Preparation for Running BOP

1. Objective

This procedure describes the preparation required prior to running the BOP. This entails preparation of the BOP at the moonpool level, the preparation of moonpool equipment (access basket, BOP transporter, underhull guide), and the rig up of all the necessary running tools at the rig floor.

For further detailed technical information on the equipment, please read this procedure in conjunction with the following

- *EOP Manual:* TH-EOP-04-19-01 Marine Drilling Risers
- *OP Manual:* TH-OP-04-04-07-C Working In the Moonpool Area

2. Safety

2.1 Work Permit

- If the operation (BOP transporter moving, hot works, etc.) requires a permit to work, a permit must be raised prior to commencing the task. This entails obtaining approvals from the **Issuing Authority** or his designated alternate, thereby ensuring that any planned SIMOPS are not affected by the operation.
- Work permit or JSEA (Job Safety and Environmental Analysis) **must** identify which operations and equipment must be shut down during operations.

2.2 Pre-job Meeting

- Hold a pre-job meeting on the rig floor with all persons involved, including the Subsea Engineers.
- The pre-job safety meeting will be performed by the **Toolpusher** or his designated alternate.
- Ensure that the crew is fully instructed on the procedures to be followed, the safety precautions to be observed, and the hazards for the entire operation.
- Review JSEA Reference: **SS-0005, SS0020.**

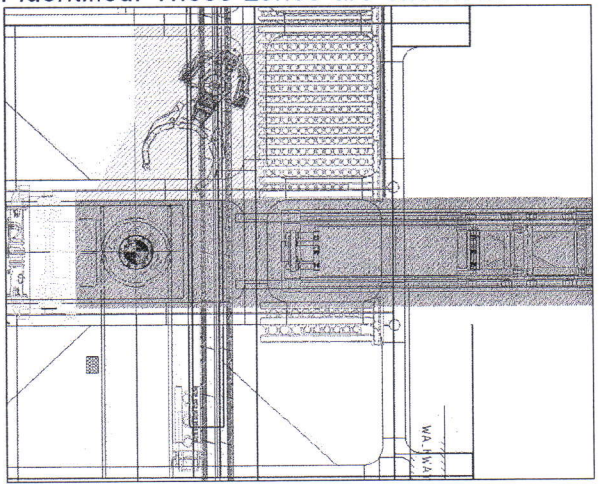
2.3 Dropped Objects Awareness

A DROPPED OBJECT COULD CAUSE A CATASTROPHE.

- Personnel working over the water or on the BOP or on the BOP transporter must use the hard hat chin straps.
- Personnel must secure all loose equipment to prevent a dropped object situation.
- Personnel must use tools from the No-Drop Toolbox or use tools that have been secured with a lanyard.
- When working in the moonpool, objects weighing less than 50 (fifty) pounds will be raised and lowered using suitable baskets. Objects weighting more than 50 (fifty) pounds will be raised and lowered using winches or cranes.

2.4 General

- All personnel not involved in this operation must keep well clear when the BOP transporter is being operated.
- Watchstanders are required when moving the BOP transporter in the moonpool to watch for intererences (hoses, cables, track obstructions, etc...)
- Clear communication in place between the Subsea Engineers, the drill floor and the BCRO (Ballast Control Room Operator) is a must for the operation.
- Visually inspect all lifting equipment.
- Check the SWL of the lifting equipment versus the equipment to be lifted.
- Ensure that all personnel are wearing personal protective equipment.
- Drill floor hazardous zones have been identified. These zones are shown in the following diagram. The pinch point zones (black stripes on yellow) are areas machinery moves into. Personnel should not work or pass through this zone. The high hazard zone (yellow stripes on red) is the area where the RHS travels in and above the spider and where the RHS upper dolly is moving. Personnel awareness of moving equipment as well as an awareness of the positions of other crew members is essential.

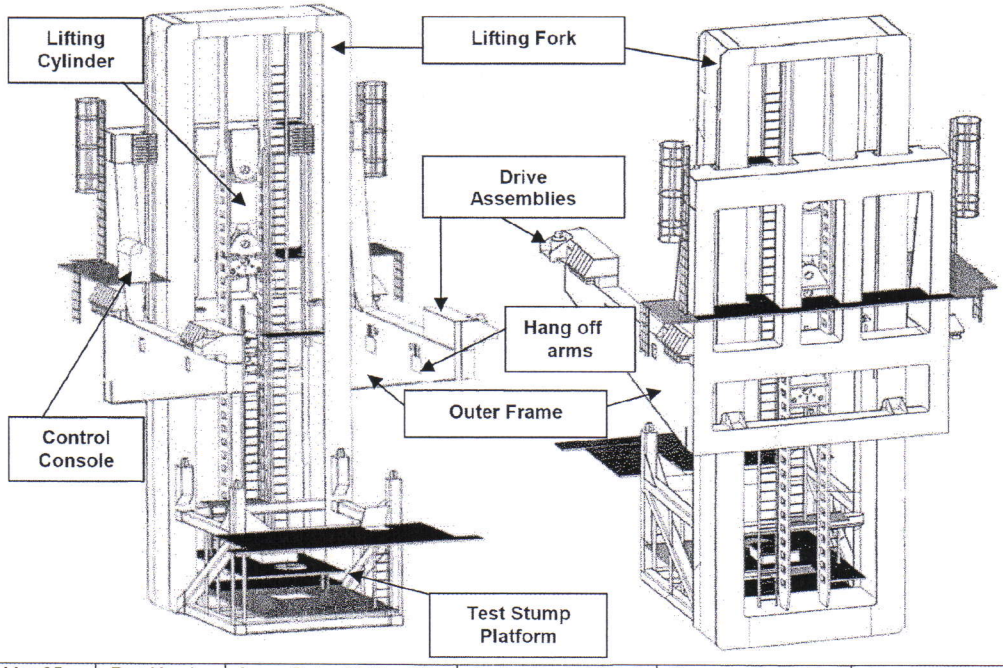


3. Functional Description of the System

BOP Transporter

The BOP transporter is a movable piece of equipment running on two rails mounted at the lower deck along the moonpool. Its function is to move the BOP stack between the stack storage position at the starboard end of the moonpool and the main well center. The transporter has the ability to lower the stack approximately 29 ft, which is relevant when the stack is located underneath the drill floor. The transporter is provided with platforms below the stack support posts for access to the BOP stack connector for maintenance and visual inspection. The platform also provides a skidding/sliding mechanism to align a test stump with the BOP stack wellhead connector.

The outer frame of the BOP transporter is equipped with four hang-off arms that fit into hang-off receptacles located on the stack. These hang-off arms can support the weight of the BOP and can thus be used to unload the lifting fork. When not in use, the arms are retracted by hydraulic cylinders into the box-construction of the outer frame. The LMRP is also equipped with hang-off arm receptacles. These receptacles are designed to receive **ONLY** the LMRP weight (264,000 lbs) and not the BOP stack (532,850 lbs). In addition, the LMRP receptacles are too high when the LMRP is assembled to the BOP stack and cannot be engaged by the hang-off arms, preventing hang-off of the full assembly BOP+LMRP onto the LMRP receptacles.



The transporter control console is located on the outer frame and hydraulic/electric power is supplied via a dragchain from the central hydraulic power unit

Underhull Guides—Maritime Hydraulics

The underhull guide system (722-MD-004A) consists of two guiding units mounted symmetrically underneath the cellar deck on the aft and forward side of the rig. The purpose of the underhull guide is to ensure safe and effective guidance of the BOP from the point where the stack frame running rails enter the guide to a position where approximately one-third of the BOP is submerged in the water. It is also used to stabilize the BOP/LMRP for engagement of the stack / LMRP on the BOP transporter.

The system is designed to transfer forces created from guiding a 400-sT BOP stack into the lower deck during operational conditions. The underhull guide consists of the following main items: bearing bracket, access platform, cylinder bracket, travel cylinder, steel frame, remote control panel, and control valve block. The dimensions are: length, 331.77 ft (8,427 mm); width, 248.58 ft (6,314 mm); and height, 306.85 ft (7,794 mm).

