



PRELIMINARY REPORT OF SURVEY

Jack-up Rig THULE POWER

Prepared for

Fode Ltd

United Arab Emirates

By

MODUSPEC ENGINEERING (INTERNATIONAL) B.V.

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ABSTRACT

This report has been written for Fode Ltd as a result of a survey conducted from 5 to 11 April 2009 on the jack-up rig THULE POWER while the unit was cold stacked in the outer section Sharjah harbor in the UAE. This report specifies what has been inspected/tested and in what manner. For the deficiencies noted a list of recommendations is provided. Where required, photos are provided to clarify the deficiencies noted.

Keywords: *Report of survey, Visual inspection*

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NOTE: The numbering system in this report corresponds with the ModuSpec survey programme and numbers which are omitted apply to equipment which was not reviewed during this survey.

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2.0 INTRODUCTION**2.1 Unit Data**

Jack-up rig:	THULE POWER
Owner:	Thule Drilling ASA
Built:	1982
Performance:	Water depth 250 ft Drilling depth 30000 ft
Location:	Sharjah Harbor UAE
Inspection dates:	5 - 11 April 2009
ModuSpec references:	KM/MB/az/ws/ir - NL2960.1

2.2 Scope of Work

In accordance with the instructions received, we attended the jack-up rig THULE POWER to complete a condition survey of the primary drilling equipment, mud system, well control equipment, marine equipment, power plant, electrical equipment, safety equipment, maintenance system and spare parts.

The purpose of this survey was to determine the general condition and state of maintenance of the equipment, in order to minimize downtime caused by mechanical breakdown during drilling operations and to ensure that the equipment is maintained in safe working order.

The survey was conducted in good faith, but the inspection of individual items of equipment was subjected to time and operational constraints imposed by rig operations at the time.

2.3 Applicable Standards and References

The criteria which have been used as reference during this survey are internationally recognized standards, local legislative requirements, client'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

3.1 Executive Summary

As instructed by Fode Ltd, we attended the jack-up rig THULE POWER which was jacked up in a standby position at the outer section of the Sharjah Harbor in Sharjah UAE.

The survey took place from the 5-11 April 2009. The purpose of the visit was to carry out a full condition survey of the primary drilling equipment, mud system, well control equipment, power plant, electrical system, safety equipment, maintenance system and spare parts. On arrival at the location we found that the rig was unmanned with exemption of two watchmen onboard. The fact that it was found that the rig was not fully operational, commissioned and manned changed our scope of work to a limited condition survey where the majority of equipment was sighted visually and evaluated with regards to completion status, condition and readiness for operation.

It was obvious that the rig had undergone a total refurbishment not only limited to renewal of main equipment, but all items of technical installations were renewed including cabling & piping as well as a lot of structural steel had been renewed. The rig can in our opinion be considered as a new rig when it is completed and fully commissioned.

The equipment observed onboard was all of well known and reliable vendors of high quality offshore equipment and the installations were carried out in a professional manner with regards to workmanship. We have during the survey raised a significant number of recommendations which in our opinion is not negative as many of the raised recommendations are items which are normal for a new building specially taken into consideration that no rig crew has been onboard to prepare the rig for operation.

The completion and commissioning state of the rig witnessed that there is still a significant amount of man hours to be assigned before the rig is ready for operation. We have listed a number of issues below which needs to be attended.

- Completion of the accommodation module
- Commissioning and integration tests of the drilling package
- Non destructive testing of load bearing items, lifting gear etc
- Recertification of pressure relief valves which has run out date
- Lifting gear registration and inspection / review of certificates
- Commissioning of not commissioned systems and clearance of punches raised
- Recertification of the rig, load line certificate, class certificate etc
- Implementation of equipment into a maintenance system
- Set up of onboard warehouse and registration of spare parts
- Purchase of critical long lead spares
- Load tests of derrick, winches, cranes etc
- Load testing of engines, load sharing adjustments
- Calibration of essential gauges & instruments
- Verification of EX integrity and hazardous areas
- Rig crew familiarisation and training in new equipment

As we did not have access to the documentation package some of the above mentioned items might have been carried out although it should be taken into consideration that it might be up to three years since equipment was commissioned and it therefore it could be necessary to carry out re-commissioning on some of the equipment.

We would like to thank the Thule Drilling representative for his assistance with arranging the daily transport to and from the rig.

3.2 Conclusion

It was obvious that the rig had undergone a total refurbishment not only limited to renewal of main equipment, but all items of technical installations were renewed including cabling & piping as well as a lot of structural steel had been renewed. The rig can in our opinion be considered as a new rig when it is completed and fully commissioned.

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- Load testing of engines, load sharing adjustments
- Calibration of essential gauges & instruments
- Verification of EX integrity and hazardous areas
- Rig crew familiarisation and training in new equipment
- Posting of warning signs & labels
- Marking of equipment names, start/stop stations etc

We have furthermore listed some of the systems below which we found not complete during our inspection.

- Fire detection system
- Portable water system
- Rig PA/GA system
- BOP Control Unit
- Bulk transfer system
- Fire extinguishing systems
- Monkeyboard (scaffold in place)
- Drilling Control System
- Emergency power system
- Cascade breathing air system

As we did not have access to the documentation package some of the above mentioned items might have been carried out although it should be taken into consideration that it might be up to three years since equipment was commissioned and it therefore it could be necessary to carry out re-commissioning on some of the equipment.

It is our strong opinion that the THULE POWER will be a safe, reliable and effective drilling unit when it is finally completed, commissioned and brought into operational mode with an effective management system & maintenance system in place.

We would like to thank the Thule Drilling representative for his assistance with arranging the daily transport to and from the rig.

17 April 2009

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3.3

End-of-Inspection Meeting Document

Date of meeting:		
	Name	Title
Client Representative(s):		
Rig Staff:		
ModuSpec Surveyor(s):		

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

Comment by the surveyor: The end-of-inspection meeting was not held because we did not meet with the client. The preliminary list of recommendations was send by email to the client at completion.

4.0 LIST OF RECOMMENDATIONS

The recommendations in this report are defined as follows:

Critical recommendations

Critical recommendations are based on shortcomings which may lead to loss of life, a serious injury or environmental damage as a result of inadequate use and/or failure of equipment.

Major recommendations

Major recommendations are based on shortcomings which 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.

Minor recommendations

Minor recommendations are based on shortcomings which may lead to a situation that contributes to an incident or to circumstances in which the required standards of operation are not met.

5.0 DRILLING EQUIPMENT

5.1 Drawworks

Make: NOV
 Type: ADS-10T
 Rated input: 3000 hp
 Year of manufacture: 2005
 Serial No.: ADS-10DTM22M006
 Capacity: 1.507.000 LBS at 14 Lines

The drawworks was visually inspected and did not appear to have been used for any drilling operation in the past. As the drawworks has not been run for an unknown period of time it is recommended to carry out an internal inspection of the gearboxes, lube oil and cooling system prior start up as well as it must be ensured that all the grease points are greased and the correct oil level is maintained. It was also noted that the crown saver toggle switch was not set correct as it had loose securing bolts, the Crown-O-Matic should be adjusted and secured in accordance with API RP 54 section 9.4.8



5.1 Drawworks general.

Drawworks Recommendations:

- 5.1.1.1 Major Adjust Crown-O-Matic toggle prior to operation.
- 5.1.1.2 Minor Inspect the drawworks internally prior to start up.
- 5.1.1.3 Minor Grease and check lubrication prior to start up.

5.1.2 Disk Brake (Universal)

The drawworks were equipped with a dual disk brake system, which was visually inspected and found in good condition as it appeared that the drawworks had not done any drilling operation since installed. It is our recommendation to review the commissioning procedures used when the brakes was commissioned and carry out the function & safety parts of the commissioning procedures again prior to operate the brakes/drawworks.

Disk Brake (Universal) Recommendation:

- 5.1.2.1.1 Major Carry out function and safety related points from the commissioning procedures prior to operation.

5.2.1 Hydraulic-Driven Rotary Table

The rig was equipped with a NOV rotary table, it was not possible to visually inspect the rotary in details due to the rig stack mode however there were no concerns anticipated as the rotary was a new rotary. It should however be checked that the rotary table has been commissioned and tested prior to use.

- | | | |
|-----------|-------|---|
| 5.2.1.1.1 | Minor | <u>Hydraulic-Driven Rotary Table Recommendation:</u>
Check the commissioning procedures for the rotary table and complete commissioning accordingly. |
|-----------|-------|---|

5.3 Top Drive System

The rig was equipped with a Varco TDS8SA top drive which was observed visually from the rig floor while it was located approximately seven meters above the rig floor. There was no accessibility to the top drive. It was noted that the installation of the mounted Varco PH100 pipe handler was not complete as the actuator for the IBOP valve was missing as was the cylinders for the link tilt system. Due to the fact that the top drive has not been running for an unknown period it is our recommendation to review the commissioning procedures and carry out re-commissioning of the safety and operational related points of the original commissioning procedure. It was also noticed that the high pressure mud jumper hose connected to the goose neck did not have any kind of safety sling installed in order to catch the hose and prevent possible injuries if the hose for some reason should fail.



5.3 Top drive HP jumper hose has no safety sling fitted.

- | | | |
|--|----------|--|
| <u>Top Drive System Recommendations:</u> | | |
| 5.3.1.1 | Critical | Install safety slings at both ends of the HP jumper hose. |
| 5.3.1.2 | Major | Re-Commission the top drives safety and operational functions. |
| 5.3.1.3 | Minor | Complete the installation of the pipe handler auxiliaries. |

5.4 Swivel

The swivel is an integrated part of the top drive and as such there were no recommendations or concerns raised.

5.7 Crown Block

The crown block was a loadmaster block which had not done any work since it was installed. It was inspected visually and found with the correct jumper bar across the sheaves and also the bumper block beneath it was secured well and made of heavy rubber. A label from the vendor Loadmaster stated that next inspection was due march 2007. It should be verified that there is no outstanding checks to be done to the block before use.

5.7.1.1 Minor Crown Block Recommendation:
Verify that all vendor checks are carried out before use.

5.8 **Travelling Block**

The travelling block was a National Oilwell block with seven cluster sheaves. The block was visually observed from the drill floor and did not raise any concerns as it has not been doing any drilling operation.

5.9 **Hook**

The hook was an integrated part of the travelling block.

5.10 **Drilling Instrumentation**

The driller cabin was examined and found to be incomplete in the drilling instrumentation system also the drillers operational chair was found not in place and not installed. The system requires completion of the instrumentation consoles and the connections to the respective remote sensors. At present, the main drilling system is a N.O.V. VICIS system with a CAD Drilling panel for BOP instrumentation and the choke system is an Electro Flow Controls system.

Various remote sensors are located throughout the rig which will be able to check and record the drilling function, B.O.P. and mud system direct for the driller inside his station on the rig floor. The drilling instrumentation must be completed and commissioned before the installation begins operational status.

5.10.1.1 Major Drilling Instrumentation Recommendation:
The drilling instrumentation needs to be completed and commissioned before the rig operations begin.

