slides were found badly scuffed, and there was no trace of any smooth bearing surface left. An attempt had been made in the past to grind out the scoring with a hand grinder, resulting in a very poor and rough finish on the lower crosshead slides. As the slides are damaged, we expect the lower crosshead surface to also be scored, and we recommend that both lower slides and crossheads be replaced on all cylinders.

When replacing the slides and crosshead, it would be advisable to have replacement crosshead bearings on hand so that these could be replaced if required.

It would be best practice to replace the crosshead bearings when crossheads are replaced, thus alleviating the need for any further maintenance to the crosshead for several years to come.

Crosshead readings on cylinder Nos. 2 and 3 were high, and these should be adjusted when repairs are completed.

The internal power end lubrication lines were hydraulic hoses that supplied oil to the right-hand main bearing. These hydraulic hoses are not suitable for this type of application. This hose had become hard and brittle and should be replaced using the original copper tubing. Other internal lubrication lines were found either loosely clamped or not supported, and this should be addressed to prevent the tubing fracturing from excessive vibration.

The crosshead covers had been replaced with Plexiglas. It was noted that this pump had several oil leaks, including pinion shaft oil seals, main bearing covers and cross head covers. Absorbent pads had been placed around the pump to catch the leaking oil. Extensive use of silicone sealant was evident on all covers and inspection hatches, and this was proven to be a major cause of pump bearing failure, as pieces of the silicone contaminates the lube oil system and becomes plugged off in various grease lines and oil passageways throughout the pump. The correct OEM gaskets should be installed to prevent contamination of the lube oil system and premature bearing failure.

An additional fluid end lubrication pump was fitted, but this was not being used. We were informed by the rig crew that this was not required. If this is the case, it should be removed.

Mud pump No. 3

An internal inspection was carried out on the pump, and all of the pump bearings were checked. The main bearings, pinion bearings and crank bearings were within tolerances. Crosshead bearing Nos. 1 and 3 were also within tolerance, but crosshead No. 2 bearing clearance was found to have a lift of 0.010", which is high. There was also evidence of damage to the lower slide, which could be caused by the breaking up of the crosshead bearing and bearing material falling onto the lower slide. A small amount of metal was also visible in the oil pump suction strainers and on the magnetic strips installed inside the crankcase.

We recommend that the crosshead bearing, slide and crosshead be replaced on cylinder No. 2. Three hydraulic hoses were also being used inside the crankcase. These had become hard and brittle and should be replaced to the original OEM copper tubing. The oil pump packing gland was found to be loose, and the bolts had backed off and were running on the pump coupling. It was also noted that the oil pressure gauge was still reading pressure with the pump stopped. The gauge should be replaced.

The crosshead covers had been replaced with Plexiglas. There was slight oil leakage coming from the rod drain box valve, as well as the top inspection hatches. As with the two previous pumps, an extensive use of silicone sealant was evident on all covers and inspection hatches. This was proven to be a major cause of pump bearing failure, as pieces of the silicone contaminates the lube oil system and becomes plugged off in various grease lines and oil passageways throughout the pump. The correct OEM gaskets should be installed to prevent contamination of the lube oil system and premature bearing failure. An additional fluid end lubrication pump was fitted, but this was not being used. We were informed by the rig crew that this was not required. If this is the case, it should be removed.

Mud pump No. 4

An internal inspection was carried out on the pump, and all of the pump bearings were checked. The main bearings, pinion bearings, crank bearings and crosshead bearings were within tolerances.

Both upper and lower crosshead slides were in good condition. It was noted that a small amount of metal particles were present on the magnetic strips. These were cleaned, and we recommend that these are rechecked at the next PM interval.

The pump was in good condition.

The crosshead covers had been replaced with Plexiglas. As with pump No. 1, it was noted that the belt guard did not fully cover the pinion shaft drive hub on the inside and that this exposed rotating hub was a potential hazard to personnel standing on top of the pump, whether engaged in pump maintenance or using the pump to access equipment in the surrounding area. There was a danger of any loose equipment; e.g., ropes or safety harness lanyards, being caught in this rotating equipment with possible fatal results. We recommend that the belt guard be extended to enclose this exposed rotating piece of equipment.

Extensive use of silicone sealant was evident on all covers and inspection hatches. This was proven to be a major cause of pump bearing failure as pieces of the silicone contaminates the lube oil system and becomes plugged off in various grease lines and oil passageways throughout the pump. The correct OEM gaskets should be installed to prevent contamination of the lube oil system and premature bearing failure.

An additional fluid end lubrication pump was fitted, but this was not being used. We were informed by the rig crew that this was not required. If this is the case, it should be removed.

The cable entry point for one of the pump proximity heads was vertically positioned, making the attached cable susceptible to damage during pump maintenance. The junction box should be repositioned to afford the cable some protection.

The NPT records were checked for the mud pumps, and no significant NPT was recorded last year. The last major work was carried out in January 2010 when a pinion being was found loose on pump No. 4; this was repaired by an NOV representative.

Scheduled PMs were being carried out on this equipment. We interviewed the crew, and they had issues with the Retsco relief valves on the mud pumps. At the time of the survey, an NOV service representative was on the rig to survey the pumps for installation of the NOV Titan BX relief valves. At the time of the survey, the mud pumps were in bad condition.

Mud Pump Discharge Pulsation Dampener

The rig was equipped with a PASAFE (Pump Acceleration Stabilizer And Flow Equalizer). While dampeners were maintenance free to a certain extent, the anticipated life of the choke tube was three to ten years. Also, the internal condition and wall thickness of the damper should be checked. We could find no records of any maintenance being carried out on the PASAFE dampers. These dampeners had been in operation for ten years.

Following is an excerpt from the Hydril pulsation dampener manual:

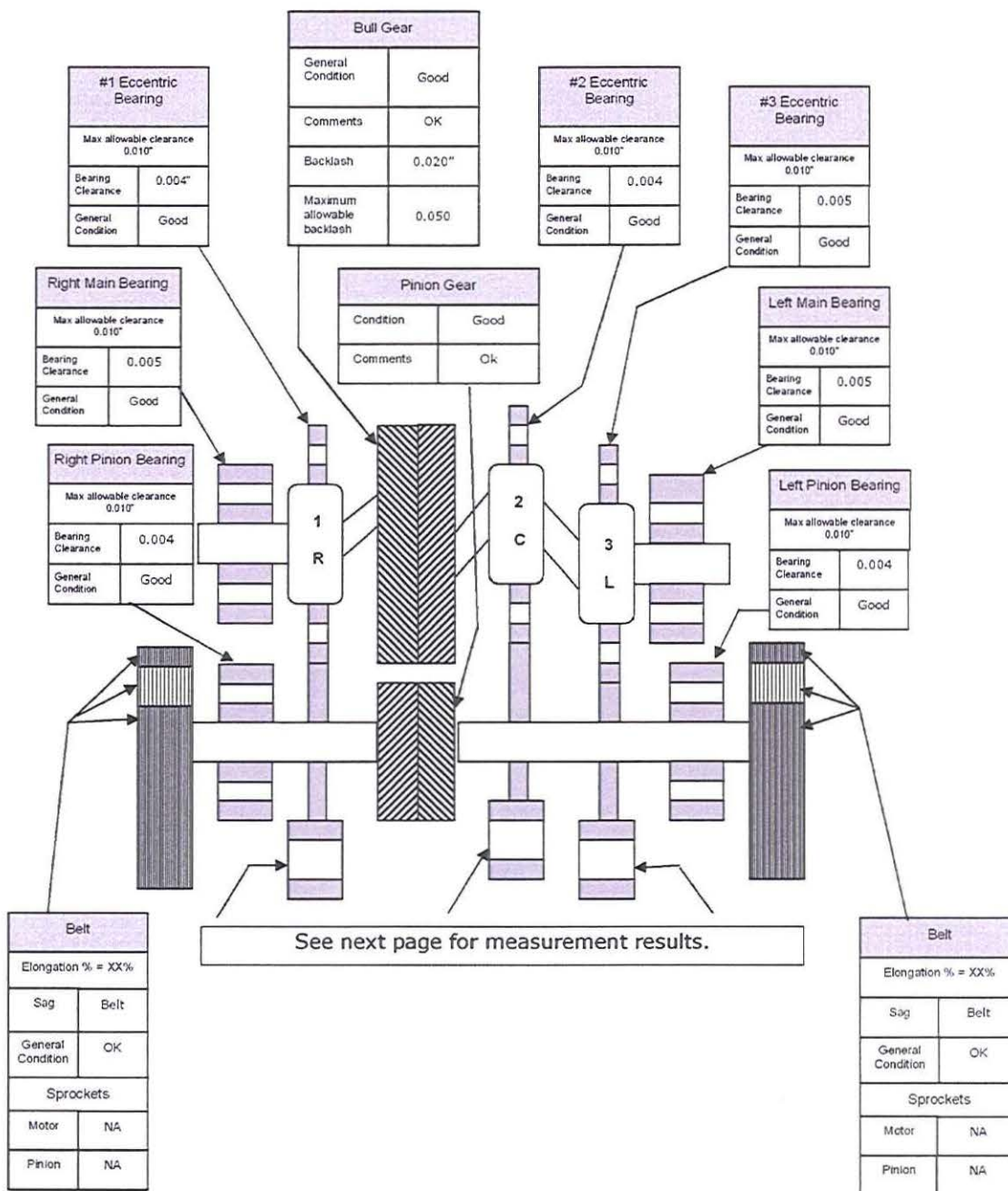
LIFE OF DISCHARGE DAMPENER AND CHOKE TUBE

The R-PASAFE Discharge Dampener has no limit to its service life other than potential loss of material from internal corrosion and/or erosion. The dampener's have been designed to ASME Section VIII Division 1 Rules for Construction of Pressure Vessels with a specific corrosion allowance. If corrosion or erosion is present, the dampener shell thickness shall be tested to assure the unit is operating within the design limits based on the ASME U1a Data Report's Shell Minimum Design Thickness provided with the discharge dampener data package - see Page 10. Life of the Choke Tube is related to service conditions. Anticipated life of a Choke Tube is from 3 to 10 years.

Recommendations:

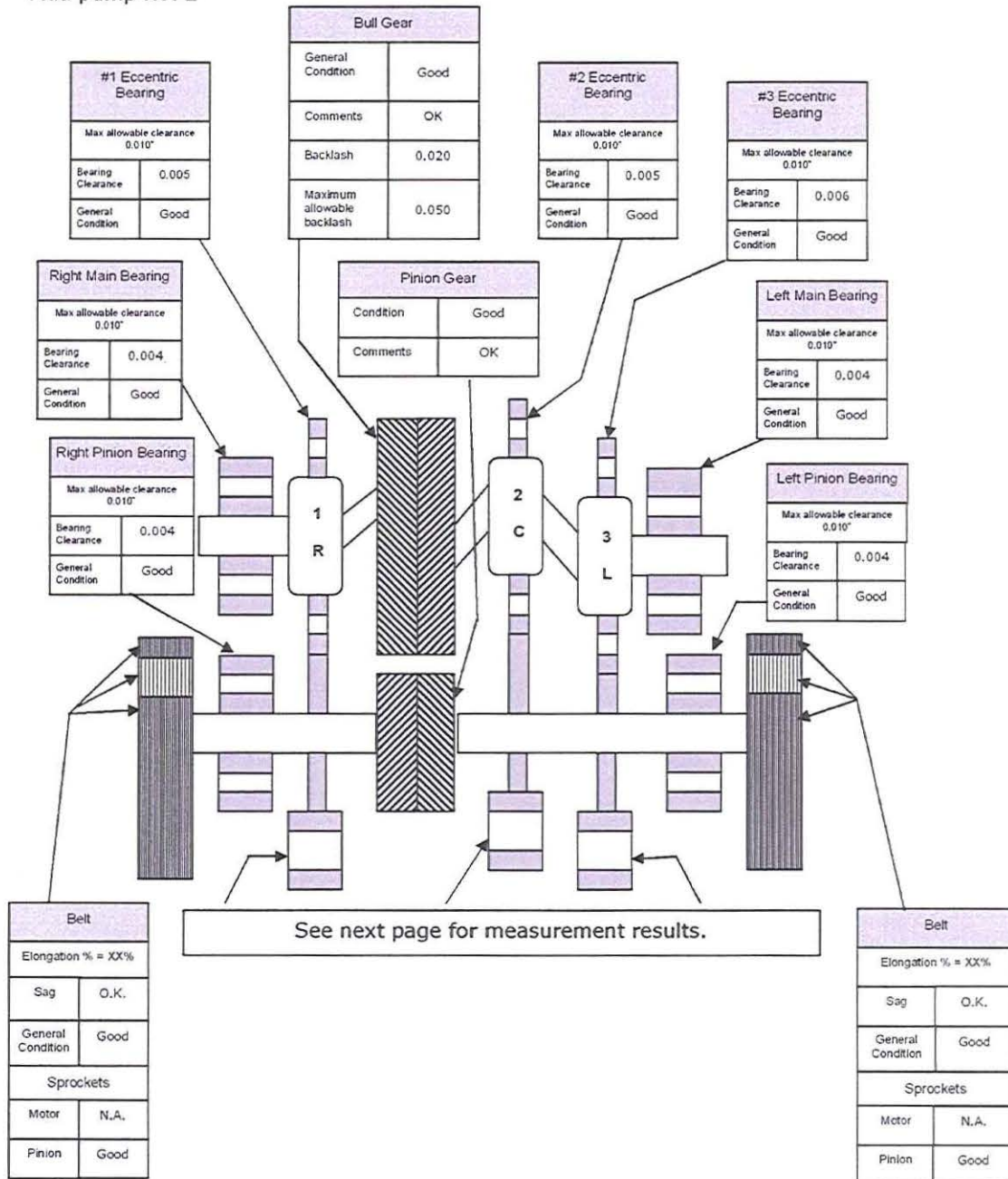
- Extend the belt guards on mud pump Nos. 1 and 4 to cover exposed rotating machinery on the inside of the belt guard Pinion shaft drive hub.
- Remove silicone sealant from all covers and hatches and install OEM gaskets during next PM intervals.
- Check all internal lube oil pipework and oil passageways for silicone sealant blockage.
- Remove the fluid end lube system pumps, if not required.
- Mud pump No. 4: Reposition the cable junction box to prevent any further cable damage from occurring.
- Replace the problematic Retsco relief valves with the Titan BX air operated valves as planned.
- Mud Pump No. 1: Adjust the crossheads to reduce clearances below 0.030".
- Discharge pulsation dampers and carry out an inspection of the PASFE dampers to determine condition of choke tube, internal condition and wall thickness.
- Mud pump No. 2: Replace the lower crosshead slides and crossheads.
- Mud pump No. 2: To follow best practice, also replace the crosshead bearings at the same time.
- Mud pump No. 2: Replace the hard and brittle hydraulic hose used on the oil supply to the main bearing.
- Mud pump No. 2: Secure the badly clamped and unsupported lube oil lines in the power end.
- Mud pump No. 2: Adjust the crosshead clearance to below 0.030".
- Mud pump No. 3: On the center crosshead bearing on cylinder No. 2, the clearance was high and the lower slide was damaged. Replace the center crosshead bearing, slide and crosshead.
- Mud pump No. 3: Replace hard and brittle hoses installed inside power end.
- Mud pump No. 3: Secure gland packing retainer and bolts on oil pump.
- Mud Pump No. 3: Replace the oil pressure gauge.
- Mud pump No. 4: Check the condition of the magnetic strips in power end at next PM interval.

Mud pump No. 1



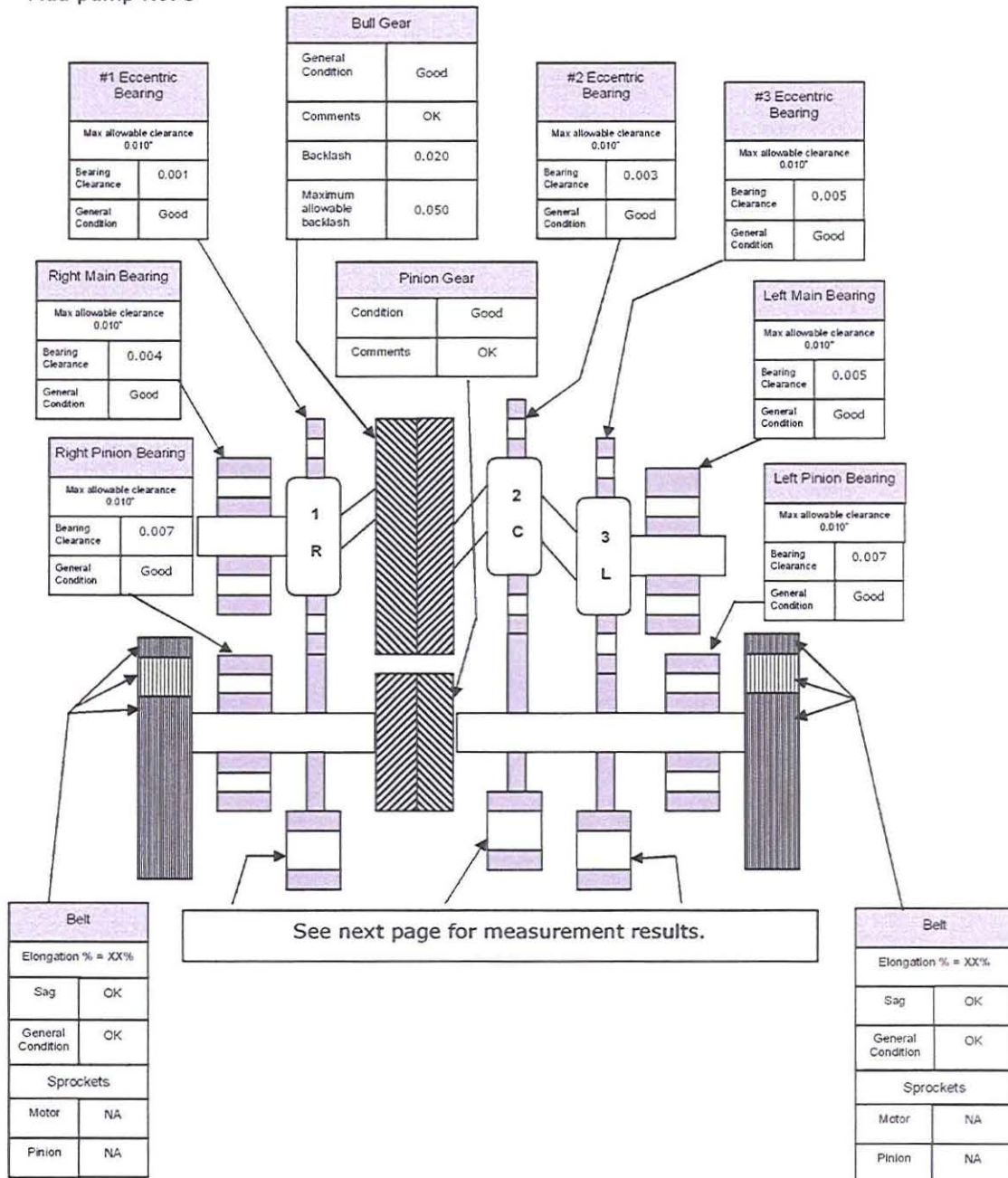
CROSSHEADS					
MAX ALLOWABLE BEARING CLEARANCE: 0.010"					
MIN/MAX CROSSHEAD GUIDE CLEARANCE: 0.025"					
CROSSHEAD	BEARING CLEARANCE	GENERAL CONDITION		FORWARD POSITION	AFT POSITION
No. 1	0.004"	Good	FORWARD	0.033	0.036
			MID	0.031	0.034
			AFT	0.030	0.035
No. 2	0.004"	Good	FORWARD	0.034	0.035
			MID	0.034	0.035
			AFT	0.034	0.036
No. 3	0.004"	Good	FORWARD	0.030	0.040
			MID	0.032	0.039
			AFT	0.036	0.038

Mud pump No. 2



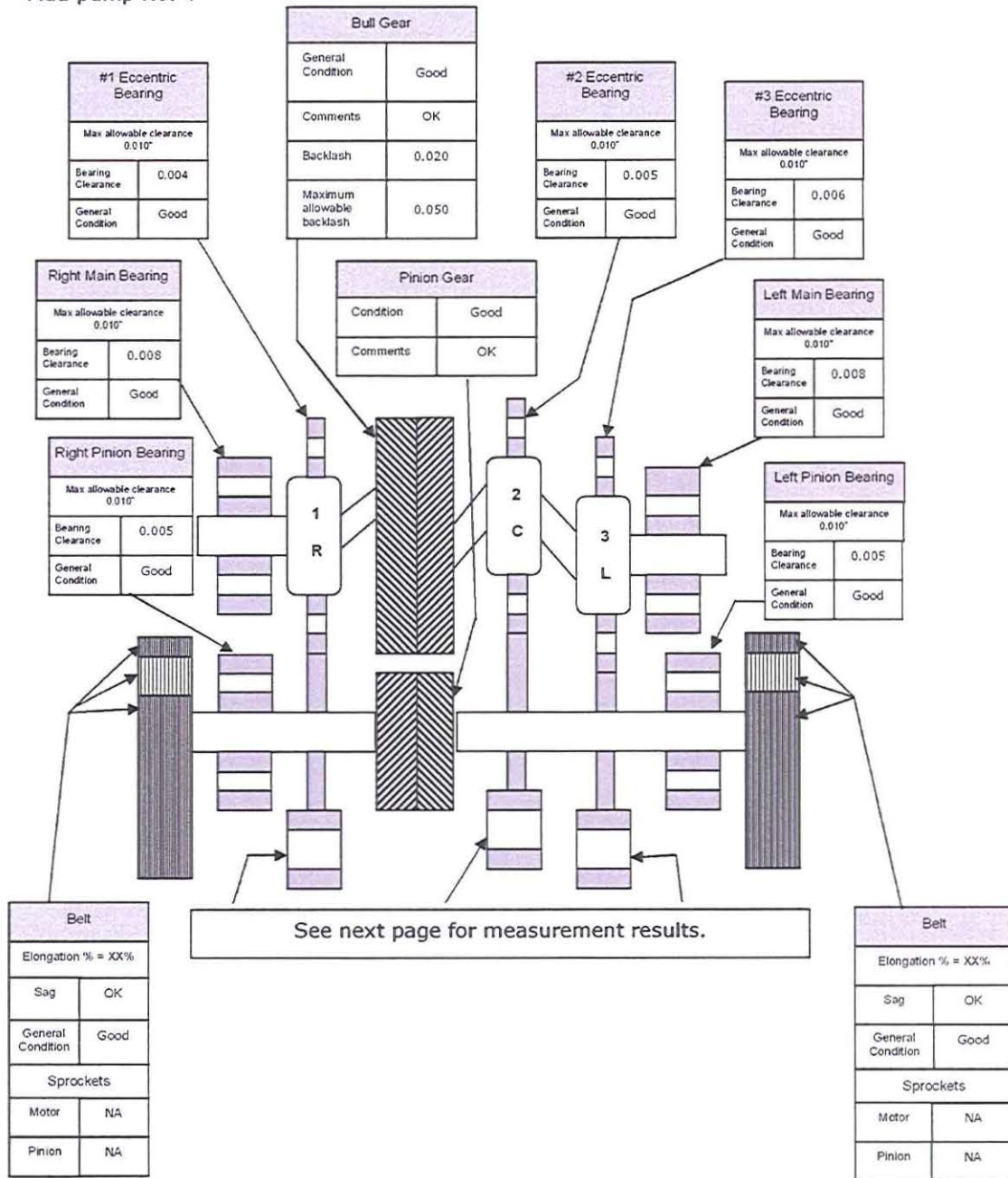
CROSSHEADS					
MAX ALLOWABLE BEARING CLEARANCE: 0.010"					
MIN/MAX CROSSHEAD GUIDE CLEARANCE: 0.025"					
CROSSHEAD	BEARING CLEARANCE	GENERAL CONDITION		FORWARD POSITION	AFT POSITION
No. 1	0.005"	BAD	FORWARD	0.022	0.025
			MID	0.025	0.025
			AFT	0.025	0.027
No. 2	0.005"	BAD	FORWARD	0.032	0.037
			MID	0.032	0.034
			AFT	0.040	0.036
No. 3	0.004"	BAD	FORWARD	0.040	0.041
			MID	0.022	0.031
			AFT	0.022	0.031

Mud pump No. 3



CROSSHEADS					
MAX ALLOWABLE BEARING CLEARANCE: 0.010"					
MIN/MAX CROSSHEAD GUIDE CLEARANCE: 0.025"					
CROSSHEAD	BEARING CLEARANCE	GENERAL CONDITION		FORWARD POSITION	AFT POSITION
No. 1	0.003"	Good	FORWARD	0.042	0.043
			MID	0.043	0.043
			AFT	0.043	0.044
No. 2	0.010"	BAD	FORWARD	0.040	0.040
			MID	0.040	0.040
			AFT	0.040	0.040
No. 3	0.003"	Good	FORWARD	0.032	0.032
			MID	0.035	0.031
			AFT	0.035	0.032

Mud pump No. 4



CROSSHEADS					
MAX ALLOWABLE BEARING CLEARANCE: 0.010"					
MIN/MAX CROSSHEAD GUIDE CLEARANCE: 0.025"					
CROSSHEAD	BEARING CLEARANCE	GENERAL CONDITION		FORWARD POSITION	AFT POSITION
No. 1	0.003"	Good	FORWARD	0.030	0.028
			MID	0.028	0.028
			AFT	0.028	0.025
No. 2	0.005"	Good	FORWARD	0.027	0.027
			MID	0.027	0.027
			AFT	0.027	0.027
No. 3	0.003"	Good	FORWARD	0.031	0.030
			MID	0.030	0.030
			AFT	0.030	0.030

Electrical Section for the Mud Pump

The AC motors associated with the mud pumps were visually inspected. Those operational were checked for high temperature and bearing noise. No abnormal noise or temperatures were noted at the time of the survey.

The GE AC motors for the mud pumps were externally and internally inspected. Internally, 1A, 1B, 2A, 2B and 3A were in a poor condition with an accumulation of grease and dust. We recommend that air filters are installed in the air inlets to the AC motors. This will help prevent more grease and dust from entering the motor.

The AC motors for mud pump No. 4 were covered with dust and must be cleaned.

Mud pump No. 1A also had a broken guard, which must be repaired.

Megger insulation readings were taken for the mud pump AC motors from the VFD drives in the switch rooms with the shunt bars removed, and the megger tester on a 500-volt range held for one minute.

The insulation value for eight motors was noted to be at an acceptable level and above the minimum Transocean standard of two meg ohms.

Due to the condition of the five AC motors, which were covered with dust and grease, we must rate this section of the report as bad.

Recommendations:

- The rig must implement a plan to change out the following mud pump AC motor due to the poor condition with grease and dust inside the motor: 1A, 1B, 2A, 2B and 3A.
- Install air filters on the air inlets on the mud pump AC motors.
- The AC motors for mud pump No. 4 must be cleaned with dry air due to the amount of dust inside the motors.
- Repair the damaged belt guard on mud pump 1A.

Below are the megger readings recorded with the rig electrician.

Mud Pump AC Motors	Phase A to Ground	Phase B to Ground	Phase C to Ground
1A	16.87 MΩ	16.27 MΩ	17.00 MΩ
1B	8.59 MΩ	9.89 MΩ	10.89 MΩ
2A	159 MΩ	160 MΩ	159 MΩ
2B	173 MΩ	176 MΩ	177 MΩ
3A	1.9 G Ω	2.6 GΩ	2.8GΩ
3B	2.36 GΩ	2.9 GΩ	3.11 GΩ
4A	12.5 MΩ	13.5 MΩ	14.3 MΩ
4B	110 MΩ	110 MΩ	112 MΩ

CMT

HP Cement Piping

The HP cement lines were visually inspected and were found in good condition. Hadco, a third-party pipework inspection company, carried out a wall thickness survey of the horsepower cement pipework in September 2009, and no defects were recorded. We reviewed the Hadco results, and these were acceptable but lacked an isometric drawing showing the layout of the pipework and where readings were taken.

The NPT records were checked for this equipment, and no significant NPT was recorded last year.

At the time of the survey, this equipment was in good condition.

Recommendation:

- Supply isometric drawings showing the layout of the pipework and where readings were taken.

HPMS

HP Mud System

The HP mud system lines were visually inspected and were found in good condition. Hadco, a third-party pipework inspection company, carried out a wall thickness survey of the horsepower cement pipework in September 2009, and no defects were recorded. We reviewed the Hadco results, and these were acceptable but lacked an isometric drawing showing the layout of the pipework and where readings were taken.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the HP mud system.

At the time of the survey, this equipment was in good condition.

Recommendation:

- Supply isometric drawings showing the layout of the pipework and where readings were taken.

4.7

Drilling Instrumentation**DIST INST****Drilling Instrumentation System**

The drilling instrumentation system consisted of NOV and Houston Digital input/output data acquisition units. The system was visually inspected and found to be in satisfactory condition. There were no issues raised by the drillers, and all instrumentation outputs were found satisfactorily displayed on the MMI units, including the remote units. There were no reported discrepancies for pit volumes, flow show indicators, mud pump strokes or weight.

We visually inspected the drilling instrumentation system on the rig while the rig was drilling.

All instrumentation gauges located in the doghouse were found to be in good working condition, and all had calibration labels attached to each gauge.

The driller and the electronics technician confirmed the condition of the drilling instruments and that the system operated without any problems. There were no records of any downtime in the RMS11 downtime reports for the last year.

All of the EXp instrumentation cabinets were properly purged with dry air. Due to operations, we were unable to check any of the purge alarms on the drill floor. Our conclusions were that the drilling instrumentation on the drill floor was in good condition based on the visual inspection, interviews and the maintenance history.

The equipment was in good condition.

DIST INST**Drilling Control/Monitoring Systems (Hi Tec, etc.)**

Three HiTech cyberbase operators were available. A dual set-up for the driller and the assistant driller in the main driller's cabin and a single cyberbase was located in the auxiliary driller's cabin and used mainly for mousehole operations.

The HiTech cyberbase functions were reviewed, and the rig crews were interviewed. A scan of the pages did not show any anomalies. Interviews were held with the operating and maintenance crews, and both parties were satisfied with the performance of the HiTech cyberbase. The software on all of the three chairs was stable and had not shown (excessive) crashes. HiTech programming was run on Windows NT, and it was reported that a software upgrade to windows EP would be carried out.

The present system was backed up by a UPS, which was found to be in good condition.

A review of maintenance history raised no issues that had not been already addressed by the planned upgrade of the system, and operating personnel had no problems either.

It was reported to us that, due to various issues with the tracking, the PRS and IR were not operated in automatic mode but only in manual mode. We recommend, therefore, that the rig address these issues with the system.

A function test of the zone management system could not be done due to operational constraints.

The equipment was in fair condition.

Recommendation:

- Investigate why the PRS and IR were not run in the automatic mode.

4.8

Riser/BOP & Well Control Equipment

WCS CONN

Connector: Riser

The rig was equipped with a Cameron 18-3/4-10 HC riser connector. At the time of the inspection, the riser connector was subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the riser connector. Upon inspection, no discrepancies were noted. Upon further investigation, it was noted that the riser connector certification would expire in June 2010 and that efforts should be made to secure a replacement riser connector while this one is sent for overhaul and re-certification.

Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 15 June 2005.

At the time of the inspection, the riser connector was in good condition.

WCS CONN

Connector: Wellhead

The rig was equipped with an 18-3/4" VETCO SUPER HD 15K wellhead connector and a CAMERON 18-3/4" DWHC 15K. At the time of the inspection, the VETCO wellhead connector was subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the wellhead connector. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that the spare Cameron wellhead connector had been sent in for a "working class overhaul" and was onshore awaiting shipment to the rig.

Upon review of certification documentation, the following dates of the last manufacturer's certification were noted: VETCO wellhead connector, 10 November 2007; Cameron wellhead connector, 05 October 2009.

At the time of the inspection, the wellhead connector was in good condition.

WCS FJRA**Flex Joint**

The rig was equipped with an Oil States 18-3/4" lower flex joint. At the time of the inspection, the lower flex joint was subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the lower flex joint. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that the lower flex joint in use was a loaner from the Nautilus and that the DEEPWATER HORIZON's lower flex joint had been sent for the five-year overhaul and was currently awaiting shipment to the rig. An assessment was not carried out on the original unit.

Upon review of certification documentation, it was noted that the date of last manufacturer's certification for the lower flex joint assigned to the rig was 16 October 2009.

No certification documentation for the loaner lower flex joint currently in use was available for review.

At the time of the inspection the lower flex joint was in good condition.

Recommendations:

- Acquire and retain valid manufacturer's certification documentation on board the rig for the loaner unit.
- Install the overhauled lower flex joint at the next opportunity as planned.

WCS RISE**Riser**

The rig was equipped with ninety ninety-foot Vetco / HMF-Class H Marine riser joints. At the time of the inspection, the majority of the riser joints were subsea and inaccessible. A non-intrusive limited visual inspection was conducted on the riser joints on deck, and it was noted that many of the riser auxiliary lines did not have pin end and box end protectors installed. Upon discussion with the subsea engineer on board, it was explained that all joints were rotated and that, when the joint reached 1,865 days of in-service, the joint was sent for overhaul, unless earlier damage was noted.

The rig had seven joints of riser at this time, which was in the process of being inspected onshore for overhauling. They consisted of two green units, one orange unit and four black units. Recently, the riser that was sent to the shore for overhaul had returned with a different style of thrust collar installed. The original style had a brace installed, which made it difficult when removing the pins. The new style saved time when removing the pins. The subsea was eventually going to have all riser switched to this style of thrust collar.

The rig crew used Francis RT 40 torque tools with Moly-Lube as a lubricant when making up the riser. In the past, the coefficient used had never seized. The rig was having issues with the tools breaking down at this time due to the torque having to be set at such a high setting. Since the change to Moly-Lube, the tools had held up with fewer problems.

After reviewing the newest up-to-date tracking sheet for the riser days in service, a majority of all joints will be due for their 1,865-day service within the next two-hundred days.

At the time of the inspection, the riser was in good condition.

Recommendation:

- Install protective caps on the lines where no protection was installed.

WCS TJT**Telescopic (Slip) Joint**

The rig was equipped with two ninety-foot Vetco slip joints with a stroke of sixty-five feet. At the time of the inspection, the slip joint was installed and in operation. A non-intrusive visual inspection was conducted on the slip joint. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that slip joint No. 1 was currently in use and that slip joint No. 2 was currently onshore being overhauled.

Upon review of certification documentation, it was noted that the date of last manufacturer's certification for slip joint No. 1 was 13 April 2009. No certification documentation was available for slip joint No. 2.

At the time of the inspection, the slip joints were in good condition.

WCS RISA**Marine Riser Adapter**

The rig was equipped with a Vetco HMF-Class H Marine riser adapter. This adapter was an integrated piece of the lower flex joint. At the time of the inspection, the marine riser adapter was subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the marine riser adapter. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that, along with the flex joint, the marine riser adapter had been sent for overhaul and re-certification and was currently awaiting shipment to the rig. Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 16 October 2009.

At the time of the inspection the marine riser adapter was in good condition.

RISH RHT**Riser Gimbal / Spider**

The rig was equipped with a Vetco hydraulic riser spider/gimbal. At the time of the inspection, the spider/gimbal was stored on deck and not in operation. A non-intrusive visual inspection and a function test were conducted on the spider/gimbal. The unit functioned open and closed with no problem. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that the riser spider/gimbal was operating properly and that there were no outstanding issues. Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 13 August 2007.

At the time of the inspection, the riser spider/gimbal was in good condition.

WCS TENR**Tensioning Ring**

The rig was equipped with a Vetco SDC tension ring. At the time of the inspection, the tension ring was subsea and inaccessible. Upon discussion with the subsea engineer on board, it was explained that the locking mechanisms were new and that, on the next move,

the open and close cylinders, as well as the umbilical, would be changed out for new. At this time, there had been no operational issues with the tension ring.

No up-to-date NDT records were available onboard the rig.

At the time of the inspection, the tension ring was in good condition.

Recommendation:

- Perform an NDT at the next available opportunity.

RTS HCYL

Riser Tensioners

The rig was equipped with six Hydralift 800K inline riser tensioners. At the time of the inspection, the riser tensioners were installed and in operation. A non-intrusive visual inspection was conducted on the riser tensioners. Upon inspection, it was noted that the tensioner cylinder protective coating was flaking off in various areas and was in need of maintenance. It was also noted that there was no record of NDT inspections for the tensioners or support structure.

Upon discussion with the subsea engineer on board, it was explained that the original tensioner rods on Nos. 1, 3, 4, 5 and 6 had been replaced and that No. 2 was scheduled to be replaced. It was also explained that five of the six moonpool HP air supply hoses had been replaced within the last twenty-four months. It was also noted that tensioner hose No. 5 was scheduled to be replaced due to damage on the outer sheathing. Upon further inspection, it was noted that tensioner No. 2 was not in service due to a leaking rod end seal.

No NDT reports for the riser tensioners or support structure were available for review.

APV

The rig was equipped with eight standby bottles and six banks of five bottles for the tensioner systems. A non-intrusive visual inspection was carried out on the bottles. Upon inspection, it was noted that the pressure relief valves were last calibrated in 2005. This was beyond the two-year inspection and recertification schedule. It was also noted that the pressure gauges on the back side were damaged. The glass was damaged on a majority of them, and on others, the glass was not visible. The flanged connection from one of the standby bottles, which was located on the starboard side end to the isolation ball valve before the main manifold for the standby bottles, was severely corroded. A protective coating maintenance was needed. The discharge line on the backside needed to be pointed in a safe direction on the majority of the valves. At the time of the survey, they were pointed toward a walkway. There were two handles missing on the main isolation ball valves in the bank of five for tensioner No. 6 that needed to be installed. After discussion with the subsea engineer, the valves that were missing handles were to be replaced. The remaining twenty-eight valves were also going to be changed out. The valves had no way of servicing them and were sticking, causing problems opening and closing and eventually breaking off handles. They were the ones on either end of the five bottles. Upon discussion with the subsea engineer on board, there had been no issues related to the APV bottles. After reviewing the last NDT inspections reports, the bottles were accepted.

At the time of the inspection, the riser tensioners were in fair condition.

Recommendations:

- Perform protective coating maintenance on the riser tensioner cylinders.
- Replace tensioner No. 5 HP air supply hose as planned.
- Perform NDT inspection of riser tensioners and support structure to determine the need for repairs and/or replacements.
- Repair the leaking rod end seal on tensioner No. 2.
- Replace damaged and discolored gauges and recalibrate.
- Perform protective coating maintenance on flanged connection on standby bottle.
- Reroute discharge lines in a safe direction away from walkway.
- Replace two missing ball valve handles on bottle in bank of five for tensioner No. 6, and replace all valves once they have arrived.
- Recalibrate the pressure relief valves.

RTS CTRU**Riser Recoil System**

The rig was equipped with a Hydralift riser recoil system. At the time of the inspection, the riser recoil system was in operation and inaccessible. A non-intrusive visual inspection was conducted on the riser recoil system. Upon discussion with the subsea engineer on board, it was explained that the riser recoil system was not functioning in an automatic state as designed. The riser recoil system is a critical system used for slowing the ascent of the riser and LMRP to prevent damage to the rig, riser and LMRP in the event of an emergency disconnect situation. The riser recoil system works off of the tensioner rod position indication, which is achieved through transducers and machined groves in the rods. It was explained that some of the tensioner rods had been changed out with new rods that do not have the machined groves, which in turn have disabled the automatic function of the riser recoil system.

At the time of the inspection, the riser recoil system was considered to be in bad condition.

Recommendation:

- Restore the riser recoil system to operate as designed.

WCS BOPR**BOP Rams (Various)**

The rig was equipped with two Cameron double 18-3/4" X 15K and one Cameron single 18-3/4" X 15K ram BOPs. At the time of the inspection, the ram BOPs were subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the ram BOPs. Upon inspection, it was noted that the last date of certification of the BOP bodies and bonnets was 13 December 2000. This was beyond the five-year inspection, overhaul and re-certification requirement. While on board, pressure tests to 250 psi and 6500 psi were carried out on all rams. The tests were witnessed and acceptable. Upon discussion with the subsea engineer on board, it was explained that the ram BOPs were operating correctly and that there were no outstanding issues.

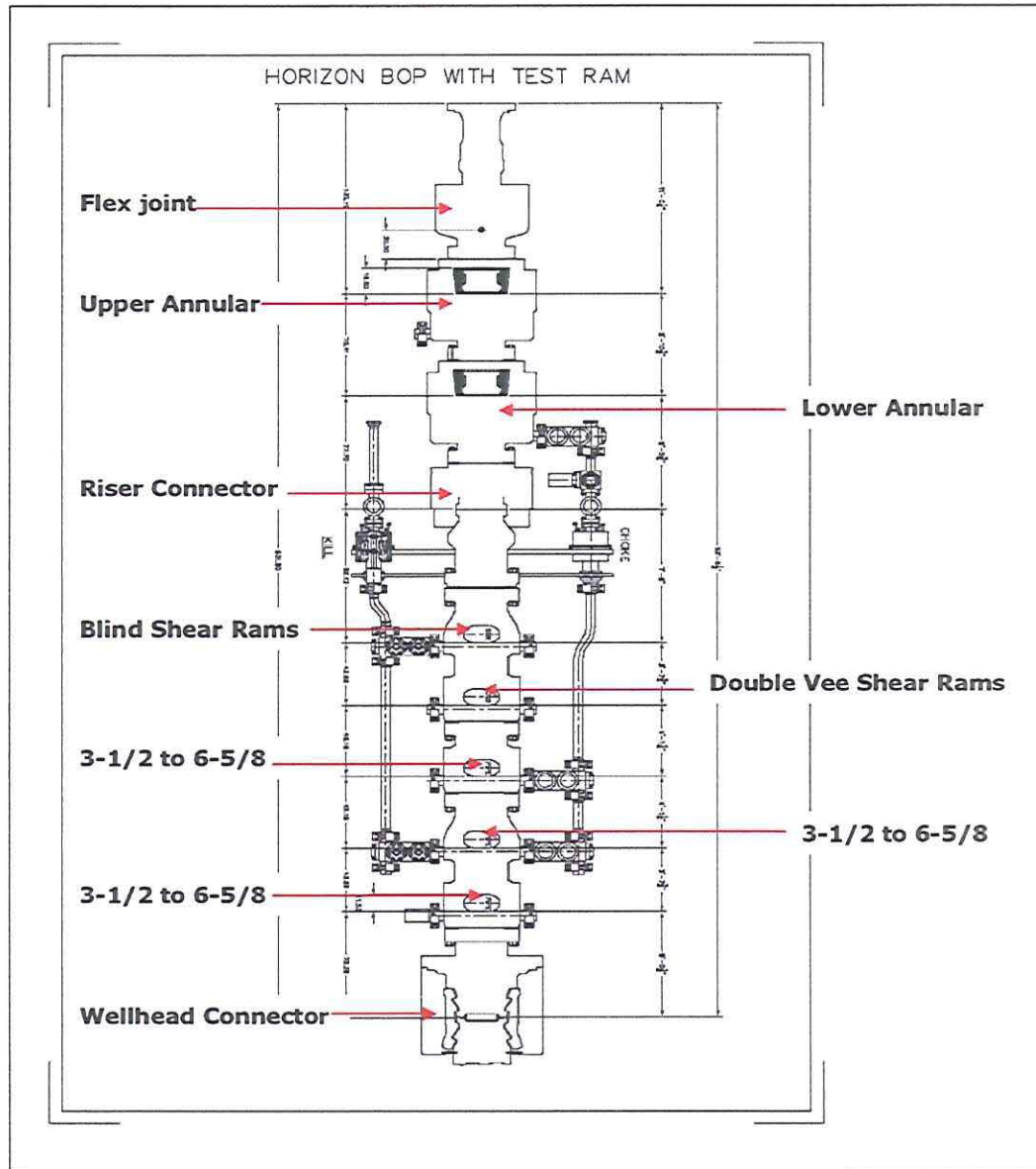


Spare Ram Blocks

At the time of the inspection, there were four sets of spare ram blocks sitting on the deck. The rams were beginning to rust. The rams needed to be cleaned up and protective coating maintenance performed.

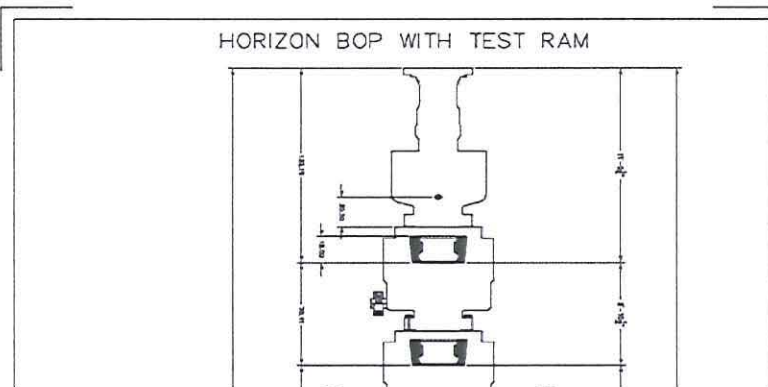
Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 13 December 2000.

Stack Configuration



Order
01 -

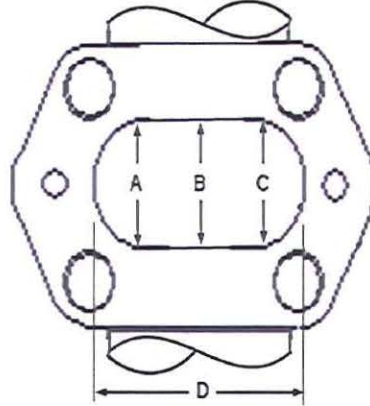
Page 49 of 112



CONFIDENTIAL

MODUSI 01 0 000049

**Ram cavity clearance measurements (Cameron BOP)
last taken 31 August 2009**



RAMS	A Clearance		D Clearance	
	Port	Starboard	Port	Starboard
Shear	.031	.029	.014	.013
Upper Pipe	.025	.029	.012	.013
Middle Pipe	.029	.030	.012	.016
Lower Pipe	.025	.033	.008	.010

Date of last certification

BOP body	S/N	Last date of Certification
Upper Double Body	11367000-1	04 October 2000
Single Body	11360580-1	13 December 2000
Lower double Body	11369619-1	13 December 2000
BSR Left Bonnet		04 October 2000
BSR Right Bonnet		04 October 2000
VSR Left Bonnet		13 December 2000
VSR Right Bonnet		13 December 2000
UPR Left Bonnet		13 December 2000
UPR Right Bonnet		13 December 2000
MPR Left Bonnet		13 December 2000
MPR Right Bonnet		13 December 2000
LPR Left Bonnet		13 December 2000
LPR Right Bonnet		13 December 2000

At the time of the inspection, the ram BOPs were in good condition.

Recommendations:

- Replace the two double ram cavity BOPs and the one single ram cavity BOP with new or re-certified ram BOPs; send the currently installed ram BOPs for the five-year inspection, overhaul and re-certification.
- Perform protective coating maintenance on the spare ram blocks and store out of weather.

WCS ANNU

BOP Annulars

The rig was equipped with a Cameron DL 18-3/4" upper annular BOP and a Cameron DL 18-3/4" lower annular BOP. At the time of the inspection, the annular BOPs were subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the Annular BOPs. Upon inspection, it was noted that the last date of certification for the upper and lower annulars was 13 December 2000. This was beyond the five-year inspection and re-certification requirement. Upon discussion with the subsea engineer on board, it was explained that, every time maintenance was required and carried out (which entailed removing the lower annular head), extraordinary difficulties were experienced in replacing the head. While on board, pressure tests were performed on the upper and lower annulars. The upper annular was tested to 250 psi and 3500 psi. The tests were all acceptable. The lower Annular was pressure tested to 250 psi and 5,000 psi. The tests were all acceptable. After the pressure tests were completed, the annulars were function tested.

During the lower annular operator hydraulic function test, while watching the flow meter an indication of a small leak was noted. Upon discussion with the subsea engineer, it was believed that the hose/fitting on the surge bottle was leaking.

Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 13 December 2000.

ELEMENTS

Upon inspection, two packing elements were located on the main deck port side. The 5,000 psi rated element was under the roof; however, it was still not stored in a controlled environment and out of harmful UV rays.

The 10,000 psi rated element was covered with black UV protective packaging, but was sitting on the main deck outside in the weather. Upon discussion with the subsea engineer, the element will be moved under the roof of the BOP house. However, it will still not be in a controlled environment.

Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 13 December 2000.

At the time of the inspection, the BOP annulars were in good condition.

Recommendations:

- Replace the upper and lower annulars with new or re-certified annulars and send the currently installed annulars for the five-year inspection, overhaul and re-certification.
- Investigate the leak and repair as necessary.
- Move elements to a controlled environment area.

WCS BOPS

BOP Stack Frame (General)

The rig was equipped with a Cameron 18-3/4" X 15K BOP stack frame. At the time of the inspection, the BOP stack frame was subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the BOP stack frame. Upon inspection, the stack frame was found to be moderately corroded and in need of protective coating maintenance. There was also minor damage to the frame legs and decks of the stack. Upon discussion with the subsea engineer on board, it was explained that there were no outstanding issues with the BOP stack frame.

At the time of the inspection, the BOP stack frame was in good condition.

Recommendation:

- Perform protective coating maintenance.

WCS VLV

Failsafe Valves

The rig was equipped with ten 3-1/16" X 15K Cameron MCS failsafe valves. At the time of the inspection, the failsafe valves were subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the failsafe valves. Upon inspection, it was noted that the last date of certification was 13 December 2000. This was beyond the five-year inspection, overhaul, and re-certification requirement. It was also noted that there

was no record of serial numbers of failsafe valve and installation locations for accurate tracking. Upon discussion with the subsea engineer on board, it was explained that there were no outstanding issues with the failsafe valves. While on board, the failsafe valves were pressure tested and function tested as well. All tests were acceptable.

Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 13 December 2000.

Failsafe Valve Assembly Location	Failsafe Valve Assembly S/N	Last Certification
?	11368458-1	13 December 2000
?	11368458-2	13 December 2000
?	11365161-1	13 December 2000
?	11363999-1	13 December 2000
?	11363999-2	13 December 2000
?	113653191-1	13 December 2000
?	113653191-2	13 December 2000
?	11365161-1	13 December 2000

At the time of the inspection, the failsafe valves were in good condition.

Recommendations:

- Acquire and retain valid manufacturer's certification documentation on board the rig.
- Maintain a log of valve serial numbers and location of installation on board the rig to accurately track equipment maintenance.

WCS CTRU**BOP Control Panels**

The rig was equipped with one Cameron remote BOP control panel located on the bridge and one Cameron remote BOP control panel located in the driller's cabin. At the time of the inspection, the BOP control panels were installed and in operation. A non-intrusive visual inspection was conducted on the BOP control panels. The driller's control panel was operated during the pressure tests using the Blue pod. All operations were satisfactory. The toolpusher's control panel was operated during the function tests on the stack using the Yellow pod.

During the functioning of the toolpusher's control panel on Yellow side, the "Pod Mismatch" light was on. The error message read "Valve Mismatch (50)." Upon inspection, it was noted that the purge air system on the driller's panel was not working properly. The door seal was leaking, and the purge air pump needed a new diaphragm. Upon discussion with the subsea engineer on board, it was explained that the crew was aware of the purge air pump issue, as well as the door seal, and had ordered the parts. It was also explained that the toolpusher's panel, which was located in the bridge, was an issue. The surface flow meter light blinked, indicating flow while the standpipe hole fill valve was closed. A Cameron field technician had informed the subsea engineer that one of the cards needed to be replaced. However, the Cameron technician did not specify which card. The crew had been in contact with Cameron personnel and was still awaiting their answer as to which card needed to be replaced.

At the time of the inspection, the BOP control panels were in fair condition.

Recommendations:

- Replace the diaphragm on the purge pump and replace the door seal on the driller's control panel.
- Investigate which card needed to be replaced and install in the panel to fix the light.
- Investigate why "Pod Mismatch" was on and correct the valve mismatch error message.

WCS PMP**BOP Mixing Unit**

The rig was equipped with a Cameron electronic BOP mixing unit with a 1200-gallon mix tank. At the time of the inspection, the BOP mixing unit was installed and in operation. A non-intrusive visual inspection was conducted on the BOP mixing unit. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that the system was operating correctly and that there were no outstanding issues with the BOP mixing unit. The crew took weekly samples and used Stack Magic 200 mixed at a three percent ration for their fluid.

At the time of the inspection, the BOP mixing unit was in good condition.

WCS ACUM**Accumulator Bottles, Stack Mounted**

The rig was equipped with eight eighty-gallon accumulator bottles located on the lower stack and four sixty-gallon accumulator bottles located on the LMRP. At the time of the inspection, the stack-mounted accumulator bottles were subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the stack-mounted accumulator bottles. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that there were no issues with the accumulators. No records were on board indicating that a UT wall thickness had been performed.

At the time of the inspection, the stack-mounted accumulator bottles were in good condition.

Recommendation:

- Perform a UT wall thickness check on the stack-mounted accumulator bottles and retain certification on board. **Completed (documentation provided).**

WCS ACUM**Accumulator Bottles, Surface**

The rig was equipped with fifty-four Cameron forty-gallon piston-type surface accumulator bottles. At the time of the inspection, the surface accumulator bottles were installed and in operation. A non-intrusive visual inspection was conducted on the surface accumulator bottles. Upon discussion with the subsea engineer on board, it was explained that there were no outstanding issues with the surface accumulator bottles.

The last UT wall thickness records show that the surface accumulator bottles were inspected 24 December 2008. The wall thickness of the surface accumulator bottles was acceptable at the time of that inspection.

At the time of the inspection, the surface accumulator bottles were in good condition.

WCS PMP**BOP Triplex Pumps**

The rig was equipped with three FMC 5000 psi triplex pumps. At the time of the inspection, the triplex pumps were installed and in operation. A non-intrusive visual inspection was conducted on the triplex pumps. Upon inspection, triplex pump No. 1 ran more loudly than the other two. Upon discussion with the subsea engineer on board, it was explained that triplex pump No. 1 ran more loudly after work had been performed on the unit. The unit had been stripped down and fully inspected, and no issues were noted during those inspections. The unit still worked correctly and, other than the loud noise, no other problems had been noted. It was also noted that the pumps did not have any markings informing workers that they started automatically. The relief valves on all three pumps were last tested and set to 5500 psi on 09 August 2000. This was beyond the two-year inspection and re-certification requirement.

At the time of the inspection, the triplex pumps were in good condition.

Recommendations:

- Investigate why triplex pump No. 1 runs more loudly than the other two installed pumps.
- Install signs informing workers that the pumps start automatically.
- Calibrate pressure relief for the two-year inspection, overhaul and re-certification program.

WCS SSHR**Hose Reels (MUX & Hydraulic)**

The rig was equipped with a Patco Blue and Yellow MUX reel supplied by Cameron in June 2000. The units had a cable capacity of 11,000 feet at eighty percent. At the time of the inspection, a function test could not be carried out on the reels due to operations. A non-intrusive visual inspection was conducted on the three reels. Upon inspection, it was noted that there was minor corrosion that was in need of protective coating maintenance. Upon discussion with the subsea engineer on board, it was explained that there were no outstanding issues with the reels. On 01 February 2010, a new slip ring was installed on the Blue MUX Reel. A new slip ring was on order to complete this on the yellow as well, once the part had arrived. The units could be operated with a remote box, and no obstructions of view were noted. No NDT certification was available for the welds at the base of the frame to the deck. The relief valve on the drive motor was not calibrated on either of the two reels. Upon inspection, it was noted that the inlet for the airline hose was beginning to corrode at the thread on the motor.

Hot Line

The rig was equipped with a Patco Hotline reel supplied by Cameron in June 2000. The unit had a hose capacity of 11,000 feet at eighty percent. At the time of the inspection, a function test could not be carried out on the reels due to being in operation. Upon inspection, it was noted that there was minor corrosion that was in need of protective coating maintenance. The drum itself also had slight warping. Upon discussion with the subsea engineer onboard, it was explained that the reel pulled too much weight in the past and that this was the reason for the warping. Plates were welded on the port side, gussets were welded on the starboard side and the drum was straightened as much as possible. After the drum was straightened, there had been no issues with rubbing.

Turn Down Sheaves

Upon inspection of the three turn down roller sheaves, was noted that there were a few deficiencies. The guide rails for the sheaves were corroded and in need of cleaning up and inspecting. Replace any hardware as needed and perform protective coating maintenance. The mounting hardware needs attention regarding protective coating maintenance and NDT inspections.

At the time of the inspection, the hose reels were in good condition.

Recommendations:

- Perform protective coating maintenance on the three hose reels.
- Acquire and retain valid NDT certification documentation on board the rig for the frame base welds.
- Clean the sheave guide rails and mounting hardware, replace as needed and perform protective coating maintenance.

WCS BOPP**BOP Control Pods**

The rig was equipped with two Cameron Mark II pods (one blue and one yellow) and one spare pod. At the time of the inspection, the BOP control pods were subsea and inaccessible. A non-intrusive limited visual inspection (via ROV) was conducted on the BOP control pods. Upon inspection, no discrepancies were noted on the two stack-mounted pods. Upon discussion with the subsea engineer on board, it was explained that the spare pod was still awaiting parts that were on order to finish reassembling the unit. All SEMS on the three pods have had new batteries installed. The rig had a detailed list as to when the SPM, shuttle valves and regulators had last been changed.

At the time of the inspection, the BOP control pods were in good condition.

WCS UMB**BOP MUX Cables**

The rig was equipped with two reels, each consisting of 11,500 feet of MUX cable. At the time of the inspection, the BOP MUX cables were installed and in operation. A non-intrusive visual inspection was conducted on the BOP MUX Cables. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that there were no outstanding issues with the MUX cables. We were informed that there was one spare cable on order for the rig.

At the time of the inspection, the BOP MUX cables were in good condition.

WCS SSHR**BOP Pod Hoses (Hydraulic)****BOP Jumper Hoses**

The stack was equipped with 1½", 1" and ½" parker poly-flex jumper control hoses. A non-intrusive visual inspection (via ROV) was performed. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that the rig currently had a hose register in place for scheduled hose changeouts and that eighty-five percent of the hoses were changed out in February and March 2010. The remaining fifteen percent of the hoses had been changed out in September 2009.

Hotline Hose

The rig was equipped with an 11,500-foot hotline installed on the reel. A visual inspection was performed, and no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that the rig had a spare hotline in the yard.

At the time of the inspection, the BOP pod hoses and the hotline hose were in good condition.

BOPH**BOP Cranes/Hoists/Handling/Transport**

The rig was equipped with a 310-ton BOP gantry crane, a Hydralift BOP transport cart, a lower stack gripper/guide assembly and an LMRP gripper/guide assembly.

BOP Crane

At the time of the inspection, the BOP gantry crane was installed and operational. A non-intrusive visual inspection, function test and brake test were conducted on the BOP gantry

crane. Upon inspection, no discrepancies were noted. All function testing and brake tests were satisfactory.

Upon discussion with the subsea engineer on board, it was explained that the crane was overdue in its load test requirement. It was further explained that the test had not been completed due to the lack of space needed for the water bags to be filled for testing. A possible solution to this problem may be to conduct the test below the moonpool area and away from any obstructions. Upon further discussion, it was also explained that there were two remote controllers: one with simultaneous operation of the main winches and one with independent operation. The remote controller with the simultaneous operation was damaged, and another was on order. The remaining controller had only independent operation and was obsolete.

Transporter

At the time of the inspection, a BOP transporter was installed and operational. A non-intrusive visual inspection and function test were conducted. Upon inspection, no discrepancies were found.

Lower Stack Gripper

A non-intrusive visual inspection and function test were conducted on the lower stack gripper. Upon inspection, it was noted that the majority of the motor and gear box mounting hardware, as well as some bolts and nuts on the track, were heavily corroded and in need of replacement. Upon discussion with the subsea engineer on board, it was explained that the BOP transporter had not been overhauled since original installation.