Moonpool Access Basket—Maritime Hydraulics

The Maritime Hydraulics moonpool access baskets (722-MB-001 on aft side, 722-MB-002 on forward side of the moonpool) serve as a platform from which to perform maintenance and operations in hard-to-reach areas of the moonpool. The system consists of the drive trolley on which the basket is installed and the access basket itself. The drive trolley runs from port side to starboard side on rails installed parallel to the moonpool bulkheads. In this operation, it will be utilized to attach the Mux and Hot Line clamps to the risers.

Man-Riding Winches

The winches are pneumatic with planetary-gear-driven cable-handling units, with automatic band brakes and manual caliper disc brakes designed for use in a marine environment. CAUTION: They are specifically designed with a pull capacity limited to handling single personnel only (rated capacity 315 lbs). The winches are equipped with a radio-control system for remote emergency shut-off using a remote controller located on the derrick body harness of the riding man.

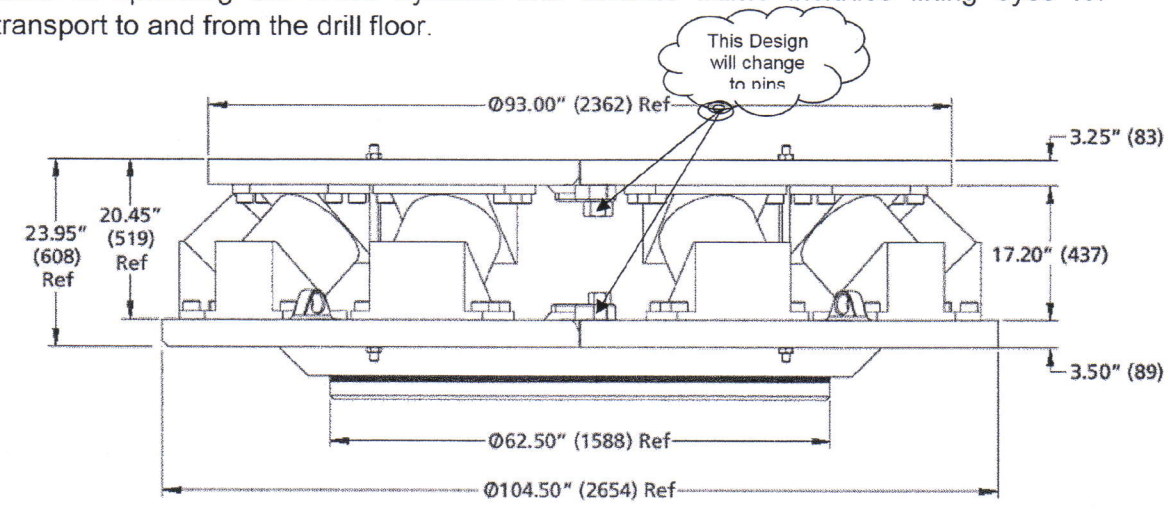
Drilling Riser Spider and Gimbal—Cameron

The spider and gimbal assembly is used during riser running and retrieving operations. Its primary purpose is to provide a hang-off platform to support the BOP and riser string during the riser joint connections. The spider is set in the rotary table and is a device equipped with retractable bars called dogs. The dogs support the suspended riser. The

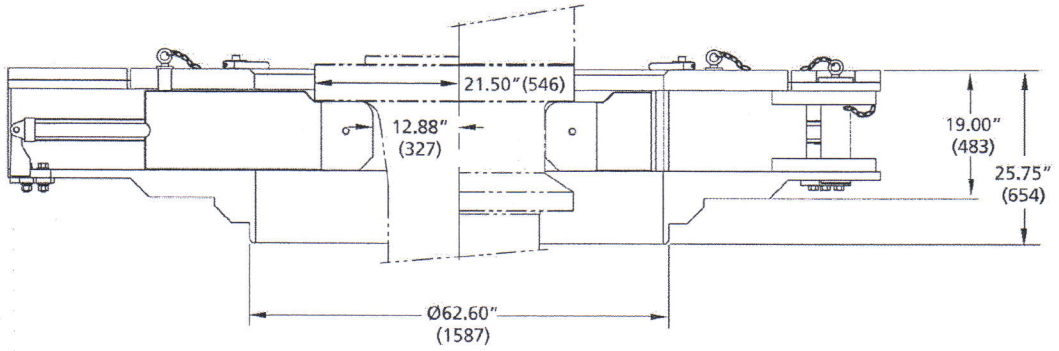
gimbal is a device supporting the spider. It allows the system to articulate through a shock absorber function. The complete unit also includes a control console.

The spider and gimbal assembly has a maximum load rating of 2.0 million pounds, a gimbal articulation capacity of 4 degrees, and a through bore of a minimum of 60 inches. The spider is hydraulically operated and controlled, using the rig's central HPU as its power source. The maximum operating pressure of the system is 3,000 psi. Supply and return hoses are connected to the rig floor hydraulic utility outlets, using quick disconnect couplings.

The control console contains the directional controls and flow and pressure readings used in operating the entire system. The console frame includes lifting eyes for transport to and from the drill floor.



Gimbal General Arrangement



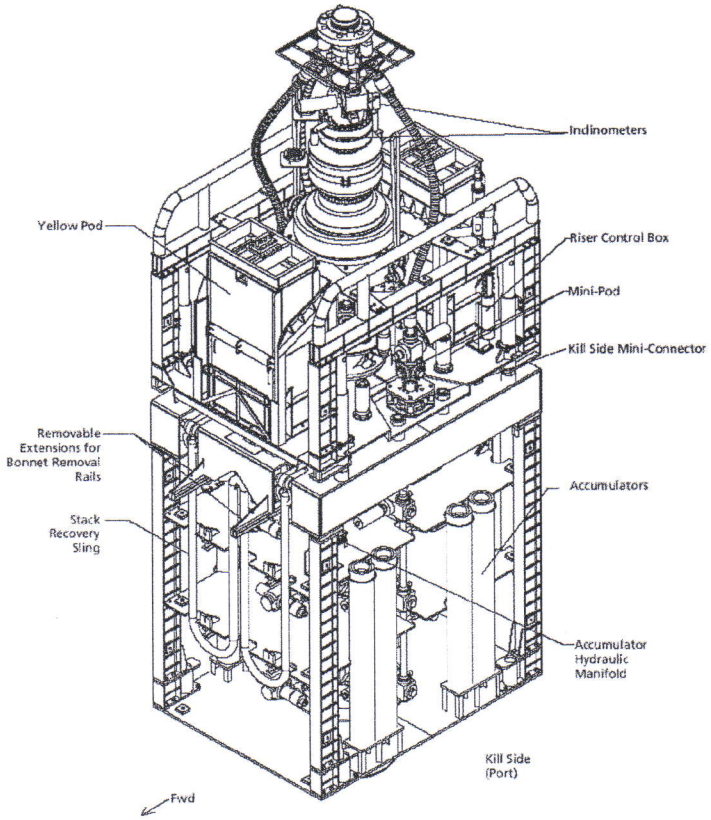
Spider General Arrangement

18¾-in. 15,000 psi BOP Stack—Cameron

The Cameron 18¾-in.15,000 psi BOP stack consists of five ram-type preventers and two annular-type preventers. The five ram-type preventers are comprised of two double ram preventers, TL BOP, 18¾-in., 15,000 psi, and one single shear ram preventer, TL BOP, 18¾-in. 15,000 psi with tandem boosters. The configuration of the stack preventers is optimized to provide maximum pressure integrity, safety, and flexibility in the event of a well control incident. Connection to the wellhead is secured by a 18¾-in., 15,000 psi, DWHC Collet Connector. The BOP stack also includes various spools, adapters, valves, and piping outlets (kill and choke lines) to permit the circulation of wellbore fluids under pressure in the event of a well control incident.

On the BOP control panel, all commands are initiated through a touchscreen. Operation of a common (non-critical) function is carried out by first depressing PUSH & HOLD and then selecting a hot area on the screen. A command box will pop up with selections appropriate to that function. Functions considered to be "critical" have a number of added steps. A grid must be cleared first, and then the command box is called. The critical side of the function in turn calls out a warning, and then the function has to be re-executed.