5.11 **Derrick**

Make: Loadmaster
Type: 30'x30'x170'
Capacity: 1600 Kips

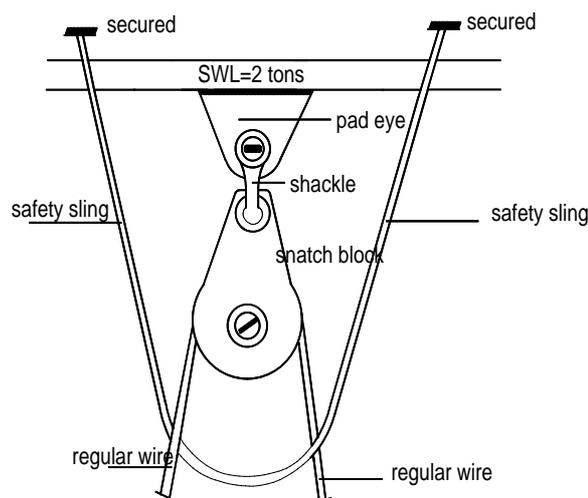
The derrick was climbed in order to carry out a visual inspection, it was obvious that that the derrick had not been involved in any drilling operation as it was very clean. A number of safety concerns were addressed at the derrick inspection which should be rectified or implemented before the rig starts the drilling operation.

As there were no documentation available we would recommend that the certificate is reviewed as well as it should be verified if the derrick has been load tested after completion. It was noticed that the derrick structure at the PS aft derrick leg had delaminated on the other surface over approximately five meters, it should be verified that this is mentioned and accepted in the final documentation for the derrick.

The derrick name plate required by API RP 54 Section 9.2.2 & API Spec 4F Section 4.2 was not sighted on the derrick structure. Although it is a Norsok requirement we would still recommend the gates on the resting platforms to be of the self closing type which they are not. The derrick ladders felt safe to climb despite the fact that a few rungs were bended and there were no climbing assist line installed. Although provisions were made there was no derrick man escape system installed, it must be ensured that a derrick man escape system is installed prior to the drilling operation commences. The house keeping on the monkeyboard level were very poor although the final installation were not complete as scaffolding was erected there was various pieces of equipment laying around on the grating, a piece of electric cable were sighted in one of the derrick members it strongly recommended that a tidy up session is held when the installation work is completed in order to prevent any dropped object incidents. There rig was equipped with two small 1000 LBS Ingersoll Rand remote controlled air winches of which one was laying loose on the monkeyboard level, the other was installed however there was no safety guard installed on the drum. Its recommended to have guards installed as well as the spare tugger should either be installed or removed from the monkeyboard. A grease manifold were sighted at the crown level, grease lines were noted to be routed to the crown block, deadline and fast line sheaves however the piping routed to the sheaves beneath the crown block were not connected up to the sheaves. Two by two tugger deflector sheaves installed on beams in the derrick had no remote grease tubes installed which is recommended to ensure that they will be greased on regular intervals.

It was noticed that there were no safety slings installed on any of the tugger sheaves installed beneath the crown level as well as the shackles, sheaves etc had not been colour coded as part of regular lifting gear inspections. The pad eyes were not marked with their respective SWL, although this is a Norsok requirement we still recommend SWL to be painted on all pad eyes to prevent mistakes and incidents in the future drilling operation.

The correct way of installing safety slings on sheaves are showed below in order to have them installed correct when provided:





5.11 Monkeyboard scaffold.



5.11 Monkeyboard poor housekeeping.



5.11 Tugger sheaves have no safety wires fitted.

Derrick Recommendations:

- | | | |
|-----------|----------|---|
| 5.11.1.1 | Critical | Install a drum guard on the monkeyboard tugger. |
| 5.11.1.2 | Critical | Tidy up the entire derrick prior to operation. |
| 5.11.1.3 | Critical | Fit the derrick man escape system. |
| 5.11.1.4 | Critical | Install safety wires on tuggers beneath the crown block. |
| 5.11.1.5 | Major | Verify if a derrick load test has been carried out after completion. |
| 5.11.1.6 | Major | Install derrick nameplate as per API RP 54 Section 9.2.2 & API Spec 4F Section 4.2. |
| 5.11.1.7 | Major | Install self closing gates at resting platforms. |
| 5.11.1.8 | Major | Install or remove loose tugger on monkeyboard. |
| 5.11.1.9 | Minor | Install a derrick climb assist system. |
| 5.11.1.10 | Minor | Straighten up the bend ladder rungs. |
| 5.11.1.11 | Minor | Verify that de-lamination found is mentioned in the final documentation. |
| 5.11.1.12 | Minor | Ensure grease hoses are connected up to the sheaves beneath the monkeyboard. |
| 5.11.1.13 | Minor | Ensure remote grease hoses are connected to the tugger deflector sheaves placed on beams in unreachable position. |
| 5.11.1.14 | Minor | Implement the sheaves, shackles etc in a lifting gear inspection scheme and colour code accordingly. |

5.13 Tuggers and Sheaves

Rig Floor:
 Make: 2 times EMCE'
 Type: K6-VL-24AX1
 Year: 2006
 Capacity: 10000 Lbs at 90 PSI

The two ea winches were inspected visually and appeared to be in a good condition as they had only done limited work during the installation phase. The winch installation did however raise some concerns of which the most critical was that we observed that there were no spooling devices on the winches. Its is therefore advised to install a

simple type of spooling device or wire guide system which will avoid hand injuries as the operating crew don't have to grab and guide the wire with their hands. It was also noticed that signs indicating the safe working load were missing and the exhaust outlets from the winches was just a piece of hose and not the correct type of mufflers to reduce unnecessary noise on the rig floor which in many cases contributes to an unsafe working environment. The winch load was given as 10000 LBS at 90 PSI air pressure, however there was no pressure regulator installed to ensure that the air pressure and thereby the winch lifting capacity would not be exceeded.

Make: 4 times RAM Winches
 Type: FK6VL-24AX10
 Capacity: 10000 Lbs at 90 PSI

The four ea winches were inspected visually and appeared to be in a good condition as they had only done limited work during the installation phase. The winch installation did however raise some concerns of which the most critical was that we observed that there were no spooling devices on the winches. Its is therefore advised to install a simple type of spooling device or wire guide system which will avoid hand injuries as the operating crew don't have to grab and guide the wire with their hands. It was also noticed that signs indicating the safe working load were missing and the exhaust outlets from the winches was missing the correct mufflers to reduce unnecessary noise on the cellar deck which in many cases contributes to an unsafe working environment. The winch load was given as 10000 LBS at 90 PSI air pressure, however there was no pressure regulator installed to ensure that the air pressure and thereby the winch lifting capacity would not be exceeded. The guards were removed from the winches and placed on the deck next to the winches.

Tuggers and Sheaves Recommendations:

- | | | |
|----------|----------|---|
| 5.13.1.1 | Critical | Install the guards on the cellar deck winches. |
| 5.13.1.2 | Critical | Install simple spooling devices to guide the wires. |
| 5.13.1.3 | Critical | Install pressure reducing valve to ensure maximum lifting capacity is not exceeded. |
| 5.13.1.4 | Minor | Install SWL signs on the winches. |

5.13.1 Man-Riding Winches

Make: 2 times EMCE (one on rig floor and one on cellar deck)
 Type: MR30FGL
 Serial No: 1.060538-1
 Year: 2006
 Capacity: 150 Kg

The man riding winch was inspected visually and found in a good condition as it had only limited usage. However we noted that the installation was not correct as the wire was not run through the slack wire protection arm as it should in order for this function to operate correct. Also there were a few signs missing, a sign indicating that the winch is only to be used for man riding is recommended as well as a sign indicating the emergency stop at the control junction box should be placed. An airline lubricator and filter unit was installed at the winch as we recommend, however we also recommend this unit to be guarded in order to protect it from the heavy equipment being handled at the rig floor.

Man-Riding Winches Recommendations:

- | | | |
|------------|-------|---|
| 5.13.1.1.1 | Major | Install the wire correct in the slack wire protector. |
| 5.13.1.1.2 | Minor | Install a sign "man riding only". |
| 5.13.1.1.3 | Minor | Install an emergency stop sign on the E-stop button. |

Only one set of manual slips were noticed stored on top of the cantilever, the slips was new and had never been in use. It is recommended to ensure that a sufficient range of slips are available before drilling commence.

5.17.2.1.1 Minor Slips and Dog Collars Recommendation:
Ensure sufficient numbers of various slips are available prior to drilling commences.

5.17.3 **Varco Slips (PS-21 and PS-30)**

The rig was equipped with a set of PS 21 hydraulic operated power slips which was installed in the rotary at the time of the inspection. The slips were inspected visually and was not seen operational. It is recommended to ensure the slips are greased as per the manufactures recommendations prior to operation start up in order to prevent operation failure and stuck slips.

5.17.3.1.1 Minor Varco Slips (PS-21 and PS-30) Recommendation:
Ensure slips are greased as per manufactures recommendations before use.

5.17.4 **Elevators**

The rig was equipped with a set of BX 4 – 500 Ton hydraulic operated elevators and a number of manual slips. The elevator inventory should be compared with the first drilling programme in order to ensure that sufficient elevators are available when drilling commences.

5.17.4.1.1 Minor Elevators Recommendation:
Ensure sufficient numbers of various elevator sizes are available prior to drilling commences.

5.17.5 **Elevator Links**

Two sets of elevator links were observed, one set 350 ton x 132 inches was visually inspected as found on the rig floor connected up with the link tilt cylinder brackets ready to be installed on the top drive. The other set was a 500 ton x 190 inches inspected on the top of the cantilever where it was found. Both sets of links were new and as such there is no concerns raised. It should however be verified with the first drilling programme that these links are of a sufficient length and load capacity to satisfy the requirements.

5.17.5.1.1 Minor Elevator Links Recommendation:
Verify the link requirement against the drilling programme.

5.17.6 **Master Bushings**

A new set of split master bushing were observed on the deck outside the accommodation.

5.17.9 **Fingerboards**

The rig was equipped with a manual fingerboard, the board was new and had not been in use whereas the fingers, latches and chains were as new condition. It was noted that there was no belly belt available and no sala blocks installed to protect the derrick

man from falling. These safety items should be installed prior to first use of the fingerboard.

5.17.9.1.1 Critical Fingerboards Recommendation:
Ensure sala blocks and belly belts are installed before first use.

5.17.12.3 **Mud Bucket**

There was no mud bucket found on the rig during the inspection, the requirement for a mud bucket should be evaluated.

5.17.12.3.1.1 Minor Mud Bucket Recommendation:
Evaluate the need for a mud bucket and purchase accordingly.

5.17.12.5 **Cherry Picker**

The rig was equipped with a NOV cherry picker which was found in parked position in the derrick. By looking at the protective plastic foil on the hydraulic cylinders it did not appear that the unit has been used or commissioned however it was noticed that the small cylinder keeping the basket angle correct had rust spots on the chrome surface, this should be cleaned of before developing into corrosion that will create leaks in the cylinder. The visual inspection of the cherry picker and its remote control panel on the rig floor did not raise any concerns as the condition was as new. It is however recommended that the unit is being commissioned and tested before its first use as it's considered as a personal hoisting unit.

5.17.12.5.1.1 Minor Cherry Picker Recommendations:
Ensure the cherry picker is tested and commissioned before it is used for personal services.

5.17.12.5.1.2 Minor Remove rust from the small basket angle cylinder.

5.18 **Iron Roughneck**

Make: NOV
Type: ST 80
Serial No: ST80M16M563 & ST80M16M564
Year: 2005

The rig were equipped with two iron roughnecks which were visually inspected and found in a good order with exemption of the hydraulic connectors for roughneck No. 1 which was not connected and not covered fully allowing dirt to get into the hydraulic quick connects. The quick disconnects should be cleaned up thoroughly before they are reconnected in order to prevent pollution of the hydraulic system. Both roughnecks torque gauges required to be calibrated prior to use as there were no signs of recent calibration.