LMRP Gripper

At the time of the inspection, LMRP and stack grippers were installed and operational. A non-intrusive visual inspection and function test were conducted on the LMRP and stack grippers. Upon inspection, no discrepancies were noted.

No certification was located aboard the rig.

At the time of the inspection, the BOP cranes/hoists/handling/transport were in fair condition.

Recommendations:

- Conduct load test as per company policy.
- Replace the obsolete controller with a controller with simultaneous main hoist operation.
- Obtain certification/NDT records and store on rig.
- Clean, inspect and replace motor and gear box mounting hardware, as well as the bolts and nuts installed on the track. Replace as needed.

WCS DIVT

Diverter Assembly

The rig was equipped with a Hydril FS 21 X 60-500 diverter assembly. At the time of the inspection, the diverter assembly was installed and operational. The diverter was inaccessible at the time of this inspection. While onboard, the diverter was function tested and closed in sixteen seconds. Upon discussion with the subsea engineer on board, it was explained that there was a discrepancy with the diverter. When switched from the trip

tanks to the shakers, the proximity switch on the trip tank valve did not indicate the change of valve position, and the trip tank light stayed illuminated. This had been checked, and the subsea department was waiting for the new proximity switch to arrive. The diverter was visually inspected by the subsea department, and a new packer was installed on 15 September 2009. Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 05 July 2000. This was beyond the five-year inspection and re-certification requirement.

At the time of the inspection, the Hydril diverter assembly was in good condition.

Recommendations:

- Replace the diverter assembly with a new or re-certified diverter and send the currently installed diverter for the five-year inspection, overhaul and re-certification.
- Replace the proximity switch on trip tank valve.

WCS CTRU**Diverter Control**

The rig was equipped with a Cameron main diverter control panel located in the accumulator room, a remote control unit located in the driller's console and another remote control panel installed in the bridge. At the time of the inspection, the diverter control was installed and operational. A non-intrusive inspection was conducted on the diverter control panels, and no discrepancies were noted. All documentation was reviewed and found to be in order. Upon discussion with the subsea engineer on board, it was explained that the only issue was the light on the trip tanks and shakers, which comes on due to the proximity switch mentioned under the diverter assembly.

At the time of the inspection, the diverter control panels were in good condition.

WCS MANI**C&K Manifold and Piping**

The rig was equipped with a 3-1/16"-15K choke and kill manifold equipped with Foley valves. The entire unit was supplied from Cameron in 2000. A portion of the valves had been refurbished at T3 Energy Services. At the time of the inspection, the choke and kill manifold was installed and operational. A non-intrusive visual inspection was conducted on the choke and kill manifold. The unit was pressure tested to 250 psi for ten minutes and 6,500 psi for ten minutes. All pressure tests were acceptable. Visually, all valves and connections appeared to be in good condition. Upon discussion with the subsea engineer on board, it was explained that there were no discrepancies on the unit. It was explained that, during the next shipyard, the entire choke and kill manifold would be changed out. Visually, the piping showed no signs of major corrosion. Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 23 February 2006 for two gate valves and 18 May 2007 for one valve. There was also certification documentation for one spare gate valve. No other documentation was located on the remaining valves. There were also UT wall thickness reports from 2007 for all of the piping in the manifold. There was no identification on the documentation as to who performed the UT inspection or to what the readings were to be compared. There was no record of serial numbers of the gate valves or installation locations for accurate tracking.

Remote Choke Consoles

The rig was equipped with two remote consoles. One was manufactured by Stewart and Stevenson and was located behind the drawworks. A non-intrusive visual inspection was conducted on the remote console. Upon inspection, it was noted that the unit was covered with oil spraying out of the drawworks. All gauges were operational. Upon discussion with the subsea engineer on board, it was explained that there was a valve for the opening and closing of the chokes that was leaking. The valve was to be replaced at the next available opportunity. No documentation was available for the calibration of the gauges installed on the unit.

The other choke console was located in the driller's cabin. A non-intrusive visual inspection was conducted on the remote console. Upon the visual inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that the gauges had to be calibrated every time the unit was operated. The crew had investigated this issue, and a solution had been found.

At the time of the inspection, the choke and kill manifold, piping and remote consoles were in good condition.

Recommendations:

- Obtain and retain valid certification documentation for the gate valves on board the rig.
- Replace the leaking valve on the remote console on the driller's floor.
- Calibrate the pressure gauges on the remote console on the driller's floor.
- Investigate why the pressure gauges on the remote console located in the driller's cabin had to be recalibrated every time.
- Maintain a log of valve serial numbers, as well as location of installation on board the rig, to accurately track equipment maintenance.

HOSE**Coflexip Type Hoses**

The rig was equipped with one each 4 1/16"-5,000 psi WP mud boost drape hose, 3 1/16"-15,000 psi WP choke drape hose, 3 1/16"-15,000 psi WP kill drape hose and both 2 9/16"-5,000 psi conduit drape hoses.

The hoses were visually inspected, and no discrepancies were noted. The coating on all upper connections was in good shape. At the time of the inspection, the lower connections were subsea and visually inspected (via ROV). Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that there had been no issues with the drape hoses. Upon review of certification documentation, it was noted that the date of last manufacturer's certification was 02 July 2004 for the mud boost drape hose, which was beyond the five-year inspection and re-certification requirement. The choke drape hose certification was 12 November 2006. The kill drape hose certification was on 28 December 2008, and the conduit drape hose certification was on 25 December 2008. The only hose out of certification was the mud boost, and this was beyond the five-year inspection and re-certification requirement. It was also noted that the protective sheathing on the mud boost hose had slipped down and was not one-hundred percent secured on one end. Upon discussion with the subsea engineer, it had been in this condition since the hose was installed.

LMRP Jumper Hoses

The rig was equipped with one each of a rigid conduit hose, a choke hose, a kill hose and a hotline hose. A non-intrusive limited visual inspection (via ROV) was conducted on the jumper hoses. Upon inspection, no discrepancies were noted. Upon discussion with the subsea engineer on board, it was explained that the choke hose had been changed out three times and that none of the others had had any problems. After reviewing the certification provided on board, the rigid conduit hose was changed out on 22 May 2007, the choke hose was last changed out on 30 December 2008, the hotline hose was changed out on 23 May 2008 and the kill hose was last changed out on 01 January 2000. The kill hose certification was beyond the five-year inspection and recertification.

At the time of the inspection, the Coflexip-type hoses were in fair condition.

Recommendations:

- Replace the mud boost drape hose with new or re-certified hose and send the currently installed hose for the five-year inspection and re-certification.
- Replace the mud boost drape hose due to damaged fire proof sheathing.
- Replace the kill jumper hose with new or re-certified hose and send the currently installed hose for the five-year inspection and re-certification.

WCS PIPE**Connectors: Hydraulic Choke and Kill**

The rig was equipped with a 3 1/16"-15,000 psi WP Cameron connector. The connectors were subsea and operational. A non-intrusive limited visual inspection (via ROV) was conducted on the two choke and kill line connectors. Upon inspection, the only issue noted was corrosion present on the outer cover and studs and nuts. Upon discussion with the subsea engineer on board, it was explained that there were no issues with the connectors at this time. Upon review of the kill certification documentation, it was noted that the date of last manufacturer's certification, overhaul and installation was 10 March 2009. Upon review of the choke connector certification documentation, it was noted that the date of last manufacturer's certification, overhaul and installation was 05 June 2006.

At the time of the inspection, the hydraulic choke and kill connectors were in good condition.

4.9

Tubular/Pipe Handling**HYD HPU****HPUs (Central or Stand-Alone)**

Hannon Central Hydraulic Unit

The rig was equipped with a central hydraulic unit, which supplied high pressure hydraulic fluid to various equipment located on the rig floor, including top drive, casing stabbing basket, drill line spooler iron roughneck and pipe racker.

The HPU was running at the time of the survey, and no excessive leakage or unusual noises were noted. Oil sampling had been taken regularly, and the oil was in good condition.

Sample Id (Fluid Category)	Cond.	Submitted by	Unit ID	Component Description	Date Taken Tested	Recommendation
44070008843 Oil		TRANSOCEAN HORIZON (20237762) AMELIA, LA) Contact: MECHANICAL SUPV. CHIEF ENGINEER	870Q- 9140-90-09	CENTRAL HYDRAULIC UNIT	02/08/10 02/12/10	All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next service interval to further monitor.

We were informed by the rig crew that the automatic sequential control panel was not functioning, and they have engaged a third-party company to rectify the sequencing panel functionality.

It was also noted that the valves on the hydraulic oil sight-glass were not the push-to-read type. We recommend that the valves either be replaced to this type or that a magnetic style sight-glass be installed. The oil cooler heat exchanger required a shield to be installed over the cooler plates.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had an issue with the automatic sequencing panel. At the time of the survey, the central HPU was in good condition.

Recommendations:

- Repair pump automatic sequencing control valve as planned.
- Valves on the hydraulic oil sight-glass are not push-to-read. Either replace the valves to the push-to-read type or install a magnetic-type glass.
- Install a splash shield over the oil cooler core.

PH FGBD

Fingerboard

Adjustable fingers on the right-hand side could have any one of the casings below racked back at any one time, but not all.

The unit was capable of field transiting with 238 stands of drill pipe without exceeding rated design loads of the derrick.

Racking platform total capacity 5-1/2" or 6-5/8 drill pipe	ft.: 31,000 (nominal)
Fixed fingers (left side of derrick) up to 6-5/8 drill pipe	ft.: 20,000 (nominal)
Adjustable fingers (right side) 7" casing	ft.: 11,000 (nominal)
or	
Adjustable fingers (right side) 9-5/8" casing	ft.: 11,000 (nominal)
or	
Adjustable fingers (right side) 13-3/8" or 13-3/4"	ft.: 9,500 (nominal)

The fingerboard was visually inspected and found in good condition. There were some safety wires attached to the fingers that were corroding, and these were being replaced during the course of the survey.

It was noted that the small bore tubing adjacent to the derrick ladder was leaking air. Also, on the main line air supply, the filter was damaged and leaking air. The NPT records were checked for this equipment, and no significant NPT was recorded last year.

Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the fingerboards. At the time of this survey, the fingerboards were in good condition.

Recommendations:

- Continue to replace the corroded finger safety wire.
- Repair the air leak on the small bore tubing adjacent to the derrick ladder.
- Replace the leaking air line filter.

PH PRS Varco PLS
2 Varco RPS-6 Column Pipe Rackers

Pipe racker capable of handling 20", 16", 13 5/8", 11 3/4", 9 7/8", 9 5/8", 7 5/8", 7 5/8" and 7". The rig was equipped with two Varco RPS-6 column pipe rackers. These were supported in the derrick by a beam running forward to aft, and each column racker had a four-wheeled carrier running on steel tracks on the rig floor. This supported the weight of the column racker.

The racker was observed in operation, and it was noted that the aft cable tensioning system was leaking oil. The rig floor steel track was also showing wear and will require replacing in the near future. We were informed by the rig crew that a modified carrier was available; the new version incorporated eight wheels instead of the original four, which would distribute and reduce the load on the individual rollers. The rig crew also stated that the track on the rig floor had been replaced six months ago and was worn again.

The column rackers could either be operated from the main driller's control station or the auxiliary control station installed forward on the rig floor.

We were also informed that the automatic function and zone management on the rackers had, as with all rig floor equipment, been disabled. The systems can only be operated manually. In manual mode, there was no protection against collision scenarios but relied on the operator only to avoid collisions with other rig floor equipment.

On reviewing the NPT associated with this equipment, there were forty-one incidents in the last year, resulting in ninety-nine hours of NPT. Most of the failures were associated with the aft column racker, as this was used most frequently. It was also noted that more than fifty percent of the failures were attributed to control and electric issues.

The NPT records were checked for this equipment, and there was a significant amount NPT was recorded last year. Scheduled PMs were being carried out on this equipment. We interviewed the crew, and they had several issues with the pipe racking system being prone

to oil leakage and damage during pipe handling operations. At the time of the survey, the pipe racking system was in fair condition.

Recommendations:

- Replace the carrier to an eight-wheel version as planned.
- Replace the worn track.
- Repair the hydraulic oil leak on the aft column racker.
- Investigate why the unit cannot be run in the automatic mode.

PH WPF**Weatherford Power Frame**

The rig was equipped with a Weatherford power frame, which was mounted on tracks on the forward side of the rig floor next to the iron roughneck. The power frame could be used for making up and breaking down tubulars in the mouse hole. During casing operations, the iron roughneck was moved back on its rails, and the power frame moved in front of it, using the same tracks. The power frame was then used as a casing tong.

During the course of the survey, the power frame was witnessed in operation, breaking down stands of heavyweight drill pipe and then feeding the drill pipe to the pipe conveyor. The unit operated normally, and no defects were noted. In reviewing the PM records, we were unable to find any records attached to this equipment.

The NPT records were checked for this equipment, and we could find no PM records for this equipment. We interviewed the crew, and they had no issues with the Weatherford power frame.

At the time of the survey, the Weatherford power frame was in good condition.

Recommendation:

- Enter the power frame into RMS and assign PMs to this equipment.

PH RBS**Varco RBS**

RBS4 4 3/4" to 8 1/4"

The rig was equipped with an RBS, which was mounted on the lower section of the guide rails above the rig floor. The equipment was witnessed in operation, and it operated normally without any hydraulic leaks or any other defects.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the RBS. At the time of this survey, the RBS was in good condition.

PH DPF**Pipe Conveyor**

The rig was equipped with a pipe conveyor, which was located forward of the rig floor on a raised catwalk. The pipe conveyor could be driven onto the rig floor and fed directly with singles from the forward pipe racker arm. The conveyor system also had the ability of lifting the tubulars from the conveyor belt and landing it on either side of the conveyor where it could be picked up with either the rig crane or the knuckle boom crane. The

conveyor was witnessed in operation, and it worked satisfactorily without any problems noted.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the pipe conveyor. At the time of this survey, the pipe conveyor was in good condition.

PH DPF**Pipe Skate**

NOV

The rig was equipped with a pipe skate, which was used to deliver joints of riser or casing to the rig floor. It was mounted aft of the rig floor on a raised catwalk.

The equipment was function tested, operating carriage pipe skate and raising cylinders. One chain was missing from the skate. The carriage chains were in poor condition, and the track was damaged where the skate had jumped off of the rails.

We were informed that, in the past, they had issues with the drive chains snapping as the cart pressures were set too high. These pressures had now been lowered to the manufacturer's recommended values. We were informed that new chains were on order.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Some PMs had been completed on this equipment, but a full PM history on this equipment was not available. We interviewed the crew, and they had issues with the pipe skate as mentioned above. At the time of this survey, the pipe skate was in bad condition.

Recommendations:

- Replace the worn carriage chains.
- Replace the missing skate chain.
- Repair the skate track.

PH PHM**Iron Roughneck**

Varco AR 3200

The rig was equipped with an AR 3200 iron roughneck, which was replaced with a rebuilt unit in September 2009. We visually inspected the unit, and minor oil leaks were present. Generally, the unit was in good condition. We witnessed the unit in operation, and all was functioning normally.

Due to sensor issues, it is not possible to run the iron roughneck in the automatic mode since the track was in several sections, thus making it difficult for the sensors to index on the roughneck's position.

The NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the iron roughneck. At the time of this survey, the iron roughneck was in good condition.

Recommendation:

- Investigate whether a different sensor system could be used to enable the roughneck in the automatic mode and be part of the zone management system.

PHL WPB**Stabbing Board****Dreco/Hydralift Casing Stabbing Basket – 28-foot Reach**

The rig was equipped with a casing stabbing basket, which was located starboard aft in the derrick above the driller's cabin. We witnessed the remote and local operation of the basket, and both sets of controls were functioning normally.

The basket had an SWL notice, which stated that the maximum weight was 500 lbs. There was no record of any load test being carried out; this should be carried out on a yearly basis. There also was no means of emergency lowering of the basket should there be a hydraulic pressure failure during operation.

NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the stabbing basket. At the time of the survey, the stabbing basket was in fair condition.

Recommendations:

- Ensure that a yearly load test is carried out.
- Investigate whether an emergency lowering system could be installed on the basket.

Offline Casing Building Equipment

The rig was equipped with an offline casing building system, which had the ability to make up a string of casing in the moonpool, using the auxiliary drawworks, a dummy rotary table, horizontal to vertical tubing handler, casing conveyor and a Weatherford power casing arm.

The casing stands were loaded individually onto the casing conveyor belt. This delivered the joint of casing to the horizontal to vertical casing handler. The stand was then raised to the vertical position, stabbed into the dummy rotary and connected to the auxiliary drawworks. The joints were then screwed together using the Weatherford power casing arm and run through casing slips mounted onto the dummy moonpool rotary.

Once the complete string was assembled and hanging in the moonpool, the BOP cart was driven to well center and the load could then be picked up and landed by the drawworks.

The off line casing building equipment was functioned and the following noted. The casing conveyor operated satisfactorily and no defects were noted. The horizontal to vertical casing handler had an issue with the lower clamp jacking motor not working. The hydraulic lines were plugged off to this, and we were informed by the rig crew that a new motor had been on order for several months but had not yet been received. Many of the hydraulic hose connections on the casing handler and under the control console were corroding out. These should be cleaned and wrapped with Denso tape. Most of the gauges in the casing handler control panel were damaged and required replacement.

NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the offline casing building system.

At the time of the survey, the offline casing building system was in fair condition.

Recommendations:

- Replace the lower clamp motor cylinder when a replacement is available.
- Clean corrosion from the hose fittings on the horizontal to vertical casing handler and on the hoses under the control console.
- Replace damaged gauges on horizontal to vertical casing handler control console.

4.10

Power Generation**ELPG ENG****Main Engines**

The rig was equipped with six Wartsila engines as follows:

Make/Type	: Wartsila / 18V32
Maximum Continuous Power	hp: 7290 KW 9775 HP
At Rotation Speed of	rpm: 720
Equipped w/Spark Arrestors	yes/no: Yes
Mufflers Installed	yes/no: Yes

In review of the history, it was noted that the PMs were being performed on a regular basis and were up to date. On interviews with crew members, it was noted that the engines must have the injectors changed. This was due to the injectors installed in the engines did not meet EPA regulations. They had ordered the correct injectors.

During the assessment, we tested all shutdowns on five of the engines. Engine No. 3 was out of service at the time. It was noted during the shutdown testing that several of the water jacket cooling sensors were disconnected and not working. They had to shut off the water supply to the port side of the rig to make the repairs needed for the water line. During the testing of the engine shut downs (high temp, low oil pressure and over speed), all of the shut down systems were normal. The engines were not due for an overhaul due to the hours on the engines at the time of assessment.

The engines were in good condition.

The hours on the engines were as follows as of 06 April 2010:

Eng. No.	Total hours to date
1	26267
2	39805
3	34789
4	29864
5	35841
6	34980

Recommendations:

- Replace the injectors as required when they are received on the rig.
- Repair the main cooling water piping for engine No. 3.
- Repair or replace all water jacket sensors on all six engines as needed.

ELPG GEN**Main AC Generator**

The six alternators were visually and intrusively inspected over the course of the assessment. They were water cooled via heat exchangers and equipped with leak detectors. All covers and guards were in place, as well as all bonding jumpers. The HV cables had adequate mechanical protection in place. Apart from No 3, which was offline at the time of the assessment, all units were observed running on load at one time or another with voltage, frequency and current parameters all being stable. Load sharing was observed to be satisfactory. Insulation resistance was tested, and below are the values recorded.

We observed several issues that must be addressed. Generator No. 1 was noted to be dirty inside on the winding. Also, several of the fins were damaged, and the buss bars had corrosion noted on the washers. In generator No. 4, the water leak detector did not work when function tested. In generator No. 5, we noted that two cables were chaffing. In generator No. 6, we noted that there was oil in the fan housing.

The rotating rectifiers were found to be clean, connections were secure and there was no evidence of heating at the field connections or diodes. Main field pole bracing hardware was inspected, and there was no evidence of any shifting. All winding connections, PTs and CTs were clean and tight.

A physical check on those generators on-line revealed no high temperatures or abnormal vibrations.

Load-sharing with all five generators was observed during our time on the vessel, and we did not observe any issues.

Generator output, winding temperatures and bearing temperatures were monitored from engine control room.

Each generator was outfitted with a saltwater / air heat exchanger, and no reports of any failures were recorded.

We reviewed the RMS reports, and we noted that all schedule PM were being carried out.

In the GRS reports, and there was no recorded downtime within the last year for the main generators.

Our conclusions were based on interviews, visuals inspection and maintenance history. We must rate the generators as good.

This equipment was in good condition.

Gen. No.	Phase A to Ground	Phase B to Ground	Phase C to Ground
1	3.67 GΩ	4.12 GΩ	5.00 GΩ
2	1.29 GΩ	1.45 GΩ	1.48 GΩ
3	6.15 GΩ	7.76 GΩ	7.67 GΩ
4	3.48 GΩ	3.90 GΩ	4.20 GΩ
5	3.73 GΩ	4.15 GΩ	4.22 GΩ
6	1.59 GΩ	1.89 GΩ	1.89 GΩ

Recommendations:

- Clean generator No. 1.
- Several fins were observed to be damaged on generator No. 1.
- Several washers were corroded on the buss bars on generator No. 1.
- Repair or replace the water leak detector on generator No. 4.
- The fan housing on generator No. 6 was covered in oil.
- Two cables were chaffing in generator No. 5 control panel.

ELPD SWBD Switchboards

There were various switchboards installed on the DEEPWATER HORIZON, with 11,000-volt, 600-volt, 480-volt and 220/110-volt boards located at various locations around the vessel. All were visually inspected, and various boards were opened for a spot check. However, due to ongoing operation, we were unable to rack out any circuit breakers at this time.

All internal components were secured, including the control wiring. No corrosion or damage was noted in any of the switchboards that we inspected, and all of the cable penetrations were sealed against water ingress.

Meters were observed to be working satisfactorily. Approved rubber matting was in front of all of the switchboards and noted to be in good condition. Nameplates were fitted to all of the panels for identification, and one-line diagrams were posted in all the switch rooms.

Each compartment had its own safety equipment available when working on the HV switch boards. The switchboards that we opened for inspection were clean, as were the rooms where the switchboards were located.

The main switchboards were equipped with a ground fault system, which function tested satisfactorily. There was a lock-out/tag-out system in place, and the policy was adhered to by the Transocean crew. No overheating was observed on the buss connections, and breakers and wiring appeared to be in good condition.

The rig had the equipment to conduct thermographic surveys, but the inspection windows still had to be installed.

There were no reports on the rig showing when current injection were last performed on the main circuit breakers. This is a five-year PM. Apart from no current injection reports, we were satisfied with the level of maintenance that had been performed.

There was no recorded downtime for the switchboards on this rig.

This section of the report was good.

Recommendations:

- Current injection must be performed on the main circuit breakers as soon as practical. This PM must be conducted every five years (Class).
- Install the inspection windows in the 11Kv switchboards to perform thermographic surveys as planned.
- Remove duct tape and install correct materials to cover holes on 480 Volt MCC switchboards.

ELPD TFMR

Main Transformers

There were several types of transformers located in various compartment around the DEEPWATER HORIZON, including:

- 8, 11kV/3450 volts 3650 kVA
- 6, 11kV/600 volt 3000 kVA
- 6, 11kV/480 volt 5000 kVA
- 4, 11kV/480 volt
- And various 480/208/120 volt transformers

At the time of the assessment, it was it was not possible to shut down any of the transformers due to ongoing drilling operations. Only an external inspection was performed. No damage to any of the panels for the transformers was observed, and all cable transits were sealed against water ingress. None of the transformers had approved rubber mats in front of each unit. It was Transocean policy to have matting in front of all transformers on the DEEPWATER HORIZON.

Warning signs were displayed on all of the transformers on the rig. The compartments where the transformers were located were air conditioned, and all was in satisfactory condition.

All of the transformers had temperature alarms installed, which were working satisfactorily with no anomalies noted. There were no reports on the rig when the main breakers were tested by means of current injection.

Recommendations:

- Approved rubber matting must be installed in front of all transformers on the rig, as per Transocean procedures HQS-HSE-PP-01, section 4, subsection 5.9.
- Install the inspection windows in the main transformers as planned to help with performing thermographic surveys.

ELPD VFD**VFD Systems**

The DEEPWATER HORIZON utilized VFD for the AC drilling motors and for the thrusters. The VFD inverter panels for the drilling and propulsion were visually inspected with one of the rig's electricians.

There were two manufacturers of VFD drives in use on the rig. ABB was the manufacturer of the VFD used for the eight thrusters, and GE was the manufacturer for the drilling system on the rig.

The VFD panels were located in various compartments on the rig, and all were inspected during our assessment. We inspected for signs of overheating and damage. Internals of the bay and components were in good condition. We were also able to witness the various systems in operation. The VFD bays were in satisfactory condition, and sufficient mechanical \ electrical interlocking was in place.

Sufficient spare parts were available on the DEEPWATER HORIZON, and a lock-out/tag-out facility was available.

The VFD for the PRS was opened for an inspection with the electronics technician. All of the panels were secured to the deck and were grounded down to the structure of the rig. The doors on the panels were also grounded. All internal components were also secured.

There was no recorded downtime for the VFD drives within the last year on this rig.

This section of the report was good.

4.11**Air Systems****AIR COMP****High Pressure Air Compressors (>500 psi)**

Hamworthy 4SWL234 horsepower compressor Nos. 1 and 2
Price W-3 horsepower compressor No. 3

Originally, the rig was equipped with two Hamworthy 4SWL234 high pressure air compressors. A third compressor was installed in 2008. The compressors were each installed with automatic air dryers and were saltwater cooled.

All of the high pressure compressors were inspected. The Price W-8 compressor was in as-new condition, and no defects were noted.

The two Hamworthy compressors, while being operational, would benefit from tidying up the various cables and tubing around the compressors.

It was also noted that the flanged jumper hoses on the cooling system had become hard and brittle and, thus, required replacement.

NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the high pressure compressors. At the time of this survey, the high pressure air compressors were in good condition.

Recommendations:

- Replace flanged cooling water hoses on high pressure compressor Nos. 1 and 2.
- Tidy up cables and tubing around high pressure compressor Nos. 1 and 2.

AIR COMP

Medium Pressure Air Compressors (40-500 psi)

The rig was equipped with four Gardner Denver air compressors. The information on the units was as follows:

Air Compressors - Medium Pressure (rig air):

Quantity	no.: 4
Make	: Gardner Denver
Model	: EBQ99F Rotary screw
Rated Capacity	scfm: 750
Working Pressure	psi: 125
Prime Mover (electric/diesel)	: Electric
Continuous Power	HP: 200

Air Dryers

Quantity	no.: 4
Make/Type	: Desiccant Dominick Hunter / DX110 Heatless
Rated Capacity	scfm: 1089

Air Compressors - Lower Pressure (bulk air):

Quantity	no.: 3
Make	: Kimray, 4 each reducing wave/back pressure valves
Model	: Series G regulator 318 FGT-BP & FGT-PR
Rated capacity	cu.ft./hr.: 10,600 each
Working pressure	psi: 60

The compressors and systems were in good condition. The hours on the compressors were as follows.

No. 1	28416.5
No. 2	55472.1
No. 3	50733.3
No. 4	53412.5

The units were under operation at the time of this assessment. All four compressors were operating normally, and the air psi was 125. The temperatures on the units were normal, reading from 178°F to 190°F on the units. On review of the history, all PMs were up to date and being completed on regular bases. It was noted that compressor end Nos. 2 and 4 on the units had been replaced in January 2010. During interviews with crew members, it was noted that the compressors, dryers and the Kim-ray reducer valves had been working well and not causing any major issues.

The air compressor system was in good condition, and no recommendations were made upon assessment.

AIR PIPE**Medium Pressure Air System Piping & Valves
(40-500 psi)**

Upon inspection, the air piping and valves were found to be in good condition. The valves were working properly and easy to open and close. The history documents revealed no problems with the pipe or valves. The PMs were up to date and being performed on regular bases. The pipes were labeled and painted in all locations. No recommendations were made during assessment.

4.12**Cooling Water/Fuel/Lube Oil/Oily Water****SEA PIPE****Saltwater Lines/Related Equipment**

The saltwater piping was in bad condition. The lines going to the watermakers were leaking in several places and on all six watermakers. The flanges were leaking around the spools at all six watermakers. The main line going to the watermakers was severely corroded. Watermaker cooler unit No. 1 was leaking around the weld of the flange where it connected to the unit. The main saltwater line going to engine No. 3 had been shut down for repairs to the piping. The main spool in the pipe had been pulled out, and the pipe was blanked off. The spool was severely corroded and leaking around the flange connections of the spool. The main valves would not close completely due to age, and the valve seals and gates were not sealing off when closed. Therefore, the water for the port side of the rig had to be shut off completely in order to install a new spool.

In review of the history, it was noted that the rig had been having problems with the saltwater lines for some time. This was due to the piping being in bad condition due to age and wearing thin. The rig crew had installed temporary soft patches on some of the piping until the pipes could be replaced.

The saltwater piping in the thruster rooms located in the lower columns were in bad condition. During interviews with crew members, it was noted that they had been replacing

short pipes as needed due to leaks. Some of the pipes had been temporarily welded in places around the flanges due to leaks.

The saltwater lines and system were in bad condition.

Recommendations:

- Replace all corroded saltwater piping as needed.
- Replace all flanges on the watermakers as needed.

TSF PIPE

Freshwater Lines/Related Equipment

The freshwater piping was in bad condition. This was due to the corroded piping throughout the rig. The main freshwater piping for the watermakers was in bad condition. The pipes were severely corroded and in need of being replaced. The piping for the main cooling heat exchangers was severely corroded and in need of being replaced. The valves at both main cooling heat exchangers located on the starboard and port sides of the rig in the engine rooms were stiff and hard to operate. In interviews with crew members, it was noted that the valves would not close and completely shut off the water supply in the main water lines. Therefore, when replacing any of the pipes or valve spools in the system, they had to shut down the main water supply to the port or starboard side of the rig. This may cause safety issues at times.

In review of the history, the PMs for the freshwater cooling systems and valves were up to date and being performed on regular bases. The cooling heat exchangers were in fair condition. The flanges were leaking because the piping was thin around the flanges at the connections. The freshwater piping was in bad condition.

Recommendations:

- Replace all freshwater piping and valves as needed.
- Install a shut-off valve for each freshwater line going to each engine. This will help in making repairs to the line and valves without shutting down the entire water supply to each side of the rig.

DRLW PIPE

Drill Water Lines/Related Equipment

The drill water piping was in good condition. The drill water pumps in the lower pump room on the starboard and port sides of the rig were in fair condition. The drill water pumps on the port side of the rig were worn and leaking due to aging of the pumps. In review of the history, it was noted that the PMs were being performed on regular bases and were up to date in the system. During interviews with crew members, it was noted that some of the drill water valves in the mud pit room were leaking by when closed.

The drill water system was in fair condition.

Recommendations:

- Replace drill water pumps as needed.
- Replace the drill water valves in the mud pit room as needed.

FUEL PIPE**Fuel Oil System Piping and Valves**

The fuel oil system and pumps were in good condition. The fuel transfer pumps located in the lower pump rooms had small leaks on the piping for the relief valves. The relief valves were tagged with "out of date" tags. The PMs were up to date on the fuel oil system, and PMs were being done on regular bases. During interviews with crew members, it was noted that the fuel oil system had been working well in the past and that no major issues were noted.

In the fuel purifier rooms, the fuel and oil tank sight-glass gauges were held open with tie wraps. This was a safety issue due to the auto shut-off valves could not work properly when tied off in the open position.

The fuel oil system was in good condition.

Recommendations:

- Remove the tie wraps on the sight-glass gauge valves (NOTE: This was taken care of by crew members before the assessment was completed).
- Retest or recertify all pressure relief valves on the fuel transfer pumps.
- Repair the small leaks on the piping for the pressure relief valves.

LUBE PIPE**Lube Oil System Piping and Valves**

The lube oil piping and system were in good condition. The pumps were operating normally, and no leaks were visible. The oil coolers were cleaned on regular bases and as required in the PM system. In reviewing the history, the PMs were up to date and no major issues were on record. During interviews with crew members, it was noted that the system had not had any problems in the past. On oil cooler No. 2, one of the lines had a small leak and was repaired by crew members during the assessment.

No recommendations were made at the time of assessment. The lube oil system was in good condition.

BILG SEP**Oily Water Treatment System**

The oily water separators were in bad condition. The tanks were severely corroded and in need of being replaced. The piping for the drain on the relief valves was not connected correctly and was leaking. The tags on the relief valves were out of date, and the valves were leaking. The pumps on both units were corroded. The piping connections going into the units were corroded and in need of being replaced/repared.

In review of the history, it was noted that the PMs were up to date and being performed on regular bases. During interviews with crew members, it was noted that the units were in bad condition. During testing of the units, it was noted that the relief valves were leaking and that the pumps were loud while running.

The oily water separators were in bad condition.

Recommendations:

- Replace the relief valves on both units as needed.
- Repair the piping connections on the units.
- Replace both oily separator units, as they were severely corroded.

4.13

Lifting Equipment

MTHL CRN

Deck Cranes

ENG No.	Total hours to date	Date of last major overhaul	Hours since last overhaul
Starboard	22,294	N/A	22,294
Port	17,371	N/A	17,371
Knuckle boom	N/A	N/A	N/A

The rig was equipped with two Liebherr Pedestal type cranes: one located on the port side of the rig and one on the starboard side of the rig on the main deck. Each crane had a 150-foot boom with 1,893 feet of boom cable. The main block rated for 92 metric tons with 1,920 feet of cable, and the whip line hook rated for 15 metric tons with 475 feet of cable. The information on the knuckle boom crane was as follows.

Make	: Outreach
Type	: Knuckle boom
Location (starboard, port, aft, forward)	: Forward
Maximum rated capacity (main hook)	lt.: 3.57
Maximum rated capacity (whip hook)	lt.: N/A
Boom length	ft.: 68
Knuckle boom	
SWL 4000 KG/ 8800 lbs. 14.6 meters / 47.9 ft	
SWL 3000 KG/ 6600 lbs. 21meters / 68 feet	
New: year 2003	
47.9 feet 6,875 lbs.	
68 feet 8,969 lbs.	

Port Crane

The sheaves at the boom tip had cable prints in the sheaves and showed signs of wear. The sewing bolts were in bad condition and severely corroded. The radiator housing was corroded around the fan guard. The housing bolt holes were severely corroded around the bolts. The hoses for the oil cooler mounted in the radiator system were hard and cracked due to age. In review of the history, it was noted that most of the hydraulic hoses had not been replaced during the life of the crane. The hydraulic hoses going to all of the winches had not been replaced as well. It was noted that the winches had not been reworked or replaced for the life of the crane. No records were provided to show that the hydraulic motors or the pumps had been reworked or replaced on the winches as well. The main block was in bad condition because the sheaves were severely worn. The main block had only one grease point, and it was for the swivel. The sheaves had no grease point for

lubrication of the sheaves or pin. The whip line sheaves at the boom tip were worn and in need of being replaced.

In review of the history and during interviews of crew members, it was noted that the engine had not been reworked or replaced during the life of the crane. It was also noted that the rig had a new engine on order for the crane. This was to be installed at the earliest opportunity.

All limits switches were in good working order during the testing and assessment of the crane.

Starboard Crane

On the starboard crane, the boom section bolts were severely corroded at each section of the boom where they join together. The sheaves at the boom tip had cable prints in the sheaves and showed signs of wear.

The sewing bolts were in bad condition and severely corroded. The radiator housing was corroded around the fan guard. The housing bolt holes were severely corroded around the bolts. The hoses for the oil cooler mounted in the radiator system were hard and cracked due to age. In review of the history, it was noted that most of the hydraulic hoses had not been replaced during the life of the crane. The hydraulic hoses going to all of the winches had not been replaced as well. It was noted that the winches had not been reworked or replaced for the life of the crane. No records were provided to show that the hydraulic motors or the pumps had been reworked or replaced on the winches as well. The main block was in bad condition because the sheaves were severely worn. The main block had only one grease point, and it was for the swivel. The sheaves had no grease point for lubrication of the sheaves or pin. The whip line sheaves at the boom tip were worn and in need of being replaced.

In review of the history and during interviews of crew members, it was noted that the engine had not been reworked or replaced during the life of the crane. It was also noted the rig had a new engine on order for the crane. This was to be installed at the earliest opportunity. The crane had had major issues for some time, according to the history and interviews of crew members. The starboard crane had a fire around 2005 and was repaired by crew members; however, this had cause issues with the crane performing correctly at times, according to the interviews.

All limits switches were in good working order during the testing and assessment of the crane.

Knuckle Boom Crane

The knuckle boom crane was in fair condition. In review of the history, the PMs were being performed on regular bases and were up to date. During interviews, it was noted that the crane had not been reworked (overhauled) during the life of the crane. No records were on hand as well. The hydraulic motors had not been overhauled or replaced. The hydraulic hoses were hard and stiff due to age. The walkway platform was in bad condition due to corrosion. However, during the assessment, the walkway platform was removed and repaired. The walkway was reinstalled and painted as well. The crane performed normally

during testing of the unit, and no abnormal noises were noted. The grabs on the unit were in good working order; however, the hose connections had small leaks at the connections.

The cranes were in bad condition.

Recommendations:

- Replace all three whip line sheaves located at boom tip on both cranes.
- Replace or rework the main block on both cranes and have recertified.
- Replace all main block sheaves in the boom on both cranes as needed.
- Install a new walkway on the boom. It is recommended to install the new walkway on the inside of the boom and add a small platform around the winch mounted in the boom.
- Rework or replace all winches on both cranes as needed and required. No records of any of the winches being replaced during the life time of the cranes were available.
- Rework/overhaul the knuckle boom crane.
- Replace all aged hydraulic hoses as needed.
- Replace or rework all hydraulic motors and pumps on the unit.

MTHL OCRN

Gantry Cranes (Excluding BOP Cranes)

The rig was equipped with an overhead gantry crane. The information of the crane was as follows:

Make	: Hydralift
Type	: Gantry type
Rated capacity	mt: 37 (18.5x2)
Location	: Aft riser deck

During the testing of the crane, no abnormal vibrations or noises were noted. All limit switches were in good working order. During interviews with crew members, it was noted that the crane was grabbing during the travel of the unit on the tracks. They had to adjust the travel limits on the unit to fix this problem. During the testing of the unit, no grabbing was noted while the cranes were moved up and down the tracks. In review of the history, it was that noted the issues of the grabbing during travel were recorded and that the repairs were recorded as well.

The PMs were being performed on regular bases and were up to date in the system. The unit was having some issues with the hoist unit's speed being out of synch with each other. During travel back and forth, hoist No. 1 moved more slowly than hoist No. 2. The limit sensors were out of synch and should be replaced, if the speed of the hoist cannot be set the same on both hoists. Before moving the crane to the port side, the operator had to first move the unit to the starboard side (about a foot). If not moved, the unit would not travel to the port. The gantry crane was in fair condition.

Recommendations:

- Replace/repair the limit sensors for the hoist travel speed.
- Repair the problem with the crane not moving to the port side without first moving the unit to the starboard side. The crane should travel both ways without problems.

PHL MWIN**Air Hoists – Man Riding**

Two man-riding hoists were located on the rig floor starboard side. These hoists were marked on the nameplate as rated for 2,500 lbs. man riding and 4,000 lbs. utility. Neither of these hoists was fitted with any load limiting device or slack line detection system. These hoists were in good condition.

An additional two man-riding hoists were located in the moonpool area. The hoist on the starboard side was in good condition and appeared to have been recently installed. The man-riding hoist on the port side, however, was in very bad condition. The wire line was corroded, and most of the paint had separated from the steel work. Corrosion on this hoist was in an advanced state. We recommend that this hoist be taken out of service and overhauled.

The moonpool winches were the same model as used on the rig floor, and none were fitted with a load limiting device or a slack line detection system. NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the man riding hoists. At the time of this survey, the man-riding hoists were in bad condition.

Recommendations:

- Replace man-riding winches with a model that has a load limit of 300 lbs. and a slack line detection device fitted.
- Overhaul the port side moonpool man-riding winch.
- Replace the corroded wire line on the moonpool port side man-riding winch.
- Fit tarpaulin covers over the winches when they are not in use.
- As an improvement opportunity, install hydraulic work access baskets in the moonpool area to remove the necessity of man riding in this area.

PH UWIN**Air Hoists – Non Man Riding**

An Ingersoll-Rand winch was mounted at the monkeyboard level. This was visually checked and found in good condition.

Mounted adjacent to the auxiliary derrick, two utility winches were located. It was noted that these were blowing oil from the exhausts and were scheduled to be repaired. The remote control panel backing plate had corroded and required replacement.

Above the driller's control room on the starboard side of the derrick forward and aft were located two winches that were designated man riding/utility. These were rated for 6,250 lbs. for man riding and 10,000 lbs. for utility. We recommend that these hoists are not used for man riding, as there was no load limiting and slack line detection devices installed.

It was also noted that there were no ball valves fitted directly adjacent to the hoist control valves. Otherwise, these hoists were in good condition.

On the port side of the rig floor were also located two additional utility hoists. These were inspected and found in good condition, with the exception of not having any isolating ball

valves fitted directly adjacent to the winch control valve, as well as the air supply hose on the port forward hoist was damaged and required replacement.

In the moonpool area, two utility winches were situated. These appeared to have recently been installed. However, due to their location, they were beginning to corrode and the paint coating was breaking down. We recommend that the paint coating be repaired and that covers be installed over the moonpool winches when they are not in use.

NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the non-man riding air hoists. At the time of this survey, the non-man riding hoists were in good condition.

Recommendations:

- Install isolation ball valves adjacent to the winch control on all hoists on the rig floor.
- Overhaul the two winches located next to the auxiliary derrick.
- Replace the corroded back plate for the auxiliary derrick air winches.
- Do not use the starboard side rig floor utility hoists for man riding.
- Replace the damaged air line on the port forward hoist.
- Repair the paint coating on the moonpool hoists.
- Install tarpaulin covers over the moonpool hoist when not in use.

MELV**Elevators**

This rig had four column elevators. During our assessment of the vessel, we inspected three of the elevators, as it was reported that one the elevators was out of service and awaiting parts. The three elevators that we did inspect were noted to be in good condition. We tested the emergency shutdowns, phones and alarm bells; all worked satisfactorily.

Recommendation:

- Repair the starboard forward elevator as planned.

4.14**Communications/Data Processing****COMM CTRU****CCTV**

The existing CCTV consisted of several cameras located at various locations, including the drill floor, shaker house, cellar deck, casing stabbing board, moonpool and helideck. The monitors for the CCTV system were installed on the bridge and drill floor, as well as several other areas around the rig.

Also on this rig, they had cameras in the pump rooms and in the thruster compartment, with monitors linked to a permanently manned space on the vessel.

During our survey of the vessel, we were able to see all of the cameras and monitors in operation. We interviewed the electronics technician, and he informed us that the CCTV No. 23 had been removed, as it was not working.

Based on our assessment of the CCTV system, we rated this section as good.

Recommendation:

- Repair or replace camera No. 23 as planned, which was not working at the time of this assessment.

COMM REQ**Radio Systems**

The NDB was visually inspected. The rig crew advised that it was functioning correctly and that there were no issues with this equipment. However, it was reported to us that the system was not required in the Gulf of Mexico.

The two sailor GMDSS radio stations—one on the bridge and one in the engine control room—were found operational and with current licenses. The batteries and chargers were found in good condition on both stations.

The various other radio systems, such as VHF, UHF, SSB and Inmarsat B and C, were installed on the vessel. These were visually inspected and found to be in good condition, including cabling and antenna installations. Maintenance records were reviewed and found to be up to date. Rig personnel had no issues with the equipment.

This section of the report was good.

COMM SCOM**Satellite Communications**

The DEEPWATER HORIZON had available e-mail, fax and telephone facilities with direct lines to Houston. We visually inspected these systems during our RCA of the vessel.

Also available on the vessel were Inmarsat Satellite B and C. We didn't function test these systems, but were informed that these systems were operational and had no defects.

The satellite domes that we visually inspected were found in good order with no evidence of cracks or discoloration.

The Inmarsat mobile earth station in the radio room, which included a radio telex facility, was visually inspected and found in satisfactory condition.

There was no outstanding issue with DNV.

We interviewed the radio operator and DP operators, and they informed us that they had no issue with the system.

This section of the report is good.

COMM**PA, PABX, Talk Back and Telephone Systems**

The telephone system installed on the DEEPWATER HORIZON was integrated with the PA system with the exchange installed on the fourth level of the accommodation. All telephones that were visually inspected over the course of this assessment were found to be in good condition. The units in hazardous areas were found suited for purpose. The PA system speakers were visually inspected and found to be in fair condition due to showing some minor corrosion.

During the course of this assessment, speaker levels were noted to be sufficient in interior and exterior. The present configuration of amplifiers could support additional units if required. There was one PA rack on the fourth level of the accommodation, and rack "B" was located in the electronics technician's work shop. Both units had their own UPS system, which we function tested. It was reported to us that the present system was obsolete and that there was a new system on the rig ready to be installed.

The rig was equipped with a warble tone generator for the gas alarm, which was tested during our RCA.

Drill floor talkback consisted of a system between the drill floor doghouse and the derrick. This was function tested and found to be satisfactory. Rig personnel advised that they had no issues with it.

From the bridge, we checked the sound-powered telephone system to various stations to from the control room and found all to be satisfactory. There appeared to be no maintenance scheduled for this equipment. Maintenance personnel had no issues with the above equipment.

As the PA system was obsolete, we must rate this section as bad.

Recommendation:

- Replace the PA system on the rig as planned.

COMM ALRM**Alarms**

During the weekly drills, we tested the general alarm system on the rig and several anomalies were noted. We observed that several alarm lights around the rig were not indentified for their use. Rig personnel must ensure that all alarm lights on the vessel are marked.

Several GA lights were not working when the alarms were activated. The list was given to the electrical department.

The alarms lights were all EX rated. With only minor defects noted, we rated this section of the report as good.

Recommendations:

- Repair the general alarm light, which not working at the time of this assessment.
- Rig personnel must ensure that all alarm lights are indentified for their use.

VMS**Data Management Monitoring & Control (VMS, PMS, DMS)**

The functional condition and reliability of the Kongsberg Vessel / Power Management System was reviewed by interviewing the rig crew and by verification of alarm and system pages. The review did not raise any major concern. The rig crew indicated that the system was stable and reliable. All functions operated as designed.

The forward console consisted of a lighting/navigation panel, AIS unit, STC console, radar unit and GPS 2 and 4 console. On the center console was a radar unit, SVC, SDP OS1, OS2, OS3, OS4 and a Kongsberg APOS. On the back row was SSS station-SVC-SVC-and stability computer.

The printers that were associated with the VMS system were tested satisfactory.

We reviewed the DP event logs, as well as the issue regarding when the rig had to disconnect in 2009.

This equipment was in good condition.

4.15**Accommodations****ACOM GEQT****Galley Refrigeration Equipment**

The rig's galley and refrigerated spaces were visually inspected. The spaces themselves were found to be in good, clean condition. All lighting was working, and the freezer alarm functioned in all spaces. All shelving was intact, and the food was stored in a neat fashion. The doors and seals were in good condition. The freezer and fish locker were at -18°C, and the cold store was at 8°C.

All chiller fans were observed running with minimal vibration and guards in place. The defrost system was operational with no build-up of ice.

The majority of the equipment in the galley was working, but it was reported to us that the main dishwasher was constantly breaking down. The steam table would not heat up to temperature, and the food mixer was not working at the time of this assessment. Many of the cabinets in the galley were damaged.

The galley range, grill and ovens were found clean and were being maintained satisfactorily. The galley exhaust grills were clean, and the local fire suppression system had been recently tested per the calibration sticker.

The laundry was found to be clean and orderly and, at the time of this assessment, all equipment in the galley was working satisfactorily.

The galley and refrigeration equipment was in fair condition.

Recommendations:

- Replace the damaged galley cabinets.
- Replace the dishwasher, steam table and food mixer due to the poor condition.

ACOM ACM**Living Quarters/Rooms**

During the course of the assessment, there was ample opportunity to observe these areas. In general, the accommodations had been maintained reasonably well and were found in good condition. Stairwells and alleyways were clean, the lighting was adequate including emergency fixtures and the bulkheads and decks were kept clean. All luminous signage was in place.

The common washrooms on each deck were found to be in good condition as well. There was a well-equipped gym, complete with a sauna and non-smoking recreation room. There was a smoking room on the fourth deck, which was inside the accommodations.

The sleeping rooms that were inspected were generally in good, clean condition; however, many were without bunk curtains or the ones that had them had fasteners missing or rails damaged. The lockers provided inside the cabins had some locks missing, and there were some without keys. Therefore, newcomers to the rig could not secure their gear.

Several areas of the floors were damaged including the mess room, as well as a hole or dent in the deck outside of room No. 330.

The majority of carpets in the rooms were stained and must be replaced.

The change room was in an acceptable condition. The lockers in each of the changing room were in good condition.

There was no alternate space on board for personnel who were going on leave to store their gear. The women's change room was in excellent condition.

The hospital was visited and found in good condition. The medic advised that all equipment was operational and that he had adequate supplies. The emergency battery-powered fixture was tested, and the hospital call alarm to the bridge functioned correctly.

The living quarters were in fair condition.

Recommendations:

- Replace the stained carpets in the accommodation bedrooms.
- Repair the floors in the accommodation, which included the mess room and decks on the third level. Also, outside of room No. 330 there was a hole or dent in the deck.

4.16**Rig Utilities****HVAC****Ventilation Systems**

The ventilation fans and duct work were in fair condition. This was due to the (VMSA) supply fans for the machinery area on the port and starboard sides of the rig. Both units were located next to the cranes. They were severely corroded, and the gaskets were in bad

condition. The supply duct for the fans on the port side of the rig had gaskets pieced together in the corners of the hatch covers, leaving gaps in the gasket. This would not let the hatch cover seal when the hatch was closed. The lip on the duct vent was corroded on the lip, and it prevented the hatch from sealing when closed. The hatch covers were corroded around the lip where the gasket fits on the cover; therefore, the hatch covers must be replaced or repaired. The louvers were corroded and must be replaced. The ventilation fans and duct for the rest of the rig was in good condition. For example, the pit room, shaker room, shack room and other areas were all in good condition.

Upon review of the history of the ventilation system, the PMs were being completed on regular bases. During interviews with crew members, it was noted that they had replaced some of the vent duct work and that no major problems were noted with the system. However, it was noted that none of the mushroom vents on the main deck had screen on them. The ventilation ducts on the main deck were not clearly labelled to identify to what area/room they vented.

The ventilation system was in fair condition.

Recommendations:

- Repair or replace (VMSA) supply ventilation ducts and hatch covers on the port and starboard sides of the rig as needed.
- Label all ventilation ducts clearly as needed.
- Replace all bad or pieced-together vent cover gaskets on vent ducts as needed.

LHTG LTI**Lighting System, non EX**

A visual inspection of the derrick lighting found that, in general, the system was in reasonable condition with the exception of the circuits outside of the bridge where several lights were not working. The lights that we inspected all had safety leads attached. This survey was conducted at night and during the day time.

The helideck lighting was visually inspected, and all fixtures were found to be in good condition with lenses cleaned and cabling and glands intact. The supply was backed up by a UPS, and this was found to be in good condition.

The emergency battery back-up lights at stairwells and exits were visually inspected and found to be in good condition, with the exception of a few that were awaiting ballasts. The emergency lighting at the lifeboats and the raft davit locations was also inspected and found satisfactory.

In general, the lighting levels around the rig were acceptable. The lighting was in good condition.

POTW WTMK**Watermakers**

The rig was equipped with six Alfa-Laval watermakers. They were in fair condition. The flange connections were showing signs of wear due to the flanges often leaking. The piping was in bad condition for the units. Therefore, the flanges were changed out often. This was causing the flange connections to wear around the seal and starting to leak at the seal. During interviews with crew members, it was noted that the watermakers were making only

about half of the amount of potable water used on the rig. The rig had to get potable water from the supply boats. They were having problems with the cooling exchangers leaking and making repairs to the piping on weekly bases.

In reviewing the history, it was noted that the PMs for the units were up to date and completed on regular bases. The crew members were cleaning the units often due to age.

The watermakers were in fair condition.

Recommendations:

- Install a new watermaker to be able to supply the amount of potable water needed for the rig.
- Replace the corroded flange connections on all six watermakers as needed.
- Replace the freshwater and saltwater piping on the watermakers as needed.

POTW**Potable Water System**

The rig was equipped with four main potable water tanks: two in each of the lower forward columns. In each lower column was situated a potable water pump and a silver cell sterilizer. The pump and valves could be remotely operated from the bridge. The pump could be lined up to either supply water to the potable water day tank located in the upper port column or to re-circulate potable water through the silver cell as required.

Water was taken from the potable water day tank by pressure set pumps where it charges the pressure set tank. From this tank, potable water passed to a UV sterilizer skid and then to a re-hardening unit to add minerals into the water that were not present in the distilled water from the watermakers. Finally, the water passed through a water softener, which used salt to carry out this process. After passing through all of this treatment system, the water was then delivered to the accommodation.

Hot water was supplied by three electric hot water heaters, and there was also a hot water re-circulating pump installed. The complete system was inspected. All of the system was operating normally, and all treatment processes were operational.

NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had no issues with the potable water system.

At the time of this survey, the potable water system was in good condition.

EVNS SWGE**Sewage Treatment Plant**

Hamworthy KSE Sewage Treatment Plant

The sewage treatment plant was inspected while it was in operation. It was comprised of a vacuum system and a treatment plant.

A vacuum was drawn on the system by a pump circulating sewage through an eductor. Two pumps and two eductors were installed in the system; one was usually enough to provide a vacuum throughout the system. The second eductor was kept as a standby. The eductor pumps also acted as macerator pumps.

As with any vacuum sanitary system, it was dependent on all of the flush valves being airtight. The crew usually had to be trained not to put any paper towels or other non-biological waste product into the toilets.

The remainder of the Hamworthy unit consisted of a series of treatment tanks. Sewage flows over various internal weirs. Air was also pumped into the unit through diffusers to assist in the bacterial breakdown of the sewage.

In the final stage of the treatment system, the sewage was treated with chlorine before being pumped overboard.

The Hamworthy sewage treatment plant was in poor condition. The main issue with the system was the corrosion on the sewage tank structure. This should be replaced during the next rig upgrade period.

One of the overboard discharge pumps had been removed, and both air compressors had been taken off of the plant. Regulated rig air was used to supply air to the tank diffuser system.

During interviews with the rig crew, we were informed that they were requesting that the Hamworthy treatment plant be removed and that an Evac vacuum system be installed in its place. This would provide the vacuum generating part of the system, as well as a holding tank. An additional treatment unit was also required, and this could be supplied by Evac or, as the crew requested, an Omni-Pure book cell unit could be installed to treat the sewage.

NPT records were checked for this equipment, and no significant NPT was recorded last year. Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had major issues with this equipment as mentioned in the above.

At the time of this survey, the sewage treatment plant was in fair condition.

Recommendation:

- At the next shipyard upgrade period, the Hamworthy sewage treatment plant should be removed and an Evac system be installed, as well as an Omni-pure unit added to treat the sewage.

LHTG LTE

Hazardous Area Electrical Equipment

A visual inspection of the hazardous areas of the rig was carried out. Due to ongoing operation, we focused on the shakers, mud processing area, pit room and drill floor. It was noted that additional third-party mud processing equipment had been added to the main deck/moonpool area.

None of the EX electrical equipment had been tagged with an ID number, and there was no HAER on this rig.

The shaker motor starters were found to be extremely dirty and covered in mud. Several were missing certification labels.

Several of the agitators in this area had severely corroded frames, and the nameplates were not legible. These required cleaning and painting. If the nameplates could not be cleaned to the point of being legible, the motor required replacing.

During this assessment, we tested the differential pressure alarms for the hazardous areas, which included the mud pit room and shaker room, as well as the lower mud process area.

Third-party equipment installed in the moonpool area was also inspected and was in poor condition.

There were no ABS-approved hazardous area drawings on the rig at the time of this assessment.

This equipment was in bad condition.

Recommendations:

- Request a third-party company to perform a hazardous area equipment inventory, label the equipment and compile an HAER spreadsheet. A survey can then be carried out to establish the true condition of all of the electrical equipment installed in the hazardous areas on the rig.
- Third-party equipment must meet Transocean standards as well.
- There were no ABS-approved hazardous area drawings posted on the rig.

HVAC**HVAC Systems**

With the electrical technician, we visually inspected the HVAC systems on the vessel. Each space with major equipment, including the switchroom, had chiller units and a dedicated air handling unit installed. We also visually inspected the units for the main accommodation, and all of the system appeared to be working satisfactorily, with controls and readouts indicating that temperatures appeared to be in good working order for each system. There was no corrosion on any of the piping that we inspected, including the air handling units. We observed that the condenser unit for the bridge, which was not working at the time of this assessment, was also severely corroded.

It was reported that several tubes in the cooling system were plugged and that the rig was waiting on a third-party company to come to the rig to address the issue.

We were also informed that the A/C unit for switchroom No. 5 was waiting for a new expansion joint.

In the port third deck AHC room, we noted that the ducting was corroded. This should be repaired or replaced.

The various workshops, office and switchboard rooms at the stern superstructure areas were fed from numerous AHUs supplied from reciprocating refrigeration compressors. The refrigeration plants were inspected, and no abnormal vibration or unusual noises were apparent at this time. Instrumentation and controls were intact, parameters were as normal and the spaces were adequately cooled.

Cooling of the switchboards and drilling facilities was provided from three refrigeration compressors.

Recommendations:

- Replace the condenser unit for the bridge, which was noted to be in poor condition with wasted metal.
- Replace the missing ceiling tiles in the starboard A/C compressor room.
- Switchroom No. 5 A/C unit was not working due to a faulty expansion joint.
- Replace the tubes that are plugged for the A/C cooling system as planned.
- Replace the corroded fan ducting in the AHC room port side third deck.

4.17

Safety and Fire Fighting**SURV RAFT****Life Rafts**

The rig was equipped with six twenty-five-man inflatable life rafts located at the forward and stern of the rig per the approved safety plan. These were inspected. The life rafts were the davits launch type. All were noted to be in satisfactory condition. The life rafts and hydrostatic releases were all in date, and it was the responsibility of the marine department to ensure that the safety equipment was in satisfactory condition. We were informed by the marine department that there were no concerns with the life rafts.

This section of the report was good.

SURV BOAT**Lifeboats**

There were four lifeboats on the rig consisting of two Fassmer 73-man boats located forward of the rig and two located at the stern of the rig. Boat No. 2, which was located forward on the rig, was also utilized as the rescue boat.

We inspected the four lifeboats. All were clean and dry inside, and all of the doors were in satisfactory condition with no structural damage noted. We observed that one of the windows in lifeboat No. 2 was cracked. There was minor skin damage on lifeboat No. 4, and also reflective tape on lifeboat No. 4 was in poor condition.

No other damage was noted on any of the boats on the rig. Internal equipment was secured, including the batteries for the boats and the GMDSS radio that was function tested with the DP operator. We performed a visual inspection of each boat, and we also ran the engines on the forward boats only. At the time of the assessment, we were unable to test the sprinkler system. No oil or water leaks were observed, and the engines started up satisfactorily. The sprinkler piping on all four boats was in satisfactory condition, with no damaged observed. The release mechanisms for all four boats were in satisfactory condition, and the boats were lowered into the water every ninety days. The sprinkler systems were function tested by the marine department. The marine department was responsible for ensuring that PM was performed on a regular basis. We were satisfied with the level of maintenance on all four lifeboats. The boats were due to be inspected by a third-party company in April 2010.

The lifeboats on this rig were in good condition.

Recommendations:

- Repair the skin damage on lifeboat No. 4.
- Replace the reflective tape on lifeboat No. 4.
- Replace the damaged glass on lifeboat No 2.