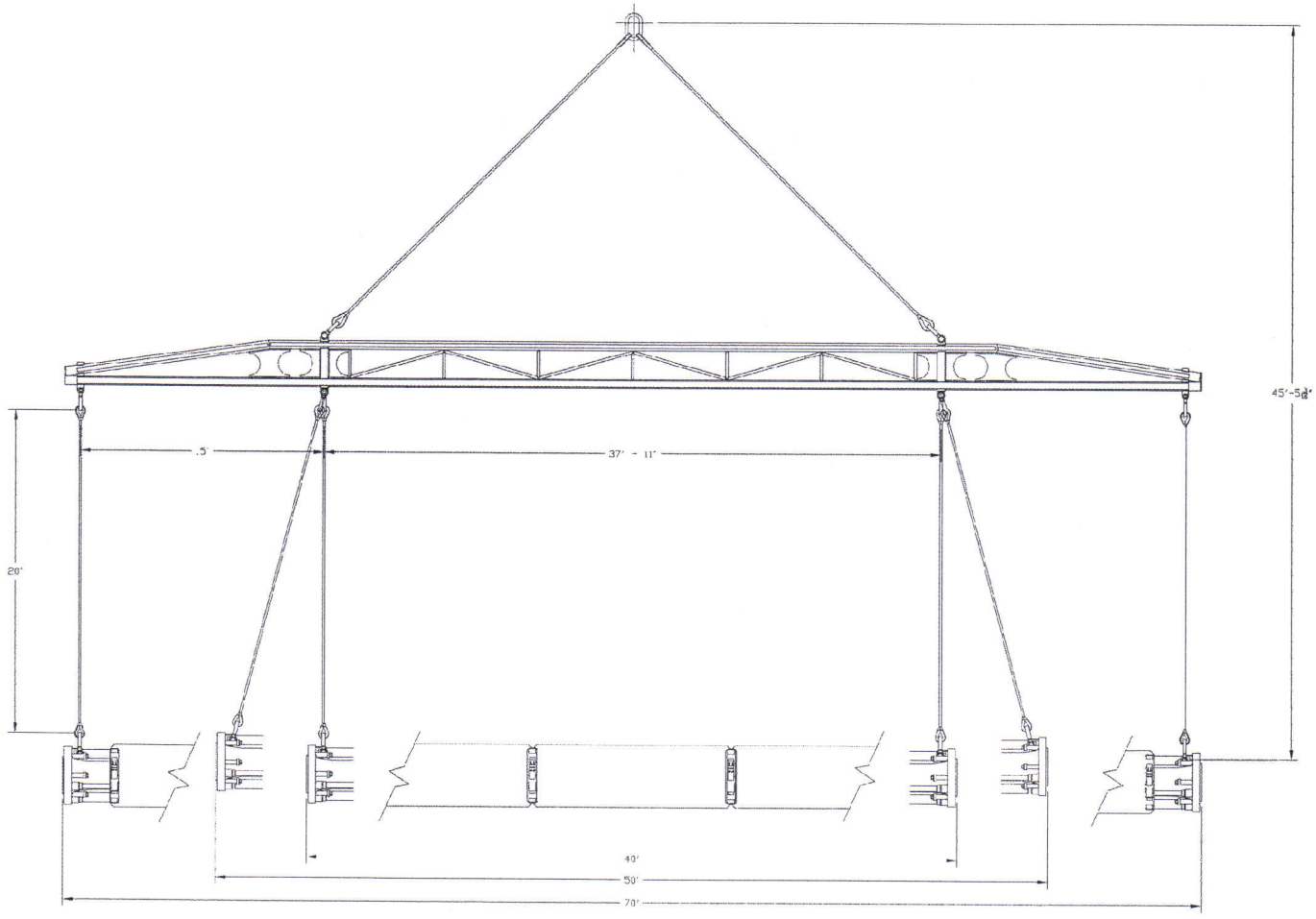
As a general rule, stack functions will be "mirrored" from one POD to the other. This is especially true in the case of positions that must be maintained for the drilling operation. In this system design, the active POD has active mirrored functions. This is accomplished either hydraulically by the POD SELECT VALVE or handled through the software.



Stack Isometric View

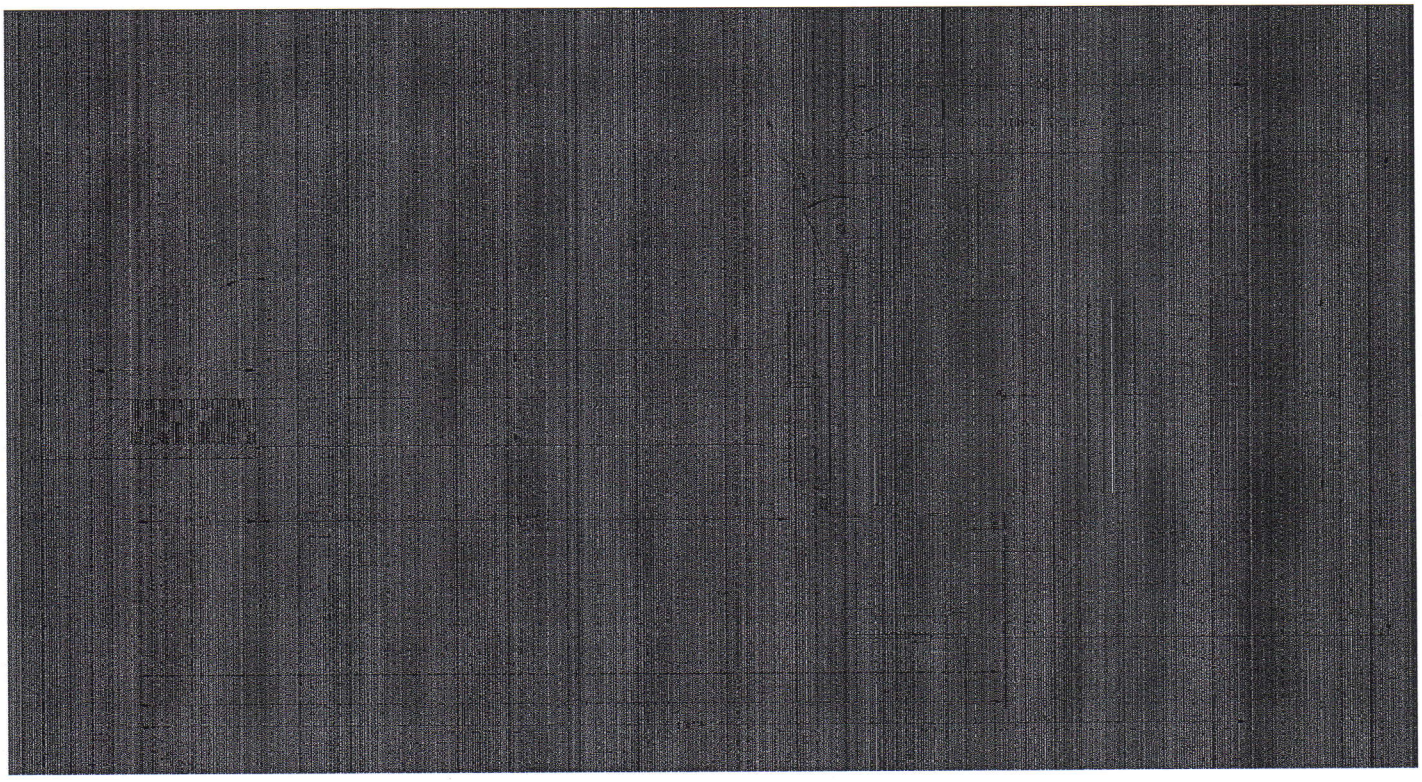
Spreader Bar—Cameron

The spreader bar is a device for lifting riser joints horizontally on the deck. The design of the spreader bar enables it to be used with riser joints of 23.3 feet, 29.2 feet, and 70 feet long. Its safe working load rating is 50,000 pounds and the crane connection linkage is a Crosby A-342 Master Link. The spreader bar has two operating positions, one for lifting 70-ft riser joints and another for lifting the 23.3-ft and 29.2-ft riser joints. When lifting a 70-ft riser joint, the drop slings should be located on the outer lugs closest to each end. When lifting either a 23.3-ft or a 29.2-ft riser joint, the drop slings should be located on the inner lugs. The 35-sT shackles at the bottom of the drop slings connect to the lifting lugs at each end of the riser joint to be lifted. Warning: The spreader bar must not be used to lift the telescoping joint.