5.18.1.1 Minor Iron Roughneck Recommendations:
Clean the hydraulic quick disconnects prior to reconnections.

5.18.1.2 Minor Recalibrate the torque gauges prior to be use.

5.19.1 **Drill Floor**

The drill floor layout was logic and well organized although the area is limited and rather crowded due to extend of the machinery installed. The drill floor had two set back areas protected with wood and equipped with drainage around the setback areas and machinery areas. Many pieces of loose grating were observed on the rig floor as well as empty oil drums, rags, nuts and cable pieces were observed all over the drill floor. It is recommended that the rig floor is tidied up before work commences as its considered as a safety hazard when such a crowded area is not kept tidy.

The drillers cabin were ergonomically correct with the VICIS operating chair placed central in the room where all the daily drilling functions could be operated from. It was noticed that there were no sun blinds installed in the cabin to enable the operator to blind off for the incoming sun in order to improve his view out of the cabin.

Drill Floor Recommendations:

- | | | |
|------------|-------|---|
| 5.19.1.1.1 | Major | Tidy up the rig floor prior to commissioning and mechanical completion. |
| 5.19.1.1.2 | Minor | Install sun blinds in the driller cabin. |

5.19.10 Hydraulic Power Unit

The hydraulic power unit was a Varco HPU with the capacity of 160 GPM at maximum 3000 PSI. The unit was placed beneath the rig floor and were visually inspected. The unit was in as new condition however it was found to be very dirty on the externals. The nearby return manifold was leaking oil.



5.19.10 Hydraulic Power Unit manifold leaking.

Hydraulic Power Unit Recommendations:

- | | | |
|-------------|-------|--------------------------|
| 5.19.10.1.1 | Minor | Repair oil leaks. |
| 5.19.10.1.2 | Minor | Clean the entre unit up. |

5.20 Drill String

There was no drill string onboard the rig, only a few singles used for testing and commissioning were observed.

5.21 Drilling Subs

There were only a few subs onboard which appeared to be brought onboard for testing and commissioning purposes.

5.21.1.1 Minor Drilling Subs Recommendation:
Ensure sufficient drilling subs are supplied prior to
commence of drilling programme.

5.22 **Fishing Tools**

There was no fishing tools observed on the rig.

5.22.1.1 Minor Fishing Tools Recommendation:
Ensure sufficient fishing tools are supplied prior to
commence of drilling programme.

6.0 MUD SYSTEM

6.1 Mud Pumps

Make: NOV
Type: HEX 240
Serial No: 11302 H & 11301H
Year: 2006

The rig was equipped with two new hex type mud pumps which had only been running 12 hrs according to the hour counters installed on the control panel. The pumps was inspected visually and found to be in good condition however we did notice a few items which should be corrected prior to use. The unit numbers should be painted in a visible place on the pumps in order to prevent misunderstandings in the future operation of the pumps. The desiccant type oil breathers were indicating that they were inactive and should therefore be replaced in order to avoid moisture and thereby corrosion in the internal machined surfaces of the pump. The discharge pressure gauges had no calibration stickers on them indicating that they are calibrated, certificates should be checked and possibly the gauges should be calibrated prior to use. One of the mud pumps (S/N 11302H) had an oil leak in the lube oil hose supplying lube oil to the pump, this leak should be rectified prior to use.

The pre-charge pumps was found with the pressure gauges disconnected and the flange connections left open, new gauges should be fitted prior to operation.

One of the associated pop off valves installed in the discharge line from the pumps was found missing and the pipe work was blanked off, the other valve had no signs of recent recalibration. Its strongly recommended to install the missing pop off valve and have the existing valve recalibrated prior to starting the pump the first time as the pop off valves are considered as a safety relieve valve protecting crew and machinery.

The lifting appliances installed on the pump designed for easy maintenance should be implemented in a lifting gear inspection scheme and colour coded in the latest lifting gear colour.

Due to the few running hours and the fact that plastic foil was wrapped around many parts of the pumps, it must be verified if the full commissioning has been completed on the pumps.



6.1 Pop off missing.

<u>Mud Pumps Recommendations:</u>		
6.1.1.1	Critical	Install missing pop off valve at pump 11301H.
6.1.1.2	Major	Re calibrate pop off valve at pump 11302H.
6.1.1.3	Minor	Repair oil leaks in oil supply line at pump 11302H.
6.1.1.4	Minor	Include the lifting appliances in an inspection scheme and colour code accordingly.
6.1.1.5	Minor	Calibrate the discharge pressure gauges.
6.1.1.6	Minor	Stencil the pump numbers at a visible place on the pumps.
6.1.1.7	Minor	Replace desiccant air breather cartridges.
6.1.1.8	Minor	Review the commissioning procedures and evaluate if full commissioning has been carried out.

6.2 Shale Shakers (General)

Make: Brandt
 Type: VSM 300
 Serial No: 300708, 300709, 300710 & 300702

The rig was equipped with four ea new Brandt shale shakers all installed correctly and connected with a Brandt header box including remote operated isolation valves operated from a nearby installed remote control panel. Apart from the fact that the shakers were not installed with shaker screens no concerns were raised towards the shaker installation.

<u>Shale Shakers (General) Recommendation:</u>		
6.2.1.1	Minor	Install correct shaker screens prior to operation.

6.4 Desilter

The rig was equipped with a 24 cone desilter unit which were visually inspected and found in as new condition.

6.5 Desander

The rig was equipped with a three cone desander unit which were visually inspected and found in as new condition.

6.6 Degasser

Make: NOV
 Type: DG 10
 Year of manufacture: 2006
 Serial No.: 6116643

The NOV degasser was visually inspected and found installed correctly with the vent line diverted to safe area. The unit was in good condition however it was noted the three way float valve was locked in position by use of tie-wraps. The reason for this should be investigated further and brought back to normal operation mode.

<u>Degasser Recommendation:</u>		
6.6.1.1	Major	Remove tie-wraps from three way float valve and ensure the valve is working correctly

6.7 Centrifugal Pumps

The rig was equipped with Mission Supreme 2500 centrifugal pumps of the sizes 8 x 6 x 14 and 4 x 3 x 13. Although the pumps only appeared to have very few running hours we did note a number of recommendations which should be addressed in order to run the pumps the most optimum and safe manner.

It was noted that the flexible joints had started to develop cracks in the rubber most likely caused by the sun and the heat the flex joints has been exposed to since installed. It is recommended to investigate these cracks further and possibly change all the cracked flex joints.

There were no gauges installed on any of the pumps, it is advised to install gauges on the pumps in order to monitor their performances and to give an early warning of cavitations and impeller wear.

There were a general lack of nameplates on the pumps and signs on the start/stop stations for the pumps. Labels and nameplates should be installed to avoid any mistakes and thereby reduce risks of incidents during operation of the pumps. The trip tank pumps did not have any form of save-all or drip tray installed beneath it. As these pumps are installed elevated with the possibility of crew walking beneath the pumps, drip trays should be installed in order to protect the crew against spills if a failure should occur or during maintenance of the pumps.

One pump skid was found on the cantilever top, it was not possible to establish whether this pump was a spare unit or if it was intended to be installed or changed out with another unit.

Finally it was noted that the guard were loose on the degasser pump and the coupling and guard were not installed on trip tank pump No. 2. Guards should be installed before the pump is started up.

Centrifugal Pumps Recommendations:

6.7.1.1	Critical	Ensure all guards are installed on the pumps.
6.7.1.2	Major	Install drip trays beneath the trip tank pumps.
6.7.1.3	Minor	Install gauges on all the pumps.
6.7.1.4	Minor	Install missing nameplates on pumps.
6.7.1.5	Minor	Install missing signs on start / stop stations.
6.7.1.6	Minor	Install coupling on trip tank No. 2.
6.7.1.7	Minor	Investigate cracked rubber flex joints and renew accordingly.

6.8 Mud Agitators

The rig were equipped with nine ea Brandt NOV agitators which all were manufactured in 2006 and were visually inspected and found in as new condition with only a few findings revealed. One of the agitators had a loose cover which should be installed properly before the agitator is started up in operation. The agitators should be marked with numbers and the start stop stations should be marked accordingly in order to prevent mistakes during operation.

Mud Agitators Recommendations:

6.8.1.1	Critical	Install missing cover on agitator.
6.8.1.2	Minor	Stencil numbers on each agitator for easy identification.
6.8.1.3	Minor	Stencil numbers on each start/stop station for easy identification.

6.9 Mud-Mixing System

The mud mixing system was a new installed system located in the sack store and comprising of three mixing hoppers, a surge tank and a chemical dosing unit as well as the mud pits located in the pit room. The system was well installed and had gauges to monitor the performance of the mixers. All the piping and valves were new and appeared to be easy to overview. The health and safety of the mixing crew were however overseen as there were no locker with PPE for the mixing crew nor was there any kind of extraction system to extract dust from the mixing tables. The nearby placed emergency shower was found with the foot pedal broken of and the foot activation chain removed. It is strongly recommended to install a PPE locker with dust masks, gloves, aprons etc as well as a dust extractor should be provided on top of each mixing hopper.

It was noted that the pit level sensors were not installed although flanges and cables were made ready for installation.

Mud-Mixing System Recommendations:

- | | | |
|---------|----------|---|
| 6.9.1.1 | Critical | Install a PPE cabinet with appropriate PPE nearby the mixing station. |
| 6.9.1.2 | Major | Repair the foot activation system on the emergency shower. |
| 6.9.1.3 | Major | Install the missing pit level sensors. |
| 6.9.1.4 | Minor | Install a dust extraction system above each hopper. |

6.9.1 Trip Tank System

The trip tank was a single tank with a smaller stripping tank located next to it. The tanks and pump arrangements was made in such a manner that it was possible to pump the tank content over the shakers before it goes to the pits which is the recommended way. There were no pit level system installed in the tank at the time of the survey, however provisions were there for installation. It is recommended to have two independent level systems installed, one mechanical system and one electronic system as per API RP53 section 16.6.

Trip Tank System Recommendation:

- | | | |
|-----------|-------|--|
| 6.9.1.1.1 | Major | Install a dual level sensor system consisting of one remote and one manual system. |
|-----------|-------|--|

6.9.2 Flow Line System

The flow line was made of 12" piping which was routed in a logical manner with minimum of turns and hatches were provided for easy access for cleaning purposes. It was noted that the air actuator for the flow line gate valve installed beneath the rig floor was heavily corroded at the valve spindle. Although it was difficult to get access to a close inspection it appeared that the spindle was chrome plated wherefore the corrosion might have caused the spindle to be beyond repair.

Flow Line System Recommendation:

- | | | |
|-----------|-------|---|
| 6.9.2.1.1 | Major | Repair or renew corroded spindle at air actuator beneath the drill floor. |
|-----------|-------|---|

6.9.4 Base Oil System

The base oil system was not found on the rig, although it was noticed that there were diesel lines available to fill the pits this was not considered as a dedicated base oil system.