ELP GEN**Standby Generator System**

In review of the history, the PMs were up to date and being completed on regular bases. In interviews with crew members, it was noted that the engine had not given them any problems in the past. We test ran the engine and checked all of the shutdowns for the engine. All of the shutdowns performed normally and were in good condition. The low oil pressure, high temperature shutdown and the overspeed test were performed with no problems. The engine could be started with either batteries or a hydraulic starter. We tested both starting systems on the engine. No problems were found, and the unit started with both systems.

The standby generator was in good condition.

Recommendation:

- The CO2 fire suppression system lines in the emergency generator room were painted white. The lines must be painted red and labelled.

With the electrical technician, we visually inspected the standby generator switchboard. All was noted to be clean and in satisfactory condition. The cable transits inside the panels were sealed to prevent water ingress. The meters and gauges were in place and appeared to be working satisfactorily. All of the internal wires and components were secured and in satisfactory condition.

There was no overheating noted on the connections for the buss bar and breakers. Safety equipment was also available in the emergency room, along with rubber matting in front of the panels.

The connection box, cabling and the earth bonds were in good condition, and the space heater was operational. The stator was found to be relatively clean and showed no signs of overheating.

We conducted an insulation test of the standby generator. All values are recorded below.

Emergency Gen. No.	Phase A to Ground	Phase B to Ground	Phase C to Ground
	2.90 MΩ	3.50 MΩ	3.10 MΩ

We rated this section of the report as good.

WTD WTDR**Hydraulically Operated Watertight Doors & Hatches**

The hydraulic watertight doors were in fair condition. The rig had two of the hydraulic doors not working correctly at the time of this assessment. The doors had to be manually opened with the hand pump. One of the doors was located on the 28½ and a half meter deck level and one located on the 24 meter deck level on the starboard side of the rig in the column. In review of the history, it was noted that the crew had been working on some of the doors and repairing the tracks for the doors as needed. It was also noted that the PMs for the doors were being completed on regular bases and that they were up to date in the system.

During interviews with the crew members, no major problems with the doors were noted. During the assessment, it was noted that three of the hydraulic doors in the port aft column were in need of being adjusted due to the doors dragging on the track at the bottom.

The hydraulic doors and hatches were in fair condition.

Recommendations:

- Adjust the hydraulic doors in the port aft column as needed.
- Repair or replace the hydraulic cylinders for the two doors that were being opened manually. Repair the doors as needed.

FDS ALRM**Fire Detection System**

The Kongsberg/Autronica combination fire and gas detection system was visually inspected with the electronics department. It was divided into three separate marshalling cubicles, with one located aft and two forward. All of the cubicles were inspected and found in good condition. A status check via the VMS system found no detectors inhibited or any in alarm.

We conducted a spot check of the detectors, heat, smoke and manual call stations. All were found to be secure and well labeled, with no visible signs of damage. The system was backed up by a UPS, which we tested and found to be satisfactory.

A review of maintenance history showed records being up to date and good comments being made in the work order notes.

The equipment was in good condition.

FFS**Fixed Fire Suppression System**

The fixed fire suppression systems were in good condition. The CO2 systems throughout the rig were clean. At the time of assessment, Total Safety was on the rig conducting the annual third-party testing and recertification of the systems. The piping and alarm systems for the units were in good condition and were being tested by Total Safety during the assessment. However, we did note that the piping for the CO2 in the emergency generator room was painted white. The regulations state that the fire fighting lines are to be painted red.

The CO2 systems located on the deck next to both cranes were in good condition. However, minor corrosion was starting to show on the top of the bottles and on the rack in which the

bottles were secured. The two CO2 systems listed were for the engine compartments of the cranes.

The CO2 systems in the lower pump rooms were in good condition. The hoses on the units were replaced during the last annual inspection and recertification of the units, according to the history of the systems. Upon interviews with crew members, it was noted that the CO2 systems were kept clean and checked regularly. On review of the history, it was noted that all PMs were up to date and performed on regular bases.

The fixed fire suppression system was in good condition.

Recommendations:

- Paint the CO2 piping in the emergency generator room red. They were painted white at the time of assessment.
- Clean the minor corrosion from the CO2 bottles and their racks for the crane CO2 systems and repaint them as needed.

FFS

Fixed Foam Fire Fighting System

The fixed fire foam system was installed in the space between the roof of the bridge and the underside of the helideck. The system consisted of a booster pump, which takes water from the fire main and a foam tank. The foam tank was equipped with a rubber bladder, which was compressed externally by the foam pump pressure. This forced foam out and into a mixing system where it was distributed to either the helideck monitors or a spray system around the heli-fuel tanks.

Three monitors were positioned around the helideck. These were located below the level of the helideck and could be accessed by stairs under the helideck.

We were informed by the rig crew that the foam was replaced in June 2009. The foam should now be sampled again to ensure that no deterioration of the foam has taken place. We were also informed that the electric motor had seized up. We recommend that the bearings be replaced in the motor.

A visual inspection was carried out on the system. Much of the pipework, pipe brackets and cable trays were corroding. The manual valve handles were also badly corroded. We recommend that the unit is re-piped and that corroded pipe brackets, cable trays and manual valves are replaced. At forward and starboard sides of the helideck, the brackets that hold the monitors require replacement, since they are undersized and corroded.

The foam system pump relief valve was dated 2007 and was due for recertification. NPT records were checked for this equipment, and no significant NPT was recorded last year.

Scheduled PM was being carried out on this equipment. We interviewed the crew, and they had issues with the corrosion on the foam system.

At the time of this survey, the foam system was in fair condition.

Recommendations:

- Take a sample of foam to ensure that no deterioration of the foam has taken place.
- Replace corroded pipework on the foam system tank and lines.
- Replace corroded cable trays on the foam system.
- Replace corroded manual valves.
- Replace corroded brackets on the foam system.
- Replace corroded and undersized brackets on the forward and starboard sides of the helideck foam monitors.
- Replace bearings in the electric foam pump motor.
- Recertify the foam system relief valve.

FFS PMP**Fire Pumps**

Two fire hydrants were opened aft of the rig. We used one of the two fire pumps located in the stern for test purposes and noted the water pressure to be 120 psi at 38.5 amps.

We walked the fire line with the marine department personnel, and no leaks were noted. There was no corrosion noted on any of the main deck fire lines. The piping was noted to be secured to the structure with pipe hangers and expansion joints.

The fire hoses, nozzles, cabinets and valves were all in satisfactory condition, well maintained and numbered as per the Transocean approved safety plan.

This section of the report was good.

FFS PIPE**Fire Main Lines & Related Equipment**

The fire main lines and equipment were in good condition. The piping was in good condition, and all was painted red. The fire main piping was labeled as required and marked with the direction of flow on the lines. The main fire fighting stations were in good working condition and well maintained. On review of the history, it was noted that the PMs were up to date and that they were performed on regular bases.

All valves were in good working condition upon assessment.

No recommendations were noted. The fire main lines and equipment were in good condition.

GDS ALRM**Gas Detection System**

The gas detection system on the rig was visually inspected in combination with the fire detection system. The gas detectors—both toxic and combustible—that were visited over the course of the assessment were found to be well maintained and in good condition. The mimic pages on VMS were reviewed, and there were no detectors either in fault or inhibited condition other than the units being serviced.

Spot testing was successful with the system, indicating that the correct alarm levels of five PPM and ten PPM for toxic gas and twenty LEL and fifty LEL for combustible as per standards.

Six portable gas detectors kept on the bridge were visually inspected and reported to be calibrated on board. It was reported to us that two of the units were not working. The four that were working were found in good condition, and all had calibration stickers attached to show at a glance the last calibration date.

A review of maintenance indicated the gas system being regularly tested and calibrated with excellent work order notes being recorded.

The equipment was in good condition.

Recommendation:

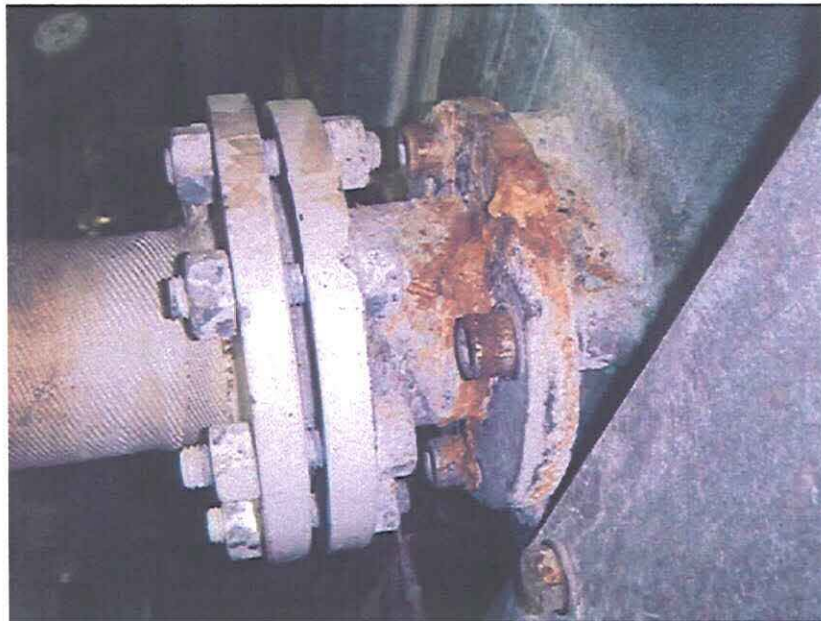
- Repair or replace the two portable gas detectors that were not working at the time of this assessment.



Main SW line No. 1 generator cooler.



Saltwater service pump No1.



Watermaker No. 1 SW line.



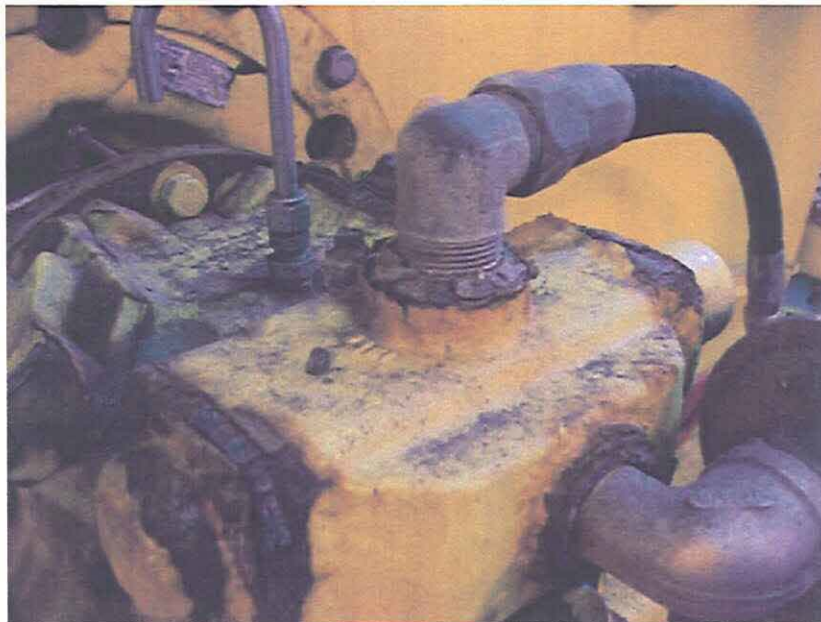
10,000 psi element.



Cables chaffing on generator No. 5.



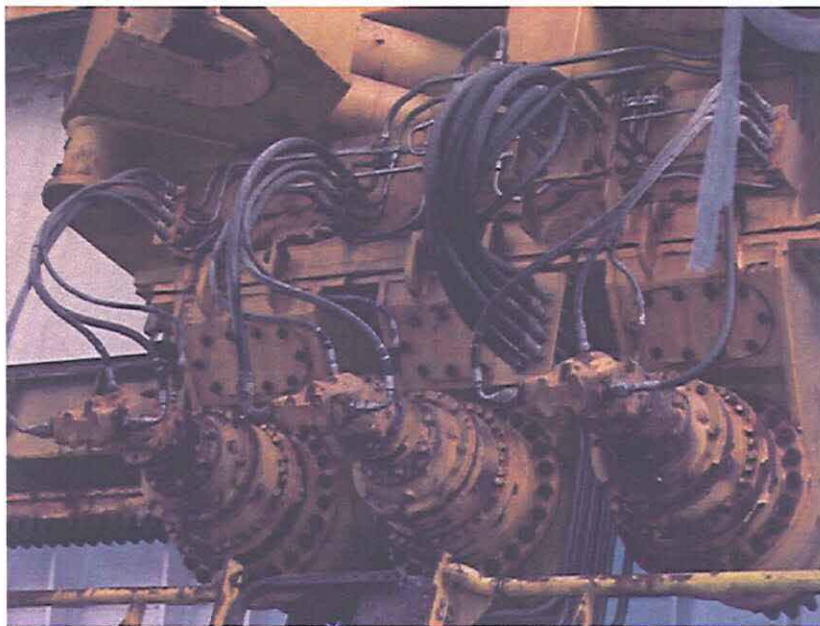
Connection box in poor condition on thruster No. 2 AC motor.



Corroded inlet on motor for yellow reel.



Corrosion on load cell column bulk tanks.



Corrosion on lower gripper motors.



Crown sheaves dry and not being greased.



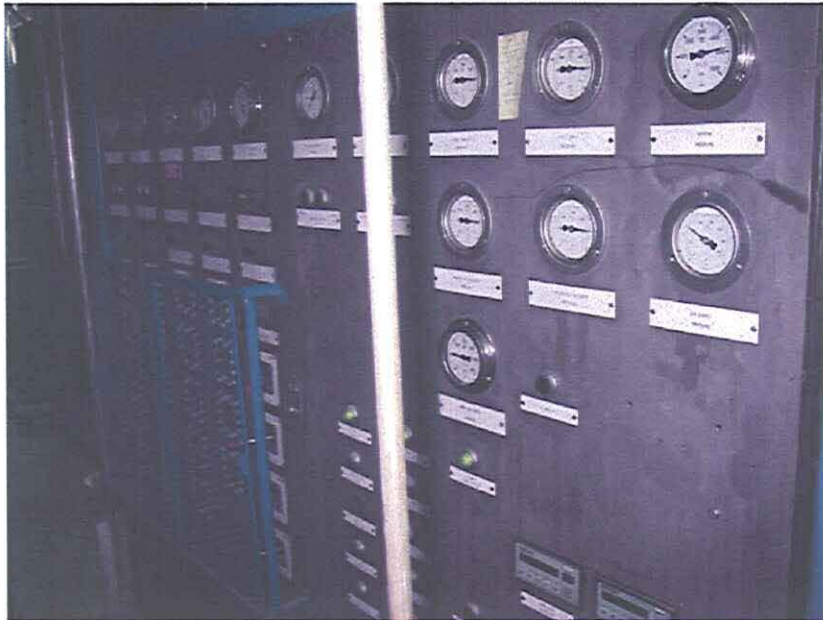
Damaged beam in derrick.



Damaged grease line at crown.



Deck grating weakened at crown.



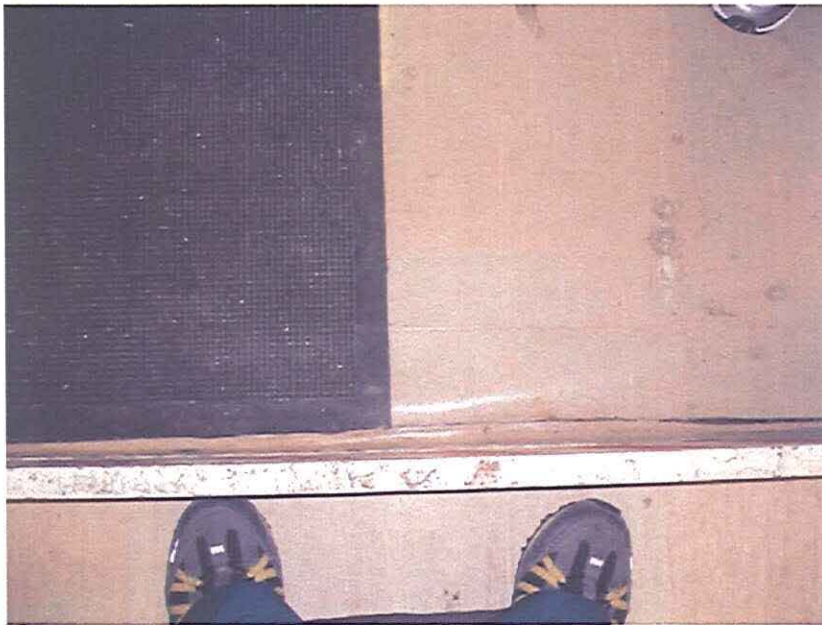
Diverter control panel.



Generator No. 1 must be cleaned.



Gantry crane 10 hydraulic motor No. 2.



Hole/dent on deck outside of room No. 330.



Lower BOP gripper bolts and track.



Major corrosion on standby APV bottle on starboard side.



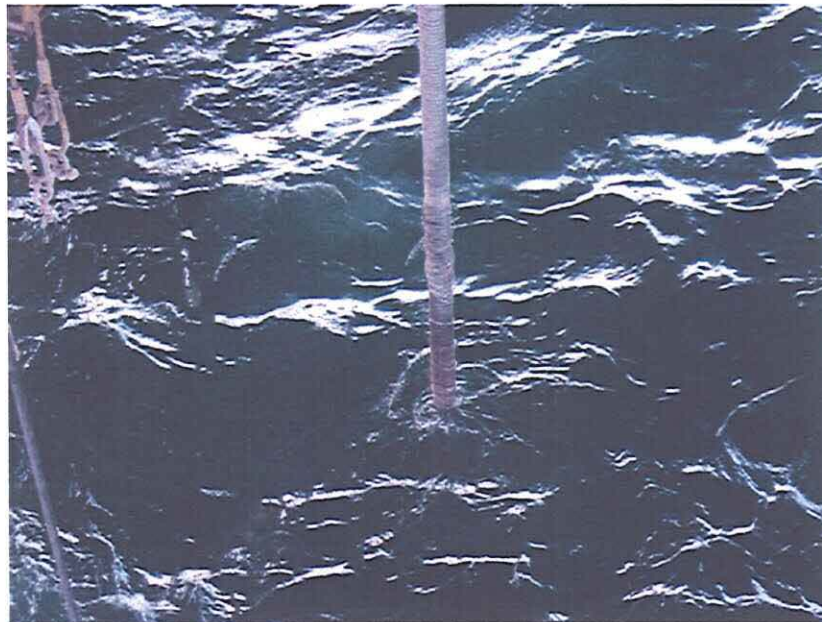
Man rider port side MP in poor condition.



Missing valve handle on APV bottle on starboard side of bank for Tensioner No. 6.



Motor guard was broken on mud pump No. 1A.



Mud boost drape hose with damaged sheathing.



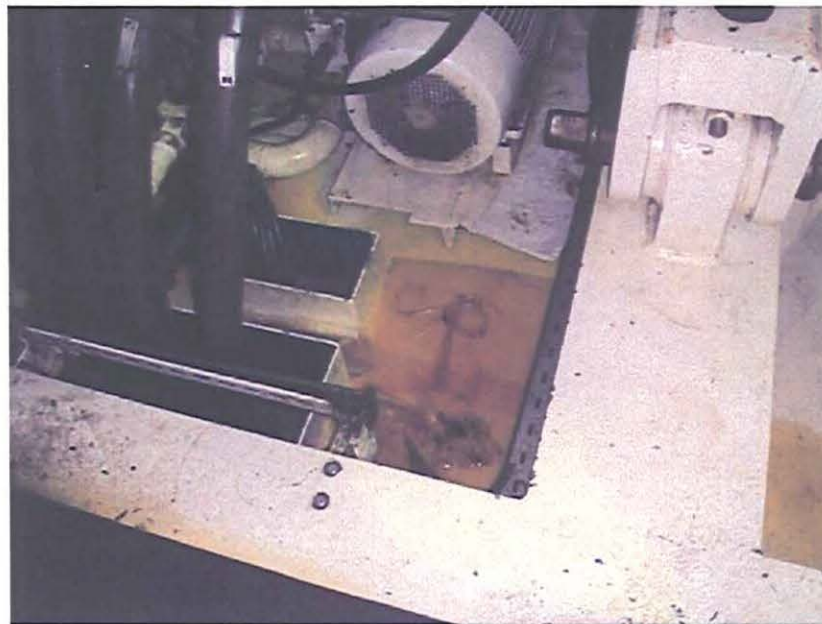
No marking for automatic start on Triplex pumps.



No reports on the rig showing when current injection was last carried out.



Oil inside generator No 6.



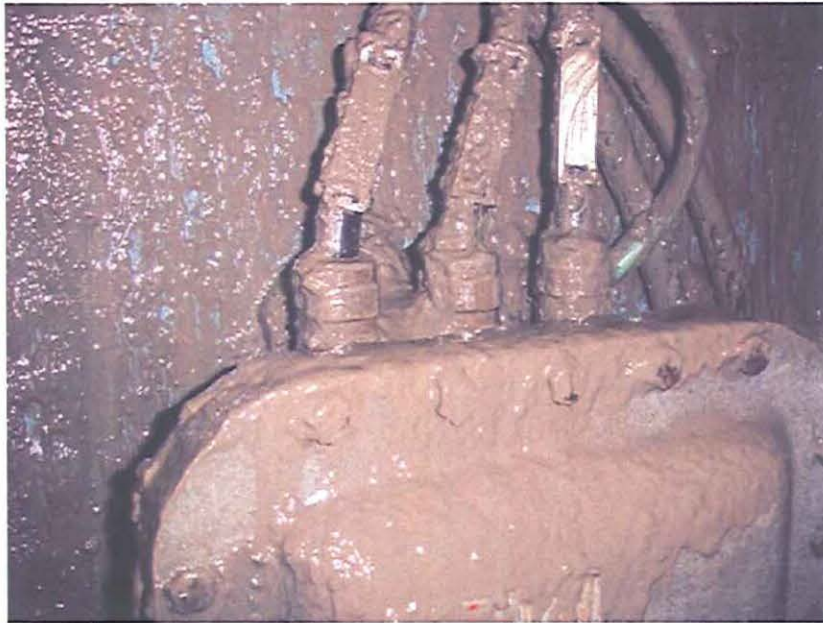
Oil leaking on drawworks from motor seals.



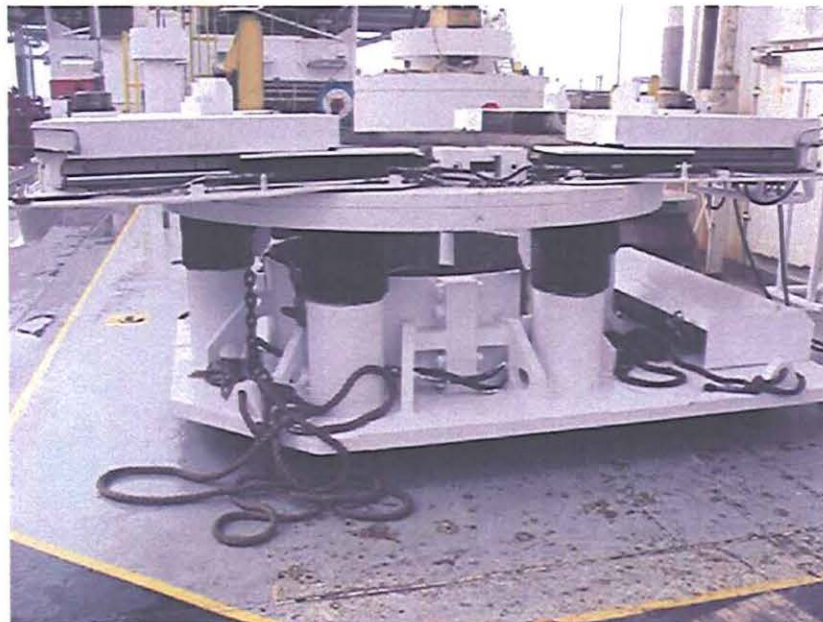
Rotted wood crown bumper.



Several ten-mile obstruction lights were not working.



Several junction boxes in the shaker house had missing certification labels.



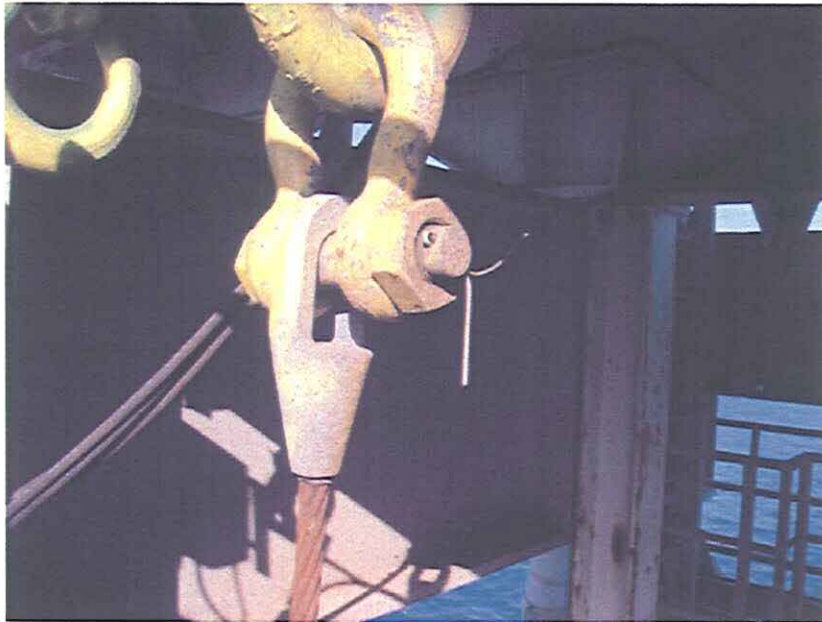
Spider and Gimbal.



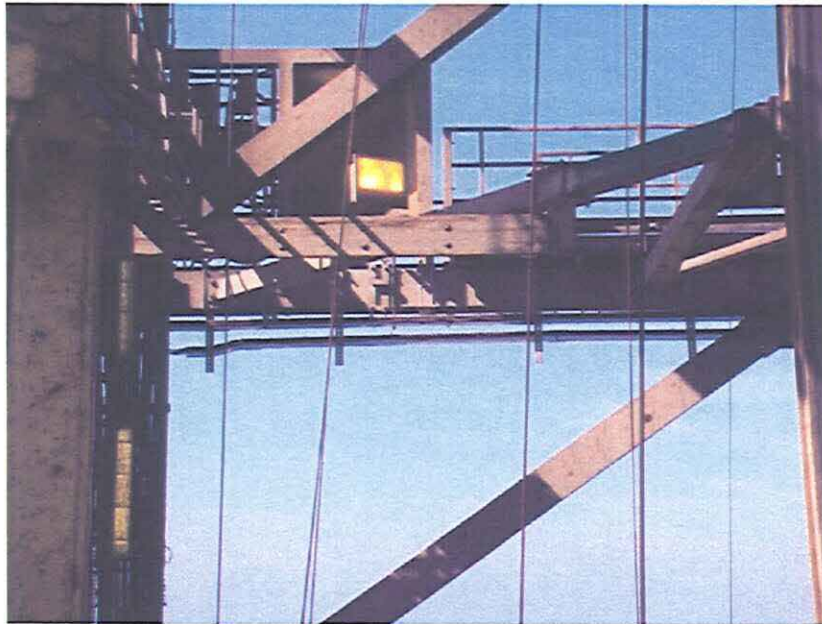
Starboard crane 15 main block.



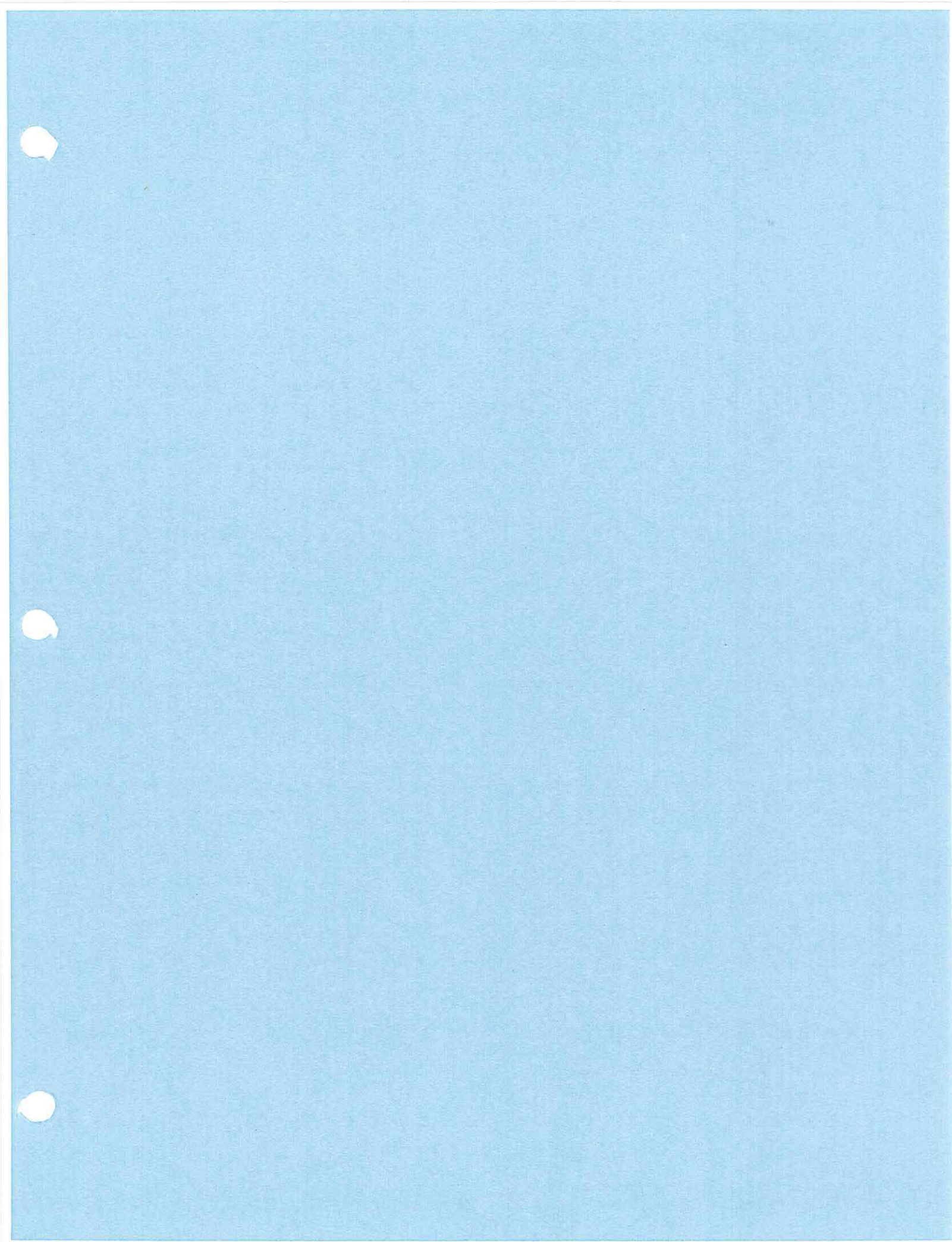
Thruster cooling heat exchanger No 1.

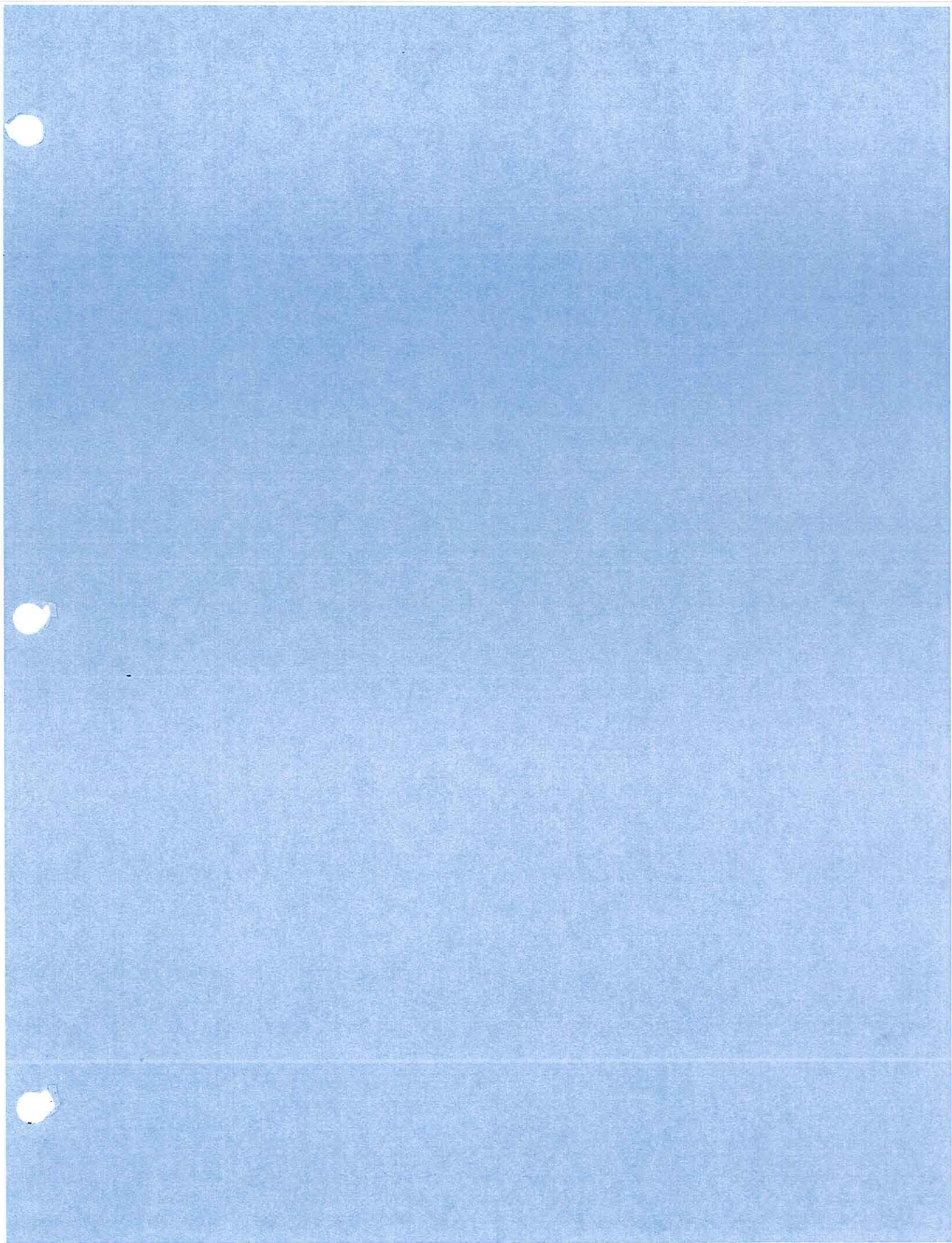


Undersized cotter pins under crown.



Wood bolted to beam in derrick was potential dropped object.







Transocean Rig Hardware Assessment Definitions

Priority Codes	A	B	C
Priority Definitions	Critical items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.	Major items that may lead to damage to essential equipment or detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.	Minor items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

Condition Levels	Level 1	Level 2	Level 3	Level 4
Equipment Definitions	<ul style="list-style-type: none"> Equipment is in bad condition; it is not working or should be removed from service until deficiencies are rectified. Equipment has excessive down time. Equipment wear is past OEM limits or is obsolete and no longer supported by OEM. 	<ul style="list-style-type: none"> Equipment is in fair condition; some major deficiencies have been noted. Equipment has some downtime. Equipment wear is getting close to OEM limits or is nearing end of useful life. 	<ul style="list-style-type: none"> Equipment is in good condition; some minor deficiencies may have been noted. 	<ul style="list-style-type: none"> Equipment is in new or like new condition. There are no deficiencies noted.
Structural Definitions	<ul style="list-style-type: none"> Structure/steel is highly corroded and/or wasted and requires replacement. 	<ul style="list-style-type: none"> Structure/steel is showing heavy corrosion and/or minor wastage. 	<ul style="list-style-type: none"> Structure/steel is well coated; may show some signs of minor corrosion. 	<ul style="list-style-type: none"> Structure/steel is new or in like new condition. There are no signs of corrosion.
Maintenance System Definitions	<ul style="list-style-type: none"> Maintenance System is not understood by crew. Major PM Tasks are more than 12 months overdue. PM's have been closed without being completed. Certification documents are missing. 	<ul style="list-style-type: none"> Some improvement areas regarding the Maintenance System. PM Tasks are 6 to 12 months overdue. PM's are not fully completed or closed without being completed as per task steps. 	<ul style="list-style-type: none"> Maintenance system is understood by crew. Major PM Tasks are completed mostly on time. 	<ul style="list-style-type: none"> All PM Tasks are always completed on time. A leader among rig class in Maintenance system performance.

This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.

CONFIDENTIAL

MODUSI 01 0 000113

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 11 Apr 2010

Rev 3

A	Critical equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.
B	Major items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.
C	Minor items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

Reference Number	DESCRIPTION	TAG			FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
		System	Comp	No				
1001	Accommodation	ACOM	ACM	001	The carpets in the rooms in the accommodation are badly stained.	C	Replace the stained carpets.	3
1002	Accommodation	ACOM	ACM	001	The floor in the mess room and other parts of the accommodation are damaged including a hole in the deck outside room 330	C	Repair as necessary.	3
1003	Galley Equipment	ACOM	GEQT	001	Several cabinets, draws and doors in the galley were damaged.	B	Replace as necessary the damaged units in the galley.	1
1004	Galley Equipment	ACOM	GEQT	001	The main bain marie, the food mixer and dish washer were noted to be in a poor condition.	B	Replace galley equipment as necessary.	1
1005	HP Tensioner APV #1	AIR	ARCV	003	Pressure Gauges damaged on all 30	B	Replace gauges with new calibrated gauges	1
1006	HP Tensioner APV #2	AIR	ARCV	004	Discharge lines face towards walkway on all 30	B	Reroute discharge lines away from walkways	2
1007	HP Tensioner APV #8	AIR	ARCV	010	Corrosion on flanged outlet from bottle to isolation ball valve	B	Perform Protective coating maintenance and replace connection if needed.	2
1008	HP Air Compressor #1	AIR	COMP	007	Flanged cooling water hoses have become hard and brittle.	C	Replace flanged cooling water hoses on 1 and 2 high pressure compressors.	3
1009	HP Air Compressor #1	AIR	COMP	007	Cables and tubing to HP Air Compressors Nos 1 & 2 are not properly supported.	C	Organize and properly support cables and tubing.	3
1010	HP Tensioner APV #26 PRV	AIR	PRV	042	Two handles missing on isolation all valve	B	Replace Handles as soon as possible and replace all valves once they are received.	2
1011	HP Tensioner Standby APV #1 PRV	AIR	PRV	047	Pressure relief valve is out of calibration on all 30	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
1012	P-Tank #1	BMS	BUTK	001	No record of when wall thickness checks on bulk storage tanks were carried out.	C	Carry out wall thickness checks on bulk air tanks	3
1013	P-Tank #1	BMS	BUTK	001	No SWP stenciled on bulk tanks.	C	Stencil all bulk tanks with SWP.	3
1014	Surge Tank #1	BMS	BUTK	011	No record of when wall thickness checks on bulk surge tanks were carried out.	C	Carry out wall thickness checks on surge tanks	3
1015	Surge Tank #1	BMS	BUTK	011	No SWP stenciled on surge tanks.	C	Stencil all surge tanks with SWP.	3
1016	Bulk Storage Instrumentation	BMS	INST	001	Hoses on column bulk tank load cells corroded out.	C	Replace corroded hoses on weight indicators	3
1017	Bulk Storage Instrumentation	BMS	INST	001	Load cells corroding out on column bulk tanks	C	Address corrosion on column bulk tank load cells	3
1018	BOP Bulkhead Guiding System	BOPH	BOPF	002	The lower gripper unit track has some bolts which are co	B	Clean up track bolts and nuts, reinspect and replace if needed	2
1019	BOP Bridge Crane #1	BOPH	OCRN	001	No current load test as per company policy	C	Conduct load test as per company policy	1
1020	BOP Bridge Crane #1	BOPH	OCRN	001	Remote controller being used is obsolete	A	Install new controller once arrived as planned	1
1021	Hazardous Area General Alarms	COMM	ALRM	001	Alarm lights in the mud pit room not identified for there use.	C	Ensure all alarm lights are identified	3
1022	Non Hazardous Area General Alarm	COMM	ALRM	002	Several alarms failed to work when activated during the weekly boat drill. (Gave list to the Chief Mate)	C	Repair as necessary.	3
1023	Non Hazardous Area CCTV Camera	COMM	CAM	002	It was reported to us camera No 23 was not working, this CCTV unit is used to monitor helicopter operation	B	Replace the broken camera.	1
1024	Public Address System	COMM	CTRU	001	PA rack amplifiers are obsolete.	C	As planned replace the PA system.	3

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1025	Drilling Instrumentation	DIST	INST	001	It was reported to us several items on the rig floor will not work in automatic which includes the PRS, IR and the zone management. During our assessment we observed the equipment was being operated manually.	C	Investigate the issues and repair as necessary.	3
1026	Crown Block Main	DRHS	CROW	001	Crown sheaves grease hoses in poor condition, several of the hoses were damaged and leaking grease. There was no evidence of grease reaching the fast line or main block clusters.	B	Replace grease line hoses or as the access is good around sheaves, install grease zerts directly in sheave pins and grease the sheaves directly. Complete	1
1027	Crown Block Main	DRHS	CROW	001	The crown bumper blocks wood has rotted out and is only being held in place by the steel mesh around the wood.	B	Replace rotted wood bumpers at the crown, or investigate if the wooden blocks can be replaced with neoprene bumper blocks.	2
1028	Derrick	DRHS	DERK	001	It was noted that two bolts not flush with derrick girts. 5th side below the monkey board level.	C	Investigate if the bolts are loose or tight in the beams, repair as necessary.	3
1029	Derrick	DRHS	DERK	001	It was noted the safety slings on the finger board were corroding out.	C	This safety slings are now being changed out by the drill crew.	3
1030	Derrick	DRHS	DERK	001	It was noted that the Port fwd air winch line rubbing on plate on derrick first level.	C	Investigate if plate can be removed or if this is not possible install a roller guide to prevent any further damage to the derrick structure.	3
1031	Derrick	DRHS	DERK	001	A large section of deck grating at the crown is corroding out.	B	Replace corroded grating at the crown level, replace with galvanized steel grating.	2
1032	Derrick	DRHS	DERK	001	The complete derrick is galvanized except for the top section which has been painted. On this top section the paint coating is breaking down and corrosion is apparent.	C	While not structurally weakened at present we would recommend the corrosion is addressed in the near future.	3
1033	Derrick	DRHS	DERK	001	It was noted that wooden rails have been fitted on two horizontal beams below the monkey board level. This wood is deteriorating and should be removed.	A	Remove wood from two horizontal beams below monkey board level; potential dropped object.	1
1034	Derrick	DRHS	DERK	001	Bent horizontal beam, caused by stands falling across derrick	C	Replace beam as previously planned.	3
1035	Derrick	DRHS	DERK	001	Standing water in derrick lower diagonals braces	C	Clean debris from lower diagonals and clean out drain holes	3
1036	Derrick	DRHS	DERK	001	Plastic covering from drill line lying in derrick beams	C	Remove debris from derrick	3
1037	Derrick	DRHS	DERK	001	Wind speed indicator not working above crown	C	Repair/replace wind speed indicator	3
1038	Derrick	DRHS	DERK	001	Block hang off lines ties off with soft line in derrick.	C	Replace soft line with wire slings, on both hang off lines.	3
1039	Derrick	DRHS	DERK	001	We are informed by the rig crew that the short block hang off line is no longer used.	C	Remove the short hang off line if no longer required.	3
1040	Derrick	DRHS	DERK	001	Under the water table: it was noted that the cotter pins are undersize on shackles, and incorrect retainers being used.	B	Fit the correct size of cotter pins to all shackles	2
1041	Derrick	DRHS	DERK	001	Under water table of the auxiliary derrick, the coating is breaking down and corrosion is present.	C	Remove corrosion and re-paint structure.	3
1042	Drawworks Active Heave	DRHS	DWKS	001	Since OEM realignment of drive motors the motor drive shafts are no longer centered in the seals and the seals are leaking.	C	Investigate with OEM if an improved design is available or other remedy to matter.	3
1043	Drawworks Active Heave	DRHS	DWKS	001	Slight oil leaks on main drive shaft oil seals	C	Repair leaking seal.	3
1044	Drawworks Active Heave	DRHS	DWKS	001	After reviewing the PM records we were unable to find when the brake caliper springs were replaced last.	A	Replace the brake caliper springs yearly as specified in the OEM service manual.	1
1045	Drawworks Active Heave	DRHS	DWKS	001	Drive motor vibration It was noted that during operations the A.C. motors were vibrating, this is a common fault with active heave drawworks, being usually attributed to alignment issues or encoder feedback issues were the motors were not running in synchronization.	C	Recheck motor alignment/encoder feedback issues	3
1046	Drawworks Auxiliary Handling	DRHS	DWKS	002	Wire spooler Hydraulic cylinder was leaking and has now been disconnected.	B	Install replacement cylinder when it arrives.	3

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1047	Drawworks Auxiliary Handling	DRHS	DWKS	002	It was noted that the paint coating on the air receiver is breaking down.	C	Remove the corrosion from the air receiver and repaint.	2
1048	Drawworks AC Drive Motor #2	DRHS	MTR	002	Ductwork was found cracked on drawworks No. 2 motor drillers side.	C	Repair cracks in ductwork, consider fitting a flex coupling in ductwork to prevent further damage being carried out on duct work due to motor vibration.	2
1049	Rotary Table	DSRT	ROT	001	The hydraulically operated rotary table was inoperative at the time of the survey. The power skid controls had been removed and sent to town for repair last year.	B	Investigate the delay on returning the power skid controls, install and test table when parts arrive.	2
1050	Top Drive	DSRT	TD	001	It was noted the top drive blower hose was poorly secured with a steel clamp.	C	Remove and reposition clamp on blower hose	2
1051	Ex/Sup. Fans	ELPD	HAZA	001	There were no reports on the rig when an Ex electrical equipment survey was last conducted.	A	An Ex survey must be carried out to establish true condition of each item of electrical equipment installed in hazardous areas on the rig per HQS-OPS-EST-694-01	1
1052	480V MCC #1	ELPD	MCC	001	Duct tape used to cover open holes in one of the MCC boards where MCC cubicles have been removed.	C	Source or fabricate maintenance covers for use when switchboard components are removed.	2
1053	VFD Switchboard Line Up #1	ELPD	SWBD	018	We observed DW3 could not be run due to a faulty buss assembly in the VFD bay.	C	As planned replace the buss assembly	2
1054	11KV/600V Drilling Power Transformer #1	ELPD	TFMR	021	Approved rubber matting is missing from the front of all transformers on the rig.	A	Install rubber matting in front of the transformers as per the transocean HQS-HSE PP-01 procedures section 4, subsection 5.9	1
1055	Main Engine #1	ELPG	ENG	001	During the engine shut down testing, it was noted the all six engines had several of the water jacket sensors disabled, due to giving false reading at times.	B	Check into what is causing the problems with the water jacket sensors and why they are giving false reading and causing them not to perform correct. Repair or replace the sensors and check with getting a third party tech out to the rig for taking care of this problem.	2
1056	Main Engine #3	ELPG	ENG	003	During the inspection of the engines and shut downs, we were unable to test the shut downs due to a main cooling water line spool had been taken out for repairs. The engine was shut down and the port side of the rig water system had to be shut off to make the repair. This was due to the main water line valves leak by and will not close off the water in the lines completely. On interviews with crew members it was noted the valves were bad and will not close off well.	B	Replace all salt water and fresh water valves as need for the engines and the main water lines.	2
1057	Main AC Generator #1	ELPG	GEN	001	Dust and metal particle were noted inside the generator No 1	B	Ensure the generator is cleaned and the metal particle removed. Complete	1
1058	Main AC Generator #1	ELPG	GEN	001	Washers inside the generator on the buss bars on No 1 generator are corroded.	B	Replace the corroded washers.	1
1059	Main AC Generator #1	ELPG	GEN	001	The cooling fins on generator No 1 are damaged with metal filings breaking off and debris entering generator housing.	B	Replace the cooling fins on No 1 generator	2
1060	Main AC Generator #4	ELPG	GEN	004	The water leak detector on No 4 generator failed to alarm when tested.	B	Repair or replace as necessary.	2
1061	Main AC Generator #5	ELPG	GEN	005	In Main Generator No. 1 junction box, one cable from V phase and one cable from U phase were chaffing.	C	Make repairs as necessary.	2
1062	Main AC Generator #6	ELPG	GEN	006	No 6 generator had oil inside the fan housing	B	Investigate oil inside the generator and repair where necessary.	1
1063	Main Engines LT Cooling System Pipework	ELPG	PIPE	001	The fresh water cooling pipe work for the heat exchanger on #1 engine was leaking at the weld next to the flange. This was located at the heat exchanger connection.	B	Repair/replace piping and flange at the heat exchange as needed.	2

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1064	Main Engines LT Cooling System Pipework	ELPG	PIPE	001	In review of the history and on visual inspection of the pipe work for all six engine heat exchangers, it was noted the pipe work has been giving problems with leaks on regular bases. The pipe work was showing to be thin and leaks occurring often, this has started to cause flooding issues of the floors at the heat exchangers as well and causing cooling problems with the engines.	B	Replace all pipe work as needed for all 6 heat exchangers for the engines at nearest opportunity..	2
1065	Oily Water Separator #1	EVNS	SEP	1	The pressure relief valves on oily water separator unit was leaking when the unit was test ran for us, and we were unable to read the date on the tag for showing the last testing of the valve. The piping for the drain going to the relief valve had been taken apart at the flange connection, and not put back in place or bolted back together.	B	Replace the pressure relief valve on the oily separator unit, and repair the piping going from the relief valve to the drain.	2
1066	Sewage Treatment Vacuum Toilet System	EVNS	SWGE	002	Sewage treatment system is severely corroded with wastage.	A	Replace the sewage treatment plant. Rig currently plans at next shipyard upgrade period an Evac system be installed, and also a Omni-pure unit be added to treat the sewage system.	1
1067	Oily Water Separator Tank Stbd	EVNS	TANK	004	The oily water separator tank was severely corroded and	B	Replace the unit as needed due to the unit tank was corroded to the point of replacement.	2
1068	Waste Oil Holding Tank Port	EVNS	TANK	001	The vent for the sludge oil tank located on the STBD side of the rig, did not have a containment around the vent and had oil running down the vent pipe on the out side of the vent.	B	Install a containment area around the sludge oil vent pipe, located on the STBD side of the rig.	2
1069	Local Control Unit CO2 Fire Suppression	FFS	CTRU	001	The pipe work for the CO2 system for the standby generator is painted white.	C	Paint CO2 system pipe work red in accordance with HQS-OPS-PP-01.	3
1070	Emergency Generator Room CO2 Fire Suppression	FFS	FS	003	The CO2 lines in the emergency generator room were painted white. Regulations require the fire fighting, CO2 etc.. all to be painted red.	C	Paint the CO2 lines in the emergency generator room red.	3
1071	Helideck Fire Monitors	FFS	MON	002	Corroded and undersized brackets on helideck monitors fwd and stb side.	C	Replace brackets to larger size, (same as installed on aft monitor).	3
1072	Helideck Foam Pump AC Motor	FFS	MTR	006	Crew reports electric motor has seized up and had been freed off.	C	Replace electric motor bearings.	3
1073	Foam System Pipework	FFS	PIPE	002	Pipe work corroded out on foam system tank and lines.	C	Replace corroded pipework.	3
1074	Foam Pump PRV	FFS	PRV	005	Test date on foam system PRV out of date (2007)	C	Re-certify PRV	3
1075	Helideck Foam System Tank	FFS	TANK	002	Corroded cable trays around foam system tanks	C	Replace corroded cable trays.	3
1076	Foam System Valves	FFS	VLV	002	Manual valve handles corroded.	C	Replace handles or complete valves if new handles are not available.	3
1077	Portable Gas Detectors	FGDS	PGD	001	Two of the six portable gas detectors were not working at the time of this assessment	C	Repair as necessary.	3
1078	Helicopter Refueling System	FUEL	HELI	001	The pressure relief valves on the fuel tank system for the chopper fueling station were out of date for being tested.	B	Have all pressure relief valves re-certified for the fueling station.	2
1079	Fuel Oil Pump #1 Port Purifier Room	FUEL	PMP	001	In both fuel purifier room the sight glass gauges were tie wrapped open on all fuel and oil tanks. This is a safety hazard, if the glass gauge was broken it valve will not work correctly to shut off the oil or fuel.	C	Repair the valves on the sight glass gauges as needed and remove the tie wraps.	2
1080	Fuel Transfer Pump #1 Port	FUEL	PMP	003	The pressure relief valves on all of the fuel transfer pumps were dated 7/07. PRVs require biannual testing.	B	Test or have all pressure relief valves recertified on all 4 of the fuel transfer pumps.	2
1081	Fuel Transfer Pump #1 Port	FUEL	PMP	003	The fuel transfer pumps on STBD side were leaking around the piping threads next to the pressure relief valves.	C	Repair the small fuel leaks around the piping threads of the fuel transfer pumps on STBD side of rig.	2

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1082	Mud Pump #1	HPMS	MP	001	It was noted that the belt guard does not fully cover the pinion shaft drive hub on the inside of the belt guard, on Mud Pump #1 and Mud Pump #4. This exposed rotating hub is a potential hazard to personnel standing on top of the pump, whether engaged in pump maintenance or using the pump to access equipment in the surrounding area. There is a danger of any loose equipment e.g. ropes or safety harness lanyards being caught in this rotating equipment with possible fatal results.	A	Extended the belt guard to enclose this exposed rotating piece of equipment.	1
1083	Mud Pump #1	HPMS	MP	001	Excessive use of silicone sealant on covers and hatches of all mud pumps.	C	This is proven to be a major cause of pump bearing failure as pieces of the silicone contaminates the lube oil system and becomes plugged off in various grease lines and oil passageways throughout the pump. The correct OEM gaskets should be installed to prevent contamination of the lube oil system and premature bearing failure.	3
1084	Mud Pump #1	HPMS	MP	001	Unused fluid end lubricating pump installed on all mud pumps.	C	If not required remove fluid end lubricating pumps.	3
1085	Mud Pump #1	HPMS	MP	001	Retsco relief valves as installed on all mud pumps require disassemble to reset.	C	As planned replace the problematic Retsco relief valves with the Titan BX air operated valves.	3
1086	Mud Pump #1	HPMS	MP	001	Crosshead readings ranged from 0.030-0.040", exceeding the maximum allowable of 0.030".	C	Adjust crosshead reading to below 0.030"	3
1087	Mud Pump #2	HPMS	MP	002	The cross head lower slides were found badly scuffed and there was no trace of any smooth bearing surface left. As the slides are damaged we would also expect the lower crosshead surface to also be scored, we would recommend that both lower slides and crossheads be replaced on all cylinders.	B	Replace lower crosshead slides and crossheads on all three cylinders. Furthermore, it would be best practice to replace the crosshead bearings when crossheads are replaced, alleviating the need for any further maintenance to the crosshead for several years to come.	2
1088	Mud Pump #2	HPMS	MP	002	Left and Center crosshead readings are high; 0.031-0.041".	C	Adjust crosshead reading to below 0.030"	3
1089	Mud Pump #2	HPMS	MP	002	A hydraulic hose was in place supplying oil to the L.H. main bearing. This hose has become hard and brittle and should be replaced using the original copper tubing.	C	Replace hard and brittle hydraulic hose with copper tubing as used on the rest of the pump internal lubrication piping.	3
1090	Mud Pump #2	HPMS	MP	002	Internal lubrication lines were found either loosely clamped or not supports, This should be addressed to prevent the tubing fracturing with excessive vibration.	C	Secure internal lubrication lines in power end.	3
1091	Mud Pump #3	HPMS	MP	003	Center crosshead bearing clearance was found have to have a lift of 0.010" which is high, there was also evidence of damage to the lower slide, which could be caused by the breaking up of the crosshead bearing and bearing material falling onto the lower slide.	B	Replace center crosshead bearing, slide and crosshead.	2
1092	Mud Pump #3	HPMS	MP	003	Three hydraulic hoses were also being used inside the crankcase these have become hard an brittle and should be replaced to the original OEM copper tubing.	C	Replace hydraulic hoses to the original OEM copper tubing.	3
1093	Mud Pump #3	HPMS	MP	003	The oil pump packing gland was found to be loose and the bolts had backed off and were running on the pump coupling.	C	Secure gland packing retainer and bolts on oil pump.	3
1094	Mud Pump #3	HPMS	MP	003	Oil pressure gauge defective.	C	Replace gauge.	3
1095	Mud Pump #4	HPMS	MP	004	Cable damaged on junction box.	C	Reposition cable junction box to prevent any further cable damage occurring.	3

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1096	Mud Pump #1A AC Drive Motor	HPMS	MTR	001	The motor winding on 1A and 1B mud pump AC motors are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 1.	1
1097	Mud Pump #1A AC Drive Motor	HPMS	MTR	001	The belt guard on mud pump 1A motor was noted to be damaged.	C	Repair or replace as necessary.	3
1098	Mud Pump #1A AC Drive Motor	HPMS	MTR	001	There are no air intake filters fitted on any of the AC motors for the mud pumps.	B	Install air filters on the air intake to the AC motors on the rig this will help further dust and grease entering the motors	2
1099	Mud Pump #2A AC Drive Motor	HPMS	MTR	005	The motor winding on 2A and 2B mud pump AC motors are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 2.	1
1100	Mud Pump #3A AC Drive Motor	HPMS	MTR	009	The motor winding on 3A mud pump AC motor are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 3A.	1
1101	Mud Pump #3A AC Drive Motor	HPMS	MTR	009	The air let vents on the mud pump AC motors are covered with oil and dust	C	Remove vents and clean.	3
1102	Mud Pump #4A AC Drive Motor	HPMS	MTR	013	The motor winding on 4A and 4B mud pump AC motors are in a covered with dust.	B	Clean motors with dry air.	2
1103	Air Conditioning Unit #5 Switchboard	HVAC	ACU	005	Switchroom 5 A/C unit was not working due to a faulty expansion joint.	B	As planned repair the same.	2
1104	Air Conditioning Unit CCR	HVAC	ACU	029	The condenser A/C unit for the bridge was not working also it had wasted metal and was in a extremely poor condition	B	Replace unit.	1
1105	Main Air Conditioning Unit #1A	HVAC	ACU	035	It was reported to us several tubes are missing for the A/C cooling system.	B	As planned repair the same.	3
1106	Air Handling Unit #1	HVAC	AHU	001	The fan ducting in the AHC room port side 3 rd deck is severely corroded	C	Replace the corroded ducting.	3
1107	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001	The VMSA ventilation ducts on the main deck, located next to the STBD and Port cranes were in bad condition. The hatch covers and louvers were corroded severely.	B	Replace the louvers and hatch covers on the ventilation ducts as needed.	2
1108	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001	The gaskets on the hatch covers for the vent duct located on Port and STBD side next to the cranes were in bad condition and had been pieced together in places on the hatches.	B	Replace all gaskets on the ventilation duct hatch covers as needed.	2
1109	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001	The vent on the main deck for the galley supply fan had grease running out of the vent and did not have a screen on the vent hood. (Vent located next to the knuckle boom crane.)	B	Clean out the vent fan duct on the galley supply vent and install new screen on the hood cover.	2
1110	Rig Central Equipment HPU	HYD	HPU	002	Automatic sequencing panel not working	C	As planned repair pump automatic sequencing control valve.	3
1111	Rig Central Equipment HPU	HYD	HPU	002	Valves on the hydraulic oil sight glass not push to read.	C	Either replaced valves to this type or install a magnetic type glass.	3
1112	Rig Central Equipment HPU	HYD	HPU	002	Oil cooler not fitted with splash shield	C	Install splash shield over oil cooler core.	3
1113	Aircraft Warning Lights	LHTG	LTE	001	The starboard forward aircraft warning lights in the derrick were not working.	C	Repair as necessary.	3
1114	Non Haz Area Emerg Lighting	LHTG	LTE	002	When spot check the battery back-lights on the rig several lights failed within the hour. (List provided to Electrician)	C	Repair as necessary.	3
1115	Mud Degasser #2	MCS	DGAS	002	No. 2 degasser down, as the vacuum pump has been removed.	A	Refit degasser vacuum pump.	3
1116	Shale Shaker Cascading #1	MCS	SHAK	001	Several junction boxes in the shaker house had missing certification labels also several junction in the shaker house were in a poor condition with corrosion.	A	Replace the junction boxes with the missing certification labels.	1
1117	Chemical Mix Tank #1 Agitator #1	MDS	AGIT	001	Several mud agitators had missing certification labels also several motors were in a poor condition with corrosion.	A	Agitators motors with missing certification labels must be replaced and motors that are severely corroded must also be replaced.	1