21-in. LK Riser Hydraulic Running Tool—Cameron

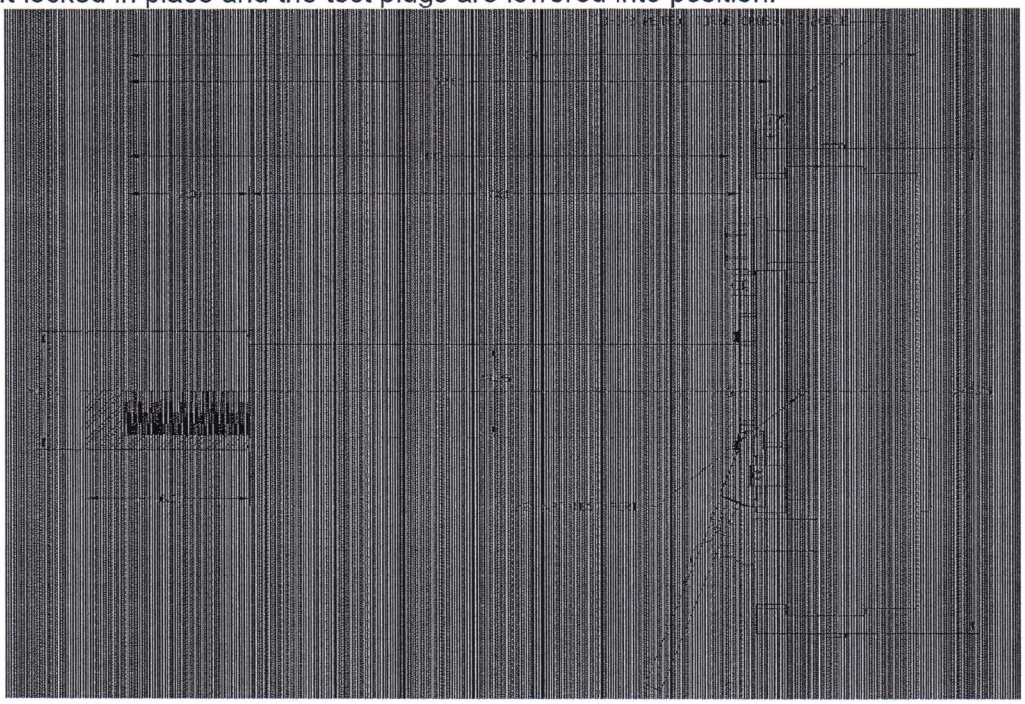
The hydraulic riser running tool is used to lift and handle the marine riser joints and to test the auxiliary lines. The lower end of the tool will stab into the LK riser pin flange and hydraulically lock into place. The tool is equipped with position indicators, which double as a manual unlock system in the event of hydraulic failure. The mandrel on the other end has a tool joint box so that common rig tools can be used for handling. An alignment pin is provided to allow orientation of the running tool, ensuring proper position for installation of the test plugs. If pressure testing of the auxiliary lines is necessary, the running tool is left locked in place and the test plugs are installed.



Hydraulic Riser Running and Testing Tool

21-in. LK Riser Manual Running Tool—Cameron

The manual riser running tool is used to lift and handle the marine riser joints and test the auxiliary lines. The bottom of the tool is configured to mate with an LK riser pin flange and to manually bolt into place. The mandrel on the other end has a tool joint box so that common rig tools can be used for handling. Two alignment pins are provided to allow orientation of the running tool, ensuring proper position for installation of the test plugs. If pressure testing of the auxiliary lines is necessary, the running tool is left locked in place and the test plugs are lowered into position.



Pipe Racking System PRS-4i

This machine is used to build stands of tubular on the drill floor and to transport them from the setback area, Foxhole, and well center as required. The racker is capable of handling single tubular joints between the conveyor and either the well center or the Foxhole for stand-building operations. The PRS upper arm can also be equipped with a riser tailing claw to tail the risers from the RHS to the main well center. Any PRS can be operated from any of the 4 chairs.

Riser Handling System (RHS-2)

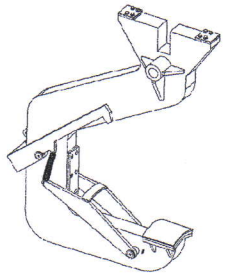
The RHS-2 is a hydraulically operated system with a single hydraulic control station designed to move heavy tubular between the pipe deck and the main well center. It is specifically designed to handle drilling risers and other large tubular, with appropriate

saddles installed, it can be used to transfer smaller tubular. The RHS-2 is completely manually controlled. It also has audible and visual alarms on the pipe deck to notify personnel in the vicinity when the system is turned on and when it is moving.

The RHS is composed mainly of the Lower Trolley Frame, the Inner Saddle Assembly, the Upper Trolley and the Outer Saddle. The Inner Saddle Assembly bolts to the front of the lower trolley frame and supports the front of the riser segment. The Upper Trolley is designed to travel on rails on the Lower Trolley Frame. The Outer Saddle is fixed to the upper trolley and is used to guide the bottom of the riser segment.

Riser Gantry Crane (RGC)

The riser gantry crane is designed to handle the drilling riser by utilizing the riser hooks and to lift 3½-in. to 20-in. tubulars (i.e., drill pipe, drill collar, casing, etc.) using a magnet specially designed for handling tubular. The following diagram shows the design of the hooks.



Risers Hooks

MUX Cables and Hotline and Reels

There are two identical MUX cables, referred to as Yellow and Blue, that supply the BOP control PODs with information sent from the surface control panels. Having two cables allows a full redundancy of the system in case one POD fails. The cables are spooled onto MUX cable reels located on the mezzanine deck of the moonpool.

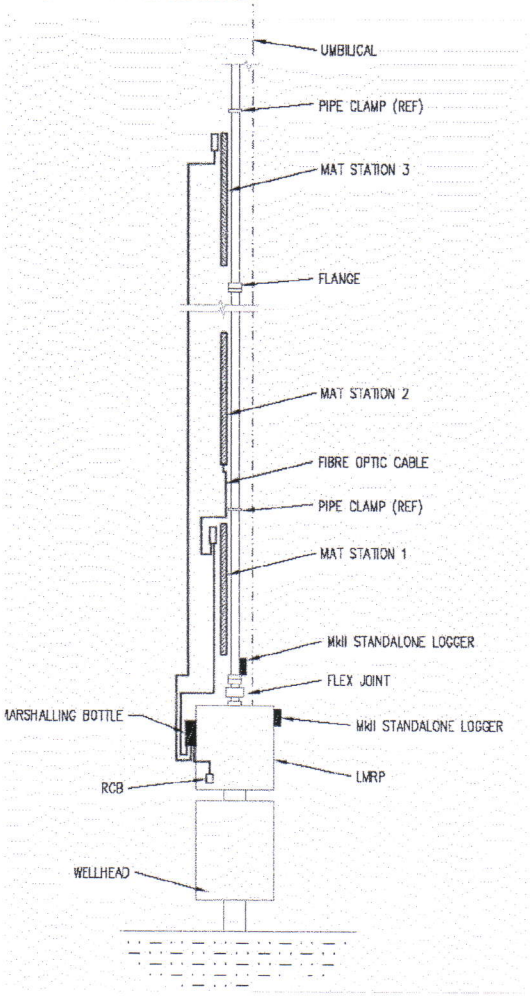
The Hotline is a hydraulic supply fluid back up to the conduit line. If anything were to happen to the conduit line while the BOP was subsea, the Hotline would supply the BOP with enough fluid to help secure the well and get the BOP back to the surface for repair.