6.10 Standpipe Manifold and Rotary Hoses

The standpipe manifold was a 10000 PSI dual manifold manufactured by Anson in 2006. The manifolds were in good condition however it was noticed that the gauges was due for recalibration in 2007 it is therefore recommended to have the gauges recalibrated prior to drilling operation commences. It is also recommended to have all the valves tagged clearly with each valves respective number and a schematic of the manifold posted.

		<u>Standpipe Manifold and Rotary Hoses Recommendations:</u>
6.10.1.1	Major	Have the standpipe gauges recalibrated before use.
6.10.1.2	Minor	Tag each manifold valve clearly and post schematic drawing.

6.10.1 Cement Manifold

The cement manifold was a 10000 PSI manifold manufactured by Anson in 2006. The manifold was in good condition. It is recommended to have all the valves tagged clearly with each valves respective number and a schematic of the manifold posted.

		<u>Cement Manifold Recommendation:</u>
6.10.1.1.1	Minor	Tag each manifold valve clearly and post schematic drawing.

6.11 Bulk Air System and Tanks

Compressor Make:	Denco
Type:	D110BR-6
Year of manufacture:	2006
Serial No.:	D110-4-6-103
Capacity:	1218 M ³ /hr
Pressure rating:	4 bar

Dryer Make:	Denco
Type:	Smard 656W
Year of manufacture:	2006
Serial No.:	4600706009
Capacity:	1218 M ³ /hr
Pressure rating:	4 bar

The rig was equipped with a separate bulk air system supplying the 6 ea bulk tanks placed on the main deck with dry bulk air. The compressor and dryer were inspected visually and found in satisfactory condition with no concerns raised however the inspection of the bulk tanks did raise a number of concerns which should be addressed before the bulk system in ready for safe operation. The safety relief valves for the bulk tanks were removed and the connecting nozzles were left open, these valves should be installed before the tanks are pressurized as it is considered as a safety hazard. The bulk tanks had no name or description stencilled at them which can create confusion in the future cement and bulk transfer operations. The level measuring system on the bulk tanks had been changed from the original load cell method to ultrasonic sensors installed on the top of the tanks. The level sensor system should be commissioned in real life mode by transferring bulk between the

tanks in order to ensure that the measuring is done correct in the dusty environment that occurs in the tanks when pressurized and used.

		<u>Bulk Air System and Tanks Recommendations:</u>
6.11.1.1	Critical	Install safety relief valves on bulk tanks before pressuring up.
6.11.1.2	Minor	Stencil description, name, capacity on the bulk tanks.
6.11.1.3	Minor	Complete pipe work, and connect vent lines.
6.11.1.4	Minor	Carry out commissioning of the level sensing system while bulk is being transferred.

6.12 Centrifuge

Make:	Brandt NOV
Type:	HS3000
Year of manufacture:	2006
Serial No.:	105470601 & 105470602

The rig was equipped with two centrifuges and associated feed pumps. The centrifuges was visually inspected and found in good condition however it did not appear that the units has been commissioned and run as the feeding pipe work was not completed and the couplings and guards were not installed either. The mechanical installation was not the most optimum solution as the transporting scroll motors were extended over the walking platform in head height causing possibilities of head injuries. As it is unpractical to move the centrifuges due to space problems a preventive action to paint the motor frame with warning colours yellow – black should be taken.

		<u>Centrifuge Recommendations:</u>
6.12.1.1	Critical	Paint the motor frame of the scroll drive motors yellow-black to warn crew of their position in head height of walking platform.
6.12.1.2	Critical	Install couplings and guards.
6.12.1.3	Major	Complete the inlet pipe work.
6.12.1.4	Minor	Complete test & commissioning of the centrifuges.

6.13 Cementing Unit

The cement unit was a Schlumberger unit which appeared to be a new unit. It was not inspected due to time constraints and no Schlumberger personnel onboard, however the unit appeared to be in operational condition. It is advised to have Schlumberger onboard in due time for checking up and testing of the unit prior to drilling operation commence.

		<u>Cementing Unit Recommendation:</u>
6.13.1.1	Minor	Obtain system status from Schlumberger and arrange for Schlumberger to prepare the unit prior to drilling operation.

7.0 WELL CONTROL EQUIPMENT

7.1.2 Cameron (Type U and UII)

The rig was equipped with a Cameron BOP stack consisting of a single and a double ram preventer of the size 13- 5/8" the stack was manufactured in 2006 and has as such not been in use. As there were no access to the double rams and no possibility of testing or opening up the BOP for internal inspection it is recommended to have the bop inspected and pressure tested before use. The lower ram preventer were visually inspected and it was found with open flange connections for the gate valves, by looking into the bores it appeared that debris was present inside. This should be cleaned out as well as should the ring gasket surfaces as these had started to rust slightly. As the original plugs for the control lines were still installed it does not appear that the BOP stack has been tested and commissioned onboard.



7.1.2 BOP stack.

- | | | |
|-----------|-------|---|
| | | <u>Cameron Type (U and UII) Recommendations:</u> |
| 7.1.2.1.1 | Major | Carry out full commissioning test of the BOP. |
| 7.1.2.1.2 | Minor | Clean out debris from the lower gate valve bores. |
| 7.1.2.1.3 | Minor | Clean all ring gasket surfaces carefully. |

7.1.5 Pressure Testing

The entire BOP stack and its control lines should be pressure tested when the installation is completed. An electrical test pump was sighted onboard however this test pump has to be hooked up electrically as well as the chart recorder has to be recalibrated prior to be used for pressure testing onboard.

- | | | |
|-----------|-------|---|
| | | <u>Pressure Testing Recommendations:</u> |
| 7.1.5.1.1 | Major | Pressure test entire BOP stack and control lines. |
| 7.1.5.1.2 | Minor | Recalibrate chart recorder on test pump prior to use. |
| 7.1.5.1.3 | Minor | Install missing electrical supply cable to the test pump. |

7.2.1 Annular-Type Preventer (General)

number of concerns were raised which should be addressed before the rig starts its drilling programme. The accumulator bottles were not marked with individual numbers for easy reference with a maintenance system and they were not marked with the SWP and the nitrogen pre-charge pressure as recommended. Further was it noticed that the 4 bottle bank was not hooked up with piping. The electrical triplex pumps should be marked with warning signs that they start up automatically. It did not appear that this unit has been commissioned as the air driven pumps has not been hooked up and the tank was found empty. By looking inside the reservoir it appeared that some contamination were present in the tank bottom, the contamination should be cleaned out as the control valves are very delicate and sensible to contaminations. The safety relief valves and pressure gauges in the unit have run out of date with regards to calibration validity and should be recalibrated prior to use.



7.7 BOP control unit air pump discharge lines not connected.

		<u>BOP Hydraulic Power Unit Recommendations:</u>
7.7.1.1	Critical	Re-calibrate due relief valves and gauges.
7.7.1.2	Minor	Mark the bottles with clearly identify numbers.
7.7.1.3	Minor	Mark the bottles with SWP.
7.7.1.4	Minor	Mark the bottles with normal nitrogen pre-charge pressure.
7.7.1.5	Minor	Complete the piping of the 4 bottle bank.
7.7.1.6	Minor	Post sign "warning pump may start automatically" on the triplex pumps.
7.7.1.7	Minor	Complete the installation of the air pumps.
7.7.1.8	Minor	The unit must be commissioned when installation is complete.
7.7.1.9	Minor	Clean out the contaminations at the reservoir bottom.

7.8 Diverter System

The diverter system was not inspected as there were no diverter observed on the rig and the diverter panel was covered up in plastic foil. The view of the diverter panel did not give us the confidence that the system has been commissioned which should be verified.



7.8 BOP diverter panel not accessible.

- 7.8.1.1 Major Diverter System Recommendation:
Carry out full commissioning of the diverter and diverter control panel prior to drilling operation if not already carried out and documented.

8.0 MARINE EQUIPMENT

8.1 Ballast System

It was not possible to carry out any kind of inspection of the ballast system and tanks due to the rig not being manned and no tank entry equipment and procedures were in place at the time of the inspection. It was noted that several tank covers on the main deck were not bolted down which is recommended to have done prior to any jacking operation.

8.1.1.1 Minor Ballast System Recommendation:
Ensure tank covers are bolted secure before jacking operation.

8.1.1 Bilge System

The bilge system was a manual system consisting of 1 ea 150 m³/hr bilge pump plus a combined emergency board fed fire/bilge pump also of 150 m³/hr capacity. Both pumps were manufactured in 2006 and was inspected visually and found satisfactory. The piping system was in good condition and the bilge valves were operational.

8.2 Overflow and Vent Checks

The vents and overflows were all checked, balls was loose and mesh screen were installed on fuel and lube tanks. Safe-alls were installed on all fuel and lube tanks. It is recommended to have all the vents stencilled with the tank number & name on them. As there has been a lot of modification work done to the rig it should be verified if the heights on vents and fans are still sufficient as per the load line regulations 19 & 20.

8.2.1.1 Major Overflow and Vent Checks Recommendations:
Verify heights of vents and ventilators as per load line regulation 19 and 20.

8.2.1.2 Minor stencil name and tank number on each tank vent.

8.3 Watertight Integrity and Compartments

The rig was equipped with a number of deck hatches and watertight doors which were visually inspected and found in an acceptable condition with only a few recommendations to be implemented. It is advised to have "Keep Closed When Afloat" stencilled on each watertight door and each hatch. Damper devices should be fitted to all hinged doors opening up to external areas in order to protect against crunches.

Watertight Integrity and Compartments Recommendations:

8.3.1.1 Major Stencil "keep closed when afloat" on all watertight doors and hatches.

8.3.1.2 Major Install dampers on all doors opening up to external areas.

8.4 Mooring System

The rig was equipped with two mooring winches of the make Emcé and the model SR20F2 installed forward of the rig. There were no wire spooled onto the winches which indicated that they has not been fully commissioned. The winches were inspected visually and they were found with an unacceptable level of corrosion

developed since the winches were installed in 2006. It is recommended to remove the rust and paint the winches with a marine use coating system in order to prevent further rust development.

Two ea winch control stations were installed at each side aft, but there were no winches installed. Its unknown whether winches are purchased to be installed or perhaps they are stored onshore in order to save deck space when not in use.

The towing gear was visually inspected while it was hoisted up under the heli-deck by the towing gear winch. The towing gear did not lead to any concerns apart from its advised that the certification is reviewed before it is used for tow.

		<u>Mooring System Recommendations:</u>
8.4.1.1	Major	Review the certification for the towing gear in order to prove fit for use.
8.4.1.2	Minor	Clarify whether 2 more winches are to be installed aft.
8.4.1.3	Minor	Remove rust and paint the winches with marine paint system.
8.4.1.4	Minor	Ensure wires are spooled on to the winches correctly prior to use.

8.5 **Registration and Classification General Requirements**

There were no registration or classification documents available for review at the time of the survey. As the rig has gone through major upgrades it is recommended to review the requirement for recertification as per the below recommendations.