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1118	Mud Storage Valves	MDS	VLV	001	All mud guns were inspected and all of these were found to be seized	C	Free off all mud guns	3
1119	Mud Storage Valves	MDS	VLV	001	Valve handle missing in pit room, valve is now being operated with a pipe wrench.	C	Install valve handle	3
1120	Crane #1 Port	MTHL	CRN	001	The boom walk-way going down the outside of the boom was not safe and was only 10 to 12 inches wide. The tie off cable was not safe for using as a tie off point as well.	A	Replace the walk-way going down the side of the boom with a wider walk way and replace the tie off cable. As a suggestion, install the walk-way on the inside of the boom and install a walkway at the boom sheaves for safe working when performing maintenance to the sheaves.	3
1121	Crane #1 Port	MTHL	CRN	001	Several of the hydraulic hoses were hard and cracked due to age. The hoses going to the winch located in the boom were hard and cracked, 2 of the hoses were leaking around the cracks in the hoses.	B	Replace all hard and cracked hydraulic hoses on crane as needed.	2
1122	Crane #1 Port	MTHL	CRN	001	The sewing bolts were severely corroded and in bad condition.	A	Replace all sewing bolts on the port crane.	3
1123	Crane #1 Port	MTHL	CRN	001	All of the sheaves on the boom tip were showing signs of wear and had cable prints in the sheaves.	B	Replace the boom tip sheaves as needed.	3
1124	Crane #1 Port	MTHL	CRN	001	No records were provided of where the winches had been replaced or rebuilt in the life of the crane. Manufacture recommendations are to have the winches reworked or replaced every 2 years.	B	Replace or rework all winches on the crane at next available opportunity.	2
1125	Crane #1 Port	MTHL	CRN	001	No records were provided of where the hydraulic motors had been replaced or rebuilt in the life of the crane. It is recommended to rework or replace the pumps every 2 years.	B	Replace or rework all hydraulic motors on the crane at next available opportunity.	2
1126	Crane #1 Port	MTHL	CRN	001	The radiator for the crane was in bad condition, the louvers were corroded severely and the housing around the radiator was corroded.	B	Replace the radiator, radiator housing and louvers on crane as needed. Replace the fans and fan guards as for the radiator and cooler as needed.	2
1127	Crane #1 Port	MTHL	CRN	001	The main block sheaves were worn on the pin and were rubbing on the sides of the block. The sheaves had cable prints worn in the face of the sheaves. By checking them with a sheave gauge, the wear was showing they were in need of changing as well. The block did not have grease points/fitting installed for lubrication of the sheaves; they were no place installed for adding grease fittings as well.	A	Replace the main block or have completely reworked and NDT test done.	3
1128	Crane #1 Port	MTHL	CRN	001	The main block sheave at the dead-man end was worn and rubbing on the sides. The sheave had cable prints in it as well. The main pins on the dead-man sheave housing was corroded and only taking grease on one side of the pin.	B	Replace the dead-man sheave and housing block. Replace all pins for the housing block as well.	3
1129	Crane #1 Port	MTHL	CRN	001	All (3) three sheaves on the boom tip for the whip line were showing signs of wear and had cable prints in the sheaves. The sheaves were rubbing on both sides, indicating wear of the pin or sheave, to the point they must be replaced at nearest opportunity.	B	Replace all (3) three whip line sheaves at boom tip at nearest opportunity.	3
1130	Crane #1 Port	MTHL	CRN	001	The engines on both deck cranes do not meet EPA standards and must be changed out. After interviews with crew members this was noted and they said the engines for the cranes were on order. The rig had no records of the engines being reworked during the life of the cranes.	C	After inspection of the engines, in both cranes, changing out the engines will take care of the oil leaks of the old engines.	3
1131	Crane #2 Stbd	MTHL	CRN	002	The bolts on each boom section where they were bolted together were in bad condition due to corrosion of the bolts.	B	Replace all boom section bolts or have NDT test done on the bolts and clean up the joint in each section of the boom and recoat with protective coating and paint boom section joints.	2

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1132	Crane #2 Stbd	MTHL	CRN	002	Several of the hydraulic hoses located on all winches were hard and cracked due to age. The hoses going to the winch located in the boom were hard and cracked, 2 of the hoses were leaking oil from the cracks in the hoses.	B	Replace all hard and cracked hydraulic hoses on crane as needed. Make a log register for keeping up with the dates, and what hoses were replaced.	1
1133	Crane #2 Stbd	MTHL	CRN	002	One of the main block sheaves at the end of the boom had wire rope prints showing in the sheave. (Inside sheave.)	B	Replace the main block sheaves at boom tip as needed.	1
1134	Crane #2 Stbd	MTHL	CRN	002	The boom walk-way going down the outside of the boom was not safe and was only 10 to 12 inches wide. The tie off cable was not safe for using as a tie off point as well.	A	Replace the walk-way going down the side of the boom with a wider walk way and replace the tie off cable. As a suggestion, install the walk-way on the inside of the boom and install a walkway at the boom sheaves for safe working when performing maintenance to the sheaves.	2
1135	Crane #2 Stbd	MTHL	CRN	002	No records were provided of where the winches had been replaced or rebuilt in the life of the crane. Manufacture recommendations are to have the winches reworked or replaced every 2 years.	B	Replace or rework all winches on the crane at next available opportunity.	2
1136	Crane #2 Stbd	MTHL	CRN	002	The radiator for the crane was in bad condition, the louvers were corroded severely and the housing around the radiator was corroded.	B	Replace the radiator, radiator housing and louvers on crane as needed. Replace the fans and fan guards as for the radiator and cooler as needed.	2
1137	Crane #2 Stbd	MTHL	CRN	002	The main block sheaves were worn on the pin and were rubbing on the sides of the block. The sheaves had cable prints worn in the face of the sheaves. By checking them with a sheave gauge, the wear was showing they were in need of changing as well. The block did not have grease points/fittings installed for lubrication of the sheaves; they were no place installed for adding grease fittings as well.	A	Replace the main block or have completely reworked and NDT test done.	1
1138	Crane #2 Stbd	MTHL	CRN	002	The main block sheave at the dead-man end was worn and rubbing on the sides. The sheave had cable prints in it as well. The main pins on the dead-man sheave housing was corroded and only taking grease on one side of the pin.	B	Replace the dead-man sheave and housing block. Replace all pins for the housing block as well.	1
1139	Crane #2 Stbd	MTHL	CRN	002	The load cell located on the dead-man cable end was bent and worn severely; the pin was worn to the point where it must be replaced.	A	Replace the load cell and pin for the load-cell; the load-cell and indicator must be calibrated when replaced.	1
1140	Crane #2 Stbd	MTHL	CRN	002	The boom camera bracket was severely corroded and the safety cable was corroded to the point it must be replaced.	B	Repair/replace the boom camera mounting bracket and replace the safety cable for the camera.	1
1141	Crane #2 Stbd	MTHL	CRN	002	All (3) three sheaves on the boom tip for the whip line were showing signs of wear and had cable prints in the sheaves. The sheaves were rubbing on both sides, indicating wear of the pin or sheave, to the point they must be replaced at nearest opportunity.	B	Replace all (3) three whip line sheaves at boom tip at nearest opportunity.	1
1142	Crane #2 Stbd	MTHL	CRN	002	After reviewing of the crane logs, it was noted, the main gear box for the crane was leaking and had to have gear oil added often.	B	Repair the leak on the main gear box as needed.	2
1143	Derrick Fingerboard Upper	PH	FGBD	001	Corroded safety lines on fingers	C	Continue replacing damaged safety lines.	3
1144	Derrick Fingerboard Upper	PH	FGBD	001	Leak on small bore tubing adjacent derrick ladder	C	Repair air leak.	3
1145	Derrick Fingerboard Upper	PH	FGBD	001	Air line filter damaged and leaking at MB level	C	Replace leaking filter.	3
1146	Pipe Racking System #1 Aft	PH	PHM	001	Hydraulic cylinder leaking on aft PRS wire tension cylinder	C	Repair hydraulic leak	3
1147	Pipe Racking System #1 Aft	PH	PHM	001	PRS track had been replaced in the past year and is wearing prematurely.	C	Replace track, preferably with harder material and change 4 wheel carriage with 8 wheel carriage as planned to displace the load.	3

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1148	Casing Rotator	PH	PHM	008	Lower clamp motor leaking and has been plugged off	C	Fit replacement hydraulic motor, We are informed that a motor has been on order for several months, and still not received.	3
1149	Casing Rotator	PH	PHM	008	Corrosion on hose hydraulic hose fitting on horizontal to vertical pipe handler and under control console.	C	Clean corrosion from hose connections and wrap with Denso tape.	3
1150	Casing Rotator	PH	PHM	008	Hydraulic gauges on control console damaged.	C	Replace hydraulic gauges.	3
1151	Rig Floor Utility Winch #1 Orange	PH	UWIN	001	Isolation ball valve for all utility winches used for manriding are not within easy reach of the operator.	C	Fit ball valve next to winch controls	3
1152	Rig Floor Utility Winch #4 Green	PH	UWIN	003	Port Fwd rig floor utility winch air supply hose damaged.	C	Replace damaged hose	3
1153	Rig Floor Utility Winch #13 Red DWKS Fwd	PH	UWIN	004	Both winches at the auxiliary derrick are blowing oil from exhausts.	C	Repair or replace winches	3
1154	Rig Floor Utility Winch #13 Red DWKS Fwd	PH	UWIN	004	Back plate for auxiliary derrick winch controls are corroded.	C	Replace back plate.	3
1155	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003	Wire corroded out	A	Replace wire.	1
1156	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003	Winch badly corroded paint falling off winch.	C	Remove winch from service carry out overhaul, remove corrosion and paint.	3
1157	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003	To prevent corrosion cover winch when not in use.	C	Fit tarpaulin over winch	3
1158	Casing Stabbing Basket	PHL	WPB	001	Check when last load test was carried out	C	Ensure a yearly load test is carried out.	3
1159	Water Maker #5	POTW	WTMK	005	The water maker #5 had a soft patch on one of the pipes, the new pipe was setting next to the unit for installing.	B	Install new pipe on #5 water maker as needed.	1
1160	Water Maker #5	POTW	WTMK	005	The main salt water line going to the water maker had a bad corroded spot showing in the line and the flange was leaking at the connection of the water maker.	B	Replace the bad salt water line going to the water maker and replace/repair the flange at the top of the unit as needed.	1
1161	Water Maker #6	POTW	WTMK	006	The main salt water line was leaking at the connection on the unit around the flange gasket.	B	Repair/replace the flange connection at the top of the water maker unit.	2
1162	Thruster #1 Heat Exchanger	PROP	HTEX	001	On inspection of the thruster cooling heat exchangers all of the heat exchangers unit were showing wear and leaks on the units. Due to ages and the units showing to be wearing thin in places the leaks are showing up more often.	C	Replace all thruster heat exchangers as needed.	2
1163	Thruster #2 AC Motor	PROP	MTR	024	It was reported to us thruster AC motor No 2 is down waiting to be replaced due to a flashover of the winding, we also noted the junction boxes for the motor were in a poor condition with severe rust	B	As planned replace No 2 thruster AC motor, also the two junction boxes	1
1164	Thruster #3 AC Motor	PROP	MTR	028	It was reported to us the fresh water radiator unit for the thruster No 3 was not operational.	B	As planned replace the FW radiator.	3
1165	Thruster #8	PROP	THR	008	#8 Thruster had some hydraulic leaks on the unit around the shaft seal on top of the unit. The hydraulic lines going to the hydraulic system were leaking at the connections.	B	Replace all of the hydraulic seals and O-rings as needed as well and repairing the hydraulic connection leaks as needed.	2
1166	Thruster #8	PROP	THR	008	The oil samples were showing water was getting into the oil system of all thrusters and in review of the history this has been going on for some time now on all of the thrusters. Numbers 2 and 3 were showing to have been getting more water into the oil system and this will continue to worsen if the seals are not replaced soon.	B	Replace the main seals on all of the thruster at the nearest opportunity. If it will be some time before this can be taken care of, it is recommended to install a filter system for each thruster in order to help prevent the water from entering into the oil system and causing major problems to the thrusters.	1
1167	Riser Skate	RISH	BOPC	001	Carriage chains worn and require replacement	C	Replace worn carriage chains.	3
1168	Riser Skate	RISH	BOPC	001	Riser skate chain missing and requires replacement.	C	Replace missing riser skate chain.	3
1169	Riser Skate	RISH	BOPC	001	Skate track is damaged, caused by cart jumping off the track.	C	Repair skate cart track.	3

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1170	Riser Overhead Bridge Crane	RISH	OCRN	001	The crane will not trolley the winches back and forth even when moving the load as needed. It was noted the limit sensors were not working correct and needed to be adjusted or replaced to solve this problem.	B	Repair/replace the limit sensors on the units as needed to set the speed of the winches for keeping the two winches even when moving the loads.	2
1171	Riser Overhead Bridge Crane	RISH	OCRN	001	It was noted during the testing of the crane, when the operator needs to move the crane to the port, he has to move the crane to the STBD first to keep the crane from (grabbing) hanging up due to FWD end moving more (faster) then the AFT end on the track system.	B	Repair the problem if possible as to the adjustment of the sensors or check into getting a manufacture tech out to the rig for making the needed repair of the unit.	2
1172	Main Deck	RST	STRU	016	The cable transit between the mud pit room and the mud pump room starboard side was not sealed correctly.	A	Ensure transit is sealed correctly.	3
1173	Main Deck	RST	STRU	016	Several areas of the rig the cable tray was corroded or damaged which included the cable tray back of galley next to life boat deck and cable tray outside mud lab door on the main deck.	C	Replace as necessary.	3
1174	Main Deck	RST	STRU	016	The ceiling tiles are missing the starboard A/C compressor room.	C	Replace the missing tiles	3
1175	Riser Recoil Controller	RTS	CTRU	002	The Riser Recoil System was not functioning in an automatic state as designed. The unit works off of Tensioner Rod position indication, which is achieved through transducers and machined groves in the rods. It was explained that some of the Tensioner rods have been changed out with new rods that do not have the machined groves, which in turn have disabled the automatic function of the Riser Recoil System.	A	Restore Riser Recoil system to operate as designed.	1
1176	Riser Tensioner #1 Cylinder #1A	RTS	HCYL	001	There were no records of NDT inspections for the Tensioners or support structure	B	Perform NDT inspection of Riser Tensioners, and support structure to determine the need for repairs and/or replacements.	2
1177	Riser Tensioner #1 Cylinder #1B	RTS	HCYL	002	The Tensioner Cylinder protective coating was flaking off in various areas, and is in need of maintenance	C	Perform protective coating maintenance on the Riser Tensioner Cylinders.	3
1178	Riser Tensioner #2 Cylinder #2A	RTS	HCYL	003	The #2 Tensioner was not in service due to a leaking Rod End seal.	B	Repair the leaking Rod End seal on #2 Tensioner.	2
1179	Riser Tensioner #5 Cylinder #5A	RTS	HCYL	009	The #5 Tensioner hose is damaged on the outer sheathing.	B	Replace the #5 Tensioner HP air supply hose as planned.	2
1180	Seawater System Pipework	SEA	PIPE	001	The sea water pipes for the engines and water makers were in bad condition, leaks are showing up daily and the pipes were corroded in different places through out the rig.	B	Replace all corroded sea water piping as needed.	2
1181	Seawater System Pipework	SEA	PIPE	001	The sea water valves going to all the main engine coolers were hard to function and showing signs of leaking around the valves.	B	Replace all sea water valves as needed for the engine coolers.	2
1182	Seawater System Pipework	SEA	PIPE	001	The piping in Thruster room #8 had some spools and piping next to the sea water service pump that needs protective coating/painting applied.	C	Put protective coating on all piping and spools as needed in Thruster room #8.	3
1183	Seawater Pump #1	SEA	PMP	001	Number 1 sea water service pump was leaking and corroded severely. The pump was worn and in need of being replaced. Located in #8 Thruster room. The pump housing was in bad condition.	B	Replace #1 sea water service pump located in Thruster room #8.	2
1184	Lifeboat #2	SURV	BOAT	2	Lifeboat #2 port door glass was cracked.	C	Replace the glass.	3
1185	Lifeboat #4	SURV	BOAT	4	There was skin damage on lifeboat No 4 and the reflective tape was in a poor condition.	C	Repair as necessary.	3

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1186	TFW Cooling System Pipework	TFS	PIPE	001	The fresh water line going to all six water makers were corroded and small leaks in several places around the connection flanges at the water makers.	B	Replace all corroded fresh water piping going to the water makers as needed.	2
1187	TFW Cooling System Pipework	TFS	PIPE	001	The discharge pressure gauge on #1 pump for the fresh water cooling system on the port side of rig, located in the #1 engine room, was broken.	B	Replace the discharge pressure gauge on #1 pump for the fresh water cooling system on port side of rig in #1 engine room.	2
1188	TFW Cooling System Pipework	TFS	PIPE	001	The valve was leaking and corroded on the main water line at #2 heat exchanger for the fresh water cooling system on the port side of the rig in #1 engine room. The valve on the line was located on the upper (top) water line on the right hand side when standing in front of the unit.	B	Replace the butterfly valve that was leaking on the upper line on #2 fresh water heat exchanger for port side of the rig, located in #1 engine room.	2
1189	TFW Cooling System Pipework	TFS	PIPE	001	The suction pressure gauge on #2 fresh water pump, located on the STBD side of the rig in #6 engine room was broken.	B	Replace the suction gauge on #2 fresh water cooling pump, located on the STBD side of the rig in #6 engine room.	2
1190	TFW Cooling System Pipework	TFS	PIPE	001	The main water line going down through the deck, located next to #2 fresh water heat exchanger on the port side of the rig in engine room #1; was severely corroded and the butterfly valve was leaking. The valve was also hard to open and close.	B	Replace the main water line going through the deck. Located next to #2 fresh water heat exchange on the port side of the rig in #1 engine room. Also replace the butterfly valve on the same pipe.	2
1191	Obstruction Lighting System	VI	LTE	002	Several 10 mile obstruction lights were not working.	C	Repair as necessary.	3
1192	18-3/4" BOP Lower Annular	WCS	ANNU	001	Leak during pressure tests	C	Investigate where the leak is once the stack is onboard and repair	3
1193	18-3/4" BOP Lower Annular	WCS	ANNU	001	Packing element is left out in weather.	B	Element needs to be packaged in protective box and protected from weather and UV. Needs to be stored in a controlled environment	2
1194	18-3/4" BOP Upper Annular	WCS	ANNU	002	Packing element is left out in weather.	B	Element needs to be packaged in protective box and protected from weather and UV. Needs to be stored in a controlled environment	2
1195	18-3/4" BOP Lower Double Rams	WCS	BOPR	003	Spare Ram Blocks stored improperly	C	Package and protect spare blocks from weather	3
1196	18-3/4" BOP Lower Double Rams	WCS	BOPR	003	Spare Ram Blocks are not protected and corrosion is starting.	C	Perform Protective coating maintenance	3
1197	18-3/4" BOP Stack/Frame	WCS	BOPS	001	Corrosion present on frame work	C	Perform Protective coating maintenance	3
1198	18-3/4" LMRP Stack/Frame	WCS	BOPS	002	Corrosion present on frame work	C	Perform Protective coating maintenance	3
1199	Drillers BOP Control Panel	WCS	CTRU	002	Purge Air System not working	B	Replace the diaphragm on the purge pump and replace the door seal	2
1200	Toolpushers BOP Control Panel	WCS	CTRU	003	Stand Pipe hole fill valve close light blinks with the Surface flow Meter light occasionally when operated.	C	Investigate which card needs to be replaced and install in the panel to fix light.	3
1201	Toolpushers BOP Control Panel	WCS	CTRU	003	Pod Mismatch and error message reading valve mismatch (50)	B	Investigate why Pod Mismatch is happening and correct Valve mismatch (50) error.	2
1202	Choke Control Unit	WCS	CTRU	005	Valve leaking on console Stewart and Stevenson unit	C	Investigate and replace leaking valve on Remote Console on Drill Floor	3
1203	Choke Control Unit	WCS	CTRU	005	Pressure gauges not calibrated on Stewart and Stevenson	C	Calibrate Pressure gauges on Remote Console on Drillers Floor	2
1204	Choke Control Unit	WCS	CTRU	005	Pressure gauges not repeating on unit inside drillers console	C	Investigate why the pressure gauges on the remote console located in Drillers House have to be recalibrated every time.	3
1205	Diverter	WCS	DIVT	001	Proximity switch on trip tank Valve is not functioning properly	C	Replace Proximity switch on trip tank valve which is faulty.	3
1206	Subsea Flex Joint	WCS	FJRA	001	The Lower Flex Joint currently in use is a loaner from the Nautilus, and the Horizons Lower Flex Joint had been sent in for the 5 yearly overhaul, and is currently awaiting shipment to the rig and an assesment was not carried out on the unit.	B	Install the overhauled Lower Flex Joint at the next opportunity as planned.	2
1207	BOP HPU Pump #1	WCS	PMP	001	Pump is unusually running louder than the other two pumps	C	Investigate loud noise coming from pump when running as compared to number 2 and 3	3
1208	BOP HPU Pump #1	WCS	PMP	001	No marking on pumps stating they start automatically	C	Install signs informing workers the pumps start automatically.	3

CONFIDENTIAL

MODUSI 01 0 000125

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
1209	BOP HPU PRV #1	WCS	PRV	001	Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
1210	BOP HPU PRV #2	WCS	PRV	002	Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
1211	BOP HPU PRV #3	WCS	PRV	003	Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
1212	Riser Joint DWH002 1K Tan	WCS	RISE	001	Riser Auxiliary Lines did not have pin end and box end covers installed	C	Install protective covers for Auxiliary Lines	3
1213	Blue BOP MUX Cable Reel	WCS	SSHR	001	Corrosion present on frame work	C	Perform Protective coating maintenance	3
1214	Yellow BOP MUX Cable Reel	WCS	SSHR	002	Corrosion present on frame work	C	Perform Protective coating maintenance	3
1215	Hot Line Hose Reel	WCS	SSHR	004	Corrosion present on frame work	C	Perform Protective coating maintenance	3
1216	Powered Watertight Doors	WTD	WTDR	003	Hydraulic door not working entering 24 meter level from column STBD side, have to manual pump the door open and closed.	C	Repair the hydraulic problem with the door at the 24 meter level.	2



Deepwater Horizon Rig Hardware Assessment HQS Maintenance Department

Date: 11 Apr 2010

Rev 3

A	Critical equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.
B	Major items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.
C	Minor items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

Reference Number	DESCRIPTION	TAG			FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
		System	Comp	No				
2001	BOP Transporter	BOPH	BOPF	001	No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
2002	BOP Bulkhead Guiding System	BOPH	BOPF	002	No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
2003	BOP Transporter Underhull Guide	BOPH	BOPF	003	No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
2004	BOP Bridge Crane #1	BOPH	OCRN	001	No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
2005	Ex./Sup. Fans	ELPD	HAZA	001	There were no identification tags on any of the electrical equipment in the hazardous areas plus there as been no Ex registrar set up.	A	Tag all electrical equipment in the hazardous areas on the rig then enter all the information into the Ex register.	1
2006	Ex./Sup. Fans	ELPD	HAZA	001	There were no ABS approved hazardous area drawing on the rig.	C	Display a set of hazardous areas drawing on the rig.	3
2007	11 KV Main Switchboard #1	ELPD	SWBD	001	There are no reports on the rig when current injection on the main circuit breakers was last performed	B	As soon as practical perform secondary current injection by a certified unbiased testing facility on the main circuit breakers (Ref: HQS-OPS-TIB-630-03).	1
2008	11KV/480V 500-KVA Transformer #1	ELPD	TFMR	005	PM are being signed off on the HV transformers without being completed due to the construction of equipment which does not allow inspection of inside the transformer with out shutting them down.	B	The rig must raise a REA to address this issue.	1
2009	Helideck Foam System Tank	FFS	TANK	002	Foam due to be sampled	C	Take sample of foam to check that no deterioration of the foam has taken place.	3
2010	Mud Pump #1 Discharge Dampener	HPMS	PDAM	001	No records of any inspection being carried out on the mud pump discharge pulsation dampeners	C	Carry out an inspection of the PASFE dampeners to determine condition of choke tube, internal condition and wall thickness. Anticipated life of choke tube is 3 to 10 years.	3
2011	HP Mud System Pipework	HPMS	PIPE	001	Wall thickness readings have been taken and put into a spread sheet form, difficult to identify were readings were taken.	C	Isometric drawings should also be supplied on high pressure pipework systems to identify were readings were taken.	3
2012	HP Mud System Pipework	HPMS	PIPE	001	Wall thickness readings have been taken and put into a spread sheet form, difficult to identify were readings were taken.	C	Isometric drawings should also be supplied on high pressure pipework systems to identify were readings were taken.	3
2013	Crane #1 Port	MTHL	CRN	001	The walkway on the boom used for maintenance of the sheaves at the boom tip, had nothing installed for being able to perform needed maintenance of the sheaves or boom tip. The only way to perform the task safely, is from a work basket using the other deck crane. This is tying up both cranes to perform the task.	C	Install a safe walkway at the boom tip for being able to perform maintenance PM's on the boom sheaves and install a safe walkway leading down the boom with a safety tie/hook off cable for attaching a harness lanyard for anti-fall equipment. This is recommended for both cranes.	3
2014	Riser Tensioner Ring	RTS	TENR	001	No NDT inspection records on board	B	Acquire and retain valid NDT certification documentation on board the rig.	1
2015	BOP Sub-Sea Accumulator Bank	WCS	ACUM	008	No up to date UT wall thickness records found on board	B	Perform proper NDT on equipment to verify wall Thickness	1

CONFIDENTIAL

MODUSI 01 0 000126

Reference Number	DESCRIPTION	System	Comp	No	FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
2016	18-3/4" BOP Lower Annular	WCS	ANNU	001	The last date of certification for the Lower Annular was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Lower Annular with new or re-certified Annulars, and send in the currently installed Annulars for the 5 yearly inspection, overhaul, and re-certification.	1
2017	18-3/4" BOP Upper Annular	WCS	ANNU	002	The last date of certification for the Upper Annular was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Upper Annular with new or re-certified Annulars, and send in the currently installed Annulars for the 5 yearly inspection, overhaul, and re-certification.	1
2018	18-3/4" BOP Middle Single Rams	WCS	BOPR	001	The last date of certification for the Middle Single Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Middle Single Ram BOP Assembly with new or re-certified Annulars, and send in the currently installed Annulars for the 5 yearly inspection, overhaul, and re-certification.	1
2019	18-3/4" BOP Lower Double Rams	WCS	BOPR	003	The last date of certification for the Lower Double Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Lower Double Ram BOP Assembly with new or re-certified Annulars, and send in the currently installed Annulars for the 5 yearly inspection, overhaul, and re-certification.	1
2020	18-3/4" BOP Upper Double Rams	WCS	BOPR	004	The last date of certification for the Upper Double Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Upper Double Ram BOP Assembly with new or re-certified Annulars, and send in the currently installed Annulars for the 5 yearly inspection, overhaul, and re-certification.	1
2021	Diverter	WCS	DIVT	001	The last date of certification for the Diverter was 5 July 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Diverter with new or re-certified Annulars, and send in the currently installed Annulars for the 5 yearly inspection, overhaul, and re-certification.	1
2022	Subsea Flex Joint	WCS	FJRA	001	No certification documentation for the Lower Flex Joint currently in use was available for review.	A	Acquire and retain valid manufacturer's certification documentation on board the rig.	1
2023	Sub Sea BOP Kill Hoses	WCS	HOSE	004	The last date of certification was 1 January 2000, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Replace the Kill LMRP Jumper Hose with new or re-certified hose, and send in the currently installed hose for the 5 yearly inspection and re-certification.	1
2024	Surface Choke Hoses	WCS	HOSE	009	The last date of certification was 2 July 2004, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Replace the Mud Boost Drape Hose with new or re-certified hose, and send in the currently installed hose for the 5 yearly inspection and re-certification.	1
2025	Choke Manifold	WCS	MANI	001	No current certification for all valves found on board	A	Obtain and retain valid certification documentation for the gate valves on board the rig.	1
2026	Choke Manifold	WCS	MANI	001	There was no record of serial numbers of Gate Valves and installation locations for accurate tracking.	C	Maintain a log of valve Serial numbers, and location of installation on board the rig to accurately track equipment maintenance.	3
2027	Blue BOP MUX Cable Reel	WCS	SSHR	001	No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
2028	Yellow BOP MUX Cable Reel	WCS	SSHR	002	No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
2029	Hot Line Hose Reel	WCS	SSHR	004	No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
2030	BOP Upper Choke Line Failsafe Valve	WCS	VLV	002	The last date of certification was 13 December 2000, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Acquire and retain valid manufacturer's certification documentation on board the rig.	1
2031	BOP Lower Choke Line Failsafe Valve	WCS	VLV	003	There was no record of serial numbers of Failsafe Valve and installation locations for accurate tracking.	A	Maintain a log of valve Serial numbers, and location of installation on board the rig to accurately track equipment maintenance.	1



Deepwater Horizon Rig Hardware

HQS Maintenance Department

Date: 11 Apr 2010

Rev 3

A	Critical equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.
B	Major items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.
C	Minor items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

Reference Number	DESCRIPTION	TAG			FINDINGS - IMPROVEMENT	RECOMMENDATION DETAIL
		System	Comp	No		
3001	Bilge System Pipework	BILG	PIPE	001	In the water maker rooms, located in front of each of the main engines; has no bilge system set up in the areas. In order to pump out the bilge areas in all 6 of the locations, the crew has to rig up a jagger pump to pump out the water or fluids as needed. The water makers are located in all of the 6 areas and the rig has had problems with the saltwater and fresh water lines leaking due to the lines are in bad condition. This is causing a safety issue due to the flooding of the rooms if a pipe burst and major water control should be lost.	Recommended to have a auto bilge system installed in the engine rooms and in the water maker rooms as needed.
3002	P-Tank #1	BMS	BUTK	001	Unable to monitor bulk tank vents from bridge to verify when filling tanks.	Install CCTV camera on vent lines.
3003	Non Hazardous Area CCTV Cameras	COMM	CAM	002	The rig crew would like to have more CCTV installed around the rig which would include the riser deck, the loading station and fwd and stern of the vessel to see the area of sea around the rig.	The rig should raise a REA to address the issue with the CCTV system.
3004	Top Drive	DSRT	TD	001	Replace top drive to 1000 ton model , present unit rated to 750 tons.	To eliminate the need to rack back the top drive when high hook loads are encountered.
3005	11KV/600V Drilling Power Transformer #1	ELPD	TFMR	021	It was reported to us the rig plan to install windows in the main transformers and switchboards to help with performing thermographic surveys.	As planned install the inspection windows in the main transformers and switchboards to help with performing thermographic surveys.
3006	Man Riding Winch #5 White Rig Floor Port Aft	PHL	MWIN	001	Man riding winches are rated at 2500 lbs, no slack line detection sytem fitted.	For maximum safety manriding winch working load should be limited to 300 lbs with slack line detection sytem installed. Consider replacing man riding winches.
3007	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003	All wiches in the moonpool area are subject to harsh conditions making them more suseptible to corrosion.	Source covers to be used on moonpool winches when not in use.
3008	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003	Consider installing 2 hydraulically operated work baskets to access equipment in the moonpool area.	This would remove the necessity of man riding in this area. Man riding should be considered the last resort to access equipment.

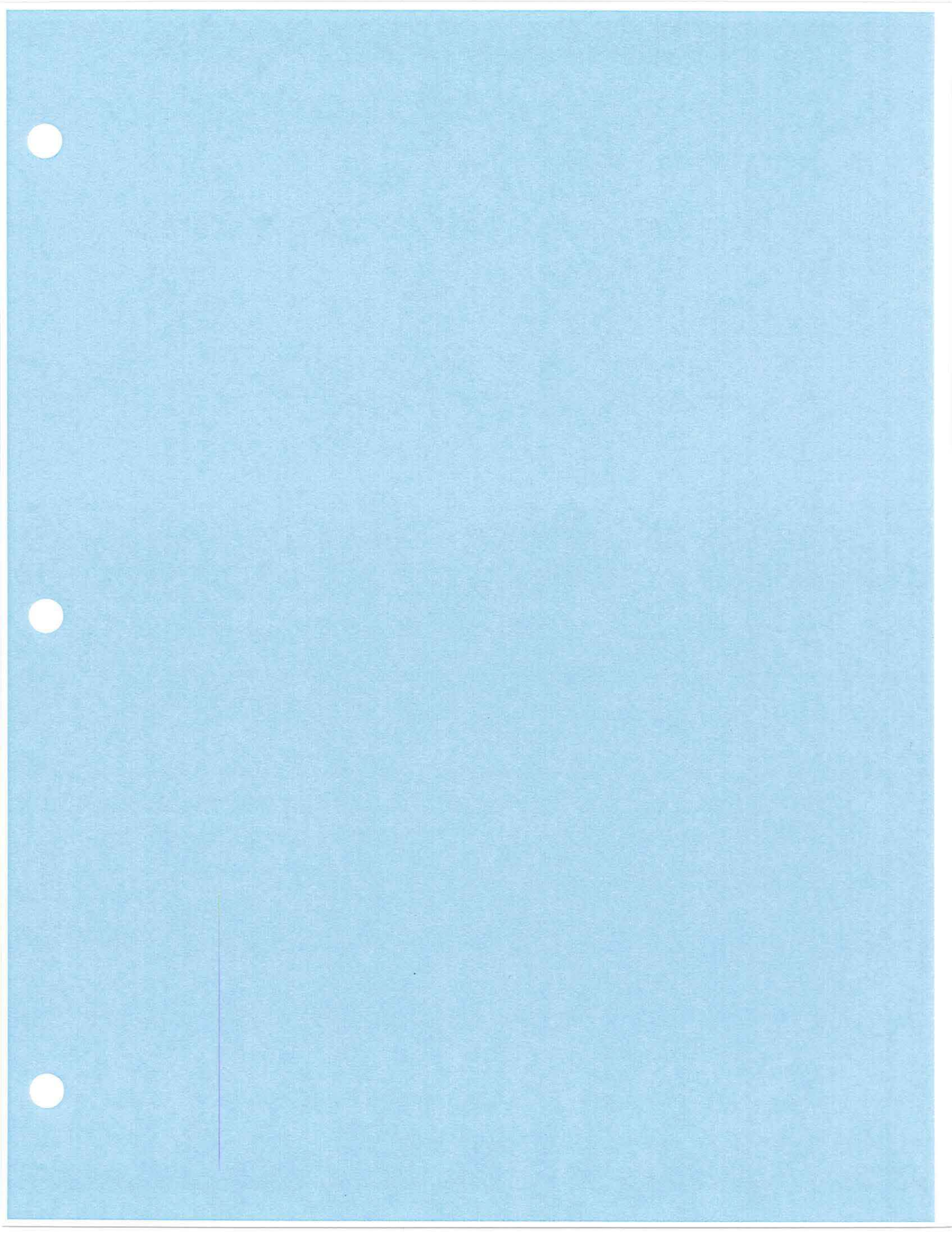
(Rig Name) Assessment (From-To Dates)

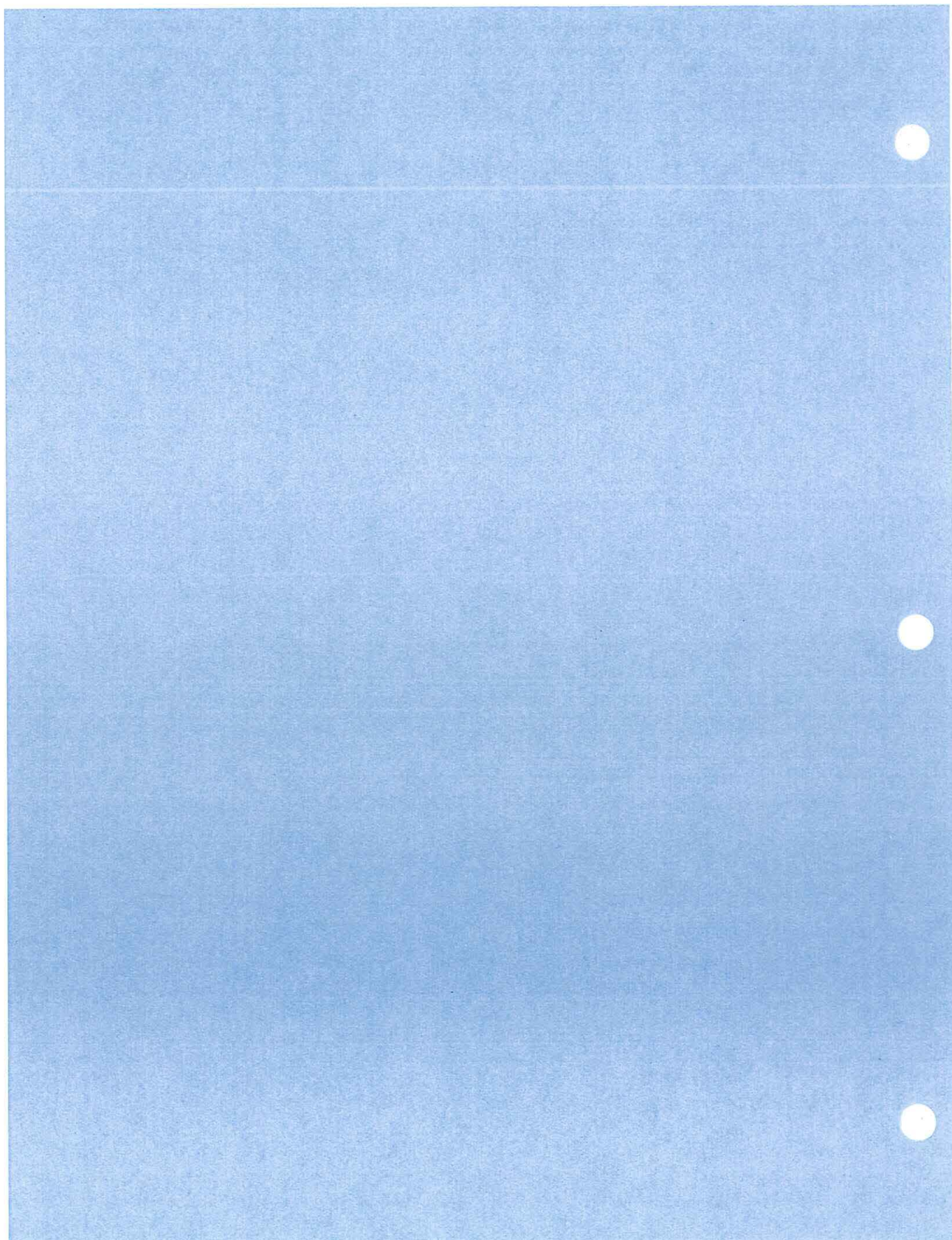
Page 1 of 2

Corrective Opportunities

CONFIDENTIAL

MODUSI 01 0 000128







Transocean Rig Hardware Assessment Definitions

Priority Codes	A	B	C
Priority Definitions	Critical items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.	Major items that may lead to damage to essential equipment or detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.	Minor items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

Condition Levels	Level 1	Level 2	Level 3
Equipment Definitions	<ul style="list-style-type: none"> • Equipment is in bad condition; it is not working or should be removed from service until deficiencies are rectified. • Equipment has excessive down time. • Equipment wear is past OEM limits or is obsolete and no longer supported by OEM. 	<ul style="list-style-type: none"> • Equipment is in fair condition; some major deficiencies have been noted. • Equipment has some downtime. • Equipment wear is getting close to OEM limits or is nearing end of useful life. 	<ul style="list-style-type: none"> • Equipment is in good condition; some minor deficiencies may have been noted.
Structural Definitions	• Structure/steel is highly corroded and/or wasted and requires replacement.	• Structure/steel is showing heavy corrosion and/or minor wastage	• Structure/steel is well coated; may show some signs of minor corrosion.

CONFIDENTIAL

MODUSI 01 0 000130

<p>Maintenance System Definitions</p>	<ul style="list-style-type: none"> • Maintenance System is not understood by crew. • Major PM Tasks are more than 12 months overdue. • PM's have been closed without being completed. • Certification documents are missing. 	<ul style="list-style-type: none"> • Some improvement areas regarding the Maintenance System. • PM Tasks are 6 to 12 months overdue. • PM's are not fully completed or closed without being completed as per task steps. 	<ul style="list-style-type: none"> • Maintenance system is understood by crew. • Major PM Tasks are completed mostly on time.
--	--	---	---

This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be tra or divulged to any other company or person without express written permission.

ms

Level 4

- Equipment is in new or like new condition. There are no deficiencies noted

- Structure/steel is new or in like new condition. There are no signs of corrosion.

CONFIDENTIAL

MODUSI 01 0 000132

- All PM Tasks are always completed on time.
- A leader among rig class in Maintenance system performance.

ansferred, reproduced, conveyed

CONFIDENTIAL

MODUSI 01 0 000133



A		Critical equipment
B		Major item failure or
C		Minor item

Reference Number	DESCRIPTION	TAG		
		System	Comp	No.
1001	Accommodation	ACOM	ACM	001
1002	Accommodation	ACOM	ACM	001
1003	Galley Equipment	ACOM	GEQT	001
1004	Galley Equipment	ACOM	GEQT	001
1005	HP Tensioner APV #1	AIR	ARCV	003
1006	HP Tensioner APV #2	AIR	ARCV	004
1007	HP Tensioner APV #8	AIR	ARCV	010
1008	HP Air Compressor #1	AIR	COMP	007

Reference Number	DESCRIPTION	System	Comp	No.
1009	HP Air Compressor #1	AIR	COMP	007
1010	HP Tensioner APV #26 PRV	AIR	PRV	042
1011	HP Tensioner Standby APV #1 PRV	AIR	PRV	047
1012	Bilge/Ballast Control HPU #1 Stbd Fwd	BLST	HPU	001
1013	P-Tank #1	BMS	BUTK	001
1014	P-Tank #1	BMS	BUTK	001
1015	Surge Tank #1	BMS	BUTK	011
1016	Surge Tank #1	BMS	BUTK	011
1017	Bulk Storage Instrumentation	BMS	INST	001
1018	Bulk Storage Instrumentation	BMS	INST	001
1019	BOP Bulkhead Guiding System	BOPH	BOPF	002
1020	BOP Bridge Crane #1	BOPH	OCRN	001
1021	BOP Bridge Crane #1	BOPH	OCRN	001
1022	Hazardous Area General Alarms	COMM	ALRM	001
1023	Non Hazardous Area General Alarm	COMM	ALRM	002

Reference Number	DESCRIPTION	System	Comp	No.
1024	Non Hazardous Area CCTV Camera	COMM	CAM	002
1025	Public Address System	COMM	CTRU	001
1026	Drilling Instrumentation	DIST	INST	001
1027	Crown Block Main	DRHS	CROW	001
1028	Crown Block Main	DRHS	CROW	001
1029	Derrick	DRHS	DERK	001
1030	Derrick	DRHS	DERK	001
1031	Derrick	DRHS	DERK	001
1032	Derrick	DRHS	DERK	001
1033	Derrick	DRHS	DERK	001
1034	Derrick	DRHS	DERK	001

Reference Number	DESCRIPTION	System	Comp	No.
1035	Derrick	DRHS	DERK	001
1036	Derrick	DRHS	DERK	001
1037	Derrick	DRHS	DERK	001
1038	Derrick	DRHS	DERK	001
1039	Derrick	DRHS	DERK	001
1040	Derrick	DRHS	DERK	001
1041	Derrick	DRHS	DERK	001
1042	Derrick	DRHS	DERK	001
1043	Drawworks Active Heave	DRHS	DWKS	001
1044	Drawworks Active Heave	DRHS	DWKS	001
1045	Drawworks Active Heave	DRHS	DWKS	001
1046	Drawworks Active Heave	DRHS	DWKS	001
1047	Drawworks Auxiliary Handling	DRHS	DWKS	002
1048	Drawworks Auxiliary Handling	DRHS	DWKS	002

Reference Number	DESCRIPTION	System	Comp	No.
1049	Drawworks AC Drive Motor #2	DRHS	MTR	002
1050	Drawworks AC Drive Motor #5	DRHS	MTR	005
1051	Rotary Table	DSRT	ROT	001
1052	Top Drive	DSRT	TD	001
1053	Ex./Sup. Fans	ELPD	HAZA	001
1054	480V MCC #1	ELPD	MCC	001
1055	VFD Switchboard Line Up #1	ELPD	SWBD	018
1056	11KV/600V Drilling Power Transformer #1	ELPD	TFMR	021
1057	Main Engine #1	ELPG	ENG	001

Reference Number	DESCRIPTION	System	Comp	No.
1058	Main Engine #3	ELPG	ENG	003
1059	Main AC Generator #1	ELPG	GEN	001
1060	Main AC Generator #1	ELPG	GEN	001
1061	Main AC Generator #1	ELPG	GEN	001
1062	Main AC Generator #4	ELPG	GEN	004
1063	Main AC Generator #5	ELPG	GEN	005
1064	Main AC Generator #6	ELPG	GEN	006
1065	Main Engines LT Cooling System Pipework	ELPG	PIPE	001

Reference Number	DESCRIPTION	System	Comp	No.
1066	Main Engines LT Cooling System Pipework	ELPG	PIPE	001
1067	Oily Water Separator #1	EVNS	SEP	1
1068	Sewage Treatment Vacuum Toilet System	EVNS	SWGE	002
1069	Oily Water Separator Tank Stbd	EVNS	TANK	004
1070	Waste Oil Holding Tank Port	EVNS	TANK	001
1071	Emergency Generator Room CO2 Fire Supression	FFS	FS	003
1072	Helideck Fire Monitors	FFS	MON	002
1073	Helideck Foam Pump AC Motor	FFS	MTR	006

Reference Number	DESCRIPTION	System	Comp	No.
1074	Foam System Pipework	FFS	PIPE	002
1075	Foam Pump PRV	FFS	PRV	005
1076	Helideck Foam System Tank	FFS	TANK	002
1077	Foam System Valves	FFS	VLV	002
1078	Portable Gas Detectors	FGDS	PGD	001
1079	Helicopter Refueling System	FUEL	HELI	001
1080	Fuel Oil Pump #1 Port Purifier Room	FUEL	PMP	001
1081	Fuel Transfer Pump #1 Port	FUEL	PMP	003
1082	Fuel Transfer Pump #1 Port	FUEL	PMP	003
1083	Mud Pump #1	HPMS	MP	001

Reference Number	DESCRIPTION	System	Comp	No.
1084	Mud Pump #1	HPMS	MP	001
1085	Mud Pump #1	HPMS	MP	001
1086	Mud Pump #1	HPMS	MP	001
1087	Mud Pump #1	HPMS	MP	001
1088	Mud Pump #2	HPMS	MP	002
1089	Mud Pump #2	HPMS	MP	002
1090	Mud Pump #2	HPMS	MP	002
1091	Mud Pump #2	HPMS	MP	002

Reference Number	DESCRIPTION	System	Comp	No.
1092	Mud Pump #3	HPMS	MP	003
1093	Mud Pump #3	HPMS	MP	003
1094	Mud Pump #3	HPMS	MP	003
1095	Mud Pump #3	HPMS	MP	003
1096	Mud Pump #4	HPMS	MP	004
1097	Mud Pump #4	HPMS	MP	004
1098	Mud Pump #1A AC Drive Motor	HPMS	MTR	001
1099	Mud Pump #1A AC Drive Motor	HPMS	MTR	001
1100	Mud Pump #1A AC Drive Motor	HPMS	MTR	001
1101	Mud Pump #2A AC Drive Motor	HPMS	MTR	005
1102	Mud Pump #3A AC Drive Motor	HPMS	MTR	009

Reference Number	DESCRIPTION	System	Comp	No.
1103	Mud Pump #3A AC Drive Motor	HPMS	MTR	009
1104	Mud Pump #4A AC Drive Motor	HPMS	MTR	013
1105	Air Conditioning Unit #5 Switchboard	HVAC	ACU	005
1106	Air Conditioning Unit CCR	HVAC	ACU	029
1107	Main Air Conditioning Unit #1A	HVAC	ACU	035
1108	Air Handling Unit #1	HVAC	AHU	001
1109	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001
1110	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001
1111	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001
1112	Rig Central Equipment HPU	HYD	HPU	002
1113	Rig Central Equipment HPU	HYD	HPU	002
1114	Rig Central Equipment HPU	HYD	HPU	002
1115	Aircraft Warning Lights	LHTG	LTE	001

Reference Number	DESCRIPTION	System	Comp	No.
1116	Non Haz Area Emerg Lighting	LHTG	LTE	002
1117	Mud Degasser #2	MCS	DGAS	002
1118	Shale Shaker Cascading #1	MCS	SHAK	001
1119	Mud Pit Tank #5 Agitator #5A AC M	MDS	MTR	005
1120	Mud Storage Valves	MDS	VLV	001
1121	Mud Storage Valves	MDS	VLV	001
1122	Crane #1 Port	MTHL	CRN	001
1123	Crane #1 Port	MTHL	CRN	001
1124	Crane #1 Port	MTHL	CRN	001
1125	Crane #1 Port	MTHL	CRN	001
1126	Crane #1 Port	MTHL	CRN	001

Reference Number	DESCRIPTION	System	Comp	No.
1127	Crane #1 Port	MTHL	CRN	001
1128	Crane #1 Port	MTHL	CRN	001
1129	Crane #1 Port	MTHL	CRN	001
1130	Crane #1 Port	MTHL	CRN	001
1131	Crane #1 Port	MTHL	CRN	001
1132	Crane #1 Port	MTHL	CRN	001

Reference Number	DESCRIPTION	System	Comp	No.
1133	Crane #2 Stbd	MTHL	CRN	002
1134	Crane #2 Stbd	MTHL	CRN	002
1135	Crane #2 Stbd	MTHL	CRN	002
1136	Crane #2 Stbd	MTHL	CRN	002
1137	Crane #2 Stbd	MTHL	CRN	002
1138	Crane #2 Stbd	MTHL	CRN	002
1139	Crane #2 Stbd	MTHL	CRN	002

Reference Number	DESCRIPTION	System	Comp	No.
1140	Crane #2 Stbd	MTHL	CRN	002
1141	Crane #2 Stbd	MTHL	CRN	002
1142	Crane #2 Stbd	MTHL	CRN	002
1143	Crane #2 Stbd	MTHL	CRN	002
1144	Crane #2 Stbd	MTHL	CRN	002
1145	Derrick Fingerboard Upper	PH	FGBD	001
1146	Derrick Fingerboard Upper	PH	FGBD	001
1147	Derrick Fingerboard Upper	PH	FGBD	001
1148	Pipe Racking System #1 Aft	PH	PHM	001
1149	Pipe Racking System #1 Aft	PH	PHM	001
1150	Casing Rotator	PH	PHM	008

Reference Number	DESCRIPTION	System	Comp	No.
1151	Casing Rotator	PH	PHM	008
1152	Casing Rotator	PH	PHM	008
1153	Rig Floor Utility Winch #1 Orange	PH	UWIN	001
1154	Rig Floor Utility Winch #4 Green	PH	UWIN	003
1155	Rig Floor Utility Winch #13 Red DWKS Fwd	PH	UWIN	004
1156	Rig Floor Utility Winch #13 Red DWKS Fwd	PH	UWIN	004
1157	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
1158	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
1159	Casing Stabbing Basket	PHL	WPB	001
1160	Water Maker #5	POTW	WTMK	005
1161	Water Maker #5	POTW	WTMK	005
1162	Water Maker #6	POTW	WTMK	006
1163	Thruster #1 Heat Exchanger	PROP	HTEX	001

Reference Number	DESCRIPTION	System	Comp	No.
1164	Thruster #2 AC Motor	PROP	MTR	024
1165	Thruster #3 AC Motor	PROP	MTR	028
1166	Thruster #8	PROP	THR	008
1167	Thruster #8	PROP	THR	008
1168	Riser Skate	RISH	BOPC	001
1169	Riser Skate	RISH	BOPC	001
1170	Riser Skate	RISH	BOPC	001
1171	Riser Overhead Bridge Crane	RISH	OCRN	001
1172	Riser Overhead Bridge Crane	RISH	OCRN	001

Reference Number	DESCRIPTION	System	Comp	No.
1173	Main Deck	RST	STRU	016
1174	Main Deck	RST	STRU	016
1175	Main Deck	RST	STRU	016
1176	Riser Recoil Controller	RTS	CTRU	002
1177	Riser Tensioner #1 Cylinder #1A	RTS	HCYL	001
1178	Riser Tensioner #1 Cylinder #1A	RTS	HCYL	001
1179	Riser Tensioner #2 Cylinder #2A	RTS	HCYL	003
1180	Riser Tensioner #5 Cylinder #5A	RTS	HCYL	009
1181	Seawater System Pipework	SEA	PIPE	001

Reference Number	DESCRIPTION	System	Comp	No.
1182	Seawater System Pipework	SEA	PIPE	001
1183	Seawater System Pipework	SEA	PIPE	001
1184	Seawater Pump #1	SEA	PMP	001
1185	Lifeboat #2	SURV	BOAT	2
1186	Lifeboat #4	SURV	BOAT	4
1187	TFW Cooling System Pipework	TFS	PIPE	001
1188	TFW Cooling System Pipework	TFS	PIPE	001
1189	TFW Cooling System Pipework	TFS	PIPE	001
1190	TFW Cooling System Pipework	TFS	PIPE	001
1191	TFW Cooling System Pipework	TFS	PIPE	001

Reference Number	DESCRIPTION	System	Comp	No.
1192	Obstruction Lighting System	VI	LTE	002
1193	18-3/4" BOP Lower Annular	WCS	ANNU	001
1194	18-3/4" BOP Lower Annular	WCS	ANNU	001
1195	18-3/4" BOP Upper Annular	WCS	ANNU	002
1196	18-3/4" BOP Lower Double Rams	WCS	BOPR	003
1197	18-3/4" BOP Lower Double Rams	WCS	BOPR	003
1198	18-3/4" BOP Stack/Frame	WCS	BOPS	001
1199	18-3/4" LMRP Stack/Frame	WCS	BOPS	002
1200	Drillers BOP Control Panel	WCS	CTRU	002
1201	Toolpushers BOP Control Panel	WCS	CTRU	003
1202	Toolpushers BOP Control Panel	WCS	CTRU	003
1203	Choke Control Unit	WCS	CTRU	005
1204	Choke Control Unit	WCS	CTRU	005
1205	Choke Control Unit	WCS	CTRU	005
1206	Diverter	WCS	DIVT	001

Reference Number	DESCRIPTION	System	Comp	No.
1207	Subsea Flex Joint	WCS	FJRA	001
1208	BOP HPU Pump #1	WCS	PMP	001
1209	BOP HPU Pump #1	WCS	PMP	001
1210	BOP HPU PRV #1	WCS	PRV	001
1211	BOP HPU PRV #2	WCS	PRV	002
1212	BOP HPU PRV #3	WCS	PRV	003
1213	Riser Joint DWH002 1K Tan	WCS	RISE	001
1214	Blue BOP MUX Cable Reel	WCS	SSHR	001
1215	Yellow BOP MUX Cable Reel	WCS	SSHR	002
1216	Hot Line Hose Reel	WCS	SSHR	004
1217	Powered Watertight Doors	WTD	WTDR	003
1218	Powered Watertight Doors	WTD	WTDR	003