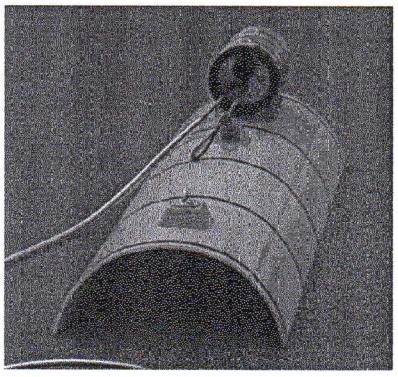
The Hotline and MUX reels are designed to be operated at the local (reel) panels or remote control panel, with both the local (reel) panel and remote panel providing the safety of being able to shut the reel down at any time.

Riser Monitoring System – 2H

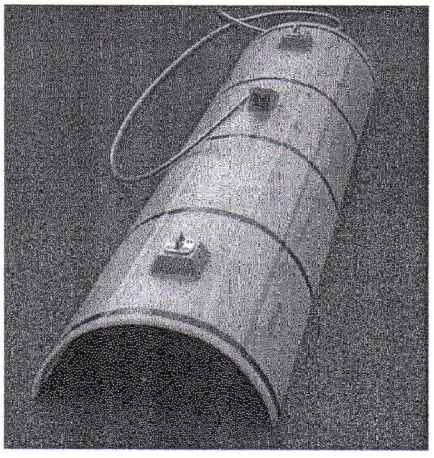
The drilling risers used on the PDQ are designed for the full 25- year field life. Due to the severity of potential operating conditions, high rates of fatigue damage accumulation may be incurred from vortex induced vibrations (VIV), and vessel motions. In order to track the fatigue damage of the drilling riser, and hence ensure integrity is maintained, real time monitoring of the riser response is performed.

2H Offshore Inc has designed the Thunder Horse PDQ drilling riser (DR) monitoring system, which includes strain monitoring sensors, motion sensors, topsides equipment and software. In total, 3 Insensys fiber optic (FO) mats, 1 2H subsea marshalling bottle and 2 2H motion sensors are required. Two mats will be located on the bottom riser joint, and one mat will be located on the second riser joint. The marshalling electronics collate all sensor data from the monitoring stations and return it to the surface via the RCB and umbilical.





Mat 1



Mat 2

4. Preparations

4.1 Before Operation Start

General

- Ensure that all personnel working on the drill floor are aware of the operation.
- Ensure good means of communication exists between personnel at the rig floor, personnel at moonpool area and the Ballast Control Room Operator.
- When working on top of the LMRP, personnel must wear a safety harness connected to an anti-fall device (inertia reel), or a man riding winch line.
- The Safety Advisors and the Toolpushers must ensure that all personnel working on the drill floor are aware of the moonpool operation.
- The moonpool access baskets must be parked when moving the BOP on its transporter.
- All personnel not involved in this operation must keep well clear when the BOP transporter is being operated.
- When working over the moonpool and/or in conjunction with drill floor, clear communication with the drill floor is essential.
- Any person working on the underhull guide platform (and thus out of sight) must stay in continuous radio contact with one person on the cellar deck.
- 3 watchstanders are required when moving the BOP transporter over the moonpool.

Foxhole

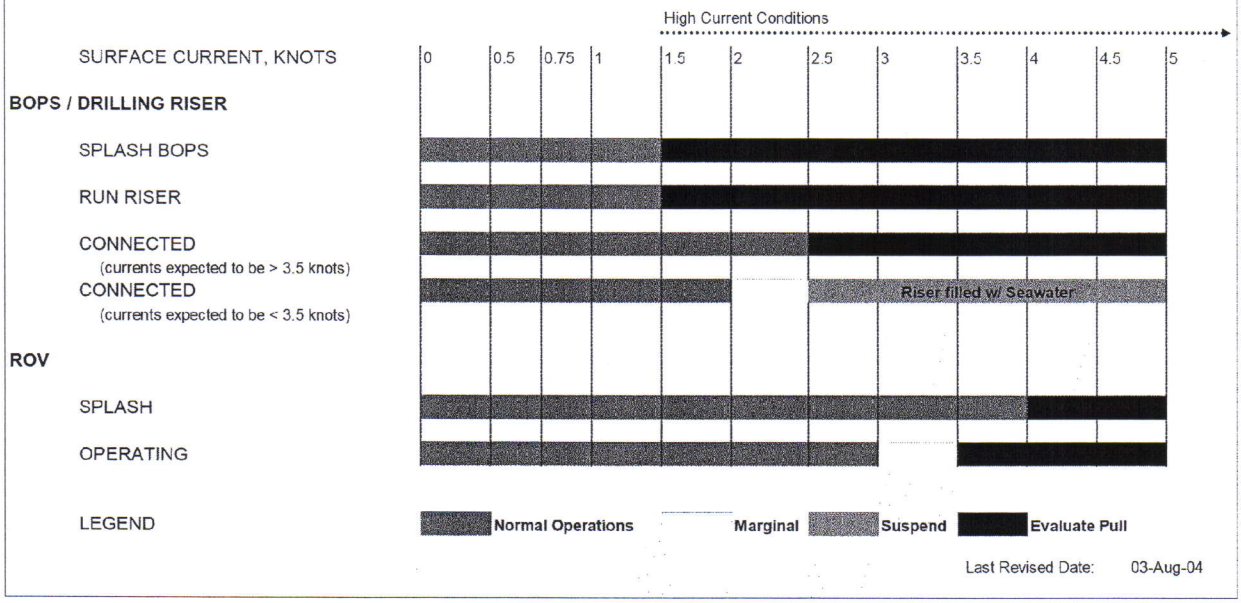
- If in place, the Foxhole will have to be removed by the drilling crew. Refer to Procedure TH-OP-04-18-09-M, "Installation/Removal of the Foxhole."

Weather Conditions

- With Control Room Operator assistance, the Toolpusher will make sure that the weather conditions meet the operability of the rig according to the following table:

SURFACE CURRENT OPERABILITY GUIDELINES

(These guidelines are to provide general guidance for the Operation Teams. Actual operational decisions will be based on knowledge of equipment and site-specific environmental conditions.)



4.2 Recommended Personnel Guidelines

This list is only indicative and solely serves as a guideline for manpower management and resources planning purposes. The operation can be achieved in compliance with standard drilling practices and with Pride and BP's safety policies using less manpower or differently qualified personnel than the ones listed below. In any case, the overall decision on manpower management belongs to the PIC and to the Toolpusher who are in the best position to assess the needs according to the situation.

- 1 crew member (with abilities of Drilling Superintendent).
- 1 crew member (with abilities of Toolpusher).
- 1 crew member (with abilities of Driller).
- 1 crew member (with abilities of Assistant Driller).
- 1 crew member (with abilities of Derrickman).
- 1 crew member (with abilities of Pump Man).
- 1 crew member (with abilities of Shaker Hand).
- 4 crew members (with abilities of Roughneck).

- 1 crew member (with abilities of Deck Foreman).
- 1 crew member (with abilities of Crane Operator).
- 3 crew members (with abilities of Roustabout).
- 2 crew members (with abilities of Subsea Engineer).
- 1 crew member (with abilities of Rig Mechanic).
- 1 crew member (with abilities of Rig Electrician).

4.3 Equipment Required

In the Moonpool

- Radios for communication with spare batteries charging, with headsets for Mux Reel Operators.
- MUX clamps, umbilical clamps and impact wrenches.
- Safety harnesses, riding belts, inertia reels and type 5 work vests for moonpool.
- Tools from the No-Drop Toolbox.
- Torque tools and units for riser bolts.
- 2 ½-in. Impact Wrench for Mux Clamp.
- Moly 503 Lubricant.
- Brushes and rags.

On the Rig Floor

- Wrench for RHS saddle bolts.
- Bucket of grease/oil mixture with application brush.
- Hydraulic hoses for spider (tools to make up connections).
- Snatch blocks and snubbing slings.
- Radios for communication with spare batteries charging, with headsets for the Driller.
- Rotary and skate entrance barricades.
- Spare seals for riser pins and service lines on riser (choke, kill, booster, and conduit lines).
- Torque tools and units for riser bolts.
- Hydraulic running and test tool with test receptacles and HP test hoses and fittings.
- Safety barrier (HP test signs and tape) for HP tests.