		<u>Registration and Classification General Requirements Recommendations:</u>
8.5.1.1	Minor	Check that a valid I.A.P.P (International Air Pollution Prevention) Certificate is available.
8.5.1.2	Minor	Check that a valid I.S.P.P. (International Sewage Pollution Prevention) Certificate is available.
8.5.1.3	Minor	Check that a valid Certificate of Registration is available.
8.5.1.4	Minor	Check that a valid Certificate for Classification of Hull is available.
8.5.1.5	Minor	Check that a valid Certificate for Classification of machinery is available.
8.5.1.6	Minor	Check that a valid International Load Line Certificate is available.
8.5.1.7	Minor	Check that a valid I.O.P.P. Certificate is available.
8.5.1.8	Minor	Check that a valid Safety Equipment Certificate is available.
8.5.1.9	Minor	Check that a valid Safety Construction Certificate is available.
8.5.1.10	Minor	Check that a valid Cargo Gear Certificate is available.
8.5.1.11	Minor	Check that a valid Ship's Radio License is available.
8.5.1.12	Minor	Check that a valid SOPEP Certificate is available.
8.5.1.13	Minor	Check that a valid International Tonnage Certificate is available.
8.5.1.14	Minor	Check that a valid IMO Modu Code Safety Certificate is available.

8.5.2 **Review of Other Documentation**

There was no documentation available to review due to the rigs operation mode, however we have made the below listed recommendations of documentation we would advise to have reviewed prior to operation.

<u>Review of Other Documentation Recommendations:</u>		
8.5.2.1.1	Minor	Review the last Inflatable life-rafts and hydrostatic release service reports and certification.
8.5.2.1.2	Minor	Review the Last service report of third party inspections of CO2 installations for engine-room, pump-room, etc.
8.5.2.1.3	Minor	Review the last Certificate for lifeboat falls.
8.5.2.1.4	Minor	Review the last Certificate for inflatable life-raft falls.
8.5.2.1.5	Minor	Review the last Certificate of Insurance.
8.5.2.1.6	Minor	Review the last outstanding recommendation list for Structural / Machinery Integrity.
8.5.2.1.7	Minor	Verify if repairs and upgrades have been conducted on equipment that is subject to certification by any of the classification authorities (C.A.) and has the approval from the C.A. been obtained?
8.5.2.1.8	Minor	Review the Oil Record Book for proper entries especially under the letters C,D,F,G,H and I.
8.5.2.1.9	Minor	Review the SOPEP (Shipboard Oil Pollution Emergency Plan).
8.5.2.1.10	Minor	Verify when the last air breathing bottles pressure test were done.

8.6 **Communication Equipment**

Note: The rig is supposed to be installed with the following communications equipment but none of it is onboard at the time of the inspection:

- AREA 3-SATCOM: INMARSAT "C"& CAP SAT SYSTEM
- GMDSS MF/HF/DSC FURNO TYPE STR-2000 AIR BAND
- VHF: JOTRON TR 6101
- NAVTEX: FURNO NX 500
- EPIRB: McMURDO SOS 406 AUTO SART: NOVA MARINE
- PUBLIC ADDRESS: AKUSTA IFE

The communications and radio room which was located inside the main accommodation on level 3 will need to be completed for the installation of the communication system. Most of the communications equipment has not been delivered onboard the rig or installed and must be completed.

<u>Communication Equipment Recommendation:</u>		
8.6.1.1	Major	Complete the installation and commissioning of the entire Communication system onboard.

8.7 **General Operations**

As the operations had not yet been started it was not possible to comment as such however we have raised a number of recommendations as that should be implemented before the rig operations starts up in order to ensure a safe and effective operation.

<u>General Operations Recommendations:</u>		
8.7.1.1	Major	A full set of loading hoses should be available.
8.7.1.2	Minor	Boat fenders should be installed.
8.7.1.3	Minor	Rig log books should be available.

- | | | |
|----------|-------|---|
| 8.7.1.4 | Minor | Ensure written instructions for pressure testing is available. |
| 8.7.1.5 | Minor | Ensure the OIM keeps records of worked man hours for each person onboard. |
| 8.7.1.6 | Minor | A poster with names of responsible persons should be posted a visible place as per MODU Code section 14.1.2.2. |
| 8.7.1.7 | Minor | The emergency audible alarms should be of a sufficient power to be heard in noisy areas as per MODU Code section 10.16.1. |
| 8.7.1.8 | Minor | A copy of the current registration certificates should be posted in a visible place. |
| 8.7.1.9 | Minor | Muster lists muster lists must be provided and posted in the accommodation and at the life boat stations. |
| 8.7.1.10 | Minor | An updated POB list is to be kept on file. |

8.8 Jacking System

The Jacking system was a Rack & Pinion Electric Jacking type comprising of:

- Nine Electric motors located on each 3 jacking legs, 27 in total.
- Each motor is 600 Volts, 3 phase, 60 Hz, 40 h.p.
- The system motors were overhauled by Southern Technology & Services in Houma, Louisiana, in the U.S.A. under Job number: 19290 in 2006.
- The electrical jacking console located inside the jacking control room on level 3 of the main accommodation requires the internal wiring to be completed and the whole jacking system requires commissioning.
- The jacking gearboxes which are leaking oil need to be repaired.



8.8 Leaking oil from various jacking leg gearboxes.

Jacking System Recommendations:

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|---------|-------|---|
| 8.8.1.1 | Major | Complete wiring and commissioning of the system. |
| 8.8.1.2 | Minor | Repair leaking oil from the jacking gearboxes where applicable. |

9.0 POWER PLANT

9.1 Diesel Engines

The rig main power was provided by four Diesel Engine Prime Movers. These are located below the main deck in a dedicated engine room. There was a single Diesel Engine Prime Mover for Emergency Power. This was located in a dedicated room on the third level outside the forward accommodation area. Also located inside the emergency generator room is a small diesel engine to operate the cold start air compressor when required. All diesel engines must be run and commissioned accordingly.

9.1.1.1 Major Diesel Engines Recommendation:
All diesel engines need running and commissioning.

9.1.3 Caterpillar Engines

Model: Caterpillar 3516 B

There was four main Caterpillar engines for main power generation located in the engine room below the main deck.

The engines were visually inspected as there was no possibility to carry out any further testing which would involve rig crew onsite. The engines were manufactured in 1996 and had been major overhauled and installed recently. The running hours was noted to be 275 Hrs on engine No. 1 which was observed in running condition. It was not possible to read the running hours of the remaining three engines as the engines had to be running in order read the running hour display. The general condition of the engines appeared to be good however it was noted that a few lube oil leaks were present at each engine. It is recommended to have these leaks repaired in order to avoid any fire hazards developing. The same engines were marked different places with different engine numbers which caused confusion it is advised to have the engines marked correctly and to remove non correct markings. As it was not possible to test the engine alarms during the survey it is recommended to have all the alarms and shutdown checked prior to drilling operation commences. Although it was not tested it came to our knowledge that the load sharing was not optimum wherefore it should be checked that the engines are sharing the generator load equally when loaded with normal drilling load and under normal drilling load surges.

The engines are cooled by a radiator system located on the starboard side of the main deck and it was noticed that there was abnormal friction noise coming from the cooling radiator fan assembly.



9.1.3 Main engine oil spill

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|-----------|-------|--|
| | | <u>Caterpillar Engines Recommendations:</u> |
| 9.1.3.1.1 | Major | Have all alarms and shutdowns tested prior to drilling operation. |
| 9.1.3.1.2 | Major | Cooling fans / radiator systems need checking and maintained. |
| 9.1.3.1.3 | Major | Repair various oil leaks on all engines. |
| 9.1.3.1.4 | Minor | Check that the engines share the load equally. |
| 9.1.3.1.5 | Minor | Stencil the engine numbers on a visible place and remove wrong numbering already marked. |

9.1.5 **Portable and Stationary Small Prime Movers**

Manufacturer: Yanmar Eng. Co.
Model: L100V6
Number: One

There was a Stationary Small Diesel Prime Mover located inside the Emergency Generator room used for running the cold start compressor so that there is a secondary alternative starting facility for the emergency generator set and can be used as another means to start the generator if the dedicated electrical starting system fails. The engine was visually inspected and found in a good condition.

9.1.7 **Fuel and Lubrication Oil Centrifuges**

Make: Westfalia
Type: OTC3-02-137
Year of manufacture: 2006

The rig was equipped with two small Westfalia diesel oil centrifuges which were installed in the engine room. The centrifuges were not running at the time of the survey and as such they were only inspected visually. It is recommended to have at least one centrifuge running all the times taking suction from the storage tanks and discharging to the day tank.

Fuel and Lubrication Oil Centrifuges Recommendation:

9.1.7.1.1 Minor Ensure at least one centrifuge is running all the time.

9.2 **Emergency Generator Set**

Diesel prime mover: Caterpillar 3508.
Emergency generator: Kato AC 910 kW. 480 Volts, 60 Hz.

The Emergency Generator Set was located inside a dedicated room which contains the diesel engine and generator and emergency switchboard. The engine/generator is covered with transit packaging at the time of the Inspection and requires running and commissioning. The room is adequately ventilated for the operation of the emergency generator. The Caterpillar diesel engine has two independent methods of starting, one being a 24 VDC. Electrical battery starting system and a dedicated diesel engine driven air start system.



9.2 Emergency generator to commission.

9.2.1.1 Major Emergency Generator Set Recommendation:
The transit packaging needs removing and the emergency generator set needs running and commissioning.

9.2.1 **Emergency Power Supply**

The emergency power supply was not checked due to the emergency generator set had not been unpacked from the transit packaging and required running and commissioning. There is a dedicated 480 Volt , 3 phase MCC for to supply the various essential equipment that needs to be supplied with electrical power in the event of a major black-out or shut-down situation with the main rig power generation system. The emergency power supply needs to be verified when the emergency generator is commissioned and run.

9.2.1.1.1 Major Emergency Power Supply Recommendation:
To be commissioned and tested.

9.2.2 **Electricity be provided for at least 18 hours**

It should be planned and provided that the following equipment and circuits be supplied from an Electrical supply for at least 18 hours;

- Fog horn or Siren
- B.O.P. Control system

38AH (2 units)

The main accommodation cooling system for the rooms and passageways was supplied by an air conditioning system of numerous split level units located on the top of the emergency generator room and on top of level four deck. They are all of the Freon 22 type and supplied by 460 volts, 60 Hz. The systems will require commissioning when the accommodation is opened up for use.

9.4.1.1.1 Major Air-Conditioning Systems Recommendation:
The air conditioning systems need commissioning.

9.5 Seawater Pumps and Piping System

Make: 2 time DESMI
Type: S125-80-275N-D02
Year of manufacture: 2006
Capacity: 80 m³/hr at 30 meter head

The rig was equipped with two sea water pumps taking suction from the same sea chest. The pumps and associated valves and piping were found in a good condition ready for operation.

Additionally there were two sea submersible seawater pumps connected electrically and with piping and installed at the Port side Jacking Leg and the power was supplied from the 480 Volt MCC inside the main switch room. A third Seawater Pump was located on the main deck and will require installing into the jacking leg. The seawater pump will require to be electrically connected to the emergency generator MCC switchboard.

9.5.1.1 Major Seawater Pumps and Piping System Recommendation:
The third seawater pump needs connecting electrically and piping then commissioning.

9.5.1 Piping Systems

The rigs piping system were visually inspected and found in a good condition with a lot of piping renewed during the rig upgrade. The majority of the piping systems were colour coded however it is recommended to make a walkthrough inspection and improve the colour coding where required. It is also recommended to have a colour code key display placed at various places such as engine rooms, mud processing areas, pit rooms and drill floor. It was not possible to clarify whether the high-pressure piping had been pressure tested to 1.5 times the working pressure as it is supposed to be.

9.5.1.1.1 Major Piping Systems Recommendations:
Verify if all high-pressure piping has been pressure tested to 1.5 times working pressure after installation.
9.5.1.1.2 Minor Post colour code key displays strategic places around the rig.
9.5.1.1.3 Minor Ensure all not colour coded pipe sections are colour coded.