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 12 Apr 2010

Rev 3

equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.
items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.
items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The carpets in the rooms in the accommodation are badly stained.	C	Replace the stained carpets.	3
The floor in the mess room and other parts of the accommodation are damaged including a hole in the deck outside room 330	C	Repair as necessary.	3
Several cabinets, draws and doors in the galley were damaged.	B	Replace as necessary the damaged units in the galley.	1
The main bain marie, the food mixer and dish washer were noted to be in a poor condition.	B	Replace galley equipment as necessary.	1
Pressure Gauges damaged on all 30 APV bottles.	B	Replace gauges with new calibrated gauges	1
Discharge lines face towards walkway on all 30 APV bottles	B	Reroute discharge lines away from walkways	2
Corrosion on flanged outlet from bottle to isolation ball valve	B	Perform Protective coating maintenance and replace connection if needed.	2
Flanged cooling water hoses have become hard and brittle.	C	Replace flanged cooling water hoses on 1 and 2 high pressure compressors.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Cables and tubing to HP Air Compressors Nos 1 & 2 are not properly supported.	C	Organize and properly support cables and tubing.	3
Two handles missing on isolation all valve	B	Replace Handles as soon as possible and replace all valves once they are received .	2
Pressure relief valve is out of calibration on all 30	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
All 4 HPU units for the ballast system has solenoids in the cabinets and they are getting hot to the point of burning out. They are using a 120V and needs to be using a 24V system. This is causing a safety issue due to the system failing to shut off the ballast valves or opening the valves when needed. During an emergency this would be a major issue. The system also operates the water tight dampers on the rig.	A	Replace all 4 HPU units and solenoid systems for the ballast system.	1
No record of when wall thickness checks on bulk storage tanks were carried out.	C	Carry out wall thickness checks on bulk air tanks	2
No SWP stenciled on bulk tanks.	C	Stencil all bulk tanks with SWP.	3
No record of when wall thickness checks on bulk surge tanks were carried out.	C	Carry out wall thickness checks on surge tanks	2
No SWP stenciled on surge tanks.	C	Stencil all surge tanks with SWP.	3
Hoses on column bulk tank load cells corroded out.	C	Replace corroded hoses on weight indicators	3
Load cells corroding out on column bulk tanks	C	Address corrosion on column bulk tank load cells	3
The lower gripper unit track has some bolts which are corroded.	B	Clean up track bolts and nuts, reinspect and replace if needed	2
No current load test as per company policy	C	Conduct load test as per company policy	1
Remote controller being used is obsolete	A	Install new controller once arrived as planned	1
Alarm lights in the mud pit room not identified for there use.	C	Ensure all alarm lights are identified	3
Several alarms failed to work when activated during the weekly boat drill. (Gave list to the Chief Mate)	C	Repair as necessary.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
It was reported to us camera No 23 was not working, this CCTV unit is used to monitor helicopter operation	B	Replace the broken camera.	1
PA rack amplifiers are obsolete.	C	As planned replace the PA system.	1
it was reported to us several items on the rig floor will not work in automatic which includes the PRS, IR and the zone management. During our assessment we observed the equipment was being operated manually.	A	Investigate the issues and repair as necessary.	2
Crown sheaves grease hoses in poor condition, several of the hoses were damaged and leaking grease. There was no evidence of grease reaching the fast line or main block clusters.	B	Replace grease line hoses or as the access is good around sheaves, install grease zerts directly in sheave pins and grease the sheaves directly. COMPLETE	1
The crown bumper blocks wood has rotted out and is only being held in place by the steel mesh around the wood.	B	Replace rotted wood bumpers at the crown, or investigate if the wooden blocks can be replaced with neoprene bumper blocks.	2
It was noted that two bolts not flush with derrick girts. Stbd side below the monkey board level.	C	Investigate if the bolts are loose or tight in the beams, repair as necessary.	3
It was noted the safety slings on the finger board were corroding out.	A	This safety slings are now being changed out by the drill crew.	2
It was noted that the Port fwd air winch line rubbing on plate on derrick first level	B	Investigate if plate can be removed or if this is not possible install a roller guide to prevent any further damage to the derrick structure.	2
A large section of deck grating at the crown is corroding out	B	Replace corroded grating at the crown level, replace with galvanized steel grating.	2
The complete derrick is galvanized except for the top section which has been painted. On this top section the paint coating is breaking down and corrosion is apparent..	C	While not structurally weakened at present we would recommend the corrosion is addressed in the near future.	3
It was noted that wooden rails have been fitted on two horizontal beams below the monkey board level. This wood is deteriorating and should be removed.	A	Remove wood from two horizontal beams below monkey board level; potential dropped object.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Bent horizontal beam, caused by stands falling across derrick	C	Replace beam as previously planned.	3
Standing water in derrick lower diagonals braces	C	Clean debris from lower diagonals and clean out drain holes	3
Plastic covering from drill line lying in derrick beams	C	Remove debris from derrick	3
Wind speed indicator not working above crown	C	Repair/replace wind speed indicator	3
Block hang off lines ties off with soft line in derrick.	C	Replace soft line with wire slings, on both hang off lines.	3
We are informed by the rig crew that the short block hang off line is no longer used.	C	Remove the short hang off line if no longer required.	3
Under the water table: it was noted that the cotter pins are undersize on shackles, and incorrect retainers being used.	B	Fit the correct size of cotter pins to all shackles	2
Under water table of the auxiliary derrick, the coating is breaking down and corrosion is present.	C	Remove corrosion and re-paint structure.	3
Since OEM realignment of drive motors the motor drive shafts are no longer centered in the seals and the seals are leaking.	C	Investigate with OEM if an improved design is available or other remedy to matter.	3
Slight oil leaks on main drive shaft oil seals	C	Repair leaking seal.	3
After reviewing the PM records we were unable to find when the brake caliper springs were replaced last.	A	Replace the brake caliper springs yearly as specified in the OEM service manual.	1
Drive motor vibration It was noted that during operations the A.C. motors were vibrating, this is a common fault with active heave drawworks, being usually attributed to alignment issues or encoder feedback issues were the motors were not running in synchronization.	C	Recheck motor alignment/encoder feedback issues	3
Wire spooler Hydraulic cylinder was leaking and has now been disconnected.	B	Install replacement cylinder when it arrives.	3
It was noted that the paint coating on the air receiver is breaking down.	C	Remove the corrosion from the air receiver and repaint.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Ductwork was found cracked on drawworks No. 2 motor drillers side.	C	Repair cracks in ductwork, consider fitting a flex coupling in ductwork to prevent further damage being carried out on duct work due to motor vibration.	3
Megger test reading was 1.15 Mohms. Transocean standard is 2 Mohm or greater.	B	Investigate and repair as necessary.	2
The hydraulically operated rotary table was inoperative at the time of the survey. The power skid controls had been removed and sent to town for repair last year.	B	Investigate the delay on returning the power skid controls, install and test table when parts arrive.	1
It was noted the top drive blower hose was poorly secured with a steel clamp.	C	Remove and reposition clamp on blower hose	3
There were no reports on the rig when an Ex electrical equipment survey was last conducted.	A	An Ex survey must be carried out to established true condition of each item of electrical equipment installed in hazardous areas on the rig per HQS-OPS-EST-694-01	1
Duct tape used to cover open holes in one of the MCC boards where MCC cubicles have been removed.	C	Source or fabricate maintenance covers for use when switchboard components are removed.	3
Buss assembly removed from DW3 VFD bay to be installed in top drive VFD bay.	C	As planned replace the buss assembly	3
Approved rubber matting is missing from the front of all transformers on the rig.	A	Install rubber matting in front of the transformers as per the Transocean HQS-HSE PP-01 procedures section 4, subsection 5.9	1
During the engine shut down testing, it was noted the all six engines had several of the water jacket sensors disabled, due to giving false reading at times.	B	Check into what is causing the problems with the water jacket sensors and why they are giving false reading and causing them not to perform correct. Repair or replace the sensors and check with getting a third party tech out to the rig for taking care of this problem.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
During the inspection of the engines and shut downs, we were unable to test the shut downs due to a main cooling water line spool had been taken out for repairs. The engine was shut down and the port side of the rig water system had to be shut off to make the repair. This was due to the main water line valves leak by and will not close off the water in the lines completely. On interviews with crew members it was noted the valves were bad and will not close off well.	B	Replace all salt water and fresh water valves as need for the engines and the main water lines.	2
Dust and metal particle were noted inside the generator No 1	B	Ensure the generator is cleaned and the metal particle removed. Complete	1
Washers inside the generator on the buss bars on No 1 generator are corroded.	B	Replace the corroded washers.	1
The cooling fins on generator No 1 are damaged with metal filings breaking off and debris entering generator housing.	B	Replace the cooling fins on No 1 generator	2
The water leak detector on No 4 generator failed to alarm when tested.	B	Repair or replace as necessary.	2
In Main Generator No. 1 junction box, one cable from V phase and one cable from U phase were chaffing.	C	Make repairs as necessary.	3
No 6 generator had oil inside the fan housing	B	Investigate oil inside the generator and repair where necessary.	1
The fresh water cooling pipe work for the heat exchanger on #1 engine was leaking at the weld next to the flange. This was located at the heat exchanger connection.	B	Repair/replace piping and flange at the heat exchange as needed.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
In review of the history and on visual inspection of the pipe work for all six engine heat exchangers, it was noted the pipe work has been giving problems with leaks on regular bases. The pipe work was showing to be thin and leaks occurring often, this has started to cause flooding issues of the floors at the heat exchangers as well and causing cooling problems with the engines.	B	Replace all pipe work as needed for all 6 heat exchangers for the engines at nearest opportunity..	2
The pressure relief valves on oily water separator unit was leaking when the unit was test ran for us, and we were unable to read the date on the tag for showing the last testing of the valve. The piping for the drain going to the relief valve had been taken apart at the flange connection, and not put back in place or bolted back together.	B	Replace the pressure relief valve on the oily separator unit, and repair the piping going from the relief valve to the drain.	2
Sewage treatment system is severely corroded with wastage.	A	Replace the sewage treatment plant. Rig currently plans at next shipyard upgrade period an Evac system be installed, and also a Omni-pure unit be added to treat the sewage system.	1
The oily water separator tank was severely corroded and	B	Replace the unit as needed due to the unit tank was corroded to the point of replacement.	2
The vent for the sludge oil tank located on the STBD side of the rig, did not have a containment around the vent and had oil running down the vent pipe on the out side of the vent.	B	Install a containment area around the sludge oil vent pipe, located on the STBD side of the rig.	2
The CO2 lines in the emergency generator room were painted white. Regulations require the fire fighting, CO2 etc.. all to be painted red.	C	Paint the CO2 lines in the emergency generator room red.	3
Corroded and undersized brackets on helideck monitors fwd and stbd side.	C	Replace brackets to larger size, (same as installed on aft monitor).	3
Crew reports electric motor has seized up and had been freed off.	C	Replace electric motor bearings.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Pipe work corroded out on foam system tank and lines.	C	Replace corroded pipework.	3
Test date on foam system PRV out of date (2007)	C	Re-certify PRV	3
Corroded cable trays around foam system tanks	C	Replace corroded cable trays.	3
Manual valve handles corroded.	C	Replace handles or complete valves if new handles are not available.	3
Two of the six portable gas detectors were not working at the time of this assessment	C	Repair as necessary.	3
The pressure relief valves on the fuel tank system for the chopper fueling station were out of date for being tested.	B	Have all pressure relief valves re-certified for the fueling station.	2
In both fuel purifier room the sight glass gauges were tie wrapped open on all fuel and oil tanks. This is a safety hazard, if the glass gauge was broken it valve will not work correctly to shut off the oil or fuel.	C	Repair the valves on the sight glass gauges as needed and remove the tie wraps.	2
The pressure relief valves on all of the fuel transfer pumps were dated 7/07. PRVs require biannual testing.	B	Test or have all pressure relief valves recertified on all 4 of the fuel transfer pumps.	2
The fuel transfer pumps on STBD side were leaking around the piping threads next to the pressure relief valves.	C	Repair the small fuel leaks around the piping threads of the fuel transfer pumps on STBD side of rig.	2
It was noted that the belt guard does not fully cover the pinion shaft drive hub on the inside of the belt guard, on Mud Pump #1 and Mud Pump #4. This exposed rotating hub is a potential hazard to personnel standing on top of the pump, whether engaged in pump maintenance or using the pump to access equipment in the surrounding area. There is a danger of any loose equipment e.g. ropes or safety harness lanyards being caught in this rotating equipment with possible fatal results.	A	Extended the belt guard to enclose this exposed rotating piece of equipment.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Excessive use of silicone sealant on covers and hatches of all mud pumps.	C	This is proven to be a major cause of pump bearing failure as pieces of the silicone contaminates the lube oil system and becomes plugged off in various grease lines and oil passageways throughout the pump. The correct OEM gaskets should be installed to prevent contamination of the lube oil system and premature bearing failure.	3
Unused fluid end lubricating pump installed on all mud pumps.	C	If not required remove fluid end lubricating pumps.	3
Retsco relief valves as installed on all mud pumps require disassemble to reset.	C	As planned replace the problematic Retsco relief valves with the Titan BX air operated valves.	3
Crosshead readings ranged from 0.030-0.040", exceeding the maximum allowable of 0.030".	B	Adjust crosshead reading to below 0.030"	2
The cross head lower slides were found badly scuffed and there was no trace of any smooth bearing surface left. As the slides are damaged we would also expect the lower crosshead surface to also be scored, we would recommend that both lower slides and crossheads be replaced on all cylinders.	B	Replace lower crosshead slides and crossheads on all three cylinders. Furthermore, it would be best practice to replace the crosshead bearings when crossheads are replaced, alleviating the need for any further maintenance to the crosshead for several years to come.	2
Left and Center crosshead readings are high; 0.031-0.041".	B	Adjust crosshead reading to below 0.030"	2
A hydraulic hose was in place supplying oil to the L.H. main bearing. This hose has become hard and brittle and should be replaced using the original copper tubing.	C	Replace hard and brittle hydraulic hose with copper tubing as used on the rest of the pump internal lubrication piping. REPORTED COMPLETE BY RIG CREW	3
Internal lubrication lines were found either loosely clamped or not supports, This should be addressed to prevent the tubing fracturing with excessive vibration.	C	Secure internal lubrication lines in power end. REPORTED COMPLETE BY RIG CREW	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Center crosshead bearing clearance was found have to have a lift of 0.010" which is high, there was also evidence of damage to the lower slide, which could be caused by the breaking up of the crosshead bearing and bearing material falling onto the lower slide.	B	Replace center crosshead bearing, slide and crosshead.	2
Three hydraulic hoses were also being used inside the crankcase these have become hard an brittle and should be replaced to the original OEM copper tubing.	C	Replace hydraulic hoses to the original OEM copper tubing. REPORTED COMPLETE BY RIG CREW	3
The oil pump packing gland was found to be loose and the bolts had backed off and were running on the pump coupling.	B	Secure gland packing retainer and bolts on oil pump. REPORTED COMPLETE BY RIG CREW	2
Oil pressure gauge defective.	C	Replace gauge.	3
Cable damaged on junction box.	C	Reposition cable junction box to prevent any further cable damage occurring.	3
A small amount of metal particles were found on the magnetic strips inside the power end, these were cleaned off.	C	We would recommend that these magnetic strips be rechecked again at the next PM interval.	3
The motor winding on 1A and 1B mud pump AC motors are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 1.	1
The belt guard on mud pump 1A motor was noted to be damaged.	C	Repair or replace as necessary.	3
There are no air intake filters fitted on any of the AC motors for the mud pumps.	B	Install air filters on the air intake to the AC motors on the rig this will help further dust and grease entering the motors	2
The motor winding on 2A and 2B mud pump AC motors are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 2.	1
The motor winding on 3A mud pump AC motor are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 3A.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The air let vents on the mud pump AC motors are covered with oil and dust	C	Remove vents and clean.	3
The motor winding on 4A and 4B mud pump AC motors are in a covered with dust.	B	Clean motors with dry air.	2
Switchroom 5 A/C unit was not working due to a faulty expansion joint.	B	As planned repair the same.	2
The condenser A/C unit for the bridge was not working also it had wasted metal and was in a extremely poor condition	B	Replace unit.	1
It was reported to us several tubes are plugged for the A/C cooling system.	B	As planned repair the same.	3
The fan ducting in the AHC room port side 3 rd deck is severely corroded	C	Replace the corroded ducting.	3
The VMSA ventilation ducts on the main deck, located next to the STBD and Port cranes were in bad condition. The hatch covers and louvers were corroded severely.	B	Replace the louvers and hatch covers on the ventilation ducts as needed.	2
The gaskets on the hatch covers for the vent duct located on Port and STBD side next to the cranes were in bad condition and had been pieced together in places on the hatches.	B	Replace all gaskets on the ventilation duct hatch covers as needed.	2
The vent on the main deck for the galley supply fan had grease running out of the vent and did not have a screen on the vent hood. (Vent located next to the knuckle boom crane.)	B	Clean out the vent fan duct on the galley supply vent and install new screen on the hood cover.	2
Automatic sequencing panel not working	C	As planned repair pump automatic sequencing control valve.	3
Valves on the hydraulic oil sight glass not push to read.	C	Either replaced valves to this type or install a magnetic type glass.	3
Oil cooler not fitted with splash shield	C	Install splash shield over oil cooler core.	3
The starboard forward aircraft warning lights in the derrick were not working.	C	Repair as necessary.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
When spot check the battery back-lights on the rig several lights failed within the hour. (List provided to Electrician)	C	Repair as necessary.	3
No. 2 degasser down, as the vacuum pump has been removed.	A	Refit degasser vacuum pump.	1
Several junction boxes in the shaker house had missing certification labels also several junction in the shaker house were in a poor condition with corrosion,	A	Replace the junction boxes with the missing certification labels.	1
Several mud agitator motors were in a poor condition with corrosion,	A	Motor should be overhauled or replaced.	1
All mud guns were inspected and all of these were found to be seized	C	Free off all mud guns	3
Valve handle missing in pit room, valve is now being operated with a pipe wrench.	C	Install valve handle	3
The boom walk-way going down the outside of the boom was not safe and was only 10 to 12 inches wide. The tie off cable was not safe for using as a tie off point as well.	A	Replace the walk-way going down the side of the boom with a wider walk way and replace the tie off cable. As a suggestion, install the walk-way on the inside of the boom and install a walkway at the boom sheaves for safe working when performing maintenance to the sheaves.	1
Several of the hydraulic hoses were hard and cracked due to age. The hoses going to the winch located in the boom were hard and cracked, 2 of the hoses were leaking around the cracks in the hoses.	B	Replace all hard and cracked hydraulic hoses on crane as needed.	2
The sewing bolts were severely corroded and in bad condition.	A	Replace all sewing bolts on the port crane.	1
All of the sheaves on the boom tip were showing signs of wear and had cable prints in the sheaves.	B	Replace the boom tip sheaves as needed.	1
No records were provided of where the winches had been replaced or rebuilt in the life of the crane. Manufacture recommendations are to have the winches reworked or replaced every 2 years.	A	Replace or rework all winches on the crane at next available opportunity.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
No records were provided of where the hydraulic motors had been replaced or rebuilt in the life of the crane. It is recommended to rework or replace the pumps every 2 years.	A	Replace or rework all hydraulic motors on the crane at next available opportunity.	1
The radiator for the crane was in bad condition, the louvers were corroded severely and the housing around the radiator was corroded.	B	Replace the radiator, radiator housing and louvers on crane as needed. Replace the fans and fan guards as for the radiator and cooler as needed.	2
The main block sheaves were worn on the pin and were rubbing on the sides of the block. The sheaves had cable prints worn in the face of the sheaves. By checking them with a sheave gauge, the wear was showing they were in need of changing as well. The block did not have grease points/fitting installed for lubrication of the sheaves; they were no place installed for adding grease fittings as well.	A	Replace the main block or have completely reworked and NDT test done.	1
The main block sheave at the dead-man end was worn and rubbing on the sides. The sheave had cable prints in it as well. The main pins on the dead-man sheave housing was corroded and only taking grease on one side of the pin.	B	Replace the dead-man sheave and housing block. Replace all pins for the housing block as well.	1
All (3) three sheaves on the boom tip for the whip line were showing signs of wear and had cable prints in the sheaves. The sheaves were rubbing on both sides, indicating wear of the pin or sheave, to the point they must be replaced at nearest opportunity.	A	Replace all (3) three whip line sheaves at boom tip at nearest opportunity.	1
The engines on both deck cranes do not meet EPA standards and must be changed out. After interviews with crew members this was noted and they said the engines for the cranes were on order. The rig had no records of the engines being reworked during the life of the cranes.	C	After inspection of the engines, in both cranes, changing out the engines will take care of the oil leaks of the old engines.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The bolts on each boom section where they were bolted together were in bad condition due to corrosion of the bolts.	B	Replace all boom section bolts or have NDT test done on the bolts and clean up the joint in each section of the boom and recoat with protective coating and paint boom section joints.	2
Several of the hydraulic hoses located on all winches were hard and cracked due to age. The hoses going to the winch located in the boom were hard and cracked, 2 of the hoses were leaking oil from the cracks in the hoses.	B	Replace all hard and cracked hydraulic hoses on crane as needed. Make a log register for keeping up with the dates, and what hoses were replaced.	1
One of the main block sheaves at the end of the boom had wire rope prints showing in the sheave. (Inside sheave.)	B	Replace the main block sheaves at boom tip as needed.	1
The boom walk-way going down the outside of the boom was not safe and was only 10 to 12 inches wide. The tie off cable was not safe for using as a tie off point as well.	A	Replace the walk-way going down the side of the boom with a wider walk way and replace the tie off cable. As a suggestion, install the walk-way on the inside of the boom and install a walkway at the boom sheaves for safe working when performing maintenance to the sheaves.	2
No records were provided of where the winches had been replaced or rebuilt in the life of the crane. Manufacture recommendations are to have the winches reworked or replaced every 2 years.	A	Replace or rework all winches on the crane at next available opportunity.	1
The radiator for the crane was in bad condition, the louvers were corroded severely and the housing around the radiator was corroded.	B	Replace the radiator, radiator housing and louvers on crane as needed. Replace the fans and fan guards as for the radiator and cooler as needed.	1
The main block sheaves were worn on the pin and were rubbing on the sides of the block. The sheaves had cable prints worn in the face of the sheaves. By checking them with a sheave gauge, the wear was showing they were in need of changing as well. The block did not have grease points/fitting installed for lubrication of the sheaves; they were no place installed for adding grease fittings as well.	A	Replace the main block or have completely reworked and NDT test done.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The main block sheave at the dead-man end was worn and rubbing on the sides. The sheave had cable prints in it as well. The main pins on the dead-man sheave housing was corroded and only taking grease on one side of the pin.	B	Replace the dead-man sheave and housing block. Replace all pins for the housing block as well.	1
The load cell located on the dead-man cable end was bent and worn severely; the pin was worn to the point where it must be replaced.	A	Replace the load cell and pin for the load-cell; the load-cell and indicator must be calibrated when replaced.	1
The boom camera bracket was severely corroded and the safety cable was corroded to the point it must be replaced.	B	Repair/replace the boom camera mounting bracket and replace the safety cable for the camera.	1
All (3) three sheaves on the boom tip for the whip line were showing signs of wear and had cable prints in the sheaves. The sheaves were rubbing on both sides, indicating wear of the pin or sheave, to the point they must be replaced at nearest opportunity.	A	Replace all (3) three whip line sheaves at boom tip at nearest opportunity.	1
After reviewing of the crane logs, it was noted, the main gear box for the crane was leaking and had to have gear oil added often.	B	Repair the leak on the main gear box as needed.	2
Corroded safety lines on fingers	A	Continue replacing damaged safety lines.	2
Leak on small bore tubing adjacent derrick ladder	C	Repair air leak.	3
Air line filter damaged and leaking at MB level	C	Replace leaking filter.	3
Hydraulic cylinder leaking on aft PRS wire tension cylinder	C	Repair hydraulic leak. COMPLETED	3
PRS track had been replaced in the past year and is wearing prematurely.	B	Replace track, preferably with harder material and change 4 wheel carriage with 8 wheel carriage as planned to displace the load.	2
Lower clamp motor leaking and has been plugged off.	B	Fit replacement hydraulic motor, We are informed that a motor has been on order for several months, and still not received.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Corrosion on hose hydraulic hose fitting on horizontal to vertical pipe handler and under control consul.	C	Clean corrosion from hose connections and wrap with Denso tape.	3
Hydraulic gauges on control consul damaged.	B	Replace hydraulic gauges.	2
Isolation ball valve for all utility winches used for manriding are not within easy reach of the operator.	A	Fit ball valve next to winch controls	2
Port Fwd rig floor utility winch air supply hose damaged.	B	Replace damaged hose	3
Both winches at the auxiliary derrick are blowing oil from exhausts.	C	Repair or replace winches	3
Back plate for auxiliary derrick winch controls are corroded.	C	Replace back plate.	3
Wire corroded out	A	Replace wire.	1
Winch badly corroded paint falling off winch.	B	Remove winch from service carry out overhaul, remove corrosion and paint.	2
Check when last load test was carried out	C	Ensure a yearly load test is carried out.	3
The water maker #5 had a soft patch on one of the pipes, the new pipe was setting next to the unit for installing.	B	Install new pipe on #5 water maker as needed.	1
The main salt water line going to the water maker had a bad corroded spot showing in the line and the flange was leaking at the connection of the water maker.	B	Replace the bad salt water line going to the water maker and replace/repair the flange at the top of the unit as needed.	1
The main salt water line was leaking at the connection on the unit around the flange gasket.	B	Repair/replace the flange connection at the top of the water maker unit.	2
On inspection of the thruster cooling heat exchangers all of the heat exchangers unit were showing wear and leaks on the units. Due to ages and the units showing to be wearing thin in places the leaks are showing up more often.	C	Replace all thruster heat exchangers as needed.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
It was reported to us thruster AC motor No 2 is down waiting to be replaced due to a flashover of the winding, we also noted the junction boxes for the motor were in a poor condition with sever rust	B	As planned replace No 2 thruster AC motor, also the two junction boxes	1
It was reported to us the fresh water radiator unit for the thruster No 3 was not operational.	B	As planned replace the F/W radiator.	1
#8 Thruster had some hydraulic leaks on the unit around the shaft seal on top of the unit. The hydraulic lines going to the hydraulic system were leaking at the connections.	B	Replace all of the hydraulic seals and O-rings as needed as well and repairing the hydraulic connection leaks as needed.	2
The oil samples were showing water was getting into the oil system of all thrusters and in review of the history this has been going on for some time now on all of the thrusters. Numbers 2 and 3 were showing to have been getting more water into the oil system and this will continue to worsen if the seals are not replaced soon.	B	Replace the main seals on all of the thruster at the nearest opportunity. If it will be some time before this can be taken care of, it is recommended to install a filter system for each thruster in order to help prevent the water from entering into the oil system and causing major problems to the thrusters.	1
Carriage chains worn and require replacement	B	Replace worn carriage chains.	2
Riser skate chain missing and requires replacement.	B	Replace missing riser skate chain.	2
Skate track is damaged, caused by cart jumping off the track.	B	Repair skate cart track.	2
The crane will not trolley the winches back and forth even when moving the load as needed. It was noted the limit sensors were not working correct and needed to be adjusted or replaced to solve this problem.	B	Repair/replace the limit sensors on the units as needed to set the speed of the winches for keeping the two winches even when moving the loads.	2
It was noted during the testing of the crane, when the operator needs to move the crane to the port, he has to move the crane to the STBD first to keep the crane from (grabbing) hanging up due to FWD end moving more (faster) then the AFT end on the track system..	B	Repair the problem if possible as to the adjustment of the sensors or check into getting a manufacture tech out to the rig for making the needed repair of the unit.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The cable transit between the mud pit room and the mud pump room starboard side was not sealed correctly.	A	Ensure transit is sealed correctly. COMPLETED	3
Several areas of the rig the cable tray was corroded or damaged which included the cable tray back of galley next to life boat deck and cable tray outside mud lab door on the main deck.	C	Replace as necessary.	3
The ceiling tiles are missing the starboard A/C compressor room.	C	Replace the missing tiles	3
The Riser Recoil System was not functioning in an automatic state as designed. The unit works off of Tensioner Rod position indication, which is achieved through transducers and machined grooves in the rods. It was explained that some of the Tensioner rods have been changed out with new rods that do not have the machined grooves, which in turn have disabled the automatic function of the Riser Recoil System.	A	Restore Riser Recoil system to operate as designed.	1
There were no records of NDT inspections for the Tensioners or support structure	B	Perform NDT inspection of Riser Tensioners, and support structure to determine the need for repairs and/or replacements.	2
The Tensioner Cylinder protective coating was flaking off in various areas, and is in need of maintenance	C	Perform protective coating maintenance on the Riser Tensioner Cylinders.	3
The #2 Tensioner was not in service due to a leaking Rod End seal.	B	Repair the leaking Rod End seal on #2 Tensioner.	2
The #5 Tensioner hose is damaged on the outer sheathing.	B	Replace the #5 Tensioner HP air supply hose as planned.	2
The sea water pipes for the engines and water makers were in bad condition, leaks are showing up daily and the pipes were corroded in different places through out the rig.	B	Replace all corroded sea water piping as needed.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The sea water valves going to all the main engine coolers were hard to function and showing signs of leaking around the valves.	B	Replace all sea water valves as needed for the engine coolers.	2
The piping in Thruster room #8 had some spools and piping next to the sea water service pump that needs protective coating/painting applied.	C	Put protective coating on all piping and spools as needed in Thruster room #8.	3
Number 1 sea water service pump was leaking and corroded severely. The pump was worn and in need of being replaced. Located in #8 Thruster room. The pump housing was in bad condition.	B	Replace #1 sea water service pump located in Thruster room #8.	2
Lifeboat #2 port door glass was cracked.	C	Replace the glass.	3
There was skin damage on lifeboat No 4 and the reflective tape was in a poor condition.	C	Repair as necessary.	3
The fresh water line going to all six water makers were corroded and small leaks in several places around the connection flanges at the water makers.	B	Replace all corroded fresh water piping going to the water makers as needed.	2
The discharge pressure gauge on #1 pump for the fresh water cooling system on the port side of rig, located in the #1 engine room, was broken.	B	Replace the discharge pressure gauge on #1 pump for the fresh water cooling system on port side of rig in #1 engine room.	2
The valve was leaking and corroded on the main water line at #2 heat exchanger for the fresh water cooling system on the port side of the rig in #1 engine room. The valve on the line was located on the upper (top) water line on the right hand side when standing in front of the unit.	B	Replace the butterfly valve that was leaking on the upper line on #2 fresh water heat exchanger for port side of the rig, located in #1 engine room.	2
The suction pressure gauge on #2 fresh water pump, located on the STBD side of the rig in #6 engine room was broken.	B	Replace the suction gauge on #2 fresh water cooling pump, located on the STBD side of the rig in #6 engine room.	2
The main water line going down through the deck, located next to #2 fresh water heat exchanger on the port side of the rig in engine room #1; was severely corroded and the butterfly valve was leaking. The valve was also hard to open and close.	B	Replace the main water line going through the deck. Located next to #2 fresh water heat exchange on the port side of the rig in #1 engine room. Also replace the butterfly valve on the same pipe.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Several 10 mile obstruction lights were not working.	C	Repair as necessary.	3
Leak during pressure tests	C	Investigate where the leak is once the stack is onboard and repair	3
Packing element is left out in weather.	B	Element needs to be packaged in protective box and protected from weather and UV. Needs to be stored in a controlled environment	2
Packing element is left out in weather.	B	Element needs to be packaged in protective box and protected from weather and UV. Needs to be stored in a controlled environment	2
Spare Ram Blocks stored improperly	C	Package and protect spare blocks from weather	3
Spare Ram Blocks are not protected and corrosion is starting.	C	Perform Protective coating maintenance	1
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Purge Air System not working	B	Replace the diaphragm on the purge pump and replace the door seal	2
Stand Pipe hole fill valve close light blinks with the Surface flow Meter light occasionally when operated.	C	Investigate which card needs to be replaced and install in the panel to fix light.	3
Pod Mismatch and error message reading valve mismatch (50)	B	Investigate why Pod Mismatch is happening and correct Valve mismatch (50) error.	2
Valve leaking on console Stewart and Stevenson unit	C	Investigate and replace leaking valve on Remote Console on Drill Floor	3
Pressure gauges not calibrated on Stewart and Stevenson	C	Calibrate Pressure gauges on Remote Console on Drillers Floor	2
Pressure gauges not repeating on unit inside drillers console	C	Investigate why the pressure gauges on the remote console located in Drillers House have to be recalibrated every time.	3
Proximity switch on trip tank Valve is not functioning properly	C	Replace Proximity switch on trip tank valve which is faulty.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The Lower Flex Joint currently in use is a loaner from the Nautilus, and the Horizons Lower Flex Joint had been sent in for the 5 yearly overhaul, and is currently awaiting shipment to the rig and an assessment was not carried out on the unit.	B	Install the overhauled Lower Flex Joint at the next opportunity as planned.	2
Pump is unusually running louder than the other two pumps	C	Investigate loud noise coming from pump when running as compared to number 2 and 3	3
No marking on pumps stating they start automatically	C	Install signs informing workers the pumps start automatically.	3
Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
Riser Auxiliary Lines did not have pin end and box end covers installed	C	Install protective covers for Auxiliary Lines	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Hydraulic door not working entering 24 meter level from column STBD side, have to manual pump the door open and closed.	C	Repair the hydraulic problem with the door at the 24 meter level.	2
Hydraulic door not working entering 28 1/2 meter level from column STBD side, have to manual pump the door open and closed.	C	Repair the hydraulic problem with the door at the 28 1/2 meter level.	2



A		Critical equipment
B		Major item failure or
C		Minor item

Reference Number	DESCRIPTION	TAG		
		System	Comp	No.
2001	BOP Transporter	BOPH	BOPF	001
2002	BOP Bulkhead Guiding System	BOPH	BOPF	002
2003	BOP Transporter Underhull Guide	BOPH	BOPF	003
2004	BOP Bridge Crane #1	BOPH	OCRN	001
2005	Ex./Sup. Fans	ELPD	HAZA	001
2006	Ex./Sup. Fans	ELPD	HAZA	001
2007	11 KV Main Switchboard #1	ELPD	SWBD	001

Reference Number	DESCRIPTION	System	Comp	No.
#REF!	Mud Pump #1 Discharge Dampener	HPMS	PDAM	001
#REF!	HP Mud System Pipework	HPMS	PIPE	001
#REF!	HP Mud System Pipework	HPMS	PIPE	001
#REF!	Crane #1 Port	MTHL	CRN	001
#REF!	Riser Tensioner Ring	RTS	TENR	001
#REF!	BOP Sub-Sea Accumulator Bank	WCS	ACUM	008
#REF!	18-3/4" BOP Lower Annular	WCS	ANNU	001
#REF!	18-3/4" BOP Upper Annular	WCS	ANNU	002
#REF!	18-3/4" BOP Middle Single Rams	WCS	BOPR	001

Reference Number	DESCRIPTION	System	Comp	No.
#REF!	18-3/4" BOP Lower Double Rams	WCS	BOPR	003
#REF!	18-3/4" BOP Upper Double Rams	WCS	BOPR	004
#REF!	Diverter	WCS	DIVT	001
#REF!	Subsea Flex Joint	WCS	FJRA	001
#REF!	Sub Sea BOP Kill Hoses	WCS	HOSE	004
#REF!	Surface Choke Hoses	WCS	HOSE	009
#REF!	Choke Manifold	WCS	MANI	001
#REF!	Choke Manifold	WCS	MANI	001
#REF!	Blue BOP MUX Cable Reel	WCS	SSHR	001
#REF!	Yellow BOP MUX Cable Reel	WCS	SSHR	002
#REF!	Hot Line Hose Reel	WCS	SSHR	004

Reference Number	DESCRIPTION	System	Comp	No.
#REF!	BOP Upper Choke Line Failsafe Valve	WCS	VLV	002
#REF!	BOP Lower Choke Line Failsafe Valve	WCS	VLV	003

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 12 Apr 2010

Rev 3

equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.
items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.
items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
There were no identification tags on any of the electrical equipment in the hazardous areas plus there as been no Ex registrar set up.	A	Tag all electrical equipment in the hazardous areas on the rig then enter all the information into the Ex register.	1
There were no ABS approved hazardous area drawing on the rig.	C	Display a set of hazardous areas drawing on the rig.	3
There are no reports on the rig when current injection on the main circuit breakers was last performed	B	As soon as practical perform secondary current injection by a certified unbiased testing facility on the main circuit breakers (Ref: HQS-OPS-TIB-630-03).	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
No records of any inspection being carried out on the mud pump discharge pulsation dampeners	C	Carry out an inspection of the PASFE dampeners to determine condition of choke tube, internal condition and wall thickness. Anticipated life of choke tube is 3 to 10 years.	3
Wall thickness readings have been taken and put into a spread sheet form, difficult to identify were readings were taken.	C	Isometric drawings should also be supplied on high pressure pipework systems to identify were readings were taken.	3
Wall thickness readings have been taken and put into a spread sheet form, difficult to identify were readings were taken.	C	Isometric drawings should also be supplied on high pressure pipework systems to identify were readings were taken.	3
The walkway on the boom used for maintenance of the sheaves at the boom tip, had nothing installed for being able to perform needed maintenance of the sheaves or boom tip. The only way to perform the task safely, is from a work basket using the other deck crane. This is tying up both cranes to perform the task.	C	Install a safe walkway at the boom tip for being able to perform maintenance PM's on the boom sheaves and install a safe walkway leading down the boom with a safety tie/hook off cable for attaching a harness lanyard for anti-fall equipment. This is recommended for both cranes.	3
No NDT inspection records on board	B	Acquire and retain valid NDT certification documentation on board the rig.	1
No up to date UT wall thickness records found on board	B	Perform proper NDT on equipment to verify wall Thickness	1
The last date of certification for the Lower Annular was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Lower Annular with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Upper Annular was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Upper Annular with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Middle Single Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Middle Single Ram BOP Assembly with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The last date of certification for the Lower Double Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Lower Double Ram BOP Assembly with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Upper Double Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Upper Double Ram BOP Assembly with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Diverter was 5 July 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Diverter with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
No certification documentation for the Lower Flex Joint currently in use was available for review.	A	Acquire and retain valid manufacturer's certification documentation on board the rig.	1
The last date of certification was 1 January 2000, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Replace the Kill LMRP Jumper Hose with new or re-certified hose, and send in the currently installed hose for the 5 yearly inspection and re-certification.	1
The last date of certification was 2 July 2004, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Replace the Mud Boost Drape Hose with new or re-certified hose, and send in the currently installed hose for the 5 yearly inspection and re-certification.	1
No current certification for all valves found on board	A	Obtain and retain valid certification documentation for the gate valves on board the rig.	1
There was no record of serial numbers of Gate Valves and installation locations for accurate tracking.	C	Maintain a log of valve Serial numbers, and location of installation on board the rig to accurately track equipment maintenance.	3
No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The last date of certification was 13 December 2000, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Acquire and retain valid manufacturer's certification documentation on board the rig.	1
There was no record of serial numbers of Failsafe Valve and installation locations for accurate tracking.	A	Maintain a log of valve Serial numbers, and location of installation on board the rig to accurately track equipment maintenance.	1

Reference Number	DESCRIPTION	System	Comp	No.
3003	Non Hazardous Area CCTV Cameras	COMM	CAM	002
3004	Top Drive	DSRT	TD	001
3005	11KV/600V Drilling Power Transformer #1	ELPD	TFMR	021
3006	Man Riding Winch #5 White Rig Floor Port Aft	PHL	MWIN	001
3007	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
3008	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 12 Apr 2010

Rev 3

equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use or failure of equipment.

items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.

items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of performance are not met.

FINDINGS - IMPROVEMENT	RECOMMENDATION DETAIL
In the water maker rooms, located in front of each of the main engines; has no bilge system set up in the areas. In order to pump out the bilge areas in all 6 of the locations, the crew has to rig up a jaggiar pump to pump out the water or fluids as needed. The water makers are located in all of the 6 areas and the rig has had problems with the saltwater and fresh water lines leaking due to the lines are in bad condition. This is causing a safety issue due to the flooding of the rooms if a pipe burst and major water control should be lost.	Recommended to have a auto bilge system installed in the engine rooms and in the water maker rooms as needed.
Unable to monitor bulk tank vents from bridge to verify when filling tanks.	Install CCTV camera on vent lines.

FINDINGS - IMPROVEMENT	RECOMMENDATION DETAIL
The rig crew would like to have more CCTV installed around the rig which would include the riser deck, the loading station and fwd and stern of the vessel to see the area of sea around the rig.	The rig should raise a REA to address the issue with the CCTV system.
Replace top drive to 1000 ton model , present unit rated to 750 tons.	To eliminate the need to rack back the top drive when high hook loads are encountered.
It was reported to us the rig plan to install windows in the main transformers and switchboards to help with performing thermographic surveys.	As planned install the inspection windows in the main transformers and switchboards to help with performing thermographic surveys.
Man riding winches are rated at 2500 lbs, no slack line detection system fitted.	For maximum safety manriding winch working load should be limited to 300 lbs with slack line detection system installed. Consider replacing man riding winches.
All winches in the moonpool area are subject to harsh conditions making them more susceptible to corrosion.	Source covers to be used on moonpool winches when not in use.
Consider installing 2 hydraulically operated work baskets to access equipment in the moonpool area.	This would remove the necessity of man riding in this area. Man riding should be considered the last resort to access equipment.

Category	Code	System
Barge	ACOM	Accommodation
Barge	BLST	Ballast / Preload Systems
Barge	COMM	Communications Systems
Barge	CPTR	Computer Systems
Barge	DPS	Dynamic Positioning System
Barge	EVNS	Environmental Management System
Barge	JS	Jacking System
Barge	MTHL	Materials Handling
Barge	MOOR	Mooring Winch System
Barge	VI	Navigation & Vessel Instrumentation
Barge	PHL	Personnel Handling
Barge	PROP	Propulsion System
Barge	RST	Rig Structure
Barge	SURV	Survival Systems
Barge	WTD	Watertight Door Systems
Barge	WMAC	Workshop Machinery
Drilling Equipment	DRHS	Derrick Hoisting System
Drilling Equipment	DIST	Drilling Management Systems
Drilling Equipment	DRLS	Drillstring
Drilling Equipment	DSRT	Drillstring Rotating Equipment
Drilling Equipment	PH	Pipehandling Equipment
Drilling Equipment	TAD	Tender Assist Drilling Package
Mud Systems	BMS	Bulk Mud System
Mud Systems	CMT	Cement System
Mud Systems	HPMS	High Pressure Mud Systems
Mud Systems	LPMS	Low Pressure Mud Systems
Mud Systems	MCS	Mud Cleaning Systems
Mud Systems	MDS	Mud Storage
Safety Systems	ESD	Emergency Shutdown System
Safety Systems	FGDS	Fire & Gas Detection
Safety Systems	FFS	Fire Fighting System
Safety Systems	SFTY	Safety Systems / Equipment
Safety Systems	VMS	Vessel Management System
Safety Systems	RSE	Rig Spare Equipment
Third Party Equipment	TPE	Third Party Equipment
Utilities	BILG	Bilge System

CONFIDENTIAL

MODUSI 01 0 000188

Utilities	AIR	Compressed Air Systems
Utilities	DRLW	Drill Water System
Utilities	ELPD	Electrical Power Distribution
Utilities	ELPG	Electrical Power Generation
Utilities	FUEL	Fuel Oil Systems
Utilities	HVAC	HVAC Systems
Utilities	HYD	Hydraulic System
Utilities	LHTG	Lighting Systems
Utilities	LUBE	Lube Oil System
Utilities	POTW	Potable Water System
Utilities	SKID	Rig Skidding
Utilities	SEA	Seawater Systems
Utilities	TFS	Treated Freshwater System
Well Control	BOPH	BOP Handling System
Well Control	CTS	Conductor Tensioning System
Well Control	COH	Crude Oil Handling
Well Control	RISH	Riser Handling
Well Control	RTS	Riser Tensioning Systems
Well Control	WCS	Well Control System
Well Control	WELT	Well Testing/Completion

CONFIDENTIAL

MODUSI 01 0 000189



Transocean Rig Hardware Assessment Definitions

Priority Codes	A	B	C
Priority Definitions	Critical items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.	Major items that may lead to damage to essential equipment or detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.	Minor items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

Condition Levels	Level 1	Level 2	Level 3
Equipment Definitions	<ul style="list-style-type: none"> • Equipment is in bad condition; it is not working or should be removed from service until deficiencies are rectified. • Equipment has excessive down time. • Equipment wear is past OEM limits or is obsolete and no longer supported by OEM. 	<ul style="list-style-type: none"> • Equipment is in fair condition; some major deficiencies have been noted. • Equipment has some downtime. • Equipment wear is getting close to OEM limits or is nearing end of useful life. 	<ul style="list-style-type: none"> • Equipment is in good condition; some minor deficiencies may have been noted.
Structural Definitions	• Structure/steel is highly corroded and/or wasted and requires replacement.	• Structure/steel is showing heavy corrosion and/or minor wastage	• Structure/steel is well coated; may show some signs of minor corrosion.

<p>Maintenance System Definitions</p>	<ul style="list-style-type: none"> • Maintenance System is not understood by crew. • Major PM Tasks are more than 12 months overdue. • PM's have been closed without being completed. • Certification documents are missing. 	<ul style="list-style-type: none"> • Some improvement areas regarding the Maintenance System. • PM Tasks are 6 to 12 months overdue. • PM's are not fully completed or closed without being completed as per task steps. 	<ul style="list-style-type: none"> • Maintenance system is understood by crew. • Major PM Tasks are completed mostly on time.
--	--	---	---

This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be traded or divulged to any other company or person without express written permission.

ms

Level 4

- Equipment is in new or like new condition. There are no deficiencies noted

- Structure/steel is new or in like new condition. There are no signs of corrosion.

CONFIDENTIAL

MODUSI 01 0 000192

- All PM Tasks are always completed on time.
- A leader among rig class in Maintenance system performance.

inferred, reproduced, conveyed



A		Critical equipment
B		Major item failure or
C		Minor item

Reference Number	DESCRIPTION	TAG		
		System	Comp	No.
1001	Accommodation	ACOM	ACM	001
1002	Accommodation	ACOM	ACM	001
1003	Galley Equipment	ACOM	GEQT	001
1004	Galley Equipment	ACOM	GEQT	001
1005	HP Tensioner APV #1	AIR	ARCV	003
1006	HP Tensioner APV #2	AIR	ARCV	004
1007	HP Tensioner APV #8	AIR	ARCV	010
1008	HP Air Compressor #1	AIR	COMP	007

Reference Number	DESCRIPTION	System	Comp	No.
1009	HP Air Compressor #1	AIR	COMP	007
1010	HP Tensioner APV #26 PRV	AIR	PRV	042
1011	HP Tensioner Standby APV #1 PRV	AIR	PRV	047
1012	Bilge/Ballast Control HPU #1 Stbd Fwd	BLST	HPU	001
1013	P-Tank #1	BMS	BUTK	001
1014	P-Tank #1	BMS	BUTK	001
1015	Surge Tank #1	BMS	BUTK	011
1016	Surge Tank #1	BMS	BUTK	011
1017	Bulk Storage Instrumentation	BMS	INST	001
1018	Bulk Storage Instrumentation	BMS	INST	001
1019	BOP Bulkhead Guiding System	BOPH	BOPF	002
1020	BOP Bridge Crane #1	BOPH	OCRN	001
1021	BOP Bridge Crane #1	BOPH	OCRN	001
1022	Hazardous Area General Alarms	COMM	ALRM	001
1023	Non Hazardous Area General Alarm	COMM	ALRM	002

Reference Number	DESCRIPTION	System	Comp	No.
1024	Non Hazardous Area CCTV Camera	COMM	CAM	002
1025	Public Address System	COMM	CTRU	001
1026	Drilling Instrumentation	DIST	INST	001
1027	Crown Block Main	DRHS	CROW	001
1028	Derrick	DRHS	DERK	001
1029	Derrick	DRHS	DERK	001
1030	Derrick	DRHS	DERK	001
1031	Derrick	DRHS	DERK	001
1032	Derrick	DRHS	DERK	001
1033	Derrick	DRHS	DERK	001
1034	Derrick	DRHS	DERK	001

Reference Number	DESCRIPTION	System	Comp	No.
1035	Derrick	DRHS	DERK	001
1036	Derrick	DRHS	DERK	001
1037	Derrick	DRHS	DERK	001
1038	Wind Sensors	VI	INST	001
1039	Derrick	DRHS	DERK	001
1040	Derrick	DRHS	DERK	001
1041	Derrick	DRHS	DERK	001
1042	Derrick	DRHS	DERK	001
1043	Drawworks Active Heave	DRHS	DWKS	001
1044	Drawworks Active Heave	DRHS	DWKS	001
1045	Drawworks Active Heave	DRHS	DWKS	001
1046	Drawworks Active Heave	DRHS	DWKS	001
1047	Drawworks Auxiliary Handling	DRHS	DWKS	002
1048	Drawworks Auxiliary Handling	DRHS	DWKS	002

Reference Number	DESCRIPTION	System	Comp	No.
1049	Drawworks AC Drive Motor #2	DRHS	MTR	002
1050	Drawworks AC Drive Motor #5	DRHS	MTR	005
1051	Rotary Table	DSRT	ROT	001
1052	Top Drive	DSRT	TD	001
1053	Ex./Sup. Fans	ELPD	HAZA	001
1054	480V MCC #1	ELPD	MCC	001
1055	VFD Switchboard Line Up #1	ELPD	SWBD	018
1056	11KV/600V Drilling Power Transformer #1	ELPD	TFMR	021
1057	Main Engine #1	ELPG	ENG	001

Reference Number	DESCRIPTION	System	Comp	No.
1058	Main Engine #3	ELPG	ENG	003
1059	Main AC Generator #1	ELPG	GEN	001
1060	Main AC Generator #1	ELPG	GEN	001
1061	Main AC Generator #1	ELPG	GEN	001
1062	Main AC Generator #4	ELPG	GEN	004
1063	Main AC Generator #5	ELPG	GEN	005
1064	Main AC Generator #6	ELPG	GEN	006
1065	Main Engines LT Cooling System Pipework	ELPG	PIPE	001

Reference Number	DESCRIPTION	System	Comp	No.
1066	Main Engines LT Cooling System Pipework	ELPG	PIPE	001
1067	Oily Water Separator #1	EVNS	SEP	1
1068	Sewage Treatment Vacuum Toilet System	EVNS	SWGE	002
1069	Oily Water Separator Tank Stbd	EVNS	TANK	004
1070	Waste Oil Holding Tank Port	EVNS	TANK	001
1071	Emergency Generator Room CO2 Fire Supression	FFS	FS	003
1072	Helideck Fire Monitors	FFS	MON	002
1073	Helideck Foam Pump AC Motor	FFS	MTR	006

Reference Number	DESCRIPTION	System	Comp	No.
1074	Foam System Pipework	FFS	PIPE	002
1075	Foam Pump PRV	FFS	PRV	005
1076	Helideck Foam System Tank	FFS	TANK	002
1077	Foam System Valves	FFS	VLV	002
1078	Portable Gas Detectors	FGDS	PGD	001
1079	Helicopter Refueling System	FUEL	HELI	001
1080	Fuel Oil Pump #1 Port Purifier Room	FUEL	PMP	001
1081	Fuel Transfer Pump #1 Port	FUEL	PMP	003
1082	Fuel Transfer Pump #1 Port	FUEL	PMP	003
1083	Mud Pump #1	HPMS	MP	001

Reference Number	DESCRIPTION	System	Comp	No.
1084	Mud Pump #1	HPMS	MP	001
1085	Mud Pump #1	HPMS	MP	001
1086	Mud Pump #1	HPMS	MP	001
1087	Mud Pump #1	HPMS	MP	001
1088	Mud Pump #2	HPMS	MP	002
1089	Mud Pump #2	HPMS	MP	002
1090	Mud Pump #2	HPMS	MP	002
1091	Mud Pump #2	HPMS	MP	002

Reference Number	DESCRIPTION	System	Comp	No.
1092	Mud Pump #3	HPMS	MP	003
1093	Mud Pump #3	HPMS	MP	003
1094	Mud Pump #3	HPMS	MP	003
1095	Mud Pump #3	HPMS	MP	003
1096	Mud Pump #4	HPMS	MP	004
1097	Mud Pump #4	HPMS	MP	004
1098	Mud Pump #1A AC Drive Motor	HPMS	MTR	001
1099	Mud Pump #1A AC Drive Motor	HPMS	MTR	001
1100	Mud Pump #1A AC Drive Motor	HPMS	MTR	001
1101	Mud Pump #2A AC Drive Motor	HPMS	MTR	005
1102	Mud Pump #3A AC Drive Motor	HPMS	MTR	009

Reference Number	DESCRIPTION	System	Comp	No.
1103	Mud Pump #3A AC Drive Motor	HPMS	MTR	009
1104	Mud Pump #4A AC Drive Motor	HPMS	MTR	013
1105	Air Conditioning Unit #5 Switchboard	HVAC	ACU	005
1106	Air Conditioning Unit CCR	HVAC	ACU	029
1107	Main Air Conditioning Unit #1A	HVAC	ACU	035
1108	Air Handling Unit #1	HVAC	AHU	001
1109	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001
1110	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001
1111	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001
1112	Rig Central Equipment HPU	HYD	HPU	002
1113	Rig Central Equipment HPU	HYD	HPU	002
1114	Rig Central Equipment HPU	HYD	HPU	002
1115	Aircraft Warning Lights	LHTG	LTE	001

Reference Number	DESCRIPTION	System	Comp	No.
1116	Non Haz Area Emerg Lighting	LHTG	LTE	002
1117	Mud Degasser #2	MCS	DGAS	002
1118	Shale Shaker Cascading #1	MCS	SHAK	001
1119	Mud Pit Tank #5 Agitator #5A AC M	MDS	MTR	005
1120	Mud Storage Valves	MDS	VLV	001
1121	Mud Storage Valves	MDS	VLV	001
1122	Crane #1 Port	MTHL	CRN	001
1123	Crane #1 Port	MTHL	CRN	001
1124	Crane #1 Port	MTHL	CRN	001
1125	Crane #1 Port	MTHL	CRN	001
1126	Crane #1 Port	MTHL	CRN	001

Reference Number	DESCRIPTION	System	Comp	No.
1127	Crane #1 Port	MTHL	CRN	001
1128	Crane #1 Port	MTHL	CRN	001
1129	Crane #1 Port	MTHL	CRN	001
1130	Crane #1 Port	MTHL	CRN	001
1131	Crane #1 Port	MTHL	CRN	001
1132	Crane #1 Port	MTHL	CRN	001

Reference Number	DESCRIPTION	System	Comp	No.
1133	Crane #2 Stbd	MTHL	CRN	002
1134	Crane #2 Stbd	MTHL	CRN	002
1135	Crane #2 Stbd	MTHL	CRN	002
1136	Crane #2 Stbd	MTHL	CRN	002
1137	Crane #2 Stbd	MTHL	CRN	002
1138	Crane #2 Stbd	MTHL	CRN	002
1139	Crane #2 Stbd	MTHL	CRN	002

Reference Number	DESCRIPTION	System	Comp	No.
1140	Crane #2 Stbd	MTHL	CRN	002
1141	Crane #2 Stbd	MTHL	CRN	002
1142	Crane #2 Stbd	MTHL	CRN	002
1143	Crane #2 Stbd	MTHL	CRN	002
1144	Crane #2 Stbd	MTHL	CRN	002
1145	Derrick Fingerboard Upper	PH	FGBD	001
1146	Derrick Fingerboard Upper	PH	FGBD	001
1147	Derrick Fingerboard Upper	PH	FGBD	001
1148	Pipe Racking System #1 Aft	PH	PHM	001
1149	Pipe Racking System #1 Aft	PH	PHM	001
1150	Casing Rotator	PH	PHM	008

Reference Number	DESCRIPTION	System	Comp	No.
1151	Casing Rotator	PH	PHM	008
1152	Casing Rotator	PH	PHM	008
1153	Rig Floor Utility Winch #1 Orange	PH	UWIN	001
1154	Rig Floor Utility Winch #4 Green	PH	UWIN	003
1155	Rig Floor Utility Winch #13 Red DWKS Fwd	PH	UWIN	004
1156	Rig Floor Utility Winch #13 Red DWKS Fwd	PH	UWIN	004
1157	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
1158	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
1159	Casing Stabbing Basket	PHL	WPB	001
1160	Water Maker #5	POTW	WTMK	005
1161	Water Maker #5	POTW	WTMK	005
1162	Water Maker #6	POTW	WTMK	006
1163	Thruster #1 Heat Exchanger	PROP	HTEX	001

Reference Number	DESCRIPTION	System	Comp	No.
1164	Thruster #2 AC Motor	PROP	MTR	024
1165	Thruster #3 AC Motor	PROP	MTR	028
1166	Thruster #1	PROP	THR	001
1167	Thruster #1	PROP	THR	001
1168	Riser Skate	RISH	BOPC	001
1169	Riser Skate	RISH	BOPC	001
1170	Riser Skate	RISH	BOPC	001
1171	Riser Overhead Bridge Crane	RISH	OCRN	001
1172	Riser Overhead Bridge Crane	RISH	OCRN	001
1173	Main Deck	RST	STRU	016

Reference Number	DESCRIPTION	System	Comp	No.
1174	Main Deck	RST	STRU	016
1175	Main Deck	RST	STRU	016
1176	Riser Recoil Controller	RTS	CTRU	002
1177	Riser Tensioner #1 Cylinder #1A	RTS	HCYL	001
1178	Riser Tensioner #1 Cylinder #1A	RTS	HCYL	001
1179	Riser Tensioner #2 Cylinder #2A	RTS	HCYL	003
1180	Riser Tensioner #5 Cylinder #5A	RTS	HCYL	009
1181	Seawater System Pipework	SEA	PIPE	001
1182	Seawater System Pipework	SEA	PIPE	001

Reference Number	DESCRIPTION	System	Comp	No.
1183	Seawater System Pipework	SEA	PIPE	001
1184	Seawater Pump #1	SEA	PMP	001
1185	Lifeboat #2	SURV	BOAT	2
1186	Lifeboat #4	SURV	BOAT	4
1187	TFW Cooling System Pipework	TFS	PIPE	001
1188	TFW Cooling System Pipework	TFS	PIPE	001
1189	TFW Cooling System Pipework	TFS	PIPE	001
1190	TFW Cooling System Pipework	TFS	PIPE	001
1191	TFW Cooling System Pipework	TFS	PIPE	001
1192	Obstruction Lighting System	VI	LTE	002

Reference Number	DESCRIPTION	System	Comp	No.
1193	18-3/4" BOP Lower Annular	WCS	ANNU	001
1194	18-3/4" BOP Lower Annular	WCS	ANNU	001
1195	18-3/4" BOP Upper Annular	WCS	ANNU	002
1196	18-3/4" BOP Lower Double Rams	WCS	BOPR	003
1197	18-3/4" BOP Lower Double Rams	WCS	BOPR	003
1198	18-3/4" BOP Stack/Frame	WCS	BOPS	001
1199	18-3/4" LMRP Stack/Frame	WCS	BOPS	002
1200	Drillers BOP Control Panel	WCS	CTRU	002
1201	Toolpushers BOP Control Panel	WCS	CTRU	003
1202	Toolpushers BOP Control Panel	WCS	CTRU	003
1203	Choke Control Unit	WCS	CTRU	005
1204	Choke Control Unit	WCS	CTRU	005
1205	Choke Control Unit	WCS	CTRU	005
1206	Diverter	WCS	DIVT	001

Reference Number	DESCRIPTION	System	Comp	No.
1207	Subsea Flex Joint	WCS	FJRA	001
1208	BOP HPU Pump #1	WCS	PMP	001
1209	BOP HPU Pump #1	WCS	PMP	001
1210	BOP HPU PRV #1	WCS	PRV	001
1211	BOP HPU PRV #2	WCS	PRV	002
1212	BOP HPU PRV #3	WCS	PRV	003
1213	Riser Joint DWH002 1K Tan	WCS	RISE	001
1214	Blue BOP MUX Cable Reel	WCS	SSHR	001
1215	Yellow BOP MUX Cable Reel	WCS	SSHR	002
1216	Hot Line Hose Reel	WCS	SSHR	004
1217	Powered Watertight Doors	WTD	WTDR	003
1218	Powered Watertight Doors	WTD	WTDR	003
	Manual Watertight Hatches	WTD	WTDR	003
	Bilge/Ballast Control HPU #1 Stbd Fwd	BLST	HPU	001

Reference Number	DESCRIPTION	System	Comp	No.
	Bilge Pump #1	BILG	PMP	001
	Manual Watertight Hatches	WTD	WTDR	003
	Manual Watertight Hatches	WTD	WTDR	003