- Moly 503 Lubricant.
- Brushes and rags.
- Equipment to perform Ultrasonic Testing if required.

Riser Monitoring System - On the Rig Floor

- 25 x Long Tie-wraps
- Neoprene (rubber) sheets 2" x 60" x 1/8" min (Quantity: 12)
- ¾" Stainless steel Band-it clamps, 17mm thick min (Quantity 6)
- 5/8" PVC coated band straps, 17 mm thick min (Quantity 6)
- Banding tool
- Hammer
- Measuring tape
- Double-sided adhesive tape for temporarily holding the neoprene during installation.

5. Operation

5.1 Preliminary Notes

- Prior to any BOP or Riser related activities, read the following procedures:

EOP Manual: TH-EOP-04-06-04	Diverter
EOP Manual: TH-EOP-04-07-02	BOP Transporter
EOP Manual: TH-EOP-04-07-03	BOP Underhull Guide
EOP Manual: TH-EOP-04-09-01	Riser Gantry Crane
EOP Manual: TH-EOP-04-09-02	Risers Handling System
EOP Manual: TH-EOP-04-19-01	Marine Drilling Risers
OP Manual: TH-OP-04-04-07-C	Working In the Moonpool Area

When working above water or above opened rotary table, all tools will have to be secured with a safety line in order to prevent any dropped object situation.

5.2 Procedure

Step 1— The Toolpusher ensures that any SIMOPS are not affected by the preparation for running the BOP and by the BOP running operation.

Step 2— Perform steps from Section 4.1, "Before Operation Start."

A - In the Moonpool

BOP Transporter

Only certified personnel are allowed to operate the BOP transporter.

Step 3— Before operating the BOP transporter, the Subsea Engineer must ensure that:

- Periodic maintenance has been performed.
- The hydraulic power unit is in operating condition and on AUTO mode and that the 3,000 psi working pressure is present in the system.
- When pressurized, the hydraulic system is leak free.
- The transporter is lubricated as per the lubrication schedule.
- The tracks on the forks used by the outer frame rollers are kept clean of any debris.
- The transporter is free of obstruction in its operating area.
- The transporter rails are clear of hoses or ropes, rags and metal debris.
- The Hillman rollers have no obstruction in front of the rollers.
- There are no unnecessary personnel in the operating area.

Step 4— Prior to starting any BOP transporter movement, the Subsea Engineer must visually check the status of the hang-off arms. This is done by observing the four indicators located on top of the grating above each hang-off arm. If the BOP is landed on the hang-off arms, the indicators have to show the hang-off arms extended. If the BOP is landed on the stack support posts, the indicators have to show that the hang-off arms are fully retracted.

Step 5— The Subsea Engineer must check the liquid level in the drip pans at the bottom of the transporter and pump the liquid out using the drain pump, if required.

Step 6— Prior to starting any BOP transporter movement, the Subsea Engineer must check that the gripper arms are on and locked.

Step 7— The BOP transporter will be moved based on Procedure TH-OP-04-04-11-C, "BOP Transporter Operations."

Step 8— The BOP is moved under the main well center when the first two joints of risers are ready to be connected. Otherwise, the BOP should not be left underneath the main well center.

Prepare BOP to Be Run

➤ **Ensure good means of communication exists between the Subsea Engineer coordinating the operation, the Subsea Engineer at the BOP transporter's control panel, the Drillers, the Toolpusher, and the BCRO.**

Step 9— The Subsea Engineer checks that the BOP is properly positioned on the transporter stack support posts.

Step 10—To travel the BOP on the BOP transporter, the BOP has to rest on the stack support posts and **not** on the **hang-off** arms. The Subsea Engineers must visually verify if the BOP has yet been landed on its support.

Step 11—The Subsea Engineer verifies that the Riser Monitoring System RCB and marshalling bottle are in place on the LMRP frame and properly secured. He also verifies that the cable's SEACON connections between the two bottles are properly set. He also makes sure that the MKII Stand alone logger bottle is in place in its holder located on the LMRP next to the blue POD.

Step 12—The Subsea Engineer verifies that the control system is fully functional and that no error messages are displayed. PODs should have been function tested daily.

The Steps 12 to 18 will be performed only if the previous BOP pressure test exceeds 14 days.

Step 13—The Subsea Engineer installs the stack test tool with test receptacles connected at the termination spool level.

Step 14—Under the supervision of the Subsea Engineer and using the starboard forward deck crane, the drill crew places the test joint in the BOP stack. They also install a new gasket on the BOP wellhead connector.

Step 15—Perform a complete BOP pressure test and function test on both PODs, recording times and volumes. For the purpose, refer to Procedure TH-OP-04-05-05-M, "Test BOP on BOP Transporter."

Step 16—The drill crew removes the test joint from the BOP stack.

Step 17—The Subsea Engineer tests down the choke, kill, and hydraulic conduit lines according to the Procedure TH-OP-04-05-05-M, "Test BOP on BOP Transporter."

Step 18—The Subsea Engineer unlocks the wellhead connector, lowers the test stump and extends it to portside.

Step 19—The Subsea Engineer removes the used gasket and installs a new ring gasket.

Step 20—The Subsea Engineer inspects the hydrate seal and replaces it as required.

Step 21—The Subsea Engineer lubricates the wellhead connector as per manufacturer's recommendations.

Step 22—The Subsea Engineer verifies that:

- All functions are in the correct stack running condition.
- The LMRP connector is locked.
- The mini connectors are locked.
- The choke and kill valves are closed, except for the lower sets of choke and kill isolation valves to allow for water fill up while running.
- All rams and annulars are open and vented.
- The wellhead connector is unlocked.
- All the hydraulic regulators are set at 1,500 psi and the solenoid supply regulators to 3,000 psi.

Step 23—The Subsea Engineer removes the stack test tool.

Step 24—The Subsea Engineer installs the beacon on the BOP stack, if not already in place.

Step 25—The Subsea Engineer verifies that the control system is ready.

The Subsea Engineer will refer to the Section 7.1 of this procedure for the detailed check lists to be completed prior to running the BOP.

Moonpool Access Basket

Step 26—The Subsea Engineer assisted by the Roustabouts stages an adequate quantity (dependent on water depth) of MUX clamps and umbilical clamps in moonpool.

Step 27— The person in charge of running the basket (Roustabout or Roughneck) has the appropriate work permit filled out and in place.

Step 28—The person in charge of running the basket performs all the necessary preparation steps described in Procedure TH-OP-03-04-10-C, "Moonpool Access Basket Operations."

Under Hull Guide

Step 29—The Subsea Engineer ensures that the underhull guidance system is free to move.

Step 30—The Subsea Engineer ensures that all cylinders are in normal (parked) position and validates that there are no hydraulic leaks.

Step 31—The Subsea Engineer checks that there is hydraulic pressure to the system. This is accomplished by slightly advancing a travel cylinder lever and noticing the pressure increase on the dial gauge. Return the lever to its neutral position and perform the same function with the opposite frame travel lever.

Step 32—The Subsea Engineer checks hydraulic functions prior to unlocking the system from its parked position or retracting the frame back to its parked position.

Step 33—Prior to moving the underhull guide, the Subsea Engineer makes sure he has activated the parking bolts into the UNLOCKED position by moving the valve lever on the control panel into the UNLOCKED position.

Step 34—The Subsea Engineer performs a complete function test and confirms equal stroke and position of both guides.

MUX Lines and Hotline Reels

Step 35—The Subsea Engineer makes sure that all hydraulic lines from the HPU to the Hotline reel are connected and that all valves at the Hotline line reel are opened.

Step 36—The Subsea Engineer makes sure the 1-inch line from the Hotline and MUX cables on the LMRP are connected.

Step 37—The Subsea Engineer makes sure that the HPU, Hotline and MUX line reels are operational.

Step 38—Before operating the reels, the reel Operators (the Roustabouts or Roughnecks) make sure that the lock-out pins are out. After operating the reels, they make sure that the lock-out pins are in.