9.6 Crane and Power System

The rig was equipped with two Diesel Hydraulic 35 tonnes capacity Amclyde cranes of newer date, it was not possible to inspect the cranes closely as the cabins were locked, no crane operator was onboard and there were no access to the documentation of the cranes. The brief external inspection did not raise any other

concerns that housekeeping should be improved as there was rubbish & debris observed on the crane platforms. It should be ensured that the cranes has valid certification including certification for wires and load sensing system which was observed through the crane cabin door window to be of the Mipeg 2000 type.

		<u>Crane and Power System Recommendations:</u>
9.6.1.1	Minor	Remove rubbish on crane platforms.
9.6.1.2	Minor	Ensure crane, wire & load-cell certification is valid before use.

9.7 Watermaker

Make:	2 times Aqua Tech
Type:	Reverse Osmosis
Year of manufacture:	2006
Capacity:	2 x 75 m ³ /day

The rigs water makers was told to be fully commissioned however the visual inspection raised concerns towards this statement. Pipe sections were taken out of one of the units discharge pump lines, fittings were missing on filter cartridge vent lines, the visual appearance of the units was not in a state that one could expect for a portable water producing plant. The chlorination plant associated to the water makers would also need to attention as chlorine container was not installed in their respective racks. The S.W pipe work of the water makers were found to be rusted. Once the units are brought into an acceptable and working condition it is recommended to have a waters sample send to a laboratory for testing of the produced water.



9.7 Watermaker piping missing.

		<u>Watermaker Recommendations:</u>
9.7.1.1	Major	Bring the water makers back to operational order.
9.7.1.2	Minor	Remove rust from pipe work and paint same.
9.7.1.3	Minor	Clean up the units in general.
9.7.1.4	Minor	Place chlorine containers in their respective racks.
9.7.1.5	Minor	Repair broken fitting on filter cartridge vents.
9.7.1.6	Minor	Send in a water sample for analysis.

9.8 Potable Water System

Make:	Speck
Type:	Hydrophore tank with 2 ea pumps

Year of manufacture: 2006
S/N: 251220
Capacity: 1000 Litres tank + 2 times 15 m³/hr pumps

The portable water system comprised bunker stations, water storage tanks, distribution piping and portable water hydrophore tank. A walk trough inspection was carried out however it was not possible to inspect the portable water tanks. The pot water bunker stations were not marked clearly so it was not possible to identify the loading piping for closer inspection. As the rig has been idling for an extensive period of time it is recommended to have the entire pot water system cleaned and chlorinated by a professional dedicated pot water tank cleaning company in order to ensure the rig operation can start up without extended sickness of the crew.

- Potable Water System Recommendations:**
- | | | |
|---------|-------|---|
| 9.8.1.1 | Major | Ensure the entire portable water system including the storage tank and distribution system is cleaned and chlorinated before use. |
| 9.8.1.2 | Minor | Colour code the bunker station and stencil the description of the individual loading stations. |

9.9 **Boiler / Water heater**

Make: 2 times OSO
Type: 17-SA/E
Year of manufacture: 2006
Capacity: 2 times 1,500 litres

There were two electrical hot water heaters fitted onboard. The heaters were equipped with pressure relief valves which were last tested may 2007. It was not possible to find when the sacrificial anodes were changed last time it is therefore recommended to consult the vendor manual in order to ensure the anodes are changed on correct interval.

- Boiler / Water heater Recommendation:**
- | | | |
|---------|-------|--|
| 9.9.1.1 | Minor | Verify with the vendor manual that the sacrificial anodes are changed at correct interval. |
|---------|-------|--|

10.0 ELECTRICAL EQUIPMENT

10.2 Main Generator

Make and model: Caterpillar SR4B
 Power: KW 1750 / 600 Volts 60 Hz
 Number: Four

A visual external inspection was carried out on the four generators and all were found in a clean dry condition. These main generators have not been load tested or commissioned and it is recommended that this be done before running the rig on power from these machines.

10.2.1.1 Major Main Generator Recommendation:
 All 4 generators to be load tested and commissioned.

10.3 Main Transformer

The main transformers were located below main deck level in dedicated dry locations. The transformers could not be inspected because they need to be commissioned and the transportation packaging needs to be removed for to allow external and internal inspections.



10.3 Main transformers require transit packaging to be removed and commissioning.

10.3.1.1 Major Main Transformer Recommendation:
 All transformers need to be released from the transit packaging and commissioned for general use.

10.4 Converters (SCR and Variable-Frequency

Make and model: N.O.V. 1861 (Job number 6753).
 Number: Six

The Variable – frequency units were located in two separate locations on the rig. One being below the main deck in the main 600 volt switch room. The other location located above the rig floor in a dedicated air conditioned / pressurised room. There was 6 in total and could not be inspected. All units require commissioning before general rig use.

Converters (SCR and Variable-Frequency)

Recommendation:

10.4.1.1 Major All variable-frequency units require commissioning before being put into use.

10.5 **Main Switchboard**

Make: NOV
Model: 1861

The main switchboard was located below the main deck inside a dedicated switch room. The main bus-bar incoming voltage being a planned 600 A.C. volts, 3 phase, 60 Hz. No visual or internal inspections were carried out as the main switchboard is needed to be commissioned. Rubber insulating matting must be fitted in front of all switchboards to restrict electrical shock hazard.



10.5 A.C. Motors. Corrosion and bad explosion proof flame paths.



10.5 NOV main switchboard.

Main Switchboard Recommendations:

- 10.5.1.1 Major The main switchboard needs to be commissioned before general use.
- 10.5.1.2 Minor The correct rubber insulating matting must be laid and fitted in front of the main switchboard.

10.6 Emergency Switchboard

Make and model Number: G.E. Evolution E9000. (480 VAC. 3 phase, 60 Hz.)
One

The emergency switchboard was located inside a dedicated enclosed room which also contains the emergency generator and diesel prime mover. The emergency switchboard requires commissioning and all transit packaging removed before an inspection can be completed.

10.6.1.1 Major Emergency Switchboard Recommendation:
The emergency switchboard requires to be commissioned before rig operation.

10.8 AC Motors

There was numerous AC motors located onboard the THULE POWER and some located in the hazardous areas. Only an external visual inspection was carried out and no insulation checks or records were recorded. Some of the AC motors are showing signs of corrosion with the paint protection missing allowing rust to be present, also some of the junction box covers require the explosion proof flame paths checking and repairing. All AC motors need commissioning before being put into operation. All coupling guards must be retro-fitted where required.

10.8.1.1 Major AC Motors Recommendations:
All AC motors require commissioning before use.
10.8.1.2 Major All AC motors require the corrosion and rust repaired.
10.8.1.3 Major All AC motors located in the hazardous areas need their respective explosion proof protection areas checked for integrity.
10.8.1.4 Critical Coupling guards must be fitted where applicable.

10.8.1 Megger Tests

No records was available on the rig for the insulation values and megger tests on the AC motors. Megger tests must be taken and recorded into a maintenance system.

10.8.1.1.1 Major Megger Tests Recommendation:
Megger tests must be taken and recorded for the AC motors before the electrical system is powered up.

10.9 Motor Control Centres

Make and model G. E. Evolution E 9000
Cuttler Hammer Freedom 2100
Marine Electrics

There was various locations on the THULE POWER with dedicated rooms for the installation of the various types of Motor Control Centres (MCC's). No visual or internal inspections were carried out because of the transit packaging in place and the respective electrical panels and circuit breakers being in the locked off position prior to commissioning. All panels need the correct labelling fitted to their respective doors. All of the MCC equipment needs to be commissioned before application.



10.9 Electrical equipment has no labels fitted.

- | | | |
|----------|-------|--|
| | | <u>Motor Control Centres Recommendations:</u> |
| 10.9.1.1 | Major | All Motor control centres need commissioning before application. |
| 10.9.1.2 | Major | All MCC panel doors need the correct labelling attached. |

10.10 Lighting System (Main)

The lighting system was not inspected for operation due to the system needs commissioning. The external visual inspection revealed that all the lighting fittings are in good clean condition and there are plenty of fittings located above decks and below decks in the machinery rooms and work spaces. There was no safety wires attached to any light fitting throughout the THULE POWER.



10.10 Lighting fittings without safety wires.

- | | | |
|-----------|-------|--|
| | | <u>Lighting System (Main) Recommendations:</u> |
| 10.10.1.1 | Major | The lighting system requires commissioning before the rig starts operational duties. |
| 10.10.1.2 | Major | Safety wires must be fitted to all lighting fittings which have them missing. |

10.11 Lighting System (Emergency)

The emergency lighting system was not inspected for operation due to the system needs commissioning. The external visual inspection revealed that all emergency lighting fittings are in a good clean condition. There are no safety wires attached to any of the emergency light fittings throughout the THULE POWER. There is no designated labelling on all the emergency lighting fittings to show that the lighting fitting is in the emergency system.

		<u>Lighting System (Emergency) Recommendations:</u>
10.11.1.1	Major	The emergency lighting system requires commissioning.
10.11.1.2	Major	Safety wires must be fitted to all emergency lighting fittings which have them missing.
10.11.1.3	Minor	All emergency lighting fittings must be labelled accordingly so they all can be noted visually of their emergency capability.

10.12 Electrical Outlets

The electrical outlets were externally inspected and all were found in a good condition. The system requires to be commissioned when the rig electrical power is established. All electrical outlets need the output voltage identification labels to be attached accordingly.

		<u>Electrical Outlets Recommendations:</u>
10.12.1.1	Major	The electrical outlets need commissioning throughout the rig.
10.12.1.2	Minor	The electrical outlets all need to be identified as to their respective output voltage.

10.13 Cables and Cable Trays

All cable trays were found to be in good corrosion free condition with the correct earth straps and installed correctly. There was numerous cables required termination into junction boxes and electrical equipment and the system requires commissioning before rig power is applied to the various circuits.



10.13 Numerous electrical cables and circuits need connecting and commissioning.

Cables and Cable Trays Recommendation:



10.15 Gas detection systems need connecting and commissioning.

10.15.1.1 Major Alarm Systems: Fire, Gas, General and Flooding Recommendation:
Systems require installation and commissioning.

10.16 **Navigation Lights and Foghorns**

Manufacturer: Orca

None of the Navigation Lights or Foghorns had been commissioned but a visual inspection was carried out and all the equipment was found to be in a good external condition at all points and locations which are required to have Navigation lighting installed. The Fog horn is manufactured by Pharos Marine Automatic Power and is located on the top of the emergency generator roof and an external inspection was carried out and the foghorn was in good condition but requires to be electrically connected to the emergency electrical supply system. The navigation lighting system Control Panel is located inside the jacking control room and requires commissioning before operation.

10.16.1.1 Major Navigation Lights and Foghorns Recommendation:
The complete system requires commissioning where applicable.

10.17 **Communication: Telephone and PA System**

None of the communication, telephone and PA system has been completely installed on board the THULE POWER. It needs to be completed and commissioned as required.

10.17.1.1 Major Communication: Telephone and PA System Recommendation:
The complete communications systems need to be completely installed and commissioned.

10.18 **Electric Welding**

No electrical welding station was inspected due to below deck restrictions. There is no above deck and hazardous location electrical welding socket installations. The electrical welding installation requires commissioning.