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 12 Apr 2010

Rev 3

equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.
items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.
items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The carpets in the rooms in the accommodation are badly stained.	C	Replace the stained carpets.	3
The floor in the mess room and other parts of the accommodation are damaged including a hole in the deck outside room 330	C	Repair as necessary.	3
Several cabinets, draws and doors in the galley were damaged.	B	Replace as necessary the damaged units in the galley.	1
The main bain marie, the food mixer and dish washer were noted to be in a poor condition.	B	Replace galley equipment as necessary.	1
Pressure Gauges damaged on all 30 APV bottles.	B	Replace gauges with new calibrated gauges	1
Discharge lines face towards walkway on all 30 APV bottles	B	Reroute discharge lines away from walkways	2
Corrosion on flanged outlet from bottle to isolation ball valve	B	Perform Protective coating maintenance and replace connection if needed.	2
Flanged cooling water hoses have become hard and brittle.	C	Replace flanged cooling water hoses on 1 and 2 high pressure compressors.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Cables and tubing to HP Air Compressors Nos 1 & 2 are not properly supported.	C	Organize and properly support cables and tubing.	3
Two handles missing on isolation all valve	B	Replace Handles as soon as possible and replace all valves once they are received .	2
Pressure relief valve is out of calibration on all 30	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
All 4 HPU units for the ballast system has solenoids in the cabinets and they are getting hot to the point of burning out. They are using a 120V and needs to be using a 24V system. This is causing a safety issue due to the system failing to shut off the ballast valves or opening the valves when needed. During an emergency this would be a major issue. The system also operates the water tight dampers on the rig.	A	Replace the 120V relays panels and relays with a 24V system.	1
No record of when wall thickness checks on bulk storage tanks were carried out.	C	Carry out wall thickness checks on bulk air tanks	2
No SWP stenciled on bulk tanks.	C	Stencil all bulk tanks with SWP.	3
No record of when wall thickness checks on bulk surge tanks were carried out.	C	Carry out wall thickness checks on surge tanks	2
No SWP stenciled on surge tanks.	C	Stencil all surge tanks with SWP.	3
Hoses on column bulk tank load cells corroded out.	C	Replace corroded hoses on weight indicators	3
Load cells corroding out on column bulk tanks	C	Address corrosion on column bulk tank load cells	3
The lower gripper unit track has some bolts which are corroded.	B	Clean up track bolts and nuts, reinspect and replace if needed	2
No current load test as per company policy	C	Conduct load test as per company policy	1
Remote controller being used is obsolete	A	Install new controller once arrived as planned	1
Alarm lights in the mud pit room not identified for there use.	C	Ensure all alarm lights are identified	3
Several alarms failed to work when activated during the weekly boat drill. (Gave list to the Chief Mate)	C	Repair as necessary.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
It was reported to us camera No 23 was not working, this CCTV unit is used to monitor helicopter operation	B	Replace the broken camera.	1
PA rack amplifiers are obsolete.	C	As planned replace the PA system.	1
it was reported to us several items on the rig floor will not work in automatic which includes the PRS, IR and the zone management. During our assessment we observed the equipment was being operated manually.	A	Investigate the issues and repair as necessary.	2
Crown sheaves grease hoses in poor condition, several of the hoses were damaged and leaking grease. There was no evidence of grease reaching the fast line or main block clusters.	B	Replace grease line hoses or as the access is good around sheaves, install grease zerks directly in sheave pins and grease the sheaves directly. COMPLETE	1
The crown bumper blocks wood has rotted out and is only being held in place by the steel mesh around the wood.	B	Replace rotted wood bumpers at the crown, or investigate if the wooden blocks can be replaced with neoprene bumper blocks.	2
It was noted that two bolts not flush with derrick girts. Stbd side below the monkey board level.	C	Check two bolts not flush with derrick girt. secure if necessary.	3
Various safety slings are corroded throughout the derrick.	A	Replace corroded safety slings throughout derrick.	2
It was noted that the Port fwd air winch line rubbing on plate on derrick first level	B	Investigate if plate can be removed or if this is not possible, install a roller guide to prevent any further damage to the derrick structure.	2
A large section of deck grating at the crown is corroding out	B	Replace corroded grating at the crown level with galvanized steel grating.	2
The complete derrick is galvanized except for the top section which has been painted. On this top section the paint coating is breaking down and corrosion is apparent.	C	Address corrosion on top painted section of derrick.	3
It was noted that wooden rails have been fitted on two horizontal beams below the monkey board level. This wood is deteriorating and should be removed.	A	Remove or replace damaged horizontal beam below monkey board level.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Bent horizontal beam, caused by stands falling across derrick	C	Remove or replace damaged horizontal beam below monkey board level.	3
Standing water in derrick lower diagonals braces	C	Clean out lower section of diagonal beams in derrick to remove standing water and debris.	3
Plastic covering from drill line lying in derrick beams	C	Remove plastic drill line coating debris throughout derrick.	3
Wind speed indicator not working above crown	C	Repair/replace wind speed indicator	3
Block hang off lines ties off with soft line in derrick.	C	Secure block hang of lines with wire slings.	3
We are informed by the rig crew that the short block hang off line is no longer used.	C	Remove the short hang off line if no longer required.	3
Under the water table: it was noted that the cotter pins are undersize on shackles, and incorrect retainers being used.	B	Fit the correct size cotter pins to all shackles.	2
Under water table of the auxiliary derrick, the coating is breaking down and corrosion is present.	C	Remove corrosion and re-paint structure.	3
Since OEM realignment of drive motors the motor drive shafts are no longer centered in the seals and the seals are leaking.	C	Investigate with OEM if an improved design is available or other remedy to matter.	3
Slight oil leaks on main drive shaft oil seals	C	Repair leaking main drive shaft oil seals.	3
After reviewing the PM records we were unable to find when the brake caliper springs were replaced last.	A	Replace the brake caliper springs yearly as specified in the OEM service manual.	1
Drive motor vibration It was noted that during operations the A.C. motors were vibrating, this is a common fault with active heave drawworks, being usually attributed to alignment issues or encoder feedback issues were the motors were not running in synchronization.	C	Verify motor alignment and encoder feedback. Repair as necessary.	3
Wire spooler Hydraulic cylinder was leaking and has now been disconnected.	B	Install replacement cylinder when it arrives.	3
It was noted that the paint coating on the air receiver is breaking down.	C	Remove the corrosion from the air receiver and repaint.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Ductwork was found cracked on drawworks No. 2 motor drillers side.	C	Repair cracked motor ductwork; consider fitting flex couplings in ductwork.	3
Megger test reading was 1.15 Mohms. Transocean standard is 2 Mohm or greater.	B	Troubleshoot and repair the low earth bond resistance reading on Drawworks AC motor No. 5.	2
The hydraulically operated rotary table was inoperative at the time of the survey. The power skid controls had been removed and sent to town for repair last year.	B	When returned to the rig, install power skid controls and make rotary table operational.	1
It was noted the top drive blower hose was poorly secured with a steel clamp.	C	Remove and reposition clamp on blower hose	3
There were no reports on the rig when an Ex electrical equipment survey was last conducted.	A	An Ex survey must be carried out to established true condition of each item of electrical equipment installed in hazardous areas on the rig per HQS-OPS-EST-694-01	1
Duct tape used to cover open holes in one of the MCC boards where MCC cubicles have been removed.	C	Source or fabricate maintenance covers for use when switchboard components are removed.	3
Buss assembly removed from DW3 VFD bay to be installed in top drive VFD bay.	C	As planned replace the missing buss assembly on Drawworks AC motor No. 3 VFD.	3
Approved rubber matting is missing from the front of all transformers on the rig.	A	Install rubber matting in front of the transformers as per the Transocean HQS-HSE PP-01 procedures section 4, subsection 5.9	1
During the engine shut down testing, it was noted the all six engines had several of the water jacket sensors disabled, due to giving false reading at times.	B	Check into what is causing the problems with the water jacket sensors and why they are giving false reading and causing them not to perform correct. Repair or replace the sensors and check with getting a third party tech out to the rig for taking care of this problem.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
During the inspection of the engines and shut downs, we were unable to test the shut downs due to a main cooling water line spool had been taken out for repairs. The engine was shut down and the port side of the rig water system had to be shut off to make the repair. This was due to the main water line valves leak by and will not close off the water in the lines completely. On interviews with crew members it was noted the valves were bad and will not close off well.	B	Replace all salt water and fresh water valves as need for the engines and the main water lines.	2
Dust and metal particle were noted inside the generator No 1	B	Ensure the generator is cleaned and the metal particle removed. Complete	1
Washers inside the generator on the buss bars on No 1 generator are corroded.	B	Replace the corroded washers.	1
The cooling fins on generator No 1 are damaged with metal filings breaking off and debris entering generator housing.	B	Replace the cooling fins on No 1 generator	2
The water leak detector on No 4 generator failed to alarm when tested.	B	Repair or replace as necessary.	2
In Main Generator No. 1 junction box, one cable from V phase and one cable from U phase were chaffing.	C	Make repairs as necessary.	3
No 6 generator had oil inside the fan housing	B	Investigate oil inside the generator and repair where necessary.	1
The fresh water cooling pipe work for the heat exchanger on #1 engine was leaking at the weld next to the flange. This was located at the heat exchanger connection.	B	Repair/replace piping and flange at the heat exchange as needed.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
In review of the history and on visual inspection of the pipe work for all six engine heat exchangers, it was noted the pipe work has been giving problems with leaks on regular bases. The pipe work was showing to be thin and leaks occurring often, this has started to cause flooding issues of the floors at the heat exchangers as well and causing cooling problems with the engines.	B	Replace all pipe work as needed for all 6 heat exchangers for the engines at nearest opportunity..	2
The pressure relief valves on oily water separator unit was leaking when the unit was test ran for us, and we were unable to read the date on the tag for showing the last testing of the valve. The piping for the drain going to the relief valve had been taken apart at the flange connection, and not put back in place or bolted back together.	B	Replace the pressure relief valve on the oily separator unit, and repair the piping going from the relief valve to the drain.	2
Sewage treatment system is severely corroded with wastage.	A	Replace the sewage treatment plant. Rig currently plans at next shipyard upgrade period an Evac system be installed, and also a Omni-pure unit be added to treat the sewage system.	1
The oily water separator tank was severely corroded and	B	Replace the unit as needed due to the unit tank was corroded to the point of replacement.	2
The vent for the sludge oil tank located on the STBD side of the rig, did not have a containment around the vent and had oil running down the vent pipe on the out side of the vent.	B	Install a containment area around the sludge oil vent pipe, located on the STBD side of the rig.	2
The CO2 lines in the emergency generator room were painted white. Regulations require the fire fighting, CO2 etc.. all to be painted red.	C	Paint the CO2 lines in the emergency generator room red.	3
Corroded and undersized brackets on helideck monitors fwd and stbd side.	C	Replace brackets to larger size, (same as installed on aft monitor).	3
Crew reports electric motor has seized up and had been freed off.	C	Replace electric motor bearings.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Pipe work corroded out on foam system tank and lines.	C	Replace corroded pipework.	3
Test date on foam system PRV out of date (2007)	C	Re-certify PRV	3
Corroded cable trays around foam system tanks	C	Replace corroded cable trays.	3
Manual valve handles corroded.	C	Replace handles or complete valves if new handles are not available.	3
Two of the six portable gas detectors were not working at the time of this assessment	C	Repair as necessary.	3
The pressure relief valves on the fuel tank system for the chopper fueling station were out of date for being tested.	B	Have all pressure relief valves re-certified for the fueling station.	2
In both fuel purifier room the sight glass gauges were tie wrapped open on all fuel and oil tanks. This is a safety hazard, if the glass gauge was broken it valve will not work correctly to shut off the oil or fuel.	C	Repair the valves on the sight glass gauges as needed and remove the tie wraps.	2
The pressure relief valves on all of the fuel transfer pumps were dated 7/07. PRVs require biannual testing.	B	Test or have all pressure relief valves recertified on all 4 of the fuel transfer pumps.	2
The fuel transfer pumps on STBD side were leaking around the piping threads next to the pressure relief valves.	C	Repair the small fuel leaks around the piping threads of the fuel transfer pumps on STBD side of rig.	2
It was noted that the belt guard does not fully cover the pinion shaft drive hub on the inside of the belt guard, on Mud Pump #1 and Mud Pump #4. This exposed rotating hub is a potential hazard to personnel standing on top of the pump, whether engaged in pump maintenance or using the pump to access equipment in the surrounding area. There is a danger of any loose equipment e.g. ropes or safety harness lanyards being caught in this rotating equipment with possible fatal results.	A	Extended the belt guard to enclose this exposed rotating piece of equipment.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Excessive use of silicone sealant on covers and hatches of all mud pumps.	C	This is proven to be a major cause of pump bearing failure as pieces of the silicone contaminates the lube oil system and becomes plugged off in various grease lines and oil passageways throughout the pump. The correct OEM gaskets should be installed to prevent contamination of the lube oil system and premature bearing failure.	3
Unused fluid end lubricating pump installed on all mud pumps.	C	If not required remove fluid end lubricating pumps.	3
Retsco relief valves as installed on all mud pumps require disassemble to reset.	C	As planned replace the problematic Retsco relief valves with the Titan BX air operated valves.	3
Crosshead readings ranged from 0.030-0.040", exceeding the maximum allowable of 0.030".	B	Adjust crosshead reading to below 0.030"	2
The cross head lower slides were found badly scuffed and there was no trace of any smooth bearing surface left. As the slides are damaged we would also expect the lower crosshead surface to also be scored, we would recommend that both lower slides and crossheads be replaced on all cylinders.	B	Replace lower crosshead slides and crossheads on all three cylinders. Furthermore, it would be best practice to replace the crosshead bearings when crossheads are replaced, alleviating the need for any further maintenance to the crosshead for several years to come.	2
Left and Center crosshead readings are high; 0.031-0.041".	B	Adjust crosshead reading to below 0.030"	2
A hydraulic hose was in place supplying oil to the L.H. main bearing. This hose has become hard and brittle and should be replaced using the original copper tubing.	C	Replace hard and brittle hydraulic hose with copper tubing as used on the rest of the pump internal lubrication piping. REPORTED COMPLETE BY RIG CREW	3
Internal lubrication lines were found either loosely clamped or not supports, This should be addressed to prevent the tubing fracturing with excessive vibration.	C	Secure internal lubrication lines in power end. REPORTED COMPLETE BY RIG CREW	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Center crosshead bearing clearance was found have to have a lift of 0.010" which is high, there was also evidence of damage to the lower slide, which could be caused by the breaking up of the crosshead bearing and bearing material falling onto the lower slide.	B	Replace center crosshead bearing, slide and crosshead.	2
Three hydraulic hoses were also being used inside the crankcase these have become hard an brittle and should be replaced to the original OEM copper tubing.	C	Replace hydraulic hoses to the original OEM copper tubing. REPORTED COMPLETE BY RIG CREW	3
The oil pump packing gland was found to be loose and the bolts had backed off and were running on the pump coupling.	B	Secure gland packing retainer and bolts on oil pump. REPORTED COMPLETE BY RIG CREW	2
Oil pressure gauge defective.	C	Replace gauge.	3
Cable damaged on junction box.	C	Reposition cable junction box to prevent any further cable damage occurring.	3
A small amount of metal particles were found on the magnetic strips inside the power end, these were cleaned off.	C	We would recommend that these magnetic strips be rechecked again at the next PM interval.	3
The motor winding on 1A and 1B mud pump AC motors are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 1.	1
The belt guard on mud pump 1A motor was noted to be damaged.	C	Repair or replace as necessary.	3
There are no air intake filters fitted on any of the AC motors for the mud pumps.	B	Install air filters on the air intake to the AC motors on the rig this will help further dust and grease entering the motors	2
The motor winding on 2A and 2B mud pump AC motors are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 2.	1
The motor winding on 3A mud pump AC motor are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 3A.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The air let vents on the mud pump AC motors are covered with oil and dust	C	Remove vents and clean.	3
The motor winding on 4A and 4B mud pump AC motors are in a covered with dust.	B	Clean motors with dry air.	2
Switchroom 5 A/C unit was not working due to a faulty expansion joint.	B	As planned repair the same.	2
The condenser A/C unit for the bridge was not working also it had wasted metal and was in a extremely poor condition	B	Replace unit.	1
It was reported to us several tubes are plugged for the A/C cooling system.	B	As planned repair the same.	3
The fan ducting in the AHC room port side 3 rd deck is severely corroded	C	Replace the corroded ducting.	3
The VMSA ventilation ducts on the main deck, located next to the STBD and Port cranes were in bad condition. The hatch covers and louvers were corroded severely.	B	Replace the louvers and hatch covers on the ventilation ducts as needed.	2
The gaskets on the hatch covers for the vent duct located on Port and STBD side next to the cranes were in bad condition and had been pieced together in places on the hatches.	B	Replace all gaskets on the ventilation duct hatch covers as needed.	2
The vent on the main deck for the galley supply fan had grease running out of the vent and did not have a screen on the vent hood. (Vent located next to the knuckle boom crane.)	B	Clean out the vent fan duct on the galley supply vent and install new screen on the hood cover.	2
Automatic sequencing panel not working	C	As planned repair pump automatic sequencing control valve.	3
Valves on the hydraulic oil sight glass not push to read.	C	Either replaced valves to this type or install a magnetic type glass.	3
Oil cooler not fitted with splash shield	C	Install splash shield over oil cooler core.	3
The starboard forward aircraft warning lights in the derrick were not working.	C	Repair or replace the starboard forward aircraft warning lights in the derrick.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
When spot check the battery back-lights on the rig several lights failed within the hour. (List provided to Electrician)	C	Repair as necessary.	3
No. 2 degasser down, as the vacuum pump has been removed.	A	Refit degasser vacuum pump.	1
Several junction boxes in the shaker house had missing certification labels also several junction in the shaker house were in a poor condition with corrosion,	A	Replace the junction boxes with the missing certification labels.	1
Several mud agitator motors were in a poor condition with corrosion,	A	Motors should be overhauled or replaced.	1
All mud guns were inspected and all of these were found to be seized	C	Free off seized mud guns.	3
Valve handle missing in pit room, valve is now being operated with a pipe wrench.	C	Refit missing valve handle.	3
The boom walk-way going down the outside of the boom was not safe and was only 10 to 12 inches wide. The tie off cable was not safe for using as a tie off point as well.	A	Replace the walk-way going down the side of the boom with a wider walk way and replace the tie off cable. As a suggestion, install the walk-way on the inside of the boom and install a walkway at the boom sheaves for safe working when performing maintenance to the sheaves.	1
Several of the hydraulic hoses were hard and cracked due to age. The hoses going to the winch located in the boom were hard and cracked, 2 of the hoses were leaking around the cracks in the hoses.	B	Replace all hard and cracked hydraulic hoses on crane as needed.	2
The sewing bolts were severely corroded and in bad condition.	A	Replace all sewing bolts on the port crane.	1
All of the sheaves on the boom tip were showing signs of wear and had cable prints in the sheaves.	B	Replace the boom tip sheaves as needed.	1
No records were provided of where the winches had been replaced or rebuilt in the life of the crane. Manufacture recommendations are to have the winches reworked or replaced every 2 years.	A	Replace or rework all winches on the crane at next available opportunity.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
No records were provided of where the hydraulic motors had been replaced or rebuilt in the life of the crane. It is recommended to rework or replace the pumps every 2 years.	A	Replace or rework all hydraulic motors on the crane at next available opportunity.	1
The radiator for the crane was in bad condition, the louvers were corroded severely and the housing around the radiator was corroded.	B	Replace the radiator, radiator housing and louvers on crane as needed. Replace the fans and fan guards as for the radiator and cooler as needed.	2
The main block sheaves were worn on the pin and were rubbing on the sides of the block. The sheaves had cable prints worn in the face of the sheaves. By checking them with a sheave gauge, the wear was showing they were in need of changing as well. The block did not have grease points/fitting installed for lubrication of the sheaves; they were no place installed for adding grease fittings as well.	A	Replace the main block or have completely reworked and NDT test done.	1
The main block sheave at the dead-man end was worn and rubbing on the sides. The sheave had cable prints in it as well. The main pins on the dead-man sheave housing was corroded and only taking grease on one side of the pin.	B	Replace the dead-man sheave and housing block. Replace all pins for the housing block as well.	1
All (3) three sheaves on the boom tip for the whip line were showing signs of wear and had cable prints in the sheaves. The sheaves were rubbing on both sides, indicating wear of the pin or sheave, to the point they must be replaced at nearest opportunity.	A	Replace all (3) three whip line sheaves at boom tip at nearest opportunity.	1
The engines on both deck cranes do not meet EPA standards and must be changed out. After interviews with crew members this was noted and they said the engines for the cranes were on order. The rig had no records of the engines being reworked during the life of the cranes.	C	After inspection of the engines, in both cranes, changing out the engines will take care of the oil leaks of the old engines.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The bolts on each boom section where they were bolted together were in bad condition due to corrosion of the bolts.	B	Replace all boom section bolts or have NDT test done on the bolts and clean up the joint in each section of the boom and recoat with protective coating and paint boom section joints.	2
Several of the hydraulic hoses located on all winches were hard and cracked due to age. The hoses going to the winch located in the boom were hard and cracked, 2 of the hoses were leaking oil from the cracks in the hoses.	B	Replace all hard and cracked hydraulic hoses on crane as needed. Make a log register for keeping up with the dates, and what hoses were replaced.	1
One of the main block sheaves at the end of the boom had wire rope prints showing in the sheave. (Inside sheave.)	B	Replace the main block sheaves at boom tip as needed.	1
The boom walk-way going down the outside of the boom was not safe and was only 10 to 12 inches wide. The tie off cable was not safe for using as a tie off point as well.	A	Replace the walk-way going down the side of the boom with a wider walk way and replace the tie off cable. As a suggestion, install the walk-way on the inside of the boom and install a walkway at the boom sheaves for safe working when performing maintenance to the sheaves.	2
No records were provided of where the winches had been replaced or rebuilt in the life of the crane. Manufacture recommendations are to have the winches reworked or replaced every 2 years.	A	Replace or rework all winches on the crane at next available opportunity.	1
The radiator for the crane was in bad condition, the louvers were corroded severely and the housing around the radiator was corroded.	B	Replace the radiator, radiator housing and louvers on crane as needed. Replace the fans and fan guards as for the radiator and cooler as needed.	1
The main block sheaves were worn on the pin and were rubbing on the sides of the block. The sheaves had cable prints worn in the face of the sheaves. By checking them with a sheave gauge, the wear was showing they were in need of changing as well. The block did not have grease points/fitting installed for lubrication of the sheaves; they were no place installed for adding grease fittings as well.	A	Replace the main block or have completely reworked and NDT test done.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The main block sheave at the dead-man end was worn and rubbing on the sides. The sheave had cable prints in it as well. The main pins on the dead-man sheave housing was corroded and only taking grease on one side of the pin.	B	Replace the dead-man sheave and housing block. Replace all pins for the housing block as well.	1
The load cell located on the dead-man cable end was bent and worn severely; the pin was worn to the point where it must be replaced.	A	Replace the load cell and pin for the load-cell; the load-cell and indicator must be calibrated when replaced.	1
The boom camera bracket was severely corroded and the safety cable was corroded to the point it must be replaced.	B	Repair/replace the boom camera mounting bracket and replace the safety cable for the camera.	1
All (3) three sheaves on the boom tip for the whip line were showing signs of wear and had cable prints in the sheaves. The sheaves were rubbing on both sides, indicating wear of the pin or sheave, to the point they must be replaced at nearest opportunity.	A	Replace all (3) three whip line sheaves at boom tip at nearest opportunity.	1
After reviewing of the crane logs, it was noted, the main gear box for the crane was leaking and had to have gear oil added often.	B	Repair the leak on the main gear box as needed.	2
Corroded safety lines on fingers	A	Continue replacing damaged safety lines.	2
Leak on small bore tubing adjacent derrick ladder	C	Repair air leak.	3
Air line filter damaged and leaking at MB level	C	Replace leaking filter.	3
Hydraulic cylinder leaking on aft PRS wire tension cylinder	C	Repair hydraulic leak. COMPLETED	3
PRS track had been replaced in the past year and is wearing prematurely.	B	Replace track, preferably with harder material and change 4 wheel carriage with 8 wheel carriage as planned to displace the load.	2
Lower clamp motor leaking and has been plugged off.	B	Fit replacement hydraulic motor, We are informed that a motor has been on order for several months, and still not received.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Corrosion on hose hydraulic hose fitting on horizontal to vertical pipe handler and under control consul.	C	Clean corrosion from hose connections and wrap with Denso tape.	3
Hydraulic gauges on control consul damaged.	B	Replace hydraulic gauges.	2
Isolation ball valve for all utility winches used for manriding are not within easy reach of the operator.	A	Fit ball valve next to winch controls	2
Port Fwd rig floor utility winch air supply hose damaged.	B	Replace damaged hose	3
Both winches at the auxiliary derrick are blowing oil from exhausts.	C	Repair or replace winches	3
Back plate for auxiliary derrick winch controls are corroded.	C	Replace back plate.	3
Wire corroded out	A	Replace wire.	1
Winch badly corroded paint falling off winch.	B	Remove winch from service carry out overhaul, remove corrosion and paint.	2
Check when last load test was carried out	C	Ensure a yearly load test is carried out.	3
The water maker #5 had a soft patch on one of the pipes, the new pipe was setting next to the unit for installing.	B	Install new pipe on #5 water maker as needed.	1
The main salt water line going to the water maker had a bad corroded spot showing in the line and the flange was leaking at the connection of the water maker.	B	Replace the bad salt water line going to the water maker and replace/repair the flange at the top of the unit as needed.	1
The main salt water line was leaking at the connection on the unit around the flange gasket.	B	Repair/replace the flange connection at the top of the water maker unit.	2
On inspection of the thruster cooling heat exchangers all of the heat exchangers unit were showing wear and leaks on the units. Due to ages and the units showing to be wearing thin in places the leaks are showing up more often.	C	Replace all thruster heat exchangers as needed.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
It was reported to us thruster AC motor No 2 is down waiting to be replaced due to a flashover of the winding, we also noted the junction boxes for the motor were in a poor condition with sever rust	B	Replace Thruster No. 2 AC drive motor and main junction boxes.	1
It was reported to us the fresh water radiator unit for the thruster No 3 was not operational.	B	Replace Thruster No. 3 fresh water radiator unit.	1
Hoses were dry cracked and hard on all thrusters.	B	Replace all cracked and hard hydraulic hoses on the thru	2
Oil samples indicate that all the thrusters have water in the gear unit oil due to leaking seals. This was noted to be particularly high in Thruster No. 3. There was a hydraulic fluid leak at the inside shaft seal of Thruster No. 8 due to a poorly positioned oil seal rubber that was raised up on the shaft.	B	Replace all shaft seals on all eight thrusters at nearest opportunity.	1
Carriage chains worn and require replacement	B	Replace worn carriage chains.	2
Riser skate chain missing and requires replacement.	B	Replace missing riser skate chain.	2
Skate track is damaged, caused by cart jumping off the track.	B	Repair skate cart track.	2
The crane will not trolley the winches back and forth even when moving the load as needed. It was noted the limit sensors were not working correct and needed to be adjusted or replaced to solve this problem.	B	Repair/replace the limit sensors on the units as needed to set the speed of the winches for keeping the two winches even when moving the loads.	2
It was noted during the testing of the crane, when the operator needs to move the crane to the port, he has to move the crane to the STBD first to keep the crane from (grabbing) hanging up due to FWD end moving more (faster) then the AFT end on the track system..	B	Repair the problem if possible as to the adjustment of the sensors or check into getting a manufacture tech out to the rig for making the needed repair of the unit.	2
The cable transit between the mud pit room and the mud pump room starboard side was not sealed correctly.	A	Ensure transit is sealed correctly. COMPLETED	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Several areas of the rig the cable tray was corroded or damaged which included the cable tray back of galley next to life boat deck and cable tray outside mud lab door on the main deck.	C	Replace as necessary.	3
The ceiling tiles are missing the starboard A/C compressor room.	C	Replace the missing tiles	3
The Riser Recoil System was not functioning in an automatic state as designed. The unit works off of Tensioner Rod position indication, which is achieved through transducers and machined groves in the rods. It was explained that some of the Tensioner rods have been changed out with new rods that do not have the machined groves, which in turn have disabled the automatic function of the Riser Recoil System.	A	Restore Riser Recoil system to operate as designed.	1
There were no records of NDT inspections for the Tensioners or support structure	B	Perform NDT inspection of Riser Tensioners, and support structure to determine the need for repairs and/or replacements.	2
The Tensioner Cylinder protective coating was flaking off in various areas, and is in need of maintenance	C	Perform protective coating maintenance on the Riser Tensioner Cylinders.	3
The #2 Tensioner was not in service due to a leaking Rod End seal.	B	Repair the leaking Rod End seal on #2 Tensioner.	2
The #5 Tensioner hose is damaged on the outer sheathing.	B	Replace the #5 Tensioner HP air supply hose as planned.	2
The sea water pipes for the engines and water makers were in bad condition, leaks are showing up daily and the pipes were corroded in different places through out the rig.	B	Replace all corroded sea water piping as needed.	2
The sea water valves going to all the main engine coolers were hard to function and showing signs of leaking around the valves.	B	Replace all sea water valves as needed for the engine coolers.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The piping in Thruster room #8 had some spools and piping next to the sea water service pump that needs protective coating/painting applied.	C	Put protective coating on all piping and spools as needed in Thruster room #8.	3
Number 1 sea water service pump was leaking and corroded severely. The pump was worn and in need of being replaced. Located in #8 Thruster room. The pump housing was in bad condition.	B	Replace #1 sea water service pump located in Thruster room #8.	2
Lifeboat #2 port door glass was cracked.	C	Replace the glass.	3
There was skin damage on lifeboat No 4 and the reflective tape was in a poor condition.	C	Repair as necessary.	3
The fresh water line going to all six water makers were corroded and small leaks in several places around the connection flanges at the water makers.	B	Replace all corroded fresh water piping going to the water makers as needed.	2
The discharge pressure gauge on #1 pump for the fresh water cooling system on the port side of rig, located in the #1 engine room, was broken.	B	Replace the discharge pressure gauge on #1 pump for the fresh water cooling system on port side of rig in #1 engine room.	2
The valve was leaking and corroded on the main water line at #2 heat exchanger for the fresh water cooling system on the port side of the rig in #1 engine room. The valve on the line was located on the upper (top) water line on the right hand side when standing in front of the unit.	B	Replace the butterfly valve that was leaking on the upper line on #2 fresh water heat exchanger for port side of the rig, located in #1 engine room.	2
The suction pressure gauge on #2 fresh water pump, located on the STBD side of the rig in #6 engine room was broken.	B	Replace the suction gauge on #2 fresh water cooling pump, located on the STBD side of the rig in #6 engine room.	2
The main water line going down through the deck, located next to #2 fresh water heat exchanger on the port side of the rig in engine room #1; was severely corroded and the butterfly valve was leaking. The valve was also hard to open and close.	B	Replace the main water line going through the deck. Located next to #2 fresh water heat exchange on the port side of the rig in #1 engine room. Also replace the butterfly valve on the same pipe.	2
Several 10 mile obstruction lights were not working.	C	Repair or replace any non-functional 10 mile obstruction lights.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Leak during pressure tests	C	Investigate where the leak is once the stack is onboard and repair	3
Packing element is left out in weather.	B	Element needs to be packaged in protective box and protected from weather and UV. Needs to be stored in a controlled environment	2
Packing element is left out in weather.	B	Element needs to be packaged in protective box and protected from weather and UV. Needs to be stored in a controlled environment	2
Spare Ram Blocks stored improperly	C	Package and protect spare blocks from weather	3
Spare Ram Blocks are not protected and corrosion is starting.	C	Perform Protective coating maintenance	1
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Purge Air System not working	B	Replace the diaphragm on the purge pump and replace the door seal	2
Stand Pipe hole fill valve close light blinks with the Surface flow Meter light occasionally when operated.	C	Investigate which card needs to be replaced and install in the panel to fix light.	3
Pod Mismatch and error message reading valve mismatch (50)	B	Investigate why Pod Mismatch is happening and correct Valve mismatch (50) error.	2
Valve leaking on console Stewart and Stevenson unit	C	Investigate and replace leaking valve on Remote Console on Drill Floor	3
Pressure gauges not calibrated on Stewart and Stevenson	C	Calibrate Pressure gauges on Remote Console on Drillers Floor	2
Pressure gauges not repeating on unit inside drillers console	C	Investigate why the pressure gauges on the remote console located in Drillers House have to be recalibrated every time.	3
Proximity switch on trip tank Valve is not functioning properly	C	Replace Proximity switch on trip tank valve which is faulty.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The Lower Flex Joint currently in use is a loaner from the Nautilus, and the Horizons Lower Flex Joint had been sent in for the 5 yearly overhaul, and is currently awaiting shipment to the rig and an assessment was not carried out on the unit.	B	Install the overhauled Lower Flex Joint at the next opportunity as planned.	2
Pump is unusually running louder than the other two pumps	C	Investigate loud noise coming from pump when running as compared to number 2 and 3	3
No marking on pumps stating they start automatically	C	Install signs informing workers the pumps start automatically.	3
Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
Riser Auxiliary Lines did not have pin end and box end covers installed	C	Install protective covers for Auxiliary Lines	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Hydraulic door not working entering 24 meter level from column STBD side, have to manual pump the door open and closed.	C	Repair the hydraulic problem with the door at the 24 meter level.	2
Hydraulic door not working entering 28 1/2 meter level from column STBD side, have to manual pump the door open and closed.	C	Repair the hydraulic problem with the door at the 28 1/2 meter level.	2
The gasket to the main hatch in the welding area is hard due to age resulting in a poor seal when the hatch is closed and should be replaced.	B	Replace the gasket for the main hatch in the welding area.	2
All the HPUs had small leaks around the hose connections and the pumps.	B	Repair leaks around hose connections and pumps.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The bilge pumps were not holding a prime at times and the crew would use the priming units that were on the rig to re-prime the pumps.	B	Repair the problem of the pumps losing prime. Investigate replacing the pump impellers or pumps.	2
The hand winch for raising the hatch cover for the main hatch in the welding area had severely worn gear teeth as well as a missing safety cover.	B	Repair or replace the hand operated winch for the main hatch in the welding area.	2
The hand winch for raising the hatch cover for the sack room had severely worn gear teeth.	B	Repair or replace the hand operated winch for the sack room hatch.	2



A		Critical c equipme
B		Major ite failure o
C		Minor ite

Reference Number	DESCRIPTION	TAG		
		System	Comp	No.
2001	BOP Transporter	BOPH	BOPF	001
2002	BOP Bulkhead Guiding System	BOPH	BOPF	002
2003	BOP Transporter Underhull Guide	BOPH	BOPF	003
2004	BOP Bridge Crane #1	BOPH	OCRN	001
2005	Ex./Sup. Fans	ELPD	HAZA	001
2006	Ex./Sup. Fans	ELPD	HAZA	001
2007	11 KV Main Switchboard #1	ELPD	SWBD	001

Reference Number	DESCRIPTION	System	Comp	No.
#REF!	Mud Pump #1 Discharge Dampener	HPMS	PDAM	001
#REF!	HP Mud System Pipework	HPMS	PIPE	001
#REF!	HP Mud System Pipework	HPMS	PIPE	001
#REF!	Crane #1 Port	MTHL	CRN	001
#REF!	Riser Tensioner Ring	RTS	TENR	001
#REF!	BOP Sub-Sea Accumulator Bank	WCS	ACUM	008
#REF!	18-3/4" BOP Lower Annular	WCS	ANNU	001
#REF!	18-3/4" BOP Upper Annular	WCS	ANNU	002
#REF!	18-3/4" BOP Middle Single Rams	WCS	BOPR	001

Reference Number	DESCRIPTION	System	Comp	No.
#REF!	18-3/4" BOP Lower Double Rams	WCS	BOPR	003
#REF!	18-3/4" BOP Upper Double Rams	WCS	BOPR	004
#REF!	Diverter	WCS	DIVT	001
#REF!	Subsea Flex Joint	WCS	FJRA	001
#REF!	Sub Sea BOP Kill Hoses	WCS	HOSE	004
#REF!	Surface Choke Hoses	WCS	HOSE	009
#REF!	Choke Manifold	WCS	MANI	001
#REF!	Choke Manifold	WCS	MANI	001
#REF!	Blue BOP MUX Cable Reel	WCS	SSHR	001
#REF!	Yellow BOP MUX Cable Reel	WCS	SSHR	002
#REF!	Hot Line Hose Reel	WCS	SSHR	004

Reference Number	DESCRIPTION	System	Comp	No.
#REF!	BOP Upper Choke Line Failsafe Valve	WCS	VLV	002
#REF!	BOP Lower Choke Line Failsafe Valve	WCS	VLV	003

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 12 Apr 2010

Rev 3

equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.
equipment items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.
equipment items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
There were no identification tags on any of the electrical equipment in the hazardous areas plus there as been no Ex registrar set up.	A	Tag all electrical equipment in the hazardous areas on the rig then enter all the information into the Ex register.	1
There were no ABS approved hazardous area drawing on the rig.	C	Display a set of hazardous areas drawing on the rig.	3
There are no reports on the rig when current injection on the main circuit breakers was last performed	B	As soon as practical perform secondary current injection by a certified unbiased testing facility on the main circuit breakers (Ref: HQS-OPS-TIB-630-03).	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
No records of any inspection being carried out on the mud pump discharge pulsation dampeners	C	Carry out an inspection of the PASFE dampeners to determine condition of choke tube, internal condition and wall thickness. Anticipated life of choke tube is 3 to 10 years.	3
Wall thickness readings have been taken and put into a spread sheet form, difficult to identify were readings were taken.	C	Isometric drawings should also be supplied on high pressure pipework systems to identify were readings were taken.	3
Wall thickness readings have been taken and put into a spread sheet form, difficult to identify were readings were taken.	C	Isometric drawings should also be supplied on high pressure pipework systems to identify were readings were taken.	3
The walkway on the boom used for maintenance of the sheaves at the boom tip, had nothing installed for being able to perform needed maintenance of the sheaves or boom tip. The only way to perform the task safely, is from a work basket using the other deck crane. This is tying up both cranes to perform the task.	C	Install a safe walkway at the boom tip for being able to perform maintenance PM's on the boom sheaves and install a safe walkway leading down the boom with a safety tie/hook off cable for attaching a harness lanyard for anti-fall equipment. This is recommended for both cranes.	3
No NDT inspection records on board	B	Acquire and retain valid NDT certification documentation on board the rig.	1
No up to date UT wall thickness records found on board	B	Perform proper NDT on equipment to verify wall Thickness	1
The last date of certification for the Lower Annular was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Lower Annular with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Upper Annular was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Upper Annular with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Middle Single Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Middle Single Ram BOP Assembly with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The last date of certification for the Lower Double Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Lower Double Ram BOP Assembly with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Upper Double Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Upper Double Ram BOP Assembly with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Diverter was 5 July 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Diverter with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
No certification documentation for the Lower Flex Joint currently in use was available for review.	A	Acquire and retain valid manufacturer's certification documentation on board the rig.	1
The last date of certification was 1 January 2000, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Replace the Kill LMRP Jumper Hose with new or re-certified hose, and send in the currently installed hose for the 5 yearly inspection and re-certification.	1
The last date of certification was 2 July 2004, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Replace the Mud Boost Drape Hose with new or re-certified hose, and send in the currently installed hose for the 5 yearly inspection and re-certification.	1
No current certification for all valves found on board	A	Obtain and retain valid certification documentation for the gate valves on board the rig.	1
There was no record of serial numbers of Gate Valves and installation locations for accurate tracking.	C	Maintain a log of valve Serial numbers, and location of installation on board the rig to accurately track equipment maintenance.	3
No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The last date of certification was 13 December 2000, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Acquire and retain valid manufacturer's certification documentation on board the rig.	1
There was no record of serial numbers of Failsafe Valve and installation locations for accurate tracking.	A	Maintain a log of valve Serial numbers, and location of installation on board the rig to accurately track equipment maintenance.	1



A		Critical c and/or fa
B		Major ite of inadep
C		Minor ite operatio

Reference Number	DESCRIPTION	TAG		
		System	Comp	No.
3001	Bilge System Pipework	BILG	PIPE	001
3002	P-Tank #1	BMS	BUTK	001

Reference Number	DESCRIPTION	System	Comp	No.
3003	Non Hazardous Area CCTV Cameras	COMM	CAM	002
3004	Top Drive	DSRT	TD	001
3005	11KV/600V Drilling Power Transformer #1	ELPD	TFMR	021
3006	Man Riding Winch #5 White Rig Floor Port Aft	PHL	MWIN	001
3007	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
3008	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 12 Apr 2010

Rev 3

equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use or failure of equipment.

items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.

items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of performance are not met.

FINDINGS - IMPROVEMENT	RECOMMENDATION DETAIL
In the water maker rooms, located in front of each of the main engines; has no bilge system set up in the areas. In order to pump out the bilge areas in all 6 of the locations, the crew has to rig up a jaggiar pump to pump out the water or fluids as needed. The water makers are located in all of the 6 areas and the rig has had problems with the saltwater and fresh water lines leaking due to the lines are in bad condition. This is causing a safety issue due to the flooding of the rooms if a pipe burst and major water control should be lost.	Recommended to have a auto bilge system installed in the engine rooms and in the water maker rooms as needed.
Unable to monitor bulk tank vents from bridge to verify when filling tanks.	Install CCTV camera on vent lines.

FINDINGS - IMPROVEMENT	RECOMMENDATION DETAIL
The rig crew would like to have more CCTV installed around the rig which would include the riser deck, the loading station and fwd and stern of the vessel to see the area of sea around the rig.	The rig should raise a REA to address the issue with the CCTV system.
Replace top drive to 1000 ton model , present unit rated to 750 tons.	To eliminate the need to rack back the top drive when high hook loads are encountered.
It was reported to us the rig plan to install windows in the main transformers and switchboards to help with performing thermographic surveys.	As planned install the inspection windows in the main transformers and switchboards to help with performing thermographic surveys.
Man riding winches are rated at 2500 lbs, no slack line detection system fitted.	For maximum safety manriding winch working load should be limited to 300 lbs with slack line detection system installed. Consider replacing man riding winches.
All winches in the moonpool area are subject to harsh conditions making them more susceptible to corrosion.	Source covers to be used on moonpool winches when not in use.
Consider installing 2 hydraulically operated work baskets to access equipment in the moonpool area.	This would remove the necessity of man riding in this area. Man riding should be considered the last resort to access equipment.

Category	Code	System
Barge	ACOM	Accommodation
Barge	BLST	Ballast / Preload Systems
Barge	COMM	Communications Systems
Barge	CPTR	Computer Systems
Barge	DPS	Dynamic Positioning System
Barge	EVNS	Environmental Management System
Barge	JS	Jacking System
Barge	MTHL	Materials Handling
Barge	MOOR	Mooring Winch System
Barge	VI	Navigation & Vessel Instrumentation
Barge	PHL	Personnel Handling
Barge	PROP	Propulsion System
Barge	RST	Rig Structure
Barge	SURV	Survival Systems
Barge	WTD	Watertight Door Systems
Barge	WMAC	Workshop Machinery
Drilling Equipment	DRHS	Derrick Hoisting System
Drilling Equipment	DIST	Drilling Management Systems
Drilling Equipment	DRLS	Drillstring
Drilling Equipment	DSRT	Drillstring Rotating Equipment
Drilling Equipment	PH	Pipehandling Equipment
Drilling Equipment	TAD	Tender Assist Drilling Package
Mud Systems	BMS	Bulk Mud System
Mud Systems	CMT	Cement System
Mud Systems	HPMS	High Pressure Mud Systems
Mud Systems	LPMS	Low Pressure Mud Systems
Mud Systems	MCS	Mud Cleaning Systems
Mud Systems	MDS	Mud Storage
Safety Systems	ESD	Emergency Shutdown System
Safety Systems	FGDS	Fire & Gas Detection
Safety Systems	FFS	Fire Fighting System
Safety Systems	SFTY	Safety Systems / Equipment
Safety Systems	VMS	Vessel Management System
Safety Systems	RSE	Rig Spare Equipment
Third Party Equipment	TPE	Third Party Equipment
Utilities	BILG	Bilge System

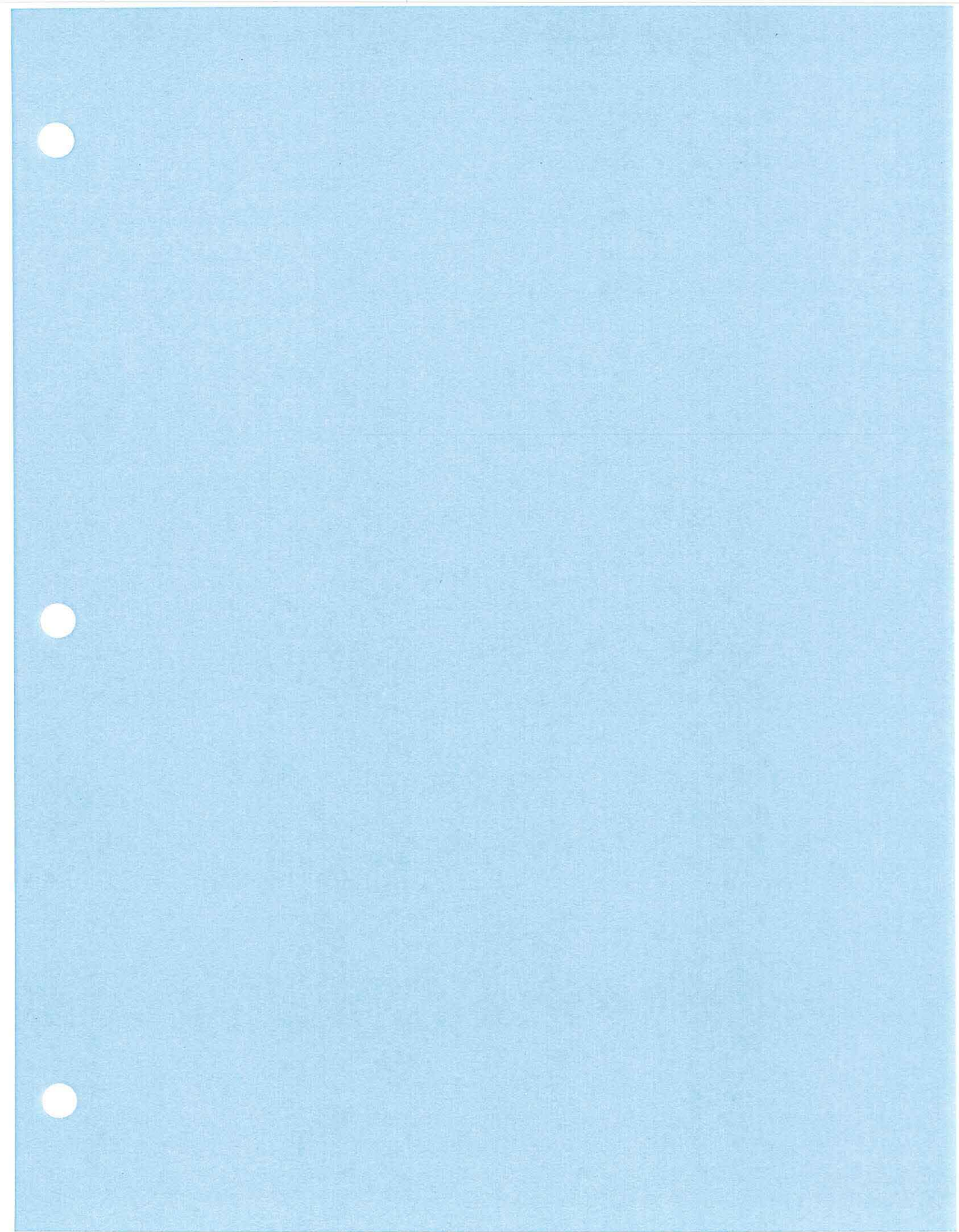
CONFIDENTIAL

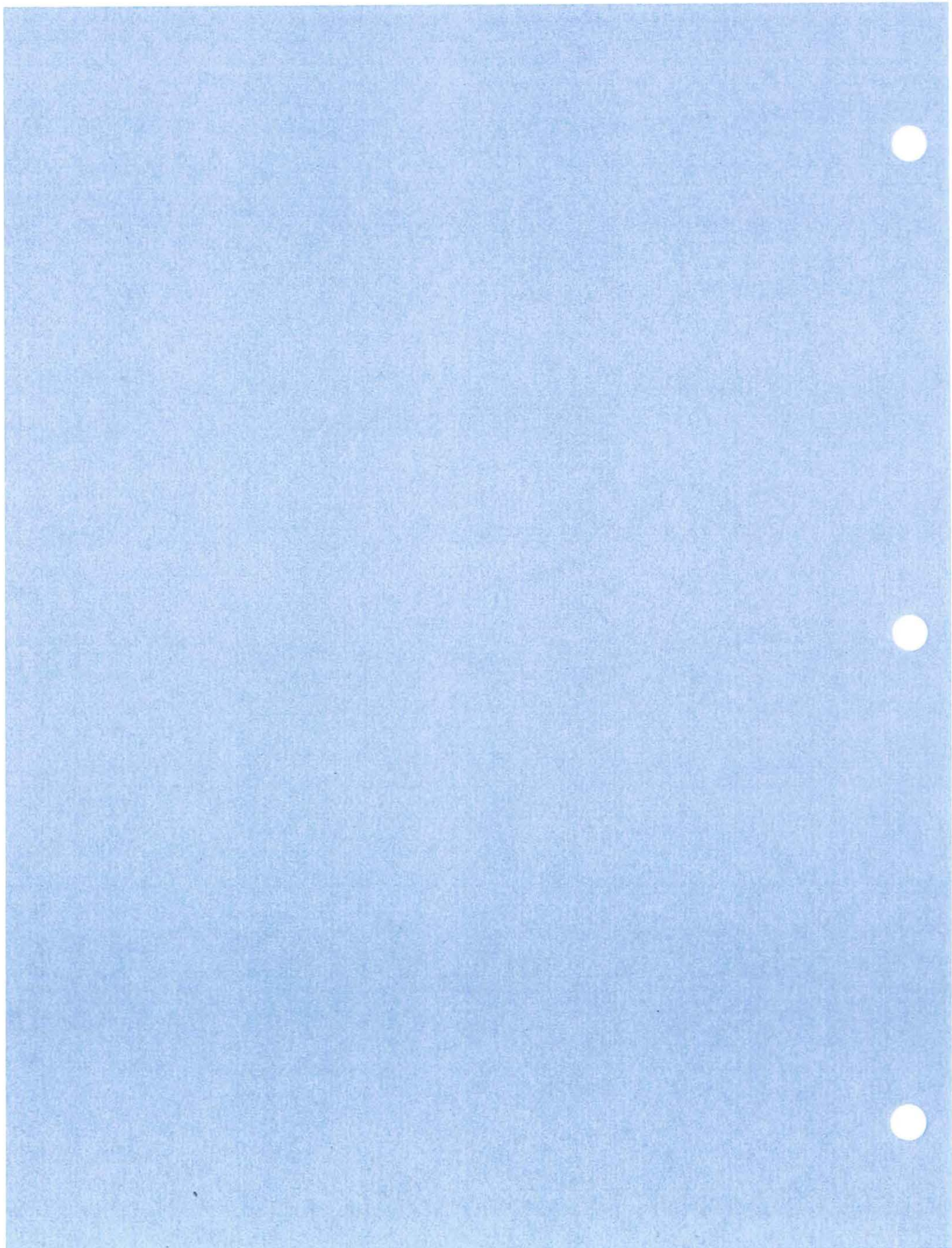
MODUSI 01 0 000250

Utilities	AIR	Compressed Air Systems
Utilities	DRLW	Drill Water System
Utilities	ELPD	Electrical Power Distribution
Utilities	ELPG	Electrical Power Generation
Utilities	FUEL	Fuel Oil Systems
Utilities	HVAC	HVAC Systems
Utilities	HYD	Hydraulic System
Utilities	LHTG	Lighting Systems
Utilities	LUBE	Lube Oil System
Utilities	POTW	Potable Water System
Utilities	SKID	Rig Skidding
Utilities	SEA	Seawater Systems
Utilities	TFS	Treated Freshwater System
Well Control	BOPH	BOP Handling System
Well Control	CTS	Conductor Tensioning System
Well Control	COH	Crude Oil Handling
Well Control	RISH	Riser Handling
Well Control	RTS	Riser Tensioning Systems
Well Control	WCS	Well Control System
Well Control	WELT	Well Testing/Completion

CONFIDENTIAL

MODUSI 01 0 000251







Transocean Rig Hardware Assessment Definitions

Priority Codes	A	B	C
Priority Definitions	Critical items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.	Major items that may lead to damage to essential equipment or detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.	Minor items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

Condition Levels	Level 1	Level 2	Level 3
Equipment Definitions	<ul style="list-style-type: none"> • Equipment is in bad condition; it is not working or should be removed from service until deficiencies are rectified. • Equipment has excessive down time. • Equipment wear is past OEM limits or is obsolete and no longer supported by OEM. 	<ul style="list-style-type: none"> • Equipment is in fair condition; some major deficiencies have been noted. • Equipment has some downtime. • Equipment wear is getting close to OEM limits or is nearing end of useful life. 	<ul style="list-style-type: none"> • Equipment is in good condition; some minor deficiencies may have been noted.
Structural Definitions	<ul style="list-style-type: none"> • Structure/steel is highly corroded and/or wasted and requires replacement. 	<ul style="list-style-type: none"> • Structure/steel is showing heavy corrosion and/or minor wastage 	<ul style="list-style-type: none"> • Structure/steel is well coated; may show some signs of minor corrosion.

Maintenance System Definitions	<ul style="list-style-type: none"> • Maintenance System is not understood by crew. • Major PM Tasks are more than 12 months overdue. • PM's have been closed without being completed. • Certification documents are missing. 	<ul style="list-style-type: none"> • Some improvement areas regarding the Maintenance System. • PM Tasks are 6 to 12 months overdue. • PM's are not fully completed or closed without being completed as per task steps. 	<ul style="list-style-type: none"> • Maintenance system is understood by crew. • Major PM Tasks are completed mostly on time.
---	--	---	---

This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be traded or divulged to any other company or person without express written permission.

ns

Level 4

- Equipment is in new or like new condition. There are no deficiencies noted

- Structure/steel is new or in like new condition. There are no signs of corrosion.