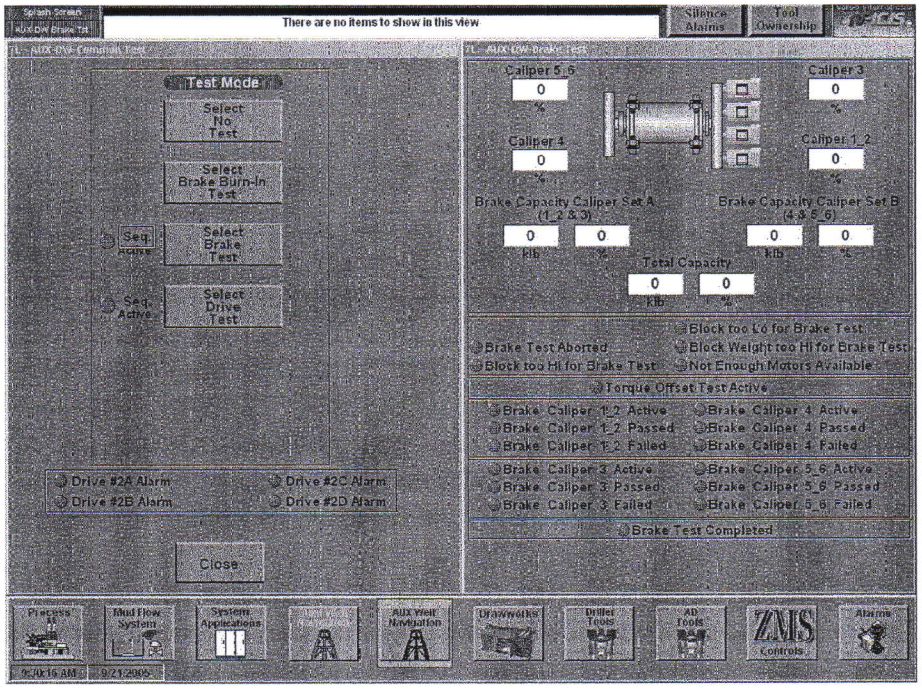
Step 39—The preferred Reel control panel to be used during the operation is the LOCAL CONBTROL PANEL.

Step 40—The Subsea Engineer will perform the pre-run reels check list as per Section 7.2.

B - On the Rig Floor

Drawworks

Step 1— Perform a brake test of the drawworks. This is accomplished by selecting the DRAWWORK module in V-ICIS. From there, the Driller clicks on TEST MODE and on BRAKE TEST. Refer to the following screen and to the Equipment Operating Procedure TH-EOP-04-03-01.



Step 2— During the preparation for running and during the running of the BOP, an inspection of the drill line will be carried out after any hard-stop (while hoisting with low load).

Step 3— At the beginning of his shift, the Driller will test the deadman button on the drawworks joystick.

V-ICIS HMI

Step 4— Set the V-ICIS process to connection mode. This can be done from any of the 4 chairs.

Step 5— Ensure that the Racker Mode for the PRS is set to RISER.

Step 6— Place the TDS into RISER mode.

Step 7— Check that the block position proximity switch's alarms are correctly set by traveling the block from up the derrick to as far down as possible.

Step 8— Perform a ZMS (Zone Management System) test.

Step 9— The E-stop circuit will be function-tested in a safe mode by the Driller and the ET (electronic technician) **every shift, if the ongoing operation allows**.

Step 10—When any system is rebooted (V-ICIS, etc.), the Driller will check that the input parameters to the system are still correct (BOP set down weight, BOP conn weight, trip heights, etc.).

General Rig Floor

Step 11—The drill crew removes the anti-slip mat.

Step 12—The drill crew rigs up the 1,000-sT links (5½ in. x 200 in.). The elevator links are stored alongside the RHS structure, on the side facing the PTC structure. A deck crane is used to lift the links and to place them onto the RHS. The RHS will carry the links towards the main well center.

Step 13—The drill crew rigs up the 1,000-sT solid body elevator and the elevator tilt cylinder (from the running tool pad eye to the TDS bolted pad eye).

Step 14—The drill crew rigs up the riser tailing arm as per Procedure TH-OP-04-04-10-M, "Rig Up Riser Tailing Claw."

Step 15—The drill crew sets the spider and gimbal in the rotary as per Procedure TH-OP-04-04-02-M, "Riser Spider and Gimbal Installation."

Step 16—The Toolpusher and the Driller verify that all end-of-drilling-phase tasks have been properly executed.

Step 17—The drill crew under the supervision of the Subsea Engineer places the manual running tool and the hydraulic running tool with test plugs on the drill floor.

Step 18—The Subsea Engineer inspects the double-grooved lifting profile of the running tools for any signs of wear. The Subsea Engineer will use the gauge, if available, to check the lifting profile. He will also verify the test subs for any damage.

Step 19—The drill crew rigs up the hydraulic running tool to the elevator, connects the hydraulic hoses to the TDS, regulates the TDS hydraulic pressure down to 1,500 psi, and tests the hydraulic hoses (1,500 psi).

Step 20—The Drill crew rigs up and tests torque tools for the riser flange bolts.

Step 21—The Assistant Driller has the AR-5000 in the parked position.

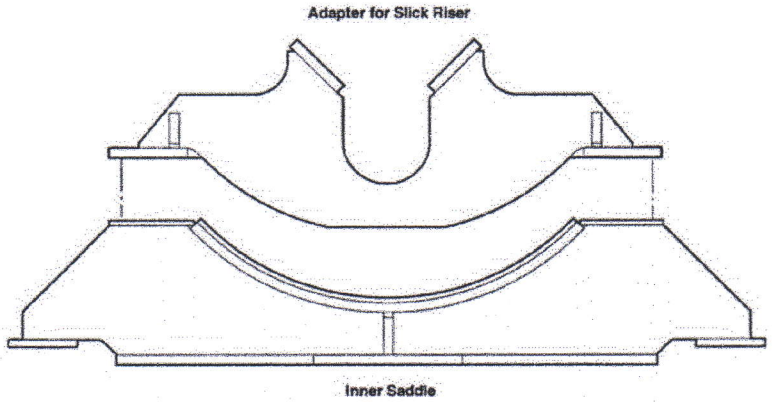
Step 22—The rig crew stages adequate quantity of thread compound for riser bolts (molybdenum disulfide lube such as NSW # 503).

Step 23—The drill crew prepares two hoses to flush and fill the auxiliary lines with water (drill water for choke, kill and booster lines, **potable water for conduit lines**).

Riser Handling System

Step 24—Rig up floor for BOP run. Rig up slick joint adapter to skate.

Step 25—The drill crew installs the adapter for handling the slick riser on the front riser handling cart (bolted to inner saddle).



Step 26—The drill crew checks the riser handling dollies for proper performance and function tests the RHS.

Step 27—The RHS operator verifies that the pilot pressure on the control station manometer is correct and adjusts it if necessary.

Step 28—The drill crew ensures that **all** ESD and warning systems are active and functioning. If the cable ESD has been activated, the RHS is reset using the blue RESET button.

Step 29—The drill crew inspects the tracks, upper and lower, making certain that there is no debris or obstacles on the tracks.

Step 30—The drill crew verifies all hydraulic components and connections are leak free.