10.18.1.1 Major Electric Welding Recommendation:
The electric welding installation needs installing and commissioning.

10.19 **Earthing and Earth Bonding**

All earthing and earth bonding is in a good correct condition throughout the THULE POWER. A thorough inspection was conducted on all electrical equipment, and external cable terminations and the earthing and earth bonding was in a good and correct condition.

10.20 **Hazardous Areas**

Various items of electrical equipment were externally inspected in the hazardous areas on the THULE POWER. Many AC motors have started to show rust and corrosion on their respective junction boxes and this will restrict the flame paths of the explosion proof properties of the equipment. A hazardous area zone plan must be displayed before rig operations begin.

10.20.1.1 Major Hazardous Areas Recommendations:
The flame paths of the explosion proof junction boxes of some AC motors and electrical panels need to be examined and addressed before the commissioning period and before power is applied.

10.20.1.2 Major A hazardous area zone map is required to be displayed before rig operations begin.

10.21 **Miscellaneous Items**

There were various lighting fittings and floodlights as well as all CCTV cameras and PA address loud speakers were found to be lacking safety slings and this will constitute a dangerous situation for dropped objects where applicable, especially above work areas and walk ways.

10.21.1.1 Major Miscellaneous Items Recommendation:
Safety slings/wires must be fitted to all equipment that is secured above decks or work places or walk ways.

11.0 SAFETY EQUIPMENT

11.1.1 Automatic Fire Detection System

The automatic fire detection system was in a uncompleted state on board the THULE POWER at the time of the inspection. Various fire detection sensors and push buttons are in place around the rig but need connecting to the system. The fire detection panel is not on the rig at the time of the inspection and this will have to be installed and commissioned. Planned maintenance records must be kept of the automatic fire detection system at all times.

<u>Automatic Fire Detection System Recommendations:</u>		
11.1.1.1.1	Major	Install and commission the fire detection system.
11.1.1.1.2	Major	Planned maintenance records must be kept of the automatic fire detection system.

11.1.2 General Extinguishing System

The rig was equipped with two fire pumps, one fed of the main switchboard and one fed of the emergency switchboard. Each pump was capable of 150 m³/ hr. Additionally there was a fire hydrophore tank with associated jockey pump installed to keep the fire main pressurized. The condition of the pumps and hydrophore was good with no comments. The fire ring main and the outlets were inspected and found in a less satisfactory condition as the hydrants were not marked clearly. The fire hose cabinets around the rig was in a less satisfactory condition with a few of the cabinets noticed as damaged, the marking of the boxes was not optimal as the fire box letters were of the same colour as the boxes. It is recommended to have the hydrants, fire hose stations marked clearly with white letters on red background. The entire fire system should be function and capacity tested to prove compliance with the relevant SOLAS requirements.

<u>General Extinguishing System Recommendations:</u>		
11.1.2.1.1	Major	Fire hose stations to be marked clearly.
11.1.2.1.2	Major	Fire hydrants to be marked clearly.
11.1.2.1.3	Major	Verify compliance with SOLAS requirements.
11.1.2.1.4	Minor	Repair damaged fire hose stations.

11.1.2.1 CO₂ System

The CO₂ system consisted of two systems, one for the emergency generator room and another one which was serving the Main generator room, mud pump room and mud pit room. The system was new and did not appear to have been commissioned as the bottles was all disconnected (due to yard stay) as well as the release station panels still had the protecting film installed. It is recommended to have the vendor onboard for final commissioning and checking of bottle volume. The installations compliance with SOLAS regulations must be verified.

<u>CO₂ System Recommendations:</u>		
11.1.2.1.1.1	Major	Complete the final commissioning.
11.1.2.1.1.2	Major	Ensure the bottles has not lost charge while been disconnected.
11.1.2.1.1.3	Major	Verify Compliance with SOLAS regulative.

11.1.3 Extinguishing Arrangements in Machinery Spaces

There were no extinguishing systems arranged in the machinery spaces at the time of the inspection. Only a few extinguishers which appeared to be placed for the yard stay. It must be ensured that extinguishing arrangements are placed in machinery spaces in accordance with SOLAS regulations before the rig starts operation.

Extinguishing Arrangements in Machinery Spaces Recommendation:

11.1.3.1.1 Major Extinguishing arrangements to be placed in machinery spaces in accordance with SOLAS.

11.1.4.4 **Emergency Fire Pump**

The rig was equipped with a combined bilge/emergency fire pump fed direly from the emergency switchboards. The pump was from 2006 and was inspected visually and found in a good condition.

11.1.4.5 **Deluge System**

The rig was equipped with a deluge system which was to be used for well testing as it was placed on the outer handrails at each sides of the rig. The system was fed of the fire pumps.

11.1.5 **Portable Extinguishers and Fire-Fighting Equipment**

The potable extinguishers observed on the rig did only appear to be temporary extinguishers intended for the yard stay. The rig must be equipped with fire extinguishers and full fill the API & SOLAS requirements for fire extinguishers with regards to type, numbers, placement, marking, language on instructions, maintenance.

Portable Extinguishers and Fire-Fighting Equipment Recommendation:

11.1.5.1.1 Major Install portable extinguishers in accordance with API and SOLAS regulations.

11.1.5.1 **Fireman's Outfits**

There we no firemen's outfits on the rig at the time of the inspection, it must be ensured that these are provided and kept available in lockers as per MODU Code section 9.9.1 & SOLAS section 17.

Fireman's Outfits Recommendation:

11.1.5.1.1.1 Major Provide firemen's outfits in accordance with MODU Code section 9.9.1 & SOLAS section 17.

11.1.5.2 **Fire-Fighting Equipment Plans**

There was no fire plans observed posted as per Class & MODU Code section 9.13.1.

Fire-Fighting Equipment Plans Recommendation:

11.1.5.2.1.1 Minor Post fire plans as per Class & MODU Code section 9.13.1.

11.1.6 **Foam System for Helideck**

The foam system for the helideck consisted of three monitors with foam tanks and a fire booster pump placed beneath the helideck. It was noted that a relief valve had

been disconnected from the booster pump and also one of the three foam monitors was missing as the pipework was found blanked off. It must be verified that the rigs are in compliance with MODU Code section 9.11.2.2 before operations starts up.



11.1.6 Helideck foam monitor missing.

		<u>Foam System for Helideck Recommendations:</u>
11.1.6.1.1	Critical	Install missing safety relief valve on helideck booster fire pump.
11.1.6.1.2	Major	Install missing foam monitor.
11.1.6.1.3	Major	Ensure the foam tanks are filled up.
11.1.6.1.4	Major	Verify compliance with MODU Code section 9.11.2.2.

11.2.1 Lifeboats

Make:	Vanguard - Chinese
Type:	930
Capacity:	2 times 105 passengers

The lifeboats could not be inspected at the time of the survey due to no rig crew onboard and no procedures for safe entry, close standby boats etc were in place. The lifeboats were however visually inspected from the outside and it was noticed that the brackets holding the grab/step line around the boat was damaged so the line was hanging down. It was also noticed that there was no wheel mark on the boats which should be verified further. Parts of the starboard lifeboat was found covered in oil which on closer inspection appeared to be from a leaking oil sight glass on the life boat davit on top of the boats. It must be ensured that the lifeboats are approved and inspected closer before the rigs goes into operation. The charges were not hooked up to the lifeboats at the time of the survey wherefore the battery condition should be checked.



11.2.1 Lifeboat covered in oil.

Lifeboats Recommendations:

- | | | |
|------------|-------|---|
| 11.2.1.1.1 | Major | Repair grab / step line outside the boats. |
| 11.2.1.1.2 | Major | Carry out a thorough inspection of the boats inventory and equipment before the rig goes into operation. |
| 11.2.1.1.3 | Minor | It must be ensured that the lifeboats adhere to Solas III reg. 52.2 with regards to inventory lists and maintenance checks. |
| 11.2.1.1.4 | Minor | It must be ensured that the rig is fitted with an emergency position indicating radio beacon (EPIRB) capable of transmitting a distress alert in the 406 MHz band as per SOLAS IV, Part C, Reg 7.1.6.1. |
| 11.2.1.1.5 | Minor | Clean oil contaminated starboard lifeboat. |
| 11.2.1.1.6 | Minor | Connect the battery chargers and evaluate the conditions of the batteries. |

11.2.1.1 Release Mechanism

It was not possible to inspect the release mechanism as there was no access to the lifeboats, it was however noted from the outside that the release line was not installed in the boats. It is recommended to have the release wires installed and also have the certificates for the release mechanisms verified.



11.2.1 Lifeboat davit no release wire.

		<u>Release Mechanism Recommendations:</u>
11.2.1.1.1.1	Critical	Install release lines on the lifeboats.
11.2.1.1.1.2	Major	Verify the certificates for the release mechanism.

11.2.2 Life-Raft Stations

The rig was equipped with 5 ea. Chinese made 25 person life rafts situated on small cradles welded to the handrails with stiffeners welded in place in the hull. The life rafts were manufactured November 2008 and were as such in good condition. However it was noted that not all the life rafts had clear marking of name, approval date etc. All the life rafts should be checked up with regards to marking. The life rafts was "wheelmarked" however it was not clear to see that they complied with SOLAS III, Reg.38.5.2 with regards to whether they were equipped with a Solas A pack which is required when the rig has to be engaged in an international voyage.

		<u>Life-Raft Stations Recommendations:</u>
11.2.2.1.1	Major	Post instructions to use at the life raft stations.
11.2.2.1.2	Major	Check if the life rafts are equipped with a Solas A pack.
11.2.2.1.3	Major	Ensure all life rafts are marked equally with the correct information stickers.
11.2.2.1.4	Major	Remove the ropes tied around some of the life rafts.

11.2.3 Lifebuoys

There was no lifebuoys observed on the rig, ensure at least the minimum number of lifebuoys are installed and equipped as per SOLAS III part C. Reg.31 and MODU Code section 10.12 is installed onboard.

		<u>Lifebuoys Recommendation:</u>
11.2.3.1.1	Major	Install lifebuoys as per SOLAS III part C. Reg.31 and MODU Code section 10.12 is installed onboard.

11.2.4 Life Jackets

There were no lifejackets onboard the rig at the time of the survey. It is recommended to have approximately 150 % life jackets onboard, some to be placed in the cabins and some to be placed in weather proof boxes near the lifeboat stations. The life jackets should be according to SOLAS III Reg. 32.1.6 and MODU Code section 10.10.

		<u>Life Jackets Recommendation:</u>
11.2.4.1.1	Major	Provide app. 150% lifejackets equipped according to SOLAS III Reg. 32.1.6 and MODU Code section 10.10.

11.2.4.1 Workvests

There were no workvests onboard at the time of the survey. It is recommended to have a sufficient numbers of workvests onboard equipped according to SOLAS III Reg. 32.2.1 and MODU Code section 10.18.8.

		<u>Workvests Recommendation:</u>
11.2.4.1.1.1	Minor	Ensure a sufficient number of workvests are available and that they complies with SOLAS III Reg. 32.2.1 and MODU Code section 10.18.8.

11.2.5 **Escape Routes**

There were no marked escape routes on the rig at the time of the inspection, a few signs were posted in the engine rooms to show the direction out but these are not considered as sufficient. It is recommended that an emergency escape plan is made up and all exit doors, corridors, emergency exits, walk ways are marked up as escape ways according to the emergency escape plan. The emergency escape plan should be implemented in the rigs operation manual.