CONFIDENTIAL

MODUSI 01 0 000254

- All PM Tasks are always completed on time.
- A leader among rig class in Maintenance system performance.

ansferred, reproduced, conveyed



A		Critical equipment
B		Major item failure or
C		Minor item

Reference Number	DESCRIPTION	TAG		
		System	Comp	No.
1001	Accommodation	ACOM	ACM	001
1002	Accommodation	ACOM	ACM	001
1003	Galley Equipment	ACOM	GEQT	001
1004	Galley Equipment	ACOM	GEQT	001
1005	HP Tensioner APV #1	AIR	ARCV	003
1006	HP Tensioner APV #2	AIR	ARCV	004
1007	HP Tensioner APV #8	AIR	ARCV	010
1008	HP Air Compressor #1	AIR	COMP	007

Reference Number	DESCRIPTION	System	Comp	No.
1009	HP Air Compressor #1	AIR	COMP	007
1010	HP Tensioner APV #26 PRV	AIR	PRV	042
1011	HP Tensioner Standby APV #1 PRV	AIR	PRV	047
1012	Bilge/Ballast Control HPU #1 Stbd Fwd	BLST	HPU	001
1013	P-Tank #1	BMS	BUTK	001
1014	P-Tank #1	BMS	BUTK	001
1015	Surge Tank #1	BMS	BUTK	011
1016	Surge Tank #1	BMS	BUTK	011
1017	Bulk Storage Instrumentation	BMS	INST	001
1018	Bulk Storage Instrumentation	BMS	INST	001
1019	BOP Bulkhead Guiding System	BOPH	BOPF	002
1020	BOP Bridge Crane #1	BOPH	OCRN	001
1021	BOP Bridge Crane #1	BOPH	OCRN	001
1022	Hazardous Area General Alarms	COMM	ALRM	001
1023	Non Hazardous Area General Alarm	COMM	ALRM	002

Reference Number	DESCRIPTION	System	Comp	No.
1024	Non Hazardous Area CCTV Camera	COMM	CAM	002
1025	Public Address System	COMM	CTRU	001
1026	Drilling Instrumentation	DIST	INST	001
1027	Crown Block Main	DRHS	CROW	001
1028	Crown Block Main	DRHS	CROW	001
1029	Derrick	DRHS	DERK	001
1030	Derrick	DRHS	DERK	001
1031	Derrick	DRHS	DERK	001
1032	Derrick	DRHS	DERK	001
1033	Derrick	DRHS	DERK	001
1034	Derrick	DRHS	DERK	001

Reference Number	DESCRIPTION	System	Comp	No.
1035	Derrick	DRHS	DERK	001
1036	Derrick	DRHS	DERK	001
1037	Derrick	DRHS	DERK	001
1038	Derrick	DRHS	DERK	001
1039	Derrick	DRHS	DERK	001
1040	Derrick	DRHS	DERK	001
1041	Derrick	DRHS	DERK	001
1042	Derrick	DRHS	DERK	001
1043	Drawworks Active Heave	DRHS	DWKS	001
1044	Drawworks Active Heave	DRHS	DWKS	001
1045	Drawworks Active Heave	DRHS	DWKS	001
1046	Drawworks Active Heave	DRHS	DWKS	001
1047	Drawworks Auxiliary Handling	DRHS	DWKS	002
1048	Drawworks Auxiliary Handling	DRHS	DWKS	002

Reference Number	DESCRIPTION	System	Comp	No.
1049	Drawworks AC Drive Motor #2	DRHS	MTR	002
1050	Drawworks AC Drive Motor #5	DRHS	MTR	005
1051	Drill Water Pump #1	DRLW	PMP	001
1052	Drill Water System Valves	DRLW	VLV	001
1053	Rotary Table	DSRT	ROT	001
1054	Top Drive	DSRT	TD	001
1055	Ex./Sup. Fans	ELPD	HAZA	001
1056	480V MCC #1	ELPD	MCC	001
1057	VFD Switchboard Line Up #1	ELPD	SWBD	018
1058	11KV/600V Drilling Power Transformer #1	ELPD	TFMR	021
1059	Main Engine #1	ELPG	ENG	001

Reference Number	DESCRIPTION	System	Comp	No.
1060	Main Engine #3	ELPG	ENG	003
1061	Main AC Generator #1	ELPG	GEN	001
1062	Main AC Generator #1	ELPG	GEN	001
1063	Main AC Generator #1	ELPG	GEN	001
1064	Main AC Generator #4	ELPG	GEN	004
1065	Main AC Generator #5	ELPG	GEN	005
1066	Main AC Generator #6	ELPG	GEN	006
1067	Main Engines LT Cooling System Pipework	ELPG	PIPE	001

Reference Number	DESCRIPTION	System	Comp	No.
1068	Oily Water Separator #1	EVNS	SEP	001
1069	Oily Water Separator #1	EVNS	SEP	001
1070	Sewage Treatment Vacuum Toilet System	EVNS	SWGE	002
1071	Oily Water Separator Tank Port	EVNS	TANK	003
1072	Waste Oil Holding Tank Port	EVNS	TANK	001
1073	Emergency Generator Room CO2 Fire Suppression	FFS	FS	003
1074	Helideck Fire Monitors	FFS	MON	002
1075	Helideck Foam Pump AC Motor	FFS	MTR	006
1076	Foam System Pipework	FFS	PIPE	002
1077	Foam Pump PRV	FFS	PRV	005
1078	Helideck Foam System Tank	FFS	TANK	002
1079	Foam System Valves	FFS	VLV	002
1080	Portable Gas Detectors	FGDS	PGD	001
1081	Helicopter Refueling System	FUEL	HELI	001

Reference Number	DESCRIPTION	System	Comp	No.
1082	Fuel Oil Pump #1 Port Purifier Room	FUEL	PMP	001
1083	Fuel Transfer Pump #1 Port	FUEL	PMP	003
1084	Fuel Transfer Pump #1 Port	FUEL	PMP	003
1085	Mud Pump #1	HPMS	MP	001
1086	Mud Pump #1	HPMS	MP	001
1087	Mud Pump #1	HPMS	MP	001
1088	Mud Pump #1	HPMS	MP	001

Reference Number	DESCRIPTION	System	Comp	No.
1089	Mud Pump #1	HPMS	MP	001
1090	Mud Pump #2	HPMS	MP	002
1091	Mud Pump #2	HPMS	MP	002
1092	Mud Pump #2	HPMS	MP	002
1093	Mud Pump #2	HPMS	MP	002
1094	Mud Pump #3	HPMS	MP	003
1095	Mud Pump #3	HPMS	MP	003
1096	Mud Pump #3	HPMS	MP	003

Reference Number	DESCRIPTION	System	Comp	No.
1097	Mud Pump #3	HPMS	MP	003
1098	Mud Pump #4	HPMS	MP	004
1099	Mud Pump #4	HPMS	MP	004
1100	Mud Pump #1A AC Drive Motor	HPMS	MTR	001
1101	Mud Pump #1A AC Drive Motor	HPMS	MTR	001
1102	Mud Pump #1A AC Drive Motor	HPMS	MTR	001
1103	Mud Pump #2A AC Drive Motor	HPMS	MTR	005
1104	Mud Pump #3A AC Drive Motor	HPMS	MTR	009
1105	Mud Pump #3A AC Drive Motor	HPMS	MTR	009
1106	Mud Pump #4A AC Drive Motor	HPMS	MTR	013
1107	Air Conditioning Unit #5 Switchboard	HVAC	ACU	005
1108	Air Conditioning Unit CCR	HVAC	ACU	029
1109	Main Air Conditioning Unit #1A	HVAC	ACU	035
1110	Air Handling Unit #1	HVAC	AHU	001

Reference Number	DESCRIPTION	System	Comp	No.
1111	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001
1112	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001
1113	Non Hazardous Area HVAC Ducting	HVAC	DUCT	001
1114	Rig Central Equipment HPU	HYD	HPU	002
1115	Rig Central Equipment HPU	HYD	HPU	002
1116	Rig Central Equipment HPU	HYD	HPU	002
1117	Aircraft Warning Lights	LHTG	LTE	001
1118	Non Haz Area Emerg Lighting	LHTG	LTE	002
1119	Mud Degasser #2	MCS	DGAS	002
1120	Shale Shaker Cascading #1	MCS	SHAK	001
1121	Mud Pit Tank #5 Agitator #5A AC M	MDS	MTR	005
1122	Mud Storage Valves	MDS	VLV	001

Reference Number	DESCRIPTION	System	Comp	No.
1123	Mud Storage Valves	MDS	VLV	001
1124	Crane #1 Port	MTHL	CRN	001
1125	Crane #1 Port	MTHL	CRN	001
1126	Crane #1 Port	MTHL	CRN	001
1127	Crane #1 Port	MTHL	CRN	001
1128	Crane #1 Port	MTHL	CRN	001
1129	Crane #1 Port	MTHL	CRN	001
1130	Crane #1 Port	MTHL	CRN	001

Reference Number	DESCRIPTION	System	Comp	No.
1131	Crane #1 Port	MTHL	CRN	001
1132	Crane #1 Port	MTHL	CRN	001
1133	Crane #1 Port	MTHL	CRN	001
1134	Crane #1 Port	MTHL	CRN	001
1135	Crane #2 Stbd	MTHL	CRN	002

Reference Number	DESCRIPTION	System	Comp	No.
1136	Crane #2 Stbd	MTHL	CRN	002
1137	Crane #2 Stbd	MTHL	CRN	002
1138	Crane #2 Stbd	MTHL	CRN	002
1139	Crane #2 Stbd	MTHL	CRN	002
1140	Crane #2 Stbd	MTHL	CRN	002
1141	Crane #2 Stbd	MTHL	CRN	002

Reference Number	DESCRIPTION	System	Comp	No.
1142	Crane #2 Stbd	MTHL	CRN	002
1143	Crane #2 Stbd	MTHL	CRN	002
1144	Crane #2 Stbd	MTHL	CRN	002
1145	Crane #2 Stbd	MTHL	CRN	002
1146	Crane #2 Stbd	MTHL	CRN	002
1147	Knuckle Boom Crane	MTHL	CRN	003
1148	Knuckle Boom Crane	MTHL	CRN	003
1149	Knuckle Boom Crane	MTHL	CRN	003
1150	Knuckle Boom Crane	MTHL	CRN	003
1151	Derrick Fingerboard Upper	PH	FGBD	001
1152	Derrick Fingerboard Upper	PH	FGBD	001
1153	Derrick Fingerboard Upper	PH	FGBD	001
1154	Pipe Racking System #1 Aft	PH	PHM	001

Reference Number	DESCRIPTION	System	Comp	No.
1155	Pipe Racking System #1 Aft	PH	PHM	001
1156	Casing Rotator	PH	PHM	008
1157	Casing Rotator	PH	PHM	008
1158	Casing Rotator	PH	PHM	008
1159	Rig Floor Utility Winch #1 Orange	PH	UWIN	001
1160	Rig Floor Utility Winch #4 Green	PH	UWIN	003
1161	Rig Floor Utility Winch #13 Red DWKS Fwd	PH	UWIN	004
1162	Rig Floor Utility Winch #13 Red DWKS Fwd	PH	UWIN	004
1163	Personnel Elevator #1 Stbd Fwd	PHL	MELV	001
1164	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
1165	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
1166	Water Maker #1	POTW	WTMK	001
1167	Water Maker #5	POTW	WTMK	005

Reference Number	DESCRIPTION	System	Comp	No.
1168	Water Maker #5	POTW	WTMK	005
1169	Water Maker #6	POTW	WTMK	006
1170	Thruster #1 Heat Exchanger	PROP	HTEX	001
1171	Thruster #2 AC Motor	PROP	MTR	024
1172	Thruster #3 AC Motor	PROP	MTR	028
1173	Thruster #8	PROP	THR	008
1174	Thruster #8	PROP	THR	008
1175	Riser Skate	RISH	BOPC	001
1176	Riser Skate	RISH	BOPC	001
1177	Riser Skate	RISH	BOPC	001

Reference Number	DESCRIPTION	System	Comp	No.
1178	Riser Overhead Bridge Crane	RISH	OCRN	001
1179	Riser Overhead Bridge Crane	RISH	OCRN	001
1180	Main Deck	RST	STRU	016
1181	Main Deck	RST	STRU	016
1182	Main Deck	RST	STRU	016
1183	Riser Recoil Controller	RTS	CTRU	002
1184	Riser Tensioner #1 Cylinder #1A	RTS	HCYL	001

Reference Number	DESCRIPTION	System	Comp	No.
1185	Riser Tensioner #1 Cylinder #1A	RTS	HCYL	001
1186	Riser Tensioner #2 Cylinder #2A	RTS	HCYL	003
1187	Riser Tensioner #5 Cylinder #5A	RTS	HCYL	009
1188	Seawater System Pipework	SEA	PIPE	001
1189	Seawater System Pipework	SEA	PIPE	001
1190	Seawater System Pipework	SEA	PIPE	001
1191	Seawater Pump #1	SEA	PMP	001
1192	Lifeboat #2	SURV	BOAT	002
1193	Lifeboat #4	SURV	BOAT	004
1194	TFW Cooling System Heat Exchanger #2 Port	TFS	HTEX	003
1195	TFW Cooling System Pipework	TFS	PIPE	001
1196	TFW Cooling System Pump #1 Port	TFS	PMP	001

Reference Number	DESCRIPTION	System	Comp	No.
1213	Diverter	WCS	DIVT	001
1214	Subsea Flex Joint	WCS	FJRA	001
1215	BOP HPU Pump #1	WCS	PMP	001
1216	BOP HPU Pump #1	WCS	PMP	001
1217	BOP HPU PRV #1	WCS	PRV	001
1218	BOP HPU PRV #2	WCS	PRV	002
1219	BOP HPU PRV #3	WCS	PRV	003
1220	Riser Joint DWH002 1K Tan	WCS	RISE	001
1221	Blue BOP MUX Cable Reel	WCS	SSHR	001
1222	Yellow BOP MUX Cable Reel	WCS	SSHR	002
1223	Hot Line Hose Reel	WCS	SSHR	004
1224	Powered Watertight Doors	WTD	WTDR	003
1225	Powered Watertight Doors	WTD	WTDR	003
1226	Powered Watertight Doors	WTD	WTDR	003

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 18 Apr 2010

Rev 3

equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.
items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.
items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The carpets in the rooms in the accommodation are badly stained.	C	Replace the stained carpets.	3
The floor in the mess room and other parts of the accommodation are damaged including a hole in the deck outside room 330	C	Repair flooring as necessary.	3
Several cabinets, draws and doors in the galley were damaged.	B	Replace the damaged galley cabinets.	1
The main steam table, the food mixer and dish washer were noted to be in a poor condition.	B	Replace the food mixer, steam table and the dish washer	1
Pressure Gauges damaged on all 30 APV bottles.	B	Replace gauges with new calibrated gauges	1
Discharge lines face towards walkway on all 30 APV bottles	B	Reroute discharge lines away from walkways	2
Corrosion on flanged outlet from bottle to isolation ball valve	B	Perform protective coating maintenance on corroded flange	2
Flanged cooling water hoses have become hard and brittle.	C	Replace flanged cooling water hoses on 1 and 2 high pressure compressors.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Cables and tubing to HP Air Compressors Nos 1 & 2 are not properly supported.	C	Organize and properly support cables and tubing.	3
Two handles missing on isolation all valve	B	Replace Handles as soon as possible and replace all valves once they are received .	2
Pressure relief valve is out of calibration on all 30	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
All 4 HPU units for the ballast system has solenoids in the cabinets and they are getting hot to the point of burning out. They are using a 120V and needs to be using a 24V system. This is causing a safety issue due to the system failing to shut off the ballast valves or opening the valves when needed. During an emergency this would be a major issue. The system also operates the water tight dampers on the rig.	A	Replace all 4 HPU units and solenoid systems for the ballast system.	1
No record of when wall thickness checks on bulk storage tanks were carried out.	C	Carry out wall thickness checks on bulk air tanks	2
No SWP stenciled on bulk tanks.	C	Stencil all bulk tanks with SWP.	3
No record of when wall thickness checks on bulk surge tanks were carried out.	C	Carry out wall thickness checks on surge tanks	2
No SWP stenciled on surge tanks.	C	Stencil all surge tanks with SWP.	3
Hoses on column bulk tank load cells corroded out.	C	Replace corroded hoses on weight indicators	3
Load cells corroding out on column bulk tanks	C	Address corrosion on column bulk tank load cells	3
The lower gripper unit track has some bolts which are corroded.	B	Address corrosion and replace track bolts and nuts as necessary.	2
No current load test as per company policy	C	Load test the BOP Crane.	1
Remote controller being used is obsolete	A	Install new controller once arrived as planned	1
Alarm lights in the mud pit room not identified for there use.	C	Ensure all alarm lights are identified	3
Several alarms failed to work when activated during the weekly boat drill. (Gave list to the Chief Mate)	C	Repair as necessary.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
It was reported to us camera No 23 was not working, this CCTV unit is used to monitor helicopter operation	B	Replace the broken camera.	1
PA rack amplifiers are obsolete.	C	As planned replace the PA system.	1
it was reported to us several items on the rig floor will not work in automatic which includes the PRS, IR and the zone management. During our assessment we observed the equipment was being operated manually.	A	Investigate the issues and repair as necessary.	2
Crown sheaves grease hoses in poor condition, several of the hoses were damaged and leaking grease. There was no evidence of grease reaching the fast line or main block clusters.	B	Replace grease line hoses or as the access is good around sheaves, install grease zerts directly in sheave pins and grease the sheaves directly. COMPLETE	1
The crown bumper blocks wood has rotted out and is only being held in place by the steel mesh around the wood.	B	Replace rotted wood bumpers at the crown, or investigate if the wooden blocks can be replaced with neoprene bumper blocks.	2
It was noted that two bolts not flush with derrick girts. Stbd side below the monkey board level.	C	Investigate if the bolts are loose or tight in the beams, repair as necessary.	3
It was noted the safety slings on the finger board were corroding out.	A	This safety slings are now being changed out by the drill crew.	2
It was noted that the Port fwd air winch line rubbing on plate on derrick first level	B	Investigate if plate can be removed or if this is not possible install a roller guide to prevent any further damage to the derrick structure.	2
A large section of deck grating at the crown is corroding out	B	Replace corroded grating at the crown level, replace with galvanized steel grating.	2
The complete derrick is galvanized except for the top section which has been painted. On this top section the paint coating is breaking down and corrosion is apparent..	C	While not structurally weakened at present we would recommend the corrosion is addressed in the near future.	3
It was noted that wooden rails have been fitted on two horizontal beams below the monkey board level. This wood is deteriorating and should be removed.	A	Remove wood from two horizontal beams below monkey board level; potential dropped object.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Bent horizontal beam, caused by stands falling across derrick	C	Replace beam as previously planned.	3
Standing water in derrick lower diagonals braces	C	Clean debris from lower diagonals and clean out drain holes	3
Plastic covering from drill line lying in derrick beams	C	Remove debris from derrick	3
Wind speed indicator not working above crown	C	Repair/replace wind speed indicator	3
Block hang off lines ties off with soft line in derrick.	C	Replace soft line with wire slings, on both hang off lines.	3
We are informed by the rig crew that the short block hang off line is no longer used.	C	Remove the short hang off line if no longer required.	3
Under the water table: it was noted that the cotter pins are undersize on shackles, and incorrect retainers being used.	B	Fit the correct size of cotter pins to all shackles	2
Under water table of the auxiliary derrick, the coating is breaking down and corrosion is present.	C	Remove corrosion and re-paint structure.	3
Since OEM realignment of drive motors the motor drive shafts are no longer centered in the seals and the seals are leaking.	C	Investigate with OEM if an improved design is available or other remedy to matter.	3
Slight oil leaks on main drive shaft oil seals	C	Repair leaking seal.	3
After reviewing the PM records we were unable to find when the brake caliper springs were replaced last.	A	Replace the brake caliper springs yearly as specified in the OEM service manual.	1
Drive motor vibration It was noted that during operations the A.C. motors were vibrating, this is a common fault with active heave drawworks, being usually attributed to alignment issues or encoder feedback issues were the motors were not running in synchronization.	C	Recheck motor alignment/encoder feedback issues	3
Wire spooler Hydraulic cylinder was leaking and has now been disconnected.	B	Install replacement cylinder when it arrives.	3
It was noted that the paint coating on the air receiver is breaking down.	C	Remove the corrosion from the air receiver and repaint.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Ductwork was found cracked on drawworks No. 2 motor drillers side.	C	Repair cracks in ductwork, consider fitting a flex coupling in ductwork to prevent further damage being carried out on duct work due to motor vibration.	3
Megger test reading was 1.15 Mohms. Transocean standard is 2 Mohm or greater.	B	Investigate and repair as necessary.	2
The drill water pumps on the Port side of the rig were worn and leaking.	B	Repair or replace drill water pumps as needed.	2
the drill water valves in the mud pit room were leaking by when closed.	B	Repair or replace the drill water valves in the mud pit room as needed.	2
The hydraulically operated rotary table was inoperative at the time of the survey. The power skid controls had been removed and sent to town for repair last year.	B	Investigate the delay on returning the power skid controls, install and test table when parts arrive.	1
It was noted the top drive blower hose was poorly secured with a steel clamp.	C	Remove and reposition clamp on blower hose	3
There were no reports on the rig when an Ex electrical equipment survey was last conducted.	A	Conduct a Hazardous Area Electrical Survey and establish a Hazardous Area Electrical Register as per HQS-OPS-EST-694-01.	1
Duct tape used to cover open holes in one of the MCC boards where MCC cubicles have been removed.	C	Source or fabricate maintenance covers for use when switchboard components are removed.	3
Buss assembly removed from DW3 VFD bay to be installed in top drive VFD bay.	C	As planned replace the buss assembly	3
Approved rubber matting is missing from the front of all transformers on the rig.	A	Install rubber matting in front of the transformers as per the Transocean HQS-HSE PP-01 procedures section 4, subsection 5.9	1
During the engine shut down testing, it was noted the all six engines had several of the water jacket sensors disabled, due to giving false reading at times.	B	Check into what is causing the problems with the water jacket sensors and why they are giving false reading and causing them not to perform correct. Repair or replace the sensors and check with getting a third party tech out to the rig for taking care of this problem.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
During the inspection of the engines and shut downs, we were unable to test the shut downs due to a main cooling water line spool had been taken out for repairs. The engine was shut down and the port side of the rig water system had to be shut off to make the repair. This was due to the main water line valves leak by and will not close off the water in the lines completely. On interviews with crew members it was noted the valves were bad and will not close off well.	B	Replace all salt water and fresh water valves as need for the engines and the main water lines.	2
Dust and metal particle were noted inside the generator No 1	B	Ensure the generator is cleaned and the metal particle removed. COMPLETE	1
Washers inside the generator on the buss bars on No 1 generator are corroded.	B	Replace the corroded washers.	1
The cooling fins on generator No 1 are damaged with metal filings breaking off and debris entering generator housing.	B	Replace the cooling fins on No 1 generator	2
The water leak detector on No 4 generator failed to alarm when tested.	B	Repair or replace as necessary.	2
In Main Generator No. 1 junction box, one cable from V phase and one cable from U phase were chaffing.	C	Make repairs as necessary.	3
No 6 generator had oil inside the fan housing	B	Investigate oil inside the generator and repair where necessary.	1
In review of the history and on visual inspection of the pipe work for all six engine heat exchangers, it was noted the fresh water cooling pipe work for the main engine heat exchangers was thin with leaks occurring often this has started to cause flooding issues of the floors at the heat exchangers as well and causing cooling problems with the engines. During the assessment there was a leak in the piping at the connection to the heat exchanger for Main Engine No. 1.	B	Replace all pipe work as needed for all 6 heat exchangers for the engines at nearest opportunity..	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The pumps and pressure relief valves on both oily water separators leaking.	B	Repair or replace the pump and pressure relief valve on both oily water separators.	2
The piping for the drain going to the relief valve had been taken apart at the flange connection.	B	Repair the piping going from the relief valve to the drain.	2
Sewage treatment system is severely corroded with wastage. One of the overboard discharge pumps has been removed and both air compressors have also been taken off the plant; regulated rig air is now used to supply air to the tank diffuser system.	A	Replace the sewage treatment plant.	1
Both oily water separator tanks were severely corroded and	B	Replace both oily water separators.	2
The vent for the sludge oil tank located on the STBD side of the rig, did not have a containment around the vent and had oil running down the vent pipe on the out side of the vent.	B	Install a containment area around the sludge oil vent pipe, located on the STBD side of the rig.	2
The CO2 lines in the emergency generator room were painted white. Regulations require the fire fighting, CO2 etc.. all to be painted red.	C	Paint the CO2 lines in the emergency generator room red.	3
Corroded and undersized brackets on helideck monitors fwd and stbd side.	C	Replace brackets to larger size, (same as installed on aft monitor).	3
Crew reports electric motor has seized up and had been freed off.	C	Replace electric motor bearings.	3
Pipe work corroded out on foam system tank and lines.	C	Replace corroded pipework.	3
Test date on foam system PRV out of date (2007)	C	Re-certify PRV	3
Corroded cable trays around foam system tanks	C	Replace corroded cable trays.	3
Manual valve handles corroded.	C	Replace handles or complete valves if new handles are not available.	3
Two of the six portable gas detectors were not working at the time of this assessment	C	Repair as necessary.	3
The pressure relief valves on the fuel tank system for the chopper fueling station were out of date for being tested.	B	Have all pressure relief valves re-certified for the fueling station.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
In both fuel purifier room the sight glass gauges were tie wrapped open on all fuel and oil tanks. This is a safety hazard, if the glass gauge was broken it valve will not work correctly to shut off the oil or fuel.	C	Repair the valves on the sight glass gauges as needed and remove the tie wraps.	2
The pressure relief valves on all of the fuel transfer pumps were dated 7/07. PRVs require biannual testing.	B	Test or have all pressure relief valves recertified on all 4 of the fuel transfer pumps.	2
The fuel transfer pumps on STBD side were leaking around the piping threads next to the pressure relief valves.	C	Repair the small fuel leaks around the piping threads of the fuel transfer pumps on STBD side of rig.	2
It was noted that the belt guard does not fully cover the pinion shaft drive hub on the inside of the belt guard, on Mud Pump #1 and Mud Pump #4. This exposed rotating hub is a potential hazard to personnel standing on top of the pump, whether engaged in pump maintenance or using the pump to access equipment in the surrounding area. There is a danger of any loose equipment e.g. ropes or safety harness lanyards being caught in this rotating equipment with possible fatal results.	A	Extended the belt guard to enclose this exposed rotating piece of equipment.	1
Excessive use of silicone sealant on covers and hatches of all mud pumps.	C	This is proven to be a major cause of pump bearing failure as pieces of the silicone contaminates the lube oil system and becomes plugged off in various grease lines and oil passageways throughout the pump. The correct OEM gaskets should be installed to prevent contamination of the lube oil system and premature bearing failure.	3
Unused fluid end lubricating pump installed on all mud pumps.	C	If not required remove fluid end lubricating pumps.	3
Retsco relief valves as installed on all mud pumps require disassemble to reset.	C	As planned replace the problematic Retsco relief valves with the Titan BX air operated valves.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Crosshead readings ranged from 0.030-0.040", exceeding the maximum allowable of 0.030".	B	Adjust crosshead reading to below 0.030"	2
The cross head lower slides were found badly scuffed and there was no trace of any smooth bearing surface left. As the slides are damaged we would also expect the lower crosshead surface to also be scored, we would recommend that both lower slides and crossheads be replaced on all cylinders.	B	Replace lower crosshead slides and crossheads on all three cylinders. Furthermore, it would be best practice to replace the crosshead bearings when crossheads are replaced, alleviating the need for any further maintenance to the crosshead for several years to come.	2
Left and Center crosshead readings are high; 0.031-0.041".	B	Adjust crosshead reading to below 0.030"	2
A hydraulic hose was in place supplying oil to the L.H. main bearing. This hose has become hard and brittle and should be replaced using the original copper tubing,	C	Replace hard and brittle hydraulic hose with copper tubing as used on the rest of the pump internal lubrication piping. REPORTED COMPLETE BY RIG CREW	3
Internal lubrication lines were found either loosely clamped or not supports, This should be addressed to prevent the tubing fracturing with excessive vibration.	C	Secure internal lubrication lines in power end. REPORTED COMPLETE BY RIG CREW	3
Center crosshead bearing clearance was found have to have a lift of 0.010" which is high, there was also evidence of damage to the lower slide, which could be caused by the breaking up of the crosshead bearing and bearing material falling onto the lower slide.	B	Replace center crosshead bearing, slide and crosshead.	2
Three hydraulic hoses were also being used inside the crankcase these have become hard an brittle and should be replaced to the original OEM copper tubing.	C	Replace hydraulic hoses to the original OEM copper tubing. REPORTED COMPLETE BY RIG CREW	3
The oil pump packing gland was found to be loose and the bolts had backed off and were running on the pump coupling.	B	Secure gland packing retainer and bolts on oil pump. REPORTED COMPLETE BY RIG CREW	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Oil pressure gauge defective.	C	Replace gauge.	3
Cable damaged on junction box.	C	Reposition cable junction box to prevent any further cable damage occurring.	3
A small amount of metal particles were found on the magnetic strips inside the power end, these were cleaned off.	C	We would recommend that these magnetic strips be rechecked again at the next PM interval.	3
The motor winding on 1A and 1B mud pump AC motors are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 1.	1
The belt guard on mud pump 1A motor was noted to be damaged.	C	Repair or replace as necessary.	3
There are no air intake filters fitted on any of the AC motors for the mud pumps.	B	Install air filters on the air intake to the AC motors on the rig this will help further dust and grease entering the motors	2
The motor winding on 2A and 2B mud pump AC motors are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 2.	1
The motor winding on 3A mud pump AC motor are in a extremely poor condition coated in grease and dust.	B	The rig must implement a plan to start to change out the main AC motors for mud pump 3A.	1
The air let vents on the mud pump AC motors are covered with oil and dust	C	Remove vents and clean.	3
The motor winding on 4A and 4B mud pump AC motors are in a covered with dust.	B	Clean motors with dry air.	2
Switchroom 5 A/C unit was not working due to a faulty expansion joint.	B	Repair the expansion joint as planned.	2
The condenser A/C unit for the bridge was not working also it had wasted metal and was in a extremely poor condition	B	Repair the plugged tubes in the cooling syetem.	1
It was reported to us several tubes are plugged for the A/C cooling system.	B	As planned repair the same.	3
The fan ducting in the AHC room port side 3 rd deck is severely corroded	C	Replace the corroded ducting in the AHC room port side 3rd deck.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The VMSA ventilation ducts on the main deck, located next to the STBD and Port cranes were in bad condition. The hatch covers and louvers were corroded severely.	B	Replace the louvers and hatch covers on the ventilation ducts as needed.	2
The gaskets on the hatch covers for the vent duct located on Port and STBD side next to the cranes were in bad condition and had been pieced together in places on the hatches.	B	Replace all gaskets on the ventilation duct hatch covers as needed.	2
The vent on the main deck for the galley supply fan had grease running out of the vent and did not have a screen on the vent hood. (Vent located next to the knuckle boom crane.)	B	Clean out the vent fan duct on the galley supply vent and install new screen on the hood cover.	2
Automatic sequencing panel not working	C	As planned repair pump automatic sequencing control valve.	3
Valves on the hydraulic oil sight glass not push to read.	C	Either replaced valves to this type or install a magnetic type glass.	3
Oil cooler not fitted with splash shield	C	Install splash shield over oil cooler core.	3
The starboard forward aircraft warning lights in the derrick were not working.	C	Repair as necessary.	3
When spot check the battery back-lights on the rig several lights failed within the hour. (List provided to Electrician)	C	Repair as necessary.	3
No. 2 degasser down, as the vacuum pump has been removed.	A	Refit degasser vacuum pump.	1
Several junction boxes in the shaker house had missing certification labels also several junction in the shaker house were in a poor condition with corrosion,	A	Replace the junction boxes with the missing certification labels.	1
Several mud agitator motors were in a poor condition with corrosion,	A	Motor should be overhauled or replaced.	1
All mud guns were inspected and all of these were found to be seized	C	Free off all mud guns	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Valve handle missing in pit room, valve is now being operated with a pipe wrench.	C	Install valve handle	3
The boom walk-way going down the outside of the boom was not safe and was only 10 to 12 inches wide. The tie off cable was not safe for using as a tie off point as well.	A	Replace the walk-way going down the side of the boom with a wider walk way and replace the tie off cable. As a suggestion, install the walk-way on the inside of the boom and install a walkway at the boom sheaves for safe working when performing maintenance to the sheaves.	1
Several of the hydraulic hoses were hard and cracked due to age. The hoses going to the winch located in the boom were hard and cracked, 2 of the hoses were leaking around the cracks in the hoses.	B	Replace all hard and cracked hydraulic hoses on crane as needed.	2
The sewing bolts were severely corroded and in bad condition.	A	Replace all sewing bolts on the port crane.	1
All of the sheaves on the boom tip were showing signs of wear and had cable prints in the sheaves.	B	Replace the boom tip sheaves as needed.	1
No records were provided of where the winches had been replaced or rebuilt in the life of the crane. Manufacture recommendations are to have the winches reworked or replaced every 2 years.	A	Replace or rework all winches on the crane at next available opportunity.	1
No records were provided of where the hydraulic motors had been replaced or rebuilt in the life of the crane. It is recommended to rework or replace the pumps every 2 years.	A	Replace or rework all hydraulic motors on the crane at next available opportunity.	1
The radiator for the crane was in bad condition, the louvers were corroded severely and the housing around the radiator was corroded.	B	Replace the radiator, radiator housing and louvers on crane as needed. Replace the fans and fan guards as for the radiator and cooler as needed.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The main block sheaves were worn on the pin and were rubbing on the sides of the block. The sheaves had cable prints worn in the face of the sheaves. By checking them with a sheave gauge, the wear was showing they were in need of changing as well. The block did not have grease points/fitting installed for lubrication of the sheaves; they were no place installed for adding grease fittings as well.	A	Replace the main block or have completely reworked and NDT test done.	1
The main block sheave at the dead-man end was worn and rubbing on the sides. The sheave had cable prints in it as well. The main pins on the dead-man sheave housing was corroded and only taking grease on one side of the pin.	B	Replace the dead-man sheave and housing block. Replace all pins for the housing block as well.	1
All (3) three sheaves on the boom tip for the whip line were showing signs of wear and had cable prints in the sheaves. The sheaves were rubbing on both sides, indicating wear of the pin or sheave, to the point they must be replaced at nearest opportunity.	A	Replace all (3) three whip line sheaves at boom tip at nearest opportunity.	1
The engines on both deck cranes do not meet EPA standards and must be changed out. After interviews with crew members this was noted and they said the engines for the cranes were on order. The rig had no records of the engines being reworked during the life of the cranes.	C	Replace the crane engine as planned.	3
The bolts on each boom section where they were bolted together were in bad condition due to corrosion of the bolts.	B	Replace all boom section bolts or have NDT test done on the bolts and clean up the joint in each section of the boom and recoat with protective coating and paint boom section joints.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Several of the hydraulic hoses located on all winches were hard and cracked due to age. The hoses going to the winch located in the boom were hard and cracked, 2 of the hoses were leaking oil from the cracks in the hoses.	B	Replace all hard and cracked hydraulic hoses on crane as needed. Make a log register for keeping up with the dates, and what hoses were replaced.	1
One of the main block sheaves at the end of the boom had wire rope prints showing in the sheave. (Inside sheave.)	B	Replace the main block sheaves at boom tip as needed.	1
The boom walk-way going down the outside of the boom was not safe and was only 10 to 12 inches wide. The tie off cable was not safe for using as a tie off point as well.	A	Replace the walk-way going down the side of the boom with a wider walk way and replace the tie off cable. As a suggestion, install the walk-way on the inside of the boom and install a walkway at the boom sheaves for safe working when performing maintenance to the sheaves.	2
No records were provided of where the winches had been replaced or rebuilt in the life of the crane. Manufacture recommendations are to have the winches reworked or replaced every 2 years.	A	Replace or rework all winches on the crane at next available opportunity.	1
The radiator for the crane was in bad condition, the louvers were corroded severely and the housing around the radiator was corroded.	B	Replace the radiator, radiator housing and louvers on crane as needed. Replace the fans and fan guards as for the radiator and cooler as needed.	1
The main block sheaves were worn on the pin and were rubbing on the sides of the block. The sheaves had cable prints worn in the face of the sheaves. By checking them with a sheave gauge, the wear was showing they were in need of changing as well. The block did not have grease points/fitting installed for lubrication of the sheaves; they were no place installed for adding grease fittings as well.	A	Replace the main block or have completely reworked and NDT test done.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The main block sheave at the dead-man end was worn and rubbing on the sides. The sheave had cable prints in it as well. The main pins on the dead-man sheave housing was corroded and only taking grease on one side of the pin.	B	Replace the dead-man sheave and housing block. Replace all pins for the housing block as well.	1
The load cell located on the dead-man cable end was bent and worn severely; the pin was worn to the point where it must be replaced.	A	Replace the load cell and pin for the load-cell; the load-cell and indicator must be calibrated when replaced.	1
The boom camera bracket was severely corroded and the safety cable was corroded to the point it must be replaced.	B	Repair/replace the boom camera mounting bracket and replace the safety cable for the camera.	1
All (3) three sheaves on the boom tip for the whip line were showing signs of wear and had cable prints in the sheaves. The sheaves were rubbing on both sides, indicating wear of the pin or sheave, to the point they must be replaced at nearest opportunity.	A	Replace all (3) three whip line sheaves at boom tip at nearest opportunity.	1
After reviewing of the crane logs, it was noted, the main gear box for the crane was leaking and had to have gear oil added often.	B	Repair the leak on the main gear box as needed.	2
The crane had not been overhauled during the life of the crane.	B	Overhaul the knuckle boom crane.	2
The hydraulic motors had not been overhauled or replaced.	B	Overhaul or replace the knuckle boom crane hydraulic motors.	2
The hydraulic hoses were hard and stiff.	B	Replace all hydraulic hoses.	2
While some of the hose connections for the grippers had small leaks at the connections.	B	Repair all leaking hose connections on the grippers.	2
Corroded safety lines on fingers	A	Continue replacing damaged safety lines.	2
Leak on small bore tubing adjacent derrick ladder	C	Repair air leak.	3
Air line filter damaged and leaking at MB level	C	Replace leaking filter.	3
Hydraulic cylinder leaking on aft PRS wire tension cylinder	C	Repair hydraulic leak. COMPLETED	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
PRS track had been replaced in the past year and is wearing prematurely.	B	Replace track, preferably with harder material and change 4 wheel carriage with 8 wheel carriage as planned to displace the load.	2
Lower clamp motor leaking and has been plugged off.	B	Fit replacement hydraulic motor.	1
Corrosion on hose hydraulic hose fitting on horizontal to vertical pipe handler and under control consul.	C	Clean corrosion from hose connections and wrap with Denso tape.	3
Hydraulic gauges on control consul damaged.	B	Replace hydraulic gauges.	2
Isolation valve for all utility winches used for manriding are not within easy reach of the operator.	A	Fit isolation valves next to winch controls.	2
Port Fwd rig floor utility winch air supply hose damaged.	B	Replace damaged Port Fwd rig floor utility winch air supply hose.	3
Both winches at the auxiliary derrick are blowing oil from exhausts.	C	Repair or replace auxiliary derrick utility winches.	3
Back plate for auxiliary derrick winch controls are corroded.	C	Replace auxiliary derrick utility winches control panel backing plate.	3
While removed from the elevator shaft to facilitate rigging equipment to/from the pontoon, the Stbd Fwd personnel elevator was damaged and has been removed from the rig for repair.	B	Return the elevator to the rig, reinstall and recertify prior to returning to service.	1
Wire corroded out	A	Replace wire.	1
Winch badly corroded paint falling off winch.	B	Remove winch from service carry out overhaul, remove corrosion and paint.	2
The fresh water line going to all six water makers were corroded and small leaks in several places around the connection flanges at the water makers.	B	Replace all corroded fresh water piping going to the water makers as needed.	2
The water maker #5 had a soft patch on one of the pipes, the new pipe was setting next to the unit for installing.	B	Install new pipe on Watermaker No. 5 as needed.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The main salt water line going to the water maker had a bad corroded spot showing in the line and the flange was leaking at the connection of the water maker.	B	Replace the bad main salt water line going to Watermaker No. 5 and replace/repair the flange at the top of the unit as needed.	1
The main salt water line was leaking at the connection on the unit around the flange gasket.	B	Repair or replace the flange connection at the top of Watermaker No. 6.	2
On inspection of the thruster cooling heat exchangers all of the heat exchangers unit were showing wear and leaks on the units. Due to ages and the units showing to be wearing thin in places the leaks are showing up more often.	C	Replace all thruster heat exchangers as needed.	2
It was reported to us thruster AC motor No 2 is down waiting to be replaced due to a flashover of the winding, we also noted the junction boxes for the motor were in a poor condition with sever rust	B	As planned replace No 2 thruster AC motor, also the two junction boxes	1
It was reported to us the fresh water radiator unit for the thruster No 3 was not operational.	B	As planned replace the F/W radiator.	1
#8 Thruster had some hydraulic leaks on the unit around the shaft seal on top of the unit. The hydraulic lines going to the hydraulic system were leaking at the connections.	B	Replace all of the hydraulic seals and O-rings as needed as well and repairing the hydraulic connection leaks as needed.	2
The oil samples were showing water was getting into the oil system of all thrusters and in review of the history this has been going on for some time now on all of the thrusters. Numbers 2 and 3 were showing to have been getting more water into the oil system and this will continue to worsen if the seals are not replaced soon.	B	Replace the main seals on all of the thruster at the nearest opportunity. If it will be some time before this can be taken care of, it is recommended to install a filter system for each thruster in order to help prevent the water from entering into the oil system and causing major problems to the thrusters.	1
Carriage chains worn and require replacement	B	Replace worn carriage chains.	2
Riser skate chain missing and requires replacement.	B	Replace missing skate chain.	2
Skate track is damaged, caused by cart jumping off the track.	B	Repair skate cart track.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The crane will not trolley the winches back and forth even when moving the load as needed. It was noted the limit sensors were not working correct and needed to be adjusted or replaced to solve this problem.	B	Replace/repair the limit sensors for the hoist travel speed.	2
It was noted during the testing of the crane, when the operator needs to move the crane to the port, he has to move the crane to the STBD first to keep the crane from (grabbing) hanging up due to FWD end moving more (faster) then the AFT end on the track system..	B	Repair the problem with the crane not moving to the Port without moving the unit to the STBD first. The crane should travel both ways with out problems.	2
The cable transit between the mud pit room and the mud pump room starboard side was not sealed correctly.	A	Ensure transit is sealed correctly. COMPLETED	3
Several areas of the rig the cable tray was corroded or damaged which included the cable tray back of galley next to life boat deck and cable tray outside mud lab door on the main deck.	C	Replace as necessary.	3
The ceiling tiles are missing the starboard A/C compressor room.	C	Replace the missing tiles	3
The Riser Recoil System was not functioning in an automatic state as designed. The unit works off of Tensioner Rod position indication, which is achieved through transducers and machined groves in the rods. It was explained that some of the Tensioner rods have been changed out with new rods that do not have the machined groves, which in turn have disabled the automatic function of the Riser Recoil System.	A	Restore Riser Recoil system to operate as designed.	1
There were no records of NDT inspections for the Tensioners or support structure	B	Perform NDT inspection of Riser Tensioners, and support structure to determine the need for repairs and/or replacements.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The Tensioner Cylinder protective coating was flaking off in various areas, and is in need of maintenance	C	Perform protective coating maintenance on the Riser Tensioner Cylinders.	3
The #2 Tensioner was not in service due to a leaking Rod End seal.	B	Repair the leaking Rod End seal on #2 Tensioner.	2
The #5 Tensioner hose is damaged on the outer sheathing.	B	Replace the #5 Tensioner HP air supply hose as planned.	2
The sea water pipes throughout the rig were corroded with leaks occurring daily.	B	Replace all corroded sea water piping as needed.	2
The sea water valves going to all the main engine coolers were hard to function and showing signs of leaking around the valves.	B	Replace all sea water valves as needed for the engine coolers.	2
The piping in Thruster room #8 had some spools and piping next to the sea water service pump that needs protective coating/painting applied.	C	Put protective coating on all piping and spools as needed in Thruster room #8.	3
Number 1 sea water service pump was leaking and corroded severely. The pump was worn and in need of being replaced. Located in #8 Thruster room. The pump housing was in bad condition.	B	Replace #1 sea water service pump located in Thruster room #8.	2
Lifeboat #2 port door glass was cracked.	C	Replace the glass.	3
There was skin damage on lifeboat No 4 and the reflective tape was in a poor condition.	C	Repair as necessary.	3
The valve was leaking and corroded on the main water line at #2 heat exchanger for the fresh water cooling system on the port side of the rig in #1 engine room. The valve on the line was located on the upper (top) water line on the right hand side when standing in front of the unit.	B	Repair or replace the valve at TFW Cooling System Heat Exchanger No. 2 Port.	2
The main water line going down through the deck next to #2 fresh water heat exchanger on the port side of the rig severely.	B	Replace the main water line going through the deck next to #2 fresh water heat exchange on the port side of the rig in #1 engine room.	2
The discharge pressure gauge on TFW Cooling System Pump No. 1 Port was broken.	B	Replace the discharge pressure gauge on TFW Cooling System Pump No. 1 Port.	2

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The suction pressure gauge on TFW Cooling System Pump No. 2 Stbd was broken.	B	Replace the suction gauge on TFW Cooling System Pump No. 2 Stbd.	2
The butterfly valve located next to TFW Cooling System Pump No. 1 Port was leaking and difficult to operate.	B	Repair or replace the butterfly valve at TFW Cooling System Pump No. 1 Port.	2
Several 10 mile obstruction lights were not working.	C	Repair as necessary.	3
Leak during pressure tests	C	Investigate where the leak is once the stack is onboard and repair	3
Packing element is left out in weather.	B	Element needs to be packaged in protective box and protected from weather and UV. Needs to be stored in a controlled environment	2
Packing element is left out in weather.	B	Element needs to be packaged in protective box and protected from weather and UV. Needs to be stored in a controlled environment	2
Spare Ram Blocks stored improperly	C	Package and protect spare blocks from weather	3
Spare Ram Blocks are not protected and corrosion is starting.	C	Perform Protective coating maintenance	1
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Purge Air System not working	B	Replace the diaphragm on the purge pump and replace the door seal	2
Stand Pipe hole fill valve close light blinks with the Surface flow Meter light occasionally when operated.	C	Investigate which card needs to be replaced to fix the surface flow meter light and install in the panel.	3
Pod Mismatch and error message reading valve mismatch (50)	B	Investigate why Pod Mismatch is happening and correct Valve mismatch (50) error.	2
Valve leaking on console Stewart and Stevenson unit	C	Investigate and replace leaking valve on Remote Console on Drill Floor	3
Pressure gauges not calibrated on Stewart and Stevenson	C	Calibrate Pressure gauges on Remote Console on Drillers Floor	2
Pressure gauges not repeating on unit inside drillers console	C	Investigate why the pressure gauges on the remote console located in Drillers House have to be recalibrated every time.	3

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
Proximity switch on trip tank Valve is not functioning properly	C	Replace Proximity switch on trip tank valve which is faulty.	3
The Lower Flex Joint currently in use is a loaner from the Nautilus, and the Horizons Lower Flex Joint had been sent in for the 5 yearly overhaul, and is currently awaiting shipment to the rig and an assessment was not carried out on the unit.	B	Install the overhauled Lower Flex Joint at the next opportunity as planned.	2
Pump is unusually running louder than the other two pumps	C	Investigate loud noise coming from pump when running as compared to number 2 and 3	3
No marking on pumps stating they start automatically	C	Install signs informing workers the pumps start automatically.	3
Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
Pressure relief valve is out of calibration	B	Recalibrate all Pressure relief valves for the 2 yearly inspection, overhaul, and re-certification program.	1
Riser Auxiliary Lines did not have pin end and box end covers installed	C	Install protective covers for Auxiliary Lines	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Corrosion present on frame work	C	Perform Protective coating maintenance	3
Hydraulic door not working entering 24 meter level from column STBD side, have to manual pump the door open and closed.	B	Repair the hydraulic problem with the door at the 24 meter level.	2
Hydraulic door not working entering 28 1/2 meter level from column STBD side, have to manual pump the door open and closed.	B	Repair the hydraulic problem with the door at the 28 1/2 meter level.	2
Three hydraulically operated doors in the Port Aft column are dragging on the bottom track.	B	Adjust dragging doors in the Port Aft column.	2



A		Critical equipment
B		Major item failure or
C		Minor item

Reference Number	DESCRIPTION	TAG		
		System	Comp	No.
2001	BOP Transporter	BOPH	BOPF	001
2002	BOP Bulkhead Guiding System	BOPH	BOPF	002
2003	BOP Transporter Underhull Guide	BOPH	BOPF	003
2004	BOP Bridge Crane #1	BOPH	OCRN	001
2005	Ex./Sup. Fans	ELPD	HAZA	001
2006	Ex./Sup. Fans	ELPD	HAZA	001
2007	11 KV Main Switchboard #1	ELPD	SWBD	001

Reference Number	DESCRIPTION	System	Comp	No.
2008	Mud Pump #1 Discharge Dampener	HPMS	PDAM	001
2009	HP Mud System Pipework	HPMS	PIPE	001
2010	HP Mud System Pipework	HPMS	PIPE	001
2011	Casing Stabbing Basket	PHL	WPB	001
2012	Riser Tensioner Ring	RTS	TENR	001
2013	BOP Sub-Sea Accumulator Bank	WCS	ACUM	008
2014	18-3/4" BOP Lower Annular	WCS	ANNU	001
2015	18-3/4" BOP Upper Annular	WCS	ANNU	002
2016	18-3/4" BOP Middle Single Rams	WCS	BOPR	001
2017	18-3/4" BOP Lower Double Rams	WCS	BOPR	003

Reference Number	DESCRIPTION	System	Comp	No.
2018	18-3/4" BOP Upper Double Rams	WCS	BOPR	004
2019	Diverter	WCS	DIVT	001
2020	Subsea Flex Joint	WCS	FJRA	001
2021	Sub Sea BOP Kill Hoses	WCS	HOSE	004
2022	Surface Choke Hoses	WCS	HOSE	009
2023	Choke Manifold	WCS	MANI	001
2024	Choke Manifold	WCS	MANI	001
2025	Blue BOP MUX Cable Reel	WCS	SSHR	001
2026	Yellow BOP MUX Cable Reel	WCS	SSHR	002
2027	Hot Line Hose Reel	WCS	SSHR	004
2028	BOP Upper Choke Line Failsafe Valve	WCS	VLV	002
2029	BOP Lower Choke Line Failsafe Valve	WCS	VLV	003

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 18 Apr 2010

Rev 3

equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.
items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.
items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
No current records/NDT certifications on board rig	B	Obtain certification/NDT records and store on rig.	1
There were no identification tags on any of the electrical equipment in the hazardous areas plus there as been no Ex registrar set up.	A	Tag all electrical equipment in the hazardous areas on the rig then enter all the information into the Ex register.	1
There were no ABS approved hazardous area drawing on the rig.	C	Display a set of hazardous areas drawing on the rig.	3
There are no reports on the rig when current injection on the main circuit breakers was last performed	B	As soon as practical perform secondary current injection by a certified unbiased testing facility on the main circuit breakers (Ref: HQS-OPS-TIB-630-03).	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
No records of any inspection being carried out on the mud pump discharge pulsation dampeners	C	Carry out an inspection of the PASFE dampeners to determine condition of choke tube, internal condition and wall thickness. Anticipated life of choke tube is 3 to 10 years.	3
Wall thickness readings have been taken and put into a spread sheet form, difficult to identify were readings were taken.	C	Isometric drawings should also be supplied on high pressure pipework systems to identify were readings were taken.	3
Wall thickness readings have been taken and put into a spread sheet form, difficult to identify were readings were taken.	C	Isometric drawings should also be supplied on high pressure pipework systems to identify were readings were taken.	3
No record of any load test being carried out.	C	Ensure a yearly load test is carried out.	3
No NDT inspection records on board	B	Acquire and retain valid NDT certification documentation on board the rig.	1
No up to date UT wall thickness records found on board	B	Perform proper NDT on equipment to verify wall Thickness	1
The last date of certification for the Lower Annular was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Lower Annular with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Upper Annular was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Upper Annular with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Middle Single Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Middle Single Ram BOP Assembly with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Lower Double Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Lower Double Ram BOP Assembly with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1

FINDINGS - IMPROVEMENT	PRIORITY	RECOMMENDATION DETAIL	LEVEL
The last date of certification for the Upper Double Ram BOP was 13 December 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Upper Double Ram BOP Assembly with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
The last date of certification for the Diverter was 5 July 2000, this is beyond the 5 yearly inspection and re-certification requirement.	A	Replace the Diverter with new or re-certified Annular, and send in the currently installed Annular for the 5 yearly inspection, overhaul, and re-certification.	1
No certification documentation for the Lower Flex Joint currently in use was available for review.	A	Acquire and retain valid manufacturer's certification documentation on board the rig.	1
The last date of certification was 1 January 2000, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Replace the Kill LMRP Jumper Hose with new or re-certified hose, and send in the currently installed hose for the 5 yearly inspection and re-certification.	1
The last date of certification was 2 July 2004, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Replace the Mud Boost Drape Hose with new or re-certified hose, and send in the currently installed hose for the 5 yearly inspection and re-certification.	1
No current certification for all valves found on board	A	Obtain and retain valid certification documentation for the gate valves on board the rig.	1
There was no record of serial numbers of Gate Valves and installation locations for accurate tracking.	C	Maintain a log of valve Serial numbers, and location of installation on board the rig to accurately track equipment maintenance.	3
No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
No NDT inspection records on board for Base Welds	B	Acquire and retain valid NDT certification documentation on board the rig.	1
The last date of certification was 13 December 2000, this is beyond the 5 yearly inspection, overhaul, and re-certification requirement.	A	Acquire and retain valid manufacturer's certification documentation on board the rig.	1
There was no record of serial numbers of Failsafe Valve and installation locations for accurate tracking.	A	Maintain a log of valve Serial numbers, and location of installation on board the rig to accurately track equipment maintenance.	1



A		Critical c and/or fa
B		Major ite of inade
C		Minor ite operatio

Reference Number	DESCRIPTION	TAG		
		System	Comp	No.
3001	Bilge System Pipework	BILG	PIPE	001
3002	P-Tank #1	BMS	BUTK	001

Reference Number	DESCRIPTION	System	Comp	No.
3003	Non Hazardous Area CCTV Cameras	COMM	CAM	002
3004	Top Drive	DSRT	TD	001
3005	11KV/600V Drilling Power Transformer #1	ELPD	TFMR	021
3006	Man Riding Winch #5 White Rig Floor Port Aft	PHL	MWIN	001
3007	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
3008	Man Riding Winch #7 Grey Moonpool Port Fwd	PHL	MWIN	003
3009	Casing Stabbing Basket	PHL	WPB	001

Deepwater Horizon Rig Hardware Assessment

HQS Maintenance Department

Date: 18 Apr 2010

Rev 3

equipment items that may lead to loss of life, a serious injury or environmental damage as a result of inadequate use or failure of equipment.

items that may lead to damage to essential equipment or have a detrimental effect on the drilling operation as a result of inadequate use and/or failure of equipment.

items that may lead to a situation that contributes to an incident or to circumstances in which the required standards of performance are not met.

FINDINGS - IMPROVEMENT	RECOMMENDATION DETAIL
In the water maker rooms, located in front of each of the main engines; has no bilge system set up in the areas. In order to pump out the bilge areas in all 6 of the locations, the crew has to rig up a jaggier pump to pump out the water or fluids as needed. The water makers are located in all of the 6 areas and the rig has had problems with the saltwater and fresh water lines leaking due to the lines are in bad condition. This is causing a safety issue due to the flooding of the rooms if a pipe burst and major water control should be lost.	Recommended to have a auto bilge system installed in the engine rooms and in the water maker rooms as needed.
Unable to monitor bulk tank vents from bridge to verify when filling tanks.	Install CCTV camera on vent lines.

FINDINGS - IMPROVEMENT	RECOMMENDATION DETAIL
The rig crew would like to have more CCTV installed around the rig which would include the riser deck, the loading station and fwd and stern of the vessel to see the area of sea around the rig.	The rig should raise a REA to address the issue with the CCTV system.
Replace top drive to 1000 ton model , present unit rated to 750 tons.	To eliminate the need to rack back the top drive when high hook loads are encountered.
It was reported to us the rig plan to install windows in the main transformers and switchboards to help with performing thermographic surveys.	As planned install the inspection windows in the main transformers and switchboards to help with performing thermographic surveys.
Man riding winches are rated at 2500 lbs, no slack line detection system fitted.	For maximum safety manriding winch working load should be limited to 300 lbs with slack line detection system installed. Consider replacing man riding winches.
All winches in the moonpool area are subject to harsh conditions making them more susceptible to corrosion.	Source covers to be used on moonpool winches when not in use.
Consider installing 2 hydraulically operated work baskets to access equipment in the moonpool area.	This would remove the necessity of man riding in this area. Man riding should be considered the last resort to access equipment.
There is also no means of emergency lowering of the basket should there be a hydraulic pressure failure during operation.	Investigate if an emergency lowering system can be installed on the basket.

Category	Code	System
Barge	ACOM	Accommodation
Barge	BLST	Ballast / Preload Systems
Barge	COMM	Communications Systems
Barge	CPTR	Computer Systems
Barge	DPS	Dynamic Positioning System
Barge	EVNS	Environmental Management System
Barge	JS	Jacking System
Barge	MTHL	Materials Handling
Barge	MOOR	Mooring Winch System
Barge	VI	Navigation & Vessel Instrumentation
Barge	PHL	Personnel Handling
Barge	PROP	Propulsion System
Barge	RST	Rig Structure
Barge	SURV	Survival Systems
Barge	WTD	Watertight Door Systems
Barge	WMAC	Workshop Machinery
Drilling Equipment	DRHS	Derrick Hoisting System
Drilling Equipment	DIST	Drilling Management Systems
Drilling Equipment	DRLS	Drillstring
Drilling Equipment	DSRT	Drillstring Rotating Equipment
Drilling Equipment	PH	Pipehandling Equipment
Drilling Equipment	TAD	Tender Assist Drilling Package
Mud Systems	BMS	Bulk Mud System
Mud Systems	CMT	Cement System
Mud Systems	HPMS	High Pressure Mud Systems
Mud Systems	LPMS	Low Pressure Mud Systems
Mud Systems	MCS	Mud Cleaning Systems
Mud Systems	MDS	Mud Storage
Safety Systems	ESD	Emergency Shutdown System
Safety Systems	FGDS	Fire & Gas Detection
Safety Systems	FFS	Fire Fighting System
Safety Systems	SFTY	Safety Systems / Equipment
Safety Systems	VMS	Vessel Management System
Safety Systems	RSE	Rig Spare Equipment
Third Party Equipment	TPE	Third Party Equipment
Utilities	BILG	Bilge System

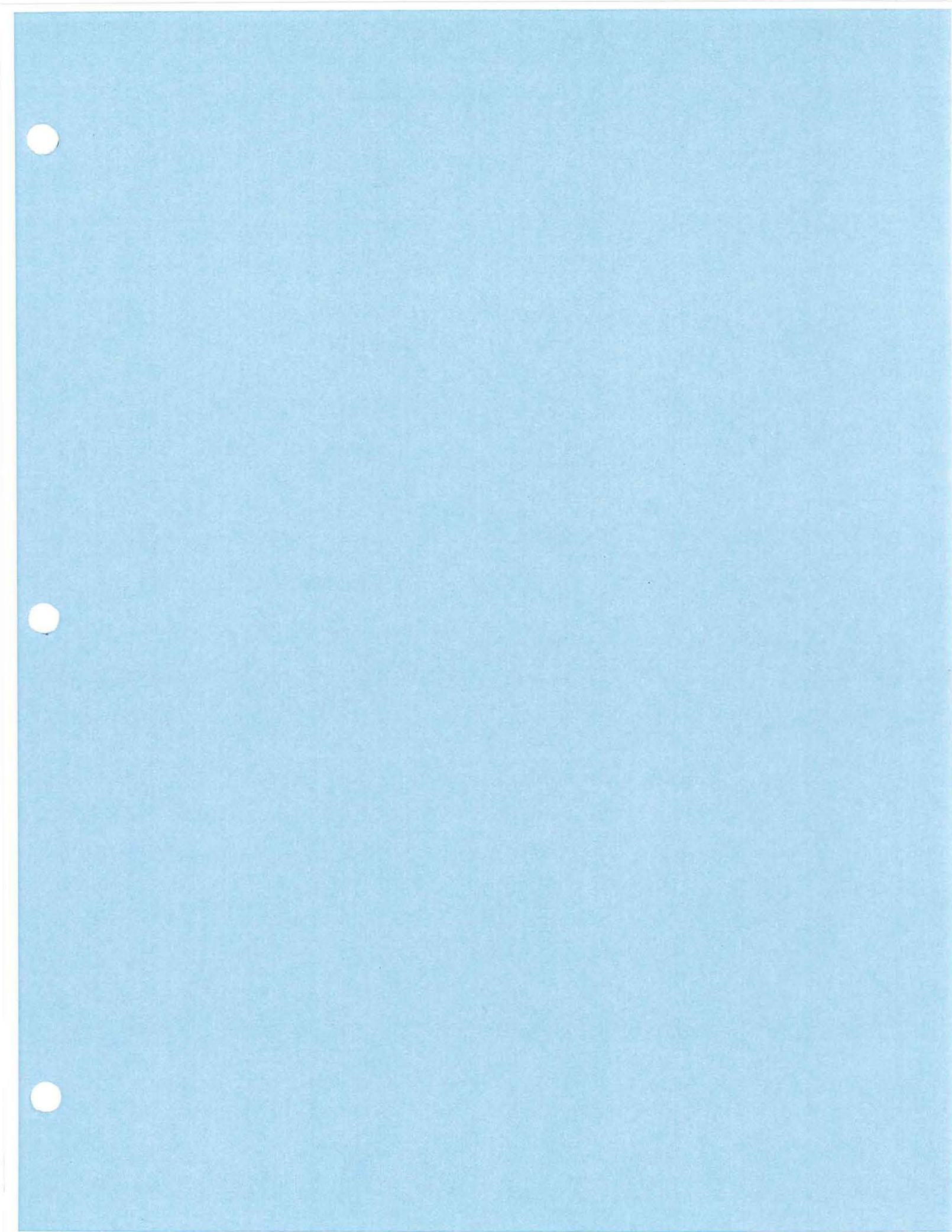
CONFIDENTIAL

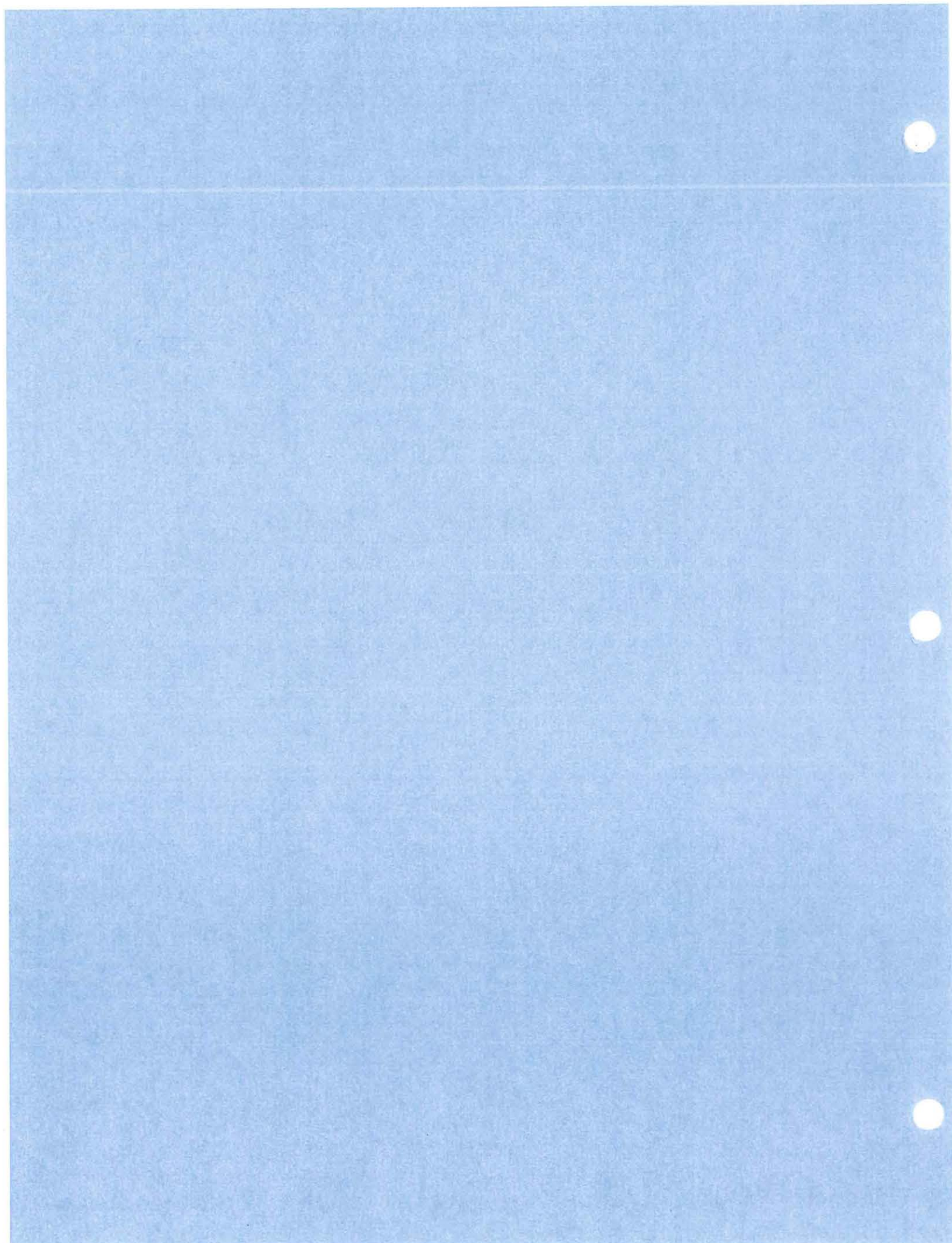
MODUSI 01 0 000308

Utilities	AIR	Compressed Air Systems
Utilities	DRLW	Drill Water System
Utilities	ELPD	Electrical Power Distribution
Utilities	ELPG	Electrical Power Generation
Utilities	FUEL	Fuel Oil Systems
Utilities	HVAC	HVAC Systems
Utilities	HYD	Hydraulic System
Utilities	LHTG	Lighting Systems
Utilities	LUBE	Lube Oil System
Utilities	POTW	Potable Water System
Utilities	SKID	Rig Skidding
Utilities	SEA	Seawater Systems
Utilities	TFS	Treated Freshwater System
Well Control	BOPH	BOP Handling System
Well Control	CTS	Conductor Tensioning System
Well Control	COH	Crude Oil Handling
Well Control	RISH	Riser Handling
Well Control	RTS	Riser Tensioning Systems
Well Control	WCS	Well Control System
Well Control	WELT	Well Testing/Completion

CONFIDENTIAL

MODUSI 01 0 000309






	Maintenance Department	Rig Hardware Assessment Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

TABLE OF CONTENTS

CONDITION LEVEL DEFINITIONS	2
CONDITION CATEGORIES & SCORES	3
MAINTENANCE SYSTEM CONDITION	3
EQUIPMENT CONDITION	3
1. HULL AND STRUCTURE	3
2. NAVIGATION / DP / PROPULSION / BALLAST / BILGE	3
3. MOORING SYSTEM	3
4. HOISTING / ROTATING EQUIPMENT	4
5. MUD / CEMENT STORAGE	4
6. MUD PROCESS	4
7. DRILLING INSTRUMENTATION	5
8. RISER / BOP & WELL CONTROL EQUIPMENT	5
9. TUBULAR / PIPE HANDLING	6
10. POWER GENERATION	6
11. AIR SYSTEMS	6
12. COOLING WATER / FUEL / LUBE OIL / OILY WATER	7
13. LIFTING EQUIPMENT	7
14. COMMUNICATIONS / DATA PROCESSING	7
15. ACCOMMODATIONS	7
16. RIG UTILITIES	7
17. SAFETY AND FIRE FIGHTING	8

Rig No.	Revision	Date		PAGE	OF
6087	0	18 APR 2010	Deepwater Horizon Rig Hardware Assessment	1	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

CONDITION LEVEL DEFINITIONS

Condition Levels	Level 1	Level 2	Level 3	Level 4
Equipment Definitions	<ul style="list-style-type: none"> • Equipment is in bad condition; it is not working or should be removed from service until deficiencies are rectified. • Equipment has excessive down time. • Equipment wear is past OEM limits or is obsolete and no longer supported by OEM. 	<ul style="list-style-type: none"> • Equipment is in fair condition; some major deficiencies have been noted. • Equipment has some downtime. • Equipment wear is getting close to OEM limits or is nearing end of useful life. 	<ul style="list-style-type: none"> • Equipment is in good condition; some minor deficiencies may have been noted. 	<ul style="list-style-type: none"> • Equipment is in new or like new condition. There are no deficiencies noted
Structural Definitions	<ul style="list-style-type: none"> • Structure/steel is highly corroded and/or wasted and requires replacement. 	<ul style="list-style-type: none"> • Structure/steel is showing heavy corrosion and/or minor wastage 	<ul style="list-style-type: none"> • Structure/steel is well coated; may show some signs of minor corrosion. 	<ul style="list-style-type: none"> • Structure/steel is new or in like new condition. There are no signs of corrosion.