<u>Escape Routes Recommendations:</u>		
11.2.5.1.1	Major	Provide an emergency escape plan.
11.2.5.1.2	Major	Mark all exit doors, corridors, emergency exits, walkways etc according to the emergency escape plan.

11.2.6 **Breathing Apparatus**

There were no breathing apparatus observed on the rig and it is therefore recommended to have sufficient sets of breathing apparatus available. The rig equipped with a cascade system to be used in case of H₂S presence on the rig. The cascade system had manifolds distributed throughout the rig with bottle racks in the mud pump room and at the helideck. It was noted that no signs were posted at the cascade manifolds and also some of the manifolds was not connected up with the required supply piping. It should be ensured that the system is fully commissioned before first use.

<u>Breathing Apparatus Recommendations:</u>		
11.2.6.1.1	Major	Supply adequate sets of Breathing Apparatus.
11.2.6.1.2	Minor	Install signs at Cascade manifolds.
11.2.6.1.3	Minor	Complete the cascade installation.
11.2.7.1.4	Minor	Carry out commissioning of cascade system.

11.3 **Flammable-Gas Detection**

The Flammable-Gas Detection system has not been fully installed at the time of the inspection. Various gas detection sensors are located around the installation and need to be connected to the cabling circuits. The main gas detection control panel was not on board the rig at the time of the inspection and the complete flammable-gas detection system need completing and commissioning.

<u>Flammable-Gas Detection Recommendation:</u>		
11.3.1.1	Major	Install and commission the system.

11.3.1 **H₂S Gas Detection**

The H₂S Gas Detection system has not been installed at the time of the Inspection. Numerous H₂S detection Sensors are located at various points around the rig but need connecting to the electric circuits. The H₂S detection control panel had not arrived on board at the time of inspection and the complete system needs completing and commissioning.

<u>H₂S Gas Detection Recommendation:</u>		
11.3.1.1.1	Major	Install and commission the system.

11.3.2 **Portable Gas Detectors**

No Portable Gas Detectors were found onboard the installation. Portable gas detectors must be provided onboard prior to drilling operations.

11.3.2.1.1 Major Portable Gas Detectors Recommendation:
Locate and establish portable gas detectors.

11.4 Helicopter Operations

No Helicopter Operations were conducted at the time of the Inspection.

11.4.1 Helideck and Markings

The Helideck and Markings were down found to be in order. The Helideck is 23 mts. in diameter and sized and rated for a Sikorski S61 helicopter, and the perimeter lighting installation was inspected externally and is in a good well maintained condition and each perimeter lamp is green colour and supplied from the emergency electrical supply system. The helideck was covered in an anti – skid surface with sufficient helicopter tie – down points. There was sufficient gradient of the surface to allow water and fluids to run off into the drainage catchment system.

11.4.2 Helicopter Landing-Area Equipment

The helicopter landing area equipment was not installed and prepared for helicopter operations, no crash boxes, no CO₂ system for engine fires were supplied. Helicopter landing equipment must be supplied in accordance with MODU Code 9.11.2.

11.4.2.1.1 Minor Helicopter Landing-Area Equipment Recommendation:
Helicopter landing equipment must be supplied in accordance with MODU Code 9.11.2.

11.5.2 Hazardous Area

Various electrical equipment which is located in the hazardous areas and examined was showing signs of corrosion and the rust was impairing the integrity of the flame proof paths. All electrical equipment located in the hazardous areas must be maintained to the standards and conditions required. A hazardous area zone map must be displayed on the installation before operations begin.

11.5.2.1.1 Major Hazardous Area Recommendations:
Electrical equipment within the hazardous areas must be maintained to explosion proof standards.

11.5.2.1.2 Major A hazardous area zone map is required to be displayed before rig operations begin.

11.6 First Aid and Sickbay

The First Aid and Sickbay was in a dedicated room within the main accommodation area on the main deck level. The sick bay has not been completed and will need medication and pharmacy items and products to be installed when operations begin.

11.6.1.1 Major First Aid and Sickbay Recommendation:
Commission the Sick Bay before rig operations begin.

11.7 Emergency Procedures Manual

No emergency procedures manual was located onboard.

11.7.1.1 Major Emergency Procedures Manual Recommendation:
Prepare the applicable emergency procedure manuals.

11.7.1 **Alarm and Public Address System**

The Public Address system was not completely installed at the time of the inspection. Various alarm lighting and PA speakers are located at numerous locations around the installation and was visually inspected and found to be in good external condition. The system needs completion and commissioning before the rig starts operations.

11.7.1.1.1 Major Alarm and Public Address System Recommendation:
Complete the installation of the PA system and commission.

11.8.1 **Independent Lifting-Gear Inspections**

It is advised that a system is implemented to ensure control of regular independent lifting gear inspections.

11.8.1.1.1 Minor Independent Lifting-Gear Recommendation:
Implement a system to control regular independent lifting gear inspections.

11.9 **Accommodation**

The Accommodation areas were found to be in an unfinished condition with ceilings, floors, ventilation and electrical wiring needing completion and commissioning. The complete accommodation package has been installed at a recent shipyard refit and is of good well built construction with sufficient bed space and toilet and washing facilities. All levels of the accommodation are air conditioned and will have a full ventilation and fire / gas alarm system.

11.9.1.1 Critical Accommodation Recommendation:
All accommodation levels and establishments need completion and commissioning.

11.9.1 **Fire Protection for Accommodation and Control Station**

Some of the main corridor doors are of the A-60 approved type fire doors and frames and have the correct labels to designate this, but the doors of the accommodation leading to the outside deck and walk way areas are of the non fire door protected type. The door to the main control station (room) does not have a label to signify what type of fire resistant door it is classified as.

11.9.2 **A-60 Bulkheads**

See 11.9.1

11.9.3 **Galley**

The Galley was inspected and found it had not been commissioned or in use at the time of the survey. The internal galley equipment will need to be completed and commissioned before the rig becomes fully operational.

11.9.3.1.1 Major Galley Recommendation:
The Galley and equipment requires commissioning.

11.11 **Housekeeping**

The rig was examined for housekeeping but the THULE POWER was not in operation at the time of the inspection. The accommodation modules are not completed and have not been commissioned. There is lots of industrial waste and rubbish lying around and the sleeping and galley quarters are not in use. The electrical and ventilation systems require completing and various rooms within the accommodation requires fitting.

11.11.1.1 Major Housekeeping Recommendation:
The accommodation areas need completing and the resultant waste will require removing.

11.11.1 **Walkways and Railings**

A walk through inspection was carried out on walkways and railings which was found in a general good condition.

11.11.3 **Decks and Stairways**

The stairs and walkways were in general in good condition as the grating had been changed out and new stairs installed however there were a number of unsafe conditions noticed which should be addressed. The ladder to the starboard crane did not have a safety cage installed; the same was noted for all the ladders to the top of the jacking structures. The stairs from the starboard side of the cantilever top to the rig floor was arranged too close to the starboard crane platform which meant that one had to bend down in order not to hit a beam in head height when passing the platform. The problem could be solved by means of painting the beams in the warning colours yellow/black however the most sensible and safe way would be to rearrange the stairs slightly to avoid the beam in head height.

The drilling line spooler deck appeared to be too small to fit the drill line spooler as one has to climb over hydraulic hoses near to the handrails which create a fall hazard. It is recommended to change the design to accommodate more space for the operator of the spooler. The chains used at hand rails to the cantilever stairs (removable stairs) should be of a bigger size in order to feel secure when using the stairs. The access way to the HPU which was through the drill floor deck should be covered by a hinged self closing cover.



11.11.3 Low free height on walkway warning colours to be painted.



11.11.3 Restricted walkway drilling line spooler.

- | | | |
|-------------|-------|--|
| | | <u>Decks and Stairways Recommendations:</u> |
| 11.11.3.1.1 | Major | Install hinged self closing cover at the HPU access. |
| 11.11.3.1.2 | Major | Install safety cages on ladders to jacking structures & starboard Crane. |
| 11.11.3.1.3 | Major | Modify starboard drill floor stairs to ensure more free height to starboard crane platform to avoid head injuries. |
| 11.11.3.1.4 | Major | Modify drill line spooler platform to make sufficient space for the operator. |
| 11.11.3.1.5 | Minor | Fit bigger size chains to removable hand rails as the stairs to the cantilever. |

11.12.2 Fuel Oil System

The fuel oil system was only briefly inspected and did as such not raise any immediate concern. However it must be ensured that the quick closing valves in the main engine fuel supply lines are tested prior to rig operation starts.

11.12.2.1.1 Minor Fuel Oil System Recommendation:
Test quick closing fuel valves.

11.13 **Permit-To-Work-System**

There was no permit to work system being used at the time of the inspection. The system must be in place before rig operations start. The permit –to-work system should be used as an effective tool as well as not to only comply with legislation. The permit system should cover:

- Hot Work
- Electrical work
- Entry to confined spaces
- Working over the side
- Pressure testing

11.13.1.1 Critical Permit-To-Work System Recommendation:
Permit-to work system must be in place and in operation before rig operation start.

12.0 MAINTENANCE SYSTEM

12.1 Preventive Maintenance

There was no Preventive Maintenance System in place onboard the THULE POWER and this must be implemented and established before the rig start operations. A feed back of technical questions, maintenance manuals of the equipment must be provided and all rig crews must be involved in maintenance activities.

12.1.1.1 Major Preventive Maintenance Recommendation:
A preventive maintenance system must be put into operation for rig start up.

12.2 Maintenance Organization and Administration

There was no maintenance organization and administration system in place onboard the rig at the time of the inspection. It is recommended that equipment certificates are readily available and maintenance manuals and records provided. Manufacturers' service information, recommendation & service alerts should be available.

12.2.1.1 Major Maintenance Organization and Administration Recommendation:
Maintenance organization and administration procedures must be implemented before rig operations begin.

12.5 Maintenance History and Analysis

There was no maintenance history and analysis system established onboard the rig. Equipment failures and down time must be recorded and there should be evidence that all maintenance work is completed.

12.5.1.1 Major Maintenance History and Analysis Recommendation:
A maintenance and history and analysis system must be implemented.

12.6 Spare Parts Inventory

There was no spare parts inventory system in place onboard the rig at the time of the inspection. The spare parts inventory system should be able to check for spare parts and their availabilities and is part of a planned maintenance system.

12.6.1.1 Major Spare Parts Inventory Recommendation:
A spare parts inventory system must be implemented.

12.7 Development Maintenance Organization

There was no development maintenance organization onboard the installation at the time of the survey. This maintenance strategy must be part of the management system. Maintenance audits and reviews must be conducted and these audits and reviews must be part of the companies' quality control system.

12.7.1.1 Major Development Maintenance Organization Recommendation:
A development maintenance organization must be implemented.

13.0 SPARE PARTS**13.1 Stock Control Philosophy**

There was no stock control philosophy or spares management policy and procedures in operation onboard the rig at the time of the inspection. No listing of stock was in place, and these issues must be implemented before rig operations begin.

13.1.1.1 Major Stock Control Philosophy Recommendation:
A stock control philosophy must be implemented.

13.2 Stock Ordering Process

There was no central warehouse in place or a list of dedicated equipment suppliers.

13.3 Stock Keeping

There were no stores facilities, or spares and materials onboard at the time of the inspection. Spares must be determined or available for new installed equipment.