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	18 APR 2010		2	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

CONFIDENTIAL

MODUSI 01 0 000311

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		


CONDITION CATEGORIES & SCORES

Item	Description	Condition Level			
		1	2	3	4
MAINTENANCE SYSTEM CONDITION					
	RMS Morning Report Jerry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	RMS System Jerry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Central Library / Technical Files Jerry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EQUIPMENT CONDITION					
1. HULL AND STRUCTURE					
RST STRU	Handrails / Walkways JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST PIPE	Vent Lines and Checks JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WTD WTD	Manual Watertight Doors / Hatches JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST STRU	Drill Floor John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST STRU	Cables / Cable Trays Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. NAVIGATION / DP / PROPULSION / BALLAST / BILGE					
VI INST	Navigation Equipment JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROP	Propulsion Unit JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROP THR	Thrusters JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DPS	DP System (A.S.K.) JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLST	Ballast Piping and Valves JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLST CTRU	Ballast Control System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BILG	Bilge System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. MOORING SYSTEM					
MOOR ANC	Anchor Winches NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MOOR LINE	Mooring Chain NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST TOW	Towing Lines and Equipment JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MOOR LINE	Mooring Wire NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	18 APR 2010		3	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

CONFIDENTIAL

MODUSI 01 0 000312

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
4. HOISTING / ROTATING EQUIPMENT					
HYD HPU	Top Drive Hydraulic Power Unit John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DWKS	Auxiliary Drawworks / Hoist John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DWKS	Drawworks Unit John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS ECBK	Auxiliary Brake (Air, Hydraulic) John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS ECBK	Electric Brake NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT ROT	Rotary Table John	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT TD	Top Drive Unit John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT TDPH	Top Drive Pipe Handler John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DERK	Derrick John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DEAD	Deadline Anchor John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DEAD	Auxiliary Deadline Anchor John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS CROW	Crown Block John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS CROW	Auxiliary Crown Block	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS TRAV	Traveling Block John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS TRAV	Auxiliary Traveling Block John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS MC	Motion Compensator NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. MUD / CEMENT STORAGE					
BMS TANK	Bulk Tank Storage JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BMS TANK	Surge Tanks JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MDS	Mud Pit Agitators, Guns, Valves John/Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. MUD PROCESS					
LPMS	Mud Mixing System John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LPMS	Mud Handling System John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LPMS	Mud Processing System John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HPMS MP	Mud Pumps John/Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS SWIV	Swivel NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CMT	HP Cement System Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HPMS	HP Mud System Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	18 APR 2010		4	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
7. DRILLING INSTRUMENTATION					
DIST INST	Drilling Instrumentation System John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DIST INST	Drilling Control/Monitoring Systems (VICIS, etc) Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. RISER / BOP & WELL CONTROL EQUIPMENT					
WCS CONN	Connector: Riser Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CONN	Connector: Wellhead Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS FJRA	Flex Joint Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS RISE	Riser Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS TJT	Telescopic (Slip) Joint Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS RISA	Marine Riser Adapter Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RISH RHT	Riser Gimbal / Spider Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS TENR	Tensioning Ring Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RTS HCYL	Riser Tensioners	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RTS CTRU	Riser Recoil System Victor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS BOPR	BOP Rams (Various) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ANNU	BOP Annulars Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS BOPS	BOP Stack Frame (General) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS VLV	Failsafe Valves Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CTRU	BOP Control Panels Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS PMP	BOP Mixing Unit Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ACUM	Accumulator Bottles, Stack Mounted Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS ACUM	Accumulator Bottles, Surface Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS BOPU	BOP Control HPU (Koomey Unit) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS PMP	BOP Triplex Pumps Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS SSHR	Hose Reels (MUX & Hydraulic) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS BOPP	BOP Control Pods Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS UMB	BOP MUX Cables Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS SSHR	BOP Pod Hoses (Hydraulic) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BOPH	BOP Cranes / Hoists / Handling / Transport Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date		PAGE	OF
6087	0	18 APR 2010	Deepwater Horizon Rig Hardware Assessment	5	8

This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
WCS DIVT	Diverter Assembly Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS CTRU	Diverter Control Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS MANI	C&K Manifold and Piping Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HOSE	Coflexip Type Hoses Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS PIPE	Connectors: Hydraulic Choke & Kill Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. TUBULAR / PIPE HANDLING					
HYD HPU	HPU's (Central or Stand-Alone) John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH FGBD	Fingerboard John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH PRS	Varco PLS NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH PHM	Manipulator Arm NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH PHM	PFA (Pipe Feeding Arm) NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH PHM	PHM (Pipe Handling Machine) NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH PRS	Varco PRS/RHA John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH DPF	Pipe Conveyor John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH DPF	Pipe Skate John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH PHM	Iron Roughneck John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PHL WPB	Stabbing Basket John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. POWER GENERATION					
ELPG ENG	Main Engines John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPG GEN	Main AC Generator Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPD SWBD	Switchboards Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPD SCR	SCR Systems Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPD TFMR	Main Transformers Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPD VFD	VFD Systems Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. AIR SYSTEMS					
AIR COMP	Low Pressure Air Compressors (\leq 500 PSI) JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AIR PIPE	Low Pressure Air Piping and Valves (\leq 500 PSI) JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AIR COMP	High Pressure Air Compressors ($>$ 500 PSI) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date		PAGE	OF
6087	0	18 APR 2010	Deepwater Horizon Rig Hardware Assessment	6	8

This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.


	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
AIR PIPE	High Pressure Air Piping and Valves (> 500 PSI) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. COOLING WATER / FUEL / LUBE OIL / OILY WATER					
SEA PIPE	Salt Water Lines / Related Equipment JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TFS PIPE	Fresh Water Lines / Related Equipment JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRLW PIPE	Drill Water Lines / Related Equipment JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FUEL PIPE	Fuel Oil System Piping and Valves JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE PIPE	Lube Oil System Piping and Valves JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BILG SEP	Oily Water Treatment System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. LIFTING EQUIPMENT					
MTHL CRN	Deck Cranes JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MTHL OCRN	Gantry Cranes (Excluding BOP Cranes) JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PHL MWIN	Air Hoists – Man Riding John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH UWIN	Air Hoists – Non Man Riding John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PHL MELV	Personnel Elevators JR/Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. COMMUNICATIONS / DATA PROCESSING					
COMM REQ	Radio Systems Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COMMS COM	Satellite Communications Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COMM	PA, PABX, Talk Back and Telephone Systems Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VMS	Data Management Monitoring & Control (VMS, PMS, DMS) Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. ACCOMMODATIONS					
ACOM GEQT	Galley Refrigeration Equipment Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACOM ACM	Living Quarters / Rooms Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. RIG UTILITIES					
HVAC	Ventilation Systems JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LHTG LTE	Lighting System, non EX Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	18 APR 2010		7	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

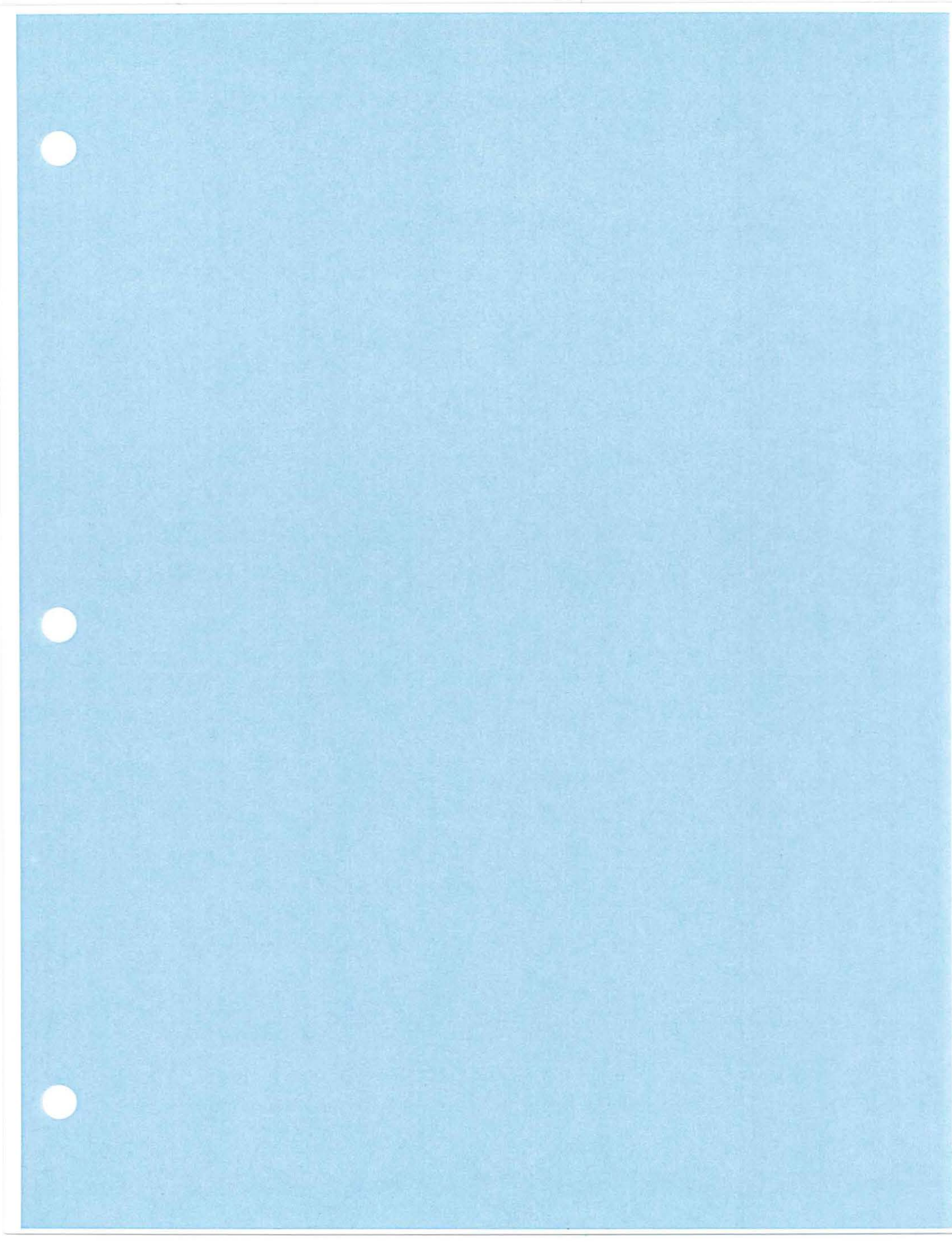
CONFIDENTIAL

MODUSI 01 0 000316

	Maintenance Department	Rig Hardware Assessment	
		Deepwater Horizon 01-14 APR 2010	
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard			

Item	Description	Condition Level			
		1	2	3	4
POTW WTMK	Watermakers JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POTW	Potable Water System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EVNS	Sanitary Water System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EVNS SWGE	Sewage Treatment Plant JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPD HAZA	Hazardous Area Electrical Equipment Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	HVAC Systems Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. SAFETY AND FIRE FIGHTING					
SURV RAFT	Life Rafts JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SURV BOAT	Lifeboats JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPG GEN	Emergency Generator System John/Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WTD WTDR	Hydraulic Watertight Doors & Hatches JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FGDS ALRM	Fire Detection System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FFS	Fixed Fire Suppression System JR/Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FFS	Fixed Foam Fire Fighting System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FFS PMP	Fire Pumps JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FFS PIPE	Fire Main Lines & Related Equipment JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FGDS ALRM	Gas Detection System Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	18 APR 2010		8	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					






	Maintenance Department	Rig Hardware Assessment Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

TABLE OF CONTENTS

CONDITION LEVEL DEFINITIONS	2
CONDITION CATEGORIES & SCORES.....	3
MAINTENANCE SYSTEM CONDITION	3
EQUIPMENT CONDITION	3
1. HULL AND STRUCTURE.....	3
2. NAVIGATION / DP / PROPULSION / BALLAST / BILGE	3
3. HOISTING / ROTATING EQUIPMENT	3
4. MUD / CEMENT STORAGE	4
5. MUD PROCESS	4
6. DRILLING INSTRUMENTATION	4
7. RISER / BOP & WELL CONTROL EQUIPMENT	4
8. TUBULAR / PIPE HANDLING	5
9. POWER GENERATION	6
10. AIR SYSTEMS	6
11. COOLING WATER / FUEL / LUBE OIL / OILY WATER	6
12. LIFTING EQUIPMENT	6
13. COMMUNICATIONS / DATA PROCESSING	7
14. ACCOMMODATIONS	7
15. RIG UTILITIES	7
16. SAFETY AND FIRE FIGHTING	7

Rig No.	Revision	Date		PAGE	OF
6087	0	12 APR 2010	Deepwater Horizon Rig Hardware Assessment	1	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

CONDITION LEVEL DEFINITIONS

Condition Levels	Level 1	Level 2	Level 3	Level 4
Equipment Definitions	<ul style="list-style-type: none"> • Equipment is in bad condition; it is not working or should be removed from service until deficiencies are rectified. • Equipment has excessive down time. • Equipment wear is past OEM limits or is obsolete and no longer supported by OEM. 	<ul style="list-style-type: none"> • Equipment is in fair condition; some major deficiencies have been noted. • Equipment has some downtime. • Equipment wear is getting close to OEM limits or is nearing end of useful life. 	<ul style="list-style-type: none"> • Equipment is in good condition; some minor deficiencies may have been noted. 	<ul style="list-style-type: none"> • Equipment is in new or like new condition. There are no deficiencies noted
Structural Definitions	<ul style="list-style-type: none"> • Structure/steel is highly corroded and/or wasted and requires replacement. 	<ul style="list-style-type: none"> • Structure/steel is showing heavy corrosion and/or minor wastage 	<ul style="list-style-type: none"> • Structure/steel is well coated; may show some signs of minor corrosion. 	<ul style="list-style-type: none"> • Structure/steel is new or in like new condition. There are no signs of corrosion.
Maintenance System Definitions	<ul style="list-style-type: none"> • Maintenance System is not understood by crew. • Major PM Tasks are more than 12 months overdue. • PM's have been closed without being completed. • Certification documents are missing. 	<ul style="list-style-type: none"> • Some improvement areas regarding the Maintenance System. • PM Tasks are 6 to 12 months overdue. • PM's are not fully completed or closed without being completed as per task steps. 	<ul style="list-style-type: none"> • Maintenance system is understood by crew. • Major PM Tasks are completed mostly on time. 	<ul style="list-style-type: none"> • All PM Tasks are always completed on time. • A leader among rig class in Maintenance system performance.

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		2	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

CONDITION CATEGORIES & SCORES

Item	Description	Condition Level			
		1	2	3	4
MAINTENANCE SYSTEM CONDITION					
	RMS Morning Report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	RMS System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Central Library / Technical Files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EQUIPMENT CONDITION					
1. HULL AND STRUCTURE					
RST STRU	Handrails / Walkways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST PIPE	Vent Lines and Checks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WTD WTD	Manual Watertight Doors / Hatches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST STRU	Drill Floor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST STRU	Cables / Cable Trays	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. NAVIGATION / DP / PROPULSION / BALLAST / BILGE					
VI INST	Navigation Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROP THR	Thrusters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DPS	DP System (A.S.K.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLST	Ballast Piping and Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLST CTRU	Ballast Control System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BILG	Bilge System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. HOISTING / ROTATING EQUIPMENT					
DRHS DWKS	Auxiliary Drawworks / Hoist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DWKS	Main Drawworks Unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT ROT	Rotary Table	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT TD	Top Drive Unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT TDPH	Top Drive Pipe Handler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DERK	Derrick	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DEAD	Deadline Anchor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment		PAGE OF
6087	0	12 APR 2010			3 8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		


Item	Description	Condition Level			
		1	2	3	4
DRHS DEAD	Auxiliary Deadline Anchor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS CROW	Crown Block	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS CROW	Auxiliary Crown Block	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS TRAV	Traveling Block	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS TRAV	Auxiliary Traveling Block	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. MUD / CEMENT STORAGE					
BMS TANK	Bulk Tank Storage	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BMS TANK	Surge Tanks	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MDS	Mud Pit Agitators, Guns, Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. MUD PROCESS					
LPMS	Mud Mixing System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LPMS	Mud Handling System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LPMS	Mud Processing System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HPMS MP	Mud Pumps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CMT	HP Cement System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HPMS	HP Mud System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. DRILLING INSTRUMENTATION					
DIST INST	Drilling Instrumentation System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DIST INST	Drilling Control/Monitoring Systems (VICIS, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. RISER / BOP & WELL CONTROL EQUIPMENT					
WCS CONN	Connector: Riser	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CONN	Connector: Wellhead	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS FA	Flex Joint	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS RISE	Riser	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS TJT	Telescopic (Slip) Joint	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS RISA	Marine Riser Adapter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RISH RHT	Riser Gimbal / Spider	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		4	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
WCS TENR	Tensioning Ring	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RTS HCYL	Riser Tensioners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RTS CTRU	Riser Recoil System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS BOPR	BOP Rams (Various)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ANNU	BOP Annulars	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS BOPS	BOP Stack Frame (General)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS VLV	Failsafe Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CTRU	BOP Control Panels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS PMP	BOP Mixing Unit	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ACUM	Accumulator Bottles, Stack Mounted	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ACUM	Accumulator Bottles, Surface	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS PMP	BOP Triplex Pumps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS SSHR	Hose Reels (MUX & Hydraulic)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS BOPP	BOP Control Pods	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS UMB	BOP MUX Cables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS SSHR	BOP Pod Hoses (Hydraulic)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BOPH	BOP Cranes / Hoists / Handling / Transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS DIVT	Diverter Assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CTRU	Diverter Control	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS MANI	C&K Manifold and Piping	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HOSE	Coflexip Type Hoses	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS PIPE	Connectors: Hydraulic Choke & Kill	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. TUBULAR / PIPE HANDLING					
HYD HPU	HPU's (Central or Stand-Alone)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PH FGBD	Fingerboard	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PH PHM	Varco PRS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH DPF	Pipe Conveyor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RISH BOPC	Pipe Skate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH PHM	Iron Roughneck	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PHL WPB	Stabbing Basket	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		5	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		


Item	Description	Condition Level			
		1	2	3	4
PH PHM	Offline Casing Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. POWER GENERATION					
ELPG ENG	Main Engines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPG GEN	Main AC Generator	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPD SWBD	Switchboards	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPD TFMR	Main Transformers	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPD VFD	VFD Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. AIR SYSTEMS					
AIR COMP	Low Pressure Air Compressors (\leq 500 PSI)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR PIPE	Low Pressure Air Piping and Valves (\leq 500 PSI)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR COMP	High Pressure Air Compressors ($>$ 500 PSI)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR PIPE	High Pressure Air Piping and Valves ($>$ 500 PSI)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11. COOLING WATER / FUEL / LUBE OIL / OILY WATER					
SEA PIPE	Salt Water Lines / Related Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TFS PIPE	Fresh Water Lines / Related Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRLW PIPE	Drill Water Lines / Related Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FUEL PIPE	Fuel Oil System Piping and Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LUBE PIPE	Lube Oil System Piping and Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BILG SEP	Oily Water Treatment System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. LIFTING EQUIPMENT					
MTHL CRN	Deck Cranes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MTHL OCRN	Gantry Cranes (Excluding BOP Cranes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PHL MWIN	Air Hoists – Man Riding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH UWIN	Air Hoists – Non Man Riding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		6	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
PHL MELV	Personnel Elevators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. COMMUNICATIONS / DATA PROCESSING					
COMM REQ	Radio Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COMMS COM	Satellite Communications	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COMM	PA, PABX, Talk Back and Telephone Systems	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VMS	Data Management Monitoring & Control (VMS, PMS, DMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14. ACCOMMODATIONS					
ACOM GEQT	Galley Refrigeration Equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACOM ACM	Living Quarters / Rooms	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. RIG UTILITIES					
HVAC	Ventilation Systems	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LHTG LTE	Lighting System, non EX	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
POTWWTMK	Watermakers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POTW	Potable Water System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EVNS	Sanitary Water System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EVNS SWGE	Sewage Treatment Plant	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPD HAZA	Hazardous Area Electrical Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	HVAC Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16. SAFETY AND FIRE FIGHTING					
SURV RAFT	Life Rafts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SURV BOAT	Lifeboats	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPG GEN	Emergency Generator System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WTD WTDR	Hydraulic Watertight Doors & Hatches	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FGDS ALRM	Fire Detection System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FFS	Fixed Fire Suppression System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FFS	Fixed Foam Fire Fighting System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FFS PMP	Fire Pumps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

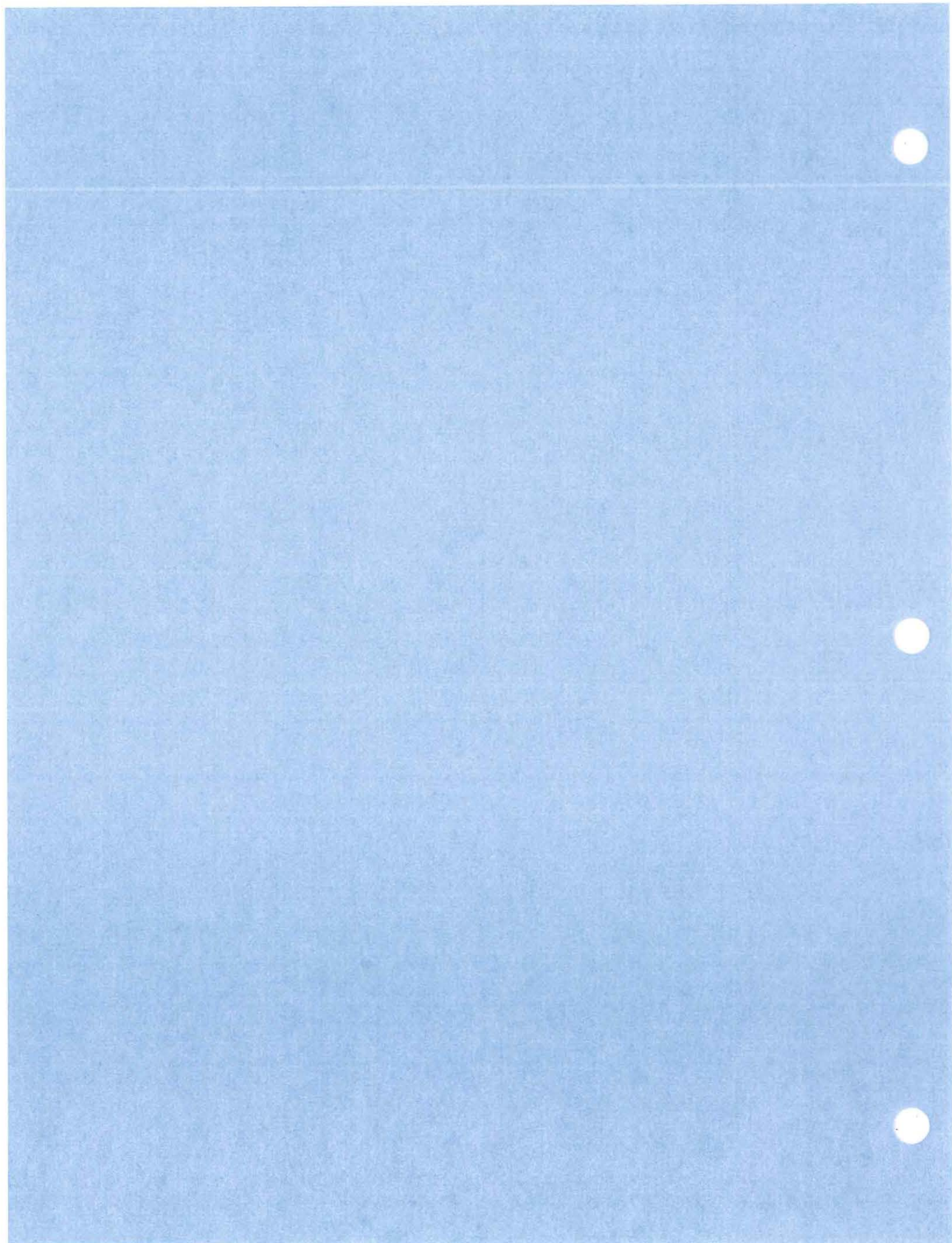
Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		7	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment Deepwater Horizon 01-12 APR 2010	
		Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard	

Item	Description	Condition Level			
		1	2	3	4
FFS PIPE	Fire Main Lines & Related Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FGDS ALRM	Gas Detection System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		8	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					






	Maintenance Department	Rig Hardware Assessment Deepwater Horizon 01-14 APR 2010
<p align="center">Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard</p>		

TABLE OF CONTENTS

CONDITION LEVEL DEFINITIONS	2
CONDITION CATEGORIES & SCORES	3
MAINTENANCE SYSTEM CONDITION	3
EQUIPMENT CONDITION	3
1. HULL AND STRUCTURE	3
2. NAVIGATION / DP / PROPULSION / BALLAST / BILGE	3
3. MOORING SYSTEM	3
4. HOISTING / ROTATING EQUIPMENT	3
5. MUD / CEMENT STORAGE	4
6. MUD PROCESS	4
7. DRILLING INSTRUMENTATION	4
8. RISER / BOP & WELL CONTROL EQUIPMENT	4
9. TUBULAR / PIPE HANDLING	5
10. POWER GENERATION	6
11. AIR SYSTEMS	6
12. COOLING WATER / FUEL / LUBE OIL / OILY WATER	6
13. LIFTING EQUIPMENT	6
14. COMMUNICATIONS / DATA PROCESSING	7
15. ACCOMMODATIONS	7
16. RIG UTILITIES	7
17. SAFETY AND FIRE FIGHTING	7

Rig No. 6087	Revision 0	Date 18 APR 2010	<p align="center">Deepwater Horizon Rig Hardware Assessment</p>	PAGE 1	OF 8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment Deepwater Horizon 01-14 APR 2010
<p align="center">Deepwater Horizon Rig Hardware Assessment</p> <p align="center">Rig Condition Scorecard</p>		

CONDITION LEVEL DEFINITIONS

Condition Levels	Level 1	Level 2	Level 3	Level 4
Equipment Definitions	<ul style="list-style-type: none"> Equipment is in bad condition; it is not working or should be removed from service until deficiencies are rectified. Equipment has excessive down time. Equipment wear is past OEM limits or is obsolete and no longer supported by OEM. 	<ul style="list-style-type: none"> Equipment is in fair condition; some major deficiencies have been noted. Equipment has some downtime. Equipment wear is getting close to OEM limits or is nearing end of useful life. 	<ul style="list-style-type: none"> Equipment is in good condition; some minor deficiencies may have been noted. 	<ul style="list-style-type: none"> Equipment is in new or like new condition. There are no deficiencies noted
Structural Definitions	<ul style="list-style-type: none"> Structure/steel is highly corroded and/or wasted and requires replacement. 	<ul style="list-style-type: none"> Structure/steel is showing heavy corrosion and/or minor wastage 	<ul style="list-style-type: none"> Structure/steel is well coated; may show some signs of minor corrosion. 	<ul style="list-style-type: none"> Structure/steel is new or in like new condition. There are no signs of corrosion.

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	18 APR 2010		2	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

CONDITION CATEGORIES & SCORES

Item	Description	Condition Level			
		1	2	3	4
MAINTENANCE SYSTEM CONDITION					
	RMS Morning Report Jerry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	RMS System Jerry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Central Library / Technical Files Jerry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EQUIPMENT CONDITION					
1. HULL AND STRUCTURE					
RST STRU	Handrails / Walkways JR 75	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST PIPE	Vent Lines and Checks JR 80	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WTD WTD	Manual Watertight Doors / Hatches JR 75	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST STRU	Drill Floor John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST STRU	Cables / Cable Trays Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. NAVIGATION / DP / PROPULSION / BALLAST / BILGE					
VI INST	Navigation Equipment Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROP THR	Thrusters JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DPS	DP System (A.S.K.) JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLST	Ballast Piping and Valves JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLST CTRU	Ballast Control System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BILG	Bilge System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. MOORING SYSTEM					
4. HOISTING / ROTATING EQUIPMENT					
DRHS DWKS	Auxiliary Drawworks / Hoist John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DWKS	Main Drawworks Unit John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT ROT	Rotary Table John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT TD	Top Drive Unit John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT TDPH	Top Drive Pipe Handler John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rig No.	Revision	Date	PAGE		OF
6087	0	18 APR 2010	3		8
Deepwater Horizon Rig Hardware Assessment					
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

CONFIDENTIAL

MODUSI 01 0 000328

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
DRHS DERK	Derrick John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DEAD	Deadline Anchor John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS DEAD	Auxiliary Deadline Anchor John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS CROW	Crown Block John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS CROW	Auxiliary Crown Block	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS TRAV	Traveling Block John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS TRAV	Auxiliary Traveling Block John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. MUD / CEMENT STORAGE					
BMS TANK	Bulk Tank Storage John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BMS TANK	Surge Tanks John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MDS	Mud Pit Agitators, Guns, Valves John/Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. MUD PROCESS					
LPMS	Mud Mixing System John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LPMS	Mud Handling System John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LPMS	Mud Processing System John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HPMS MP	Mud Pumps John/Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CMT	HP Cement System Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HPMS	HP Mud System Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. DRILLING INSTRUMENTATION					
DIST INST	Drilling Instrumentation System Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DIST INST	Drilling Control/Monitoring Systems (VICIS, etc) Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. RISER / BOP & WELL CONTROL EQUIPMENT					
WCS CONN	Connector: Riser Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CONN	Connector: Wellhead Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS FJRA	Flex Joint Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS RISE	Riser Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS TJT	Telescopic (Slip) Joint Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No. 6087	Revision 0	Date 18 APR 2010	Deepwater Horizon Rig Hardware Assessment	PAGE 4	OF 8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
WCS RISA	Marine Riser Adapter Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RISH RHT	Riser Gimbal / Spider Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS TENR	Tensioning Ring Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RTS HCYL	Riser Tensioners Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RTS CTRU	Riser Recoil System Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS BOPR	BOP Rams (Various) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ANNU	BOP Annulars Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS BOPS	BOP Stack Frame (General) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS VLV	Failsafe Valves Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CTRU	BOP Control Panels Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS PMP	BOP Mixing Unit Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ACUM	Accumulator Bottles, Stack Mounted Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ACUM	Accumulator Bottles, Surface Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS PMP	BOP Triplex Pumps Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS SSHR	Hose Reels (MUX & Hydraulic) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS BOPP	BOP Control Pods Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS UMB	BOP MUX Cables Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS SSHR	BOP Pod Hoses (Hydraulic) Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BOPH	BOP Cranes / Hoists / Handling / Transport Victor 50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS DIVT	Diverter Assembly Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CTRU	Diverter Control Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS MANI	C&K Manifold and Piping Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HOSE	Coflexip Type Hoses Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS PIPE	Connectors: Hydraulic Choke & Kill Victor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. TUBULAR / PIPE HANDLING					
HYD HPU	HPU's (Central or Stand-Alone) John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PH FGBD	Fingerboard John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PH PRS	Varco PRS John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH DPF	Pipe Conveyor John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PH DPF	Pipe Skate John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	18 APR 2010		5	8

This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
PH PHM	Iron Roughneck John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PHL WPB	Stabbing Basket John 50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. POWER GENERATION					
ELPG ENG	Main Engines JR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPG GEN	Main AC Generator Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPD SWBD	Switchboards Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPD TFMR	Main Transformers Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPD VFD	VFD Systems Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11. AIR SYSTEMS					
AIR COMP	Low Pressure Air Compressors (\leq 500 PSI) JR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR PIPE	Low Pressure Air Piping and Valves (\leq 500 PSI) JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AIR COMP	High Pressure Air Compressors ($>$ 500 PSI) John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR PIPE	High Pressure Air Piping and Valves ($>$ 500 PSI) John	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12. COOLING WATER / FUEL / LUBE OIL / OILY WATER					
SEA PIPE	Salt Water Lines / Related Equipment JR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TFS PIPE	Fresh Water Lines / Related Equipment JR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRLW PIPE	Drill Water Lines / Related Equipment JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FUEL PIPE	Fuel Oil System Piping and Valves JR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LUBE PIPE	Lube Oil System Piping and Valves JR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BILG SEP	Oily Water Treatment System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. LIFTING EQUIPMENT					
MTHL CRN	Deck Cranes JR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MTHL OCRN	Gantry Cranes (Excluding BOP Cranes) JR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PHL MWIN	Air Hoists – Man Riding John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH UWIN	Air Hoists – Non Man Riding John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	18 APR 2010		6	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-14 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
PHL MELV	Personnel Elevators JR/Alan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. COMMUNICATIONS / DATA PROCESSING					
COMM REQ	Radio Systems Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COMMSCOM	Satellite Communications Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COMM	PA, PABX, Talk Back and Telephone Systems Alan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VMS	Data Management Monitoring & Control (VMS, PMS, DMS) Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15. ACCOMMODATIONS					
ACOM GEQT	Galley Refrigeration Equipment Alan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACOM ACM	Living Quarters / Rooms Alan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. RIG UTILITIES					
HVAC	Ventilation Systems JR	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LHTG LTE	Lighting System, non EX Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
POTWWTMK	Watermakers JR	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POTW	Potable Water System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EVNS	Sanitary Water System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EVNS SWGE	Sewage Treatment Plant JR	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPD HAZA	Hazardous Area Electrical Equipment Alan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	HVAC Systems Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. SAFETY AND FIRE FIGHTING					
SURV RAFT	Life Rafts Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SURV BOAT	Lifeboats Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPG GEN	Emergency Generator System John/Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WTD WTDR	Hydraulic Watertight Doors & Hatches JR 70	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FGDS ALRM	Fire Detection System Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FFS	Fixed Fire Suppression System JR/Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FFS	Fixed Foam Fire Fighting System JR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FFS PMP	Fire Pumps JR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Rig No.	Revision	Date	PAGE		OF
6087	0	18 APR 2010	7		8
Deepwater Horizon Rig Hardware Assessment					
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment	
		Deepwater Horizon 01-14 APR 2010	
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard			

Item	Description	Condition Level			
		1	2	3	4
FFS PIPE	Fire Main Lines & Related Equipment JR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FGDS ALRM	Gas Detection System Alan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	18 APR 2010		8	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

CONFIDENTIAL

MODUSI 01 0 000333






	Maintenance Department	Rig Hardware Assessment Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

TABLE OF CONTENTS

CONDITION LEVEL DEFINITIONS	2
CONDITION CATEGORIES & SCORES.....	3
MAINTENANCE SYSTEM CONDITION	3
EQUIPMENT CONDITION	3
1. HULL AND STRUCTURE.....	3
2. NAVIGATION / DP / PROPULSION / BALLAST / BILGE	3
3. HOISTING / ROTATING EQUIPMENT	3
4. MUD / CEMENT STORAGE	4
5. MUD PROCESS	4
6. DRILLING INSTRUMENTATION	4
7. RISER / BOP & WELL CONTROL EQUIPMENT	4
8. TUBULAR / PIPE HANDLING	5
9. POWER GENERATION	6
10. AIR SYSTEMS	6
11. COOLING WATER / FUEL / LUBE OIL / OILY WATER	6
12. LIFTING EQUIPMENT	6
13. COMMUNICATIONS / DATA PROCESSING	7
14. ACCOMMODATIONS	7
15. RIG UTILITIES	7
16. SAFETY AND FIRE FIGHTING	7


Rig No.	Revision	Date		PAGE	OF
6087	0	12 APR 2010	Deepwater Horizon Rig Hardware Assessment	1	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

CONDITION LEVEL DEFINITIONS

Condition Levels	Level 1	Level 2	Level 3	Level 4
Equipment Definitions	<ul style="list-style-type: none"> • Equipment is in bad condition; it is not working or should be removed from service until deficiencies are rectified. • Equipment has excessive down time. • Equipment wear is past OEM limits or is obsolete and no longer supported by OEM. 	<ul style="list-style-type: none"> • Equipment is in fair condition; some major deficiencies have been noted. • Equipment has some downtime. • Equipment wear is getting close to OEM limits or is nearing end of useful life. 	<ul style="list-style-type: none"> • Equipment is in good condition; some minor deficiencies may have been noted. 	<ul style="list-style-type: none"> • Equipment is in new or like new condition. There are no deficiencies noted
Structural Definitions	<ul style="list-style-type: none"> • Structure/steel is highly corroded and/or wasted and requires replacement. 	<ul style="list-style-type: none"> • Structure/steel is showing heavy corrosion and/or minor wastage 	<ul style="list-style-type: none"> • Structure/steel is well coated; may show some signs of minor corrosion. 	<ul style="list-style-type: none"> • Structure/steel is new or in like new condition. There are no signs of corrosion.
Maintenance System Definitions	<ul style="list-style-type: none"> • Maintenance System is not understood by crew. • Major PM Tasks are more than 12 months overdue. • PM's have been closed without being completed. • Certification documents are missing. 	<ul style="list-style-type: none"> • Some improvement areas regarding the Maintenance System. • PM Tasks are 6 to 12 months overdue. • PM's are not fully completed or closed without being completed as per task steps. 	<ul style="list-style-type: none"> • Maintenance system is understood by crew. • Major PM Tasks are completed mostly on time. 	<ul style="list-style-type: none"> • All PM Tasks are always completed on time. • A leader among rig class in Maintenance system performance.

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		2	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

CONDITION CATEGORIES & SCORES

Item	Description	Condition Level			
		1	2	3	4
MAINTENANCE SYSTEM CONDITION					
	RMS Morning Report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	RMS System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Central Library / Technical Files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EQUIPMENT CONDITION					
1. HULL AND STRUCTURE					
RST STRU	Handrails / Walkways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST PIPE	Vent Lines and Checks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WTD WTDR	Manual Watertight Doors / Hatches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST STRU	Drill Floor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RST STRU	Cables / Cable Trays	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. NAVIGATION / DP / PROPULSION / BALLAST / BILGE					
VI INST	Navigation Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROP THR	Thrusters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DPS	DP System (A.S.K.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLST	Ballast Piping and Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLST CTRU	Ballast Control System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BILG	Bilge System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. HOISTING / ROTATING EQUIPMENT					
DRHS DWKS	Auxiliary Drawworks / Hoist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DWKS	Main Drawworks Unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT ROT	Rotary Table	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT TD	Top Drive Unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DSRT TDPH	Top Drive Pipe Handler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DERK	Derrick	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS DEAD	Deadline Anchor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment		PAGE OF
6087	0	12 APR 2010			3 8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
DRHS DEAD	Auxiliary Deadline Anchor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS CROW	Crown Block	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRHS CROW	Auxiliary Crown Block	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS TRAV	Traveling Block	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRHS TRAV	Auxiliary Traveling Block	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. MUD / CEMENT STORAGE					
BMS TANK	Bulk Tank Storage	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BMS TANK	Surge Tanks	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MDS	Mud Pit Agitators, Guns, Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. MUD PROCESS					
LPMS	Mud Mixing System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LPMS	Mud Handling System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LPMS	Mud Processing System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HPMS MP	Mud Pumps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CMT	HP Cement System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HPMS	HP Mud System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. DRILLING INSTRUMENTATION					
DIST INST	Drilling Instrumentation System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DIST INST	Drilling Control/Monitoring Systems (VICIS, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. RISER / BOP & WELL CONTROL EQUIPMENT					
WCS CONN	Connector: Riser	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CONN	Connector: Wellhead	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS FA	Flex Joint	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS RISE	Riser	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS TJT	Telescopic (Slip) Joint	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS RISA	Marine Riser Adapter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RISH RHT	Riser Gimbal / Spider	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		4	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
WCS TENR	Tensioning Ring	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RTS HCYL	Riser Tensioners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RTS CTRU	Riser Recoil System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS BOPR	BOP Rams (Various)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ANNU	BOP Annulars	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS BOPS	BOP Stack Frame (General)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS VLV	Failsafe Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CTRU	BOP Control Panels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS PMP	BOP Mixing Unit	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ACUM	Accumulator Bottles, Stack Mounted	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS ACUM	Accumulator Bottles, Surface	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS PMP	BOP Triplex Pumps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS SSHR	Hose Reels (MUX & Hydraulic)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS BOPP	BOP Control Pods	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS UMB	BOP MUX Cables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS SSHR	BOP Pod Hoses (Hydraulic)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BOPH	BOP Cranes / Hoists / Handling / Transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WCS DIVT	Diverter Assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS CTRU	Diverter Control	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS MANI	C&K Manifold and Piping	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HOSE	Coflexip Type Hoses	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WCS PIPE	Connectors: Hydraulic Choke & Kill	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. TUBULAR / PIPE HANDLING					
HYD HPU	HPU's (Central or Stand-Alone)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PH FGBD	Fingerboard	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PH PHM	Varco PRS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH DPF	Pipe Conveyor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RISH BOPC	Pipe Skate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH PHM	Iron Roughneck	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PHL WPB	Stabbing Basket	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		5	8

This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.

	Maintenance Department	Rig Hardware Assessment
		Deepwater Horizon 01-12 APR 2010
Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard		

Item	Description	Condition Level			
		1	2	3	4
PH PHM	Offline Casing Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. POWER GENERATION					
ELPG ENG	Main Engines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPG GEN	Main AC Generator	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPD SWBD	Switchboards	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPD TFMR	Main Transformers	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPD VFD	VFD Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. AIR SYSTEMS					
AIR COMP	Low Pressure Air Compressors (\leq 500 PSI)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR PIPE	Low Pressure Air Piping and Valves (\leq 500 PSI)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR COMP	High Pressure Air Compressors ($>$ 500 PSI)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR PIPE	High Pressure Air Piping and Valves ($>$ 500 PSI)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11. COOLING WATER / FUEL / LUBE OIL / OILY WATER					
SEA PIPE	Salt Water Lines / Related Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TFS PIPE	Fresh Water Lines / Related Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DRLW PIPE	Drill Water Lines / Related Equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FUEL PIPE	Fuel Oil System Piping and Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LUBE PIPE	Lube Oil System Piping and Valves	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BILG SEP	Oily Water Treatment System	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. LIFTING EQUIPMENT					
MTHL CRN	Deck Cranes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MTHL OCRN	Gantry Cranes (Excluding BOP Cranes)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PHL MWIN	Air Hoists – Man Riding	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PH UWIN	Air Hoists – Non Man Riding	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		6	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					



Maintenance Department

Rig Hardware
Assessment
Deepwater Horizon
01-12 APR 2010Deepwater Horizon Rig Hardware Assessment
Rig Condition Scorecard

Item	Description	Condition Level			
		1	2	3	4
PHL MELV	Personnel Elevators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. COMMUNICATIONS / DATA PROCESSING					
COMM REQ	Radio Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COMMS COM	Satellite Communications	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COMM	PA, PABX, Talk Back and Telephone Systems	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VMS	Data Management Monitoring & Control (VMS, PMS, DMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14. ACCOMMODATIONS					
ACOM GEQT	Galley Refrigeration Equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACOM ACM	Living Quarters / Rooms	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. RIG UTILITIES					
HVAC	Ventilation Systems	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LHTG LTE	Lighting System, non EX	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
POTWWTMK	Watermakers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POTW	Potable Water System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EVNS	Sanitary Water System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EVNS SWGE	Sewage Treatment Plant	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELPD HAZA	Hazardous Area Electrical Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	HVAC Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16. SAFETY AND FIRE FIGHTING					
SURV RAFT	Life Rafts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SURV BOAT	Lifeboats	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELPG GEN	Emergency Generator System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
WTD WTDR	Hydraulic Watertight Doors & Hatches	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FGDS ALRM	Fire Detection System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FFS	Fixed Fire Suppression System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FFS	Fixed Foam Fire Fighting System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FFS PMP	Fire Pumps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		7	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					

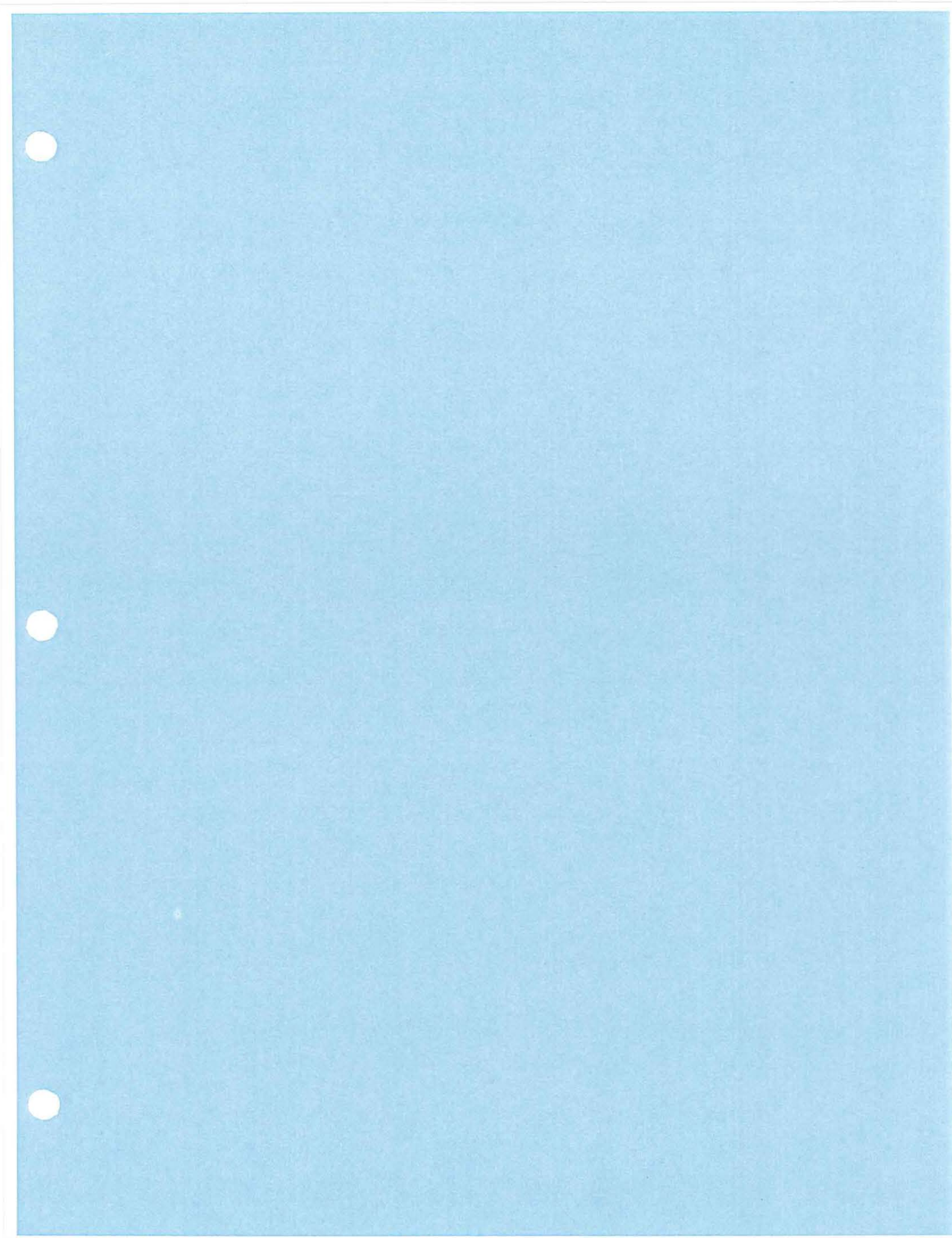
CONFIDENTIAL

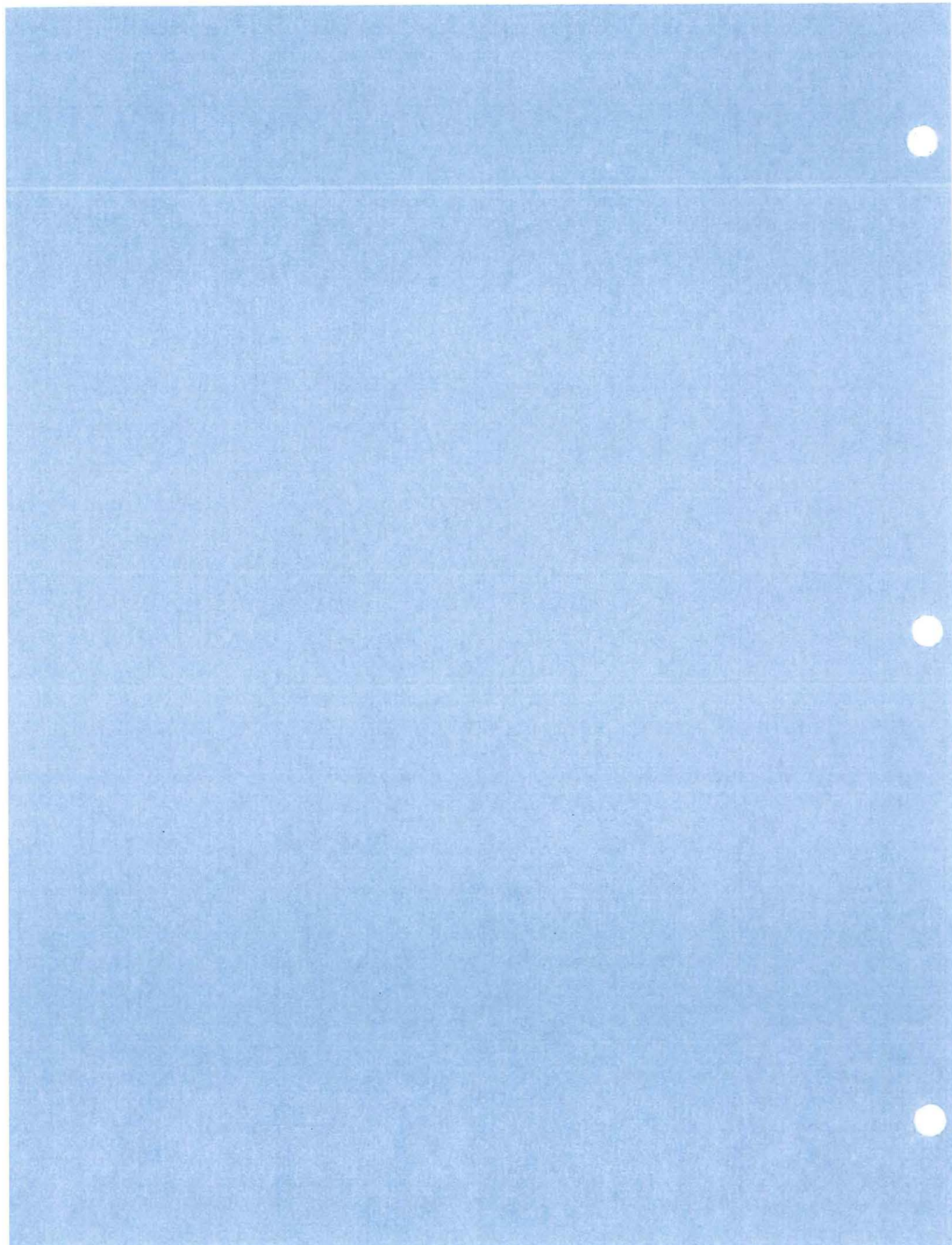
MODUSI 01 0 000340

	Maintenance Department	Rig Hardware Assessment Deepwater Horizon 01-12 APR 2010	
		Deepwater Horizon Rig Hardware Assessment Rig Condition Scorecard	

Item	Description	Condition Level			
		1	2	3	4
FFS PIPE	Fire Main Lines & Related Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FGDS ALRM	Gas Detection System	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Rig No.	Revision	Date	Deepwater Horizon Rig Hardware Assessment	PAGE	OF
6087	0	12 APR 2010		8	8
This document contains confidential information proprietary to Transocean Offshore Deepwater Drilling, Inc. and may not be transferred, reproduced, conveyed or divulged to any other company or person without express written permission.					





Subsea Conclusion

Upon Inspection it was found that the overall condition of the Subsea Equipment was in good condition. The main issues with the majority of the equipment after the assessment were that the certifications were out of the 5 yearly overhaul and recertification. Another issue was that the units need to have a protective coating maintenance on the items which were mainly located in the moon pool. Another issue which included the equipment was that the pressure relief valves had not been recertified within the past two yearly requirements or pressure gauges having been calibrated. There were three main systems which had been rated fair and one system which was rated bad.

The first system which was rated in bad condition was the Riser Recoil System. It was not functioning in an automatic state as designed. The Riser Recoil System is a critical system used for slowing the ascent of the Riser, and LMRP to prevent damage to the Rig, Riser, and LMRP in the event of an emergency disconnect situation. The Riser recoil System works off of the Tensioner Rod position indication, which is achieved through transducers and machined groves in the rods. It was explained that some of the Tensioner rods have been changed out with new rods that do not have the machined groves, which in turn have disabled the automatic function of the Riser Recoil System.

The second system which was rated in fair condition was the Riser Tensioner System. This system has a leaking tensioner and in need of protective coating maintenance to be performed. There are also no NDT certifications on the structural supports. The APV bottles are also classified in these sections which have broken pressure gauges, relief valves which have not been calibrated since 2005. The isolation ball valves for each bottle do not have any way to service them. The valves are sticking and some have broken handles.

The third system is the BOP Cranes, hoist, handling and transporter. This entire system has no NDT documents for any of the load bearing areas. There are also no results for a load test being performed on the units. The units are all in need of protective coating maintenance. The lower Gripper assembly track and mounting hardware need to be cleaned up and replaced if necessary due to major corrosion.

The final system which was labeled as being in fair condition is the BOP Control Panels. The Drillers Control Panel Air Purge System is not functioning properly and the panel is leaking. The door seal needs to be changed and the purge pump needs to have a new diaphragm installed. The crew is aware of this and once the parts arrive which have been ordered, they will be installed.

No current injection reports for the main circuit breakers.

None of the Ex electrical equipment as been tagged with an ID number.

PM for the electrical equipment in hazardous areas as not been preformed.

The condition of the electrical equipment in hazardous is poor with missing certification labels and corrosion on the flame paths.

The AC motors for the mud pumps are in poor condition with grease and dust in side 1A, 1B, 2A and 2B.

Several obstruction lights are not working around the rig.

There is a new PA system to be installed the existing one in obsolete.

The rig floor equipment is run in manual and not automatic as designed.

The stained carpets must be replaced with the bedroom.

Several areas of the accommodation have damaged floors including the mess room.

Cabinets and draws in the galley are in a poor condition and must be replaced.

The steam table, dishwasher and food mixer are in a poor condition.

No 1 was noted to be dirty inside on the winding, also in No 1 several of the fins were damaged and one other item the buss bars had corrosion noted on the washers.

No 4 generator the water leak detector did not work when function tested.

No 5 generator we noted two cables were chaffing.

In No 6 generator we noted there was oil in the fan housing.

Thruster No 2 is down waiting on new motor.

No rubber matting in front of the transformers on the rig.

The main concerns found during the course of the survey are listed below:

Drawworks while in fair condition it had issues with motor and main shaft oil leaks. The OEM recommends the brake springs are replaced yearly and this is not being carried out.

The rotary table had been down for several months waiting on a control skid.

While the top drive was in good condition it is rated for 750 tons, the rest of the lifting equipment is rated for 1000 tons; we would recommend that this also be replaced with a 100 ton unit alleviating the necessity of racking the top drive back during riser and casing handling operations.

During a derrick inspect we found several potential dropped objects, these including damaged timber bolted to beams, rotted timber at crown bumpers and loose bolts in derrick. The cotter pins securing the shackle pins were also found to be undersize.

Block hang off lines are also poorly secured with soft line.

During the crown inspection it was found that the crown sheaves were receiving little to no grease, this being attributed to damaged grease lines, the grease lines have now been removed and the sheaves are being greased directly.

On inspection of the mud pumps the following was found:

No. 1 pump had excessive crosshead clearance.

No. 2 pump the crosshead slides, and crossheads require replacing.

No. 3 pump Replace center crosshead bearing, crosshead, and lower slide.

No. 4 pump was in good condition.

PM records were reviewed on the PASAFE pulsation dampers and we could find no records of these being checked in the last 10 years OEM recommends the choke tube life is from 3 to 10 years, we would recommend these are inspected.

The column pipe racking system has a worn track; we are informed it was replaced six months ago. NOV have a modified carriage available with eight wheels instead on the four which is in use at present and when installed will help distribute the load more evenly.

The riser skate is in poor condition requiring replacement chains and repairs to the cart track.

The stabbing basket was tested and found working satisfactorily but we could find no record of a load test being carried out.

The rigs man-riding winches are all rated for 2500 lbs we would recommend that these winches be replaced to the new industry standard of 300 lbs SWL and are installed with a slack line detection system.

The rigs sanitary water treatment tank is badly corroded and should be replaced at the next shipyard upgrade period preferably with an Evac system and a Omni-pure treatment plant.

JR Kilcrease

Conclusion

The rig was clean and the paint was in good condition.

The deck cranes were in bad condition. The main block on both cranes were worn and in need of replacement. The whip line sheaves were worn and must be replaced. The gantry crane was in fair condition. The walkway on the booms for both deck cranes, was only about 10 inches wide. The walk way at the boom tip had no platform around the sheaves and causing a safety issue when performing the PM maintenance on the crane. The winch located in the boom had no walkway or platform around the unit for maintenance. It was recommended for a walkway to be installed in-side the boom for walking the boom when performing maintenance on the winch located in the boom and for safe access to the boom tip sheaves.

The salt water and fresh water piping was in bad condition due to age. The piping for the cooling systems and the water makers were in bad condition. The piping was leaking around the water makers and the cooling heat exchangers. The salt water service pumps in the lower pump rooms were in bad condition. The pumps were leaking and in need of replacements.

Number 2 thruster motor was out of service and must be replaced. All of the thruster were having problems with water getting into the gear box due to the seals were in need of replacement.

The ballast system was in fair condition. This was due to the hydraulic system for the ballast valves were causing problems. The units were not closing the valves correctly due to the solenoids on the 4 units in the columns were heating up to the point of burning out or shutting off when using the system. Number 3 ballast pump was in bad condition, due to not staying primed and not pumping correctly when in use. The pump must be replaced if repairs cannot be make for the pump to work correctly.

The walkways on the lower sides of the columns were in bad condition and must be replaced.

The water makers were in fair condition; however, the units were not making the amount of potable water needed to supply the rig. The units were making half of the amount of water being used daily.

The water maker rooms located in front of each of the main engines did not have a automatic bilge system. The crew members were pumping out the bilge in the areas with dlapragm type pumps manually. With the fresh water and salt water piping in bad condition, the rig was having issues with the pipes leaking often. This could cause a flooding issue if the main water line burst in the water maker rooms. The bilge pumps located in the lower pump rooms were having issues with not staying primed when in use.

The drill water pumps and piping was in fair condition. The drill water pumps were worn and in need of replacements due to age.

MSU 01 0 000220

CONFIDENTIAL

MODUSI 01 0 000345