C - On the Deck

Riser Tally

Step 1— The Toolpusher, Driller, and Subsea Engineer will issue a riser tally. The Tally will be given to the Crane Operator for the riser's preparation on deck. Refer to the following diagram for a tally example:

Number	Item Length	Cumul Length	item dry weight, lbm	order dry weight, lbm	Description
1	70	70	30,839	30,838	.875" wall Bare Joints, 70 ft.
2	70	140	44,556	75,394	.875" wall Buoyant Joints, 5,500 ft. rated, 70 ft. fitted for RMS
3	70	210	47,367	122,761	.875" wall Buoyant Joints, 5,500 ft. rated, 70 ft.
4	70	280	41,984	164,746	.750" wall Buoyant Joints, 4,500 ft. rated, 70 ft. fitted for RMS
5	70	350	44,644	209,390	.750" wall Buoyant Joints, 4,500 ft. rated, 70 ft.
6	70	420	44,644	254,034	.750" wall Buoyant Joints, 4,500 ft. rated, 70 ft.
7	70	490	44,644	298,678	.750" wall Buoyant Joints, 4,500 ft. rated, 70 ft.
8	70	560	44,644	343,322	.750" wall Buoyant Joints, 4,500 ft. rated, 70 ft.
9	70	630	44,644	387,966	.750" wall Bare Joints, 70 ft.
10	70	700	44,644	432,610	.750" wall Bare Joints, 70 ft.
11	70	770	44,644	477,254	Buoyant Joints, 5,000 ft. rated, 75 ft.
12	70	840	44,644	521,898	Buoyant Joints, 5,000 ft. rated, 75 ft.
13	70	910	44,644	566,542	Buoyant Joints, 6,500 ft. rated, 75 ft.
14	23.3	933.3	13,571	580,113	Pup joint - 23.3 foot, complete with auxiliary lines
15	23.3	956.6	13,571	593,684	Pup joint - 23.3 foot, complete with auxiliary lines
16	29.17	985.77	15,689	609,373	Pup joint - 29.17 foot, complete with auxiliary lines

Riser Gantry Crane

The RGC will be the preferred means for lifting and handling the riser joints from the deck to the RHS.

Step 2— The Crane Operator and the Roustabouts install and connect the RGC risers' hooks.

Step 3— They check the riser gantry crane for proper performance and function.

Step 4— The Crane Operator makes sure that the riser hooks are in **synchronized mode** prior to starting to lift a joint.

Risers

Step 5— The Subsea Engineer and the Roustabouts make sure that the seal subs in the risers, the telescoping joint, and the termination joint have been checked after the riser pull out,

Step 6— The Subsea Engineer and the Roustabouts inspect the seal surfaces on pins and seals in boxes.

Step 7— The Subsea Engineer and the Roustabouts inspect the riser flotation modules' condition.

Step 8— The Subsea Engineer and the Roustabouts check the presence of the dowel pins and of the roll pins securing the retainer nuts and the flange nuts on the risers' ends.

Deck Cranes and Spreader Bar

The deck cranes will be the back-up solution for handling the riser joints from the deck to the RHS. In such a case, the spreader bar will be used.

Step 9— Spreader bar: When lifting, the deck crew ensures that all shackles are free to rotate about their pins and that all slings are unrestricted in their movement. The shackles should not be in a position that could cause them to bind up or to be subject to undesirable loading conditions. Maintain the free motion of the shackles and slings until all of the slack is eliminated from the slings. Caution: All lifting should be done slowly and deliberately.

Step 10—A visual inspection of the spreader bar is carried out by the Crane Operator and the Roustabouts prior to commencing the work. If any signs of damage or wear are found, the yearly maintenance procedure should be followed for assessing the spreader bar for continued operation.

6. Post-Operation Checks

N/A

7. Attachments

7.1 BOP Pre-Run Checklist **7.2 Hotline / MUX Cable Reels Pre-run Checklist**

7.1 BOP Pre-Run Check List

	HYDRAULICS CHECKLIST ITEM	Completed (sign)
1	Calculate proper pre-charge and Check all Accumulator Precharges	
2	Visually check all hoses on LMRP	
3	Visually check all hoses on BOP stack	
4	Function-Check all ROV-operated ball valves	
5	Visual check of stab plates, Choke and Kill Connectors, pod stabs, aux. Stabs	
6	Check BOP Stack/LMRP Regulators and settings	
7	Check operation of rigid conduit flush valve	
8	Check fluid-mixing system	
9	Check mix-ratio of mixed fluid	
10	Perform leak checks during function testing	
11	Make sure hydrostatic pressure-measurement transducers for proper operation	
	ELECTRICAL CHECKLIST ITEM	**Completed (sign)**
1	Check the mux cable connectors check all ccp/ccr cables	
2	Check solenoid cables/"pie" cables for cracking, bubbles, or any sign of calcuim deposits.	
3	Nitrogen-purge any electronics pressure housing that has been opened for service	
4	Check event logger to make sure it's functional and settings are correct	
5	Check pressure xducers for proper operation	
6	Check subsea and surface power supplies for proper operation	
7	Do a Visual check of all cables and cable routing on LMRP	
8	Check ERA sensors	
9	Check SEM temperature sensors	
10	Check each control panel for proper operation (visual check and during function checks-see Function Testing)	
11	Check the wellbore pressure/ temperature sensor	
12	Check both of the pressure/ temperature sensors on the LMRP	

	MECHANICAL CHECKLIST ITEM	Completed (sign)
1	Check anodes	
2	Check piping supports	
3	Check piping flanges-visual and spot-check bolt torque on flanges	
4	Inspect for corrosion of non-stainless materials/fasteners, etc.	
5	Inspect AX gasket and functionality of retainer pins	
6	Check hydrate seal on wellhead connector (If applicable)	
7	Check BOP mandrel	
8	Check wear bushing(s) / Annuflex	
9	Check for key-seating in bore	
10	Inspect lift cylinders for pods	
11	Inspect box-end seals on riser adapter	
12	check that riser connector, wellhead connector and minipod connector have been lubricated	
13	Check Pod Lock stabs	
14	Check that stack connector flags are functional (during stump test)	
15	Check that lmrp connector flags are functional	
16	Check emergency recovery slings lmrp/bop	
17	Grease mud-boost valve	
18	Grease C&K valves	
21	Check hydraulic function stingers and seals and lubricate Pod stabs.	
22	Check receptacles on lmrp and Stack; replace the seals where necessary	
23	Check the 2 pressure/temperature connectors stab on the LMRP	
24	Check Accumulator U-bolts	

	BOPS/RAMS CHECKLIST ITEM	Completed (sign)
1	Check rubber goods and expendables-update ram maintenance records	
2	Make sure cavities are clean and lubricated after ram goods are changed/checked	
3	Retorque any flanges or bonnets that were broken loose	

	FUNCTION TESTING CHECKLIST ITEM	Completed (sign)
1	**Perform stack function tests and Verify all Functions visually**	
2	**Perform Automatic disconnect tests-all Sequences**	
3	**Function-test all rams at 300 psi and record closing time; record flows based on procedure TH-OP-04-05-05-M "Test BOP on BOP Transporter"**	
4	**Function-test all rams at full closing pressure-record closing time, flows based on procedure TH-OP-04-05-05-M "Test BOP on BOP Transporter"**	
5	**Function-test ROV stabs; check and replace seals as needed**	
6	**Pressure test all rams to full rated pressure with the test tool based on procedure TH-OP-04-05-05-M "Test BOP on BOP Transporter"** make sure hydraulics are in the VENT position when tested	
7	**Pressure test all failsafe valves on both sides**	
8	**Pressure test the wellhead connector based on procedure TH-OP-04-05-05-M "Test BOP on BOP Transporter"** Make sure the hydraulics are in the VENT position when tested Make sure that a stump-test of the wellhead connector is performed	
9	**Test the riser recoil prevention system**	

7.2 Hotline and MUX Cable Reels Pre-run Check List

	HOTLINE REEL PRE-RUN CHECK LIST	Verify (sign)
1	**All bleed valves on the HPU are in the close position.**	
2	**All panel valves are in the vent position and the pilot regulator is set at 0 psi.**	
3	**Select Pump A to the AUTO position and allow the system to build up pressure.**	
4	**After the pressure has stabilized and the pump has stopped:** **Check for any leaks in the system.** If any leaks are present turn Pump A to OFF position, vent the system pressure, and repair the leak. Then start to bring system pressure back up again.	
5	**Set HPU panel pilot regulator to 2,200 psi.**	
6	**Select the Surface Accumulator valve at the HPU panel to SUPPLY.**	
7	**Check to see if there are leaks in the pipework.** If any leaks are present set the Surface Accumulator valve to VENT. Fix the leak, then set the valve back to SUPPLY.	
8	**Set the Hotline supply valve on the HPU panel to SUPPLY and allow the line to pressure up.** Pump up the hotline along with the accumulators to prevent a hammering effect. If any signs of leaks, ISOLATE the valve and fix the leak.	
9	**At the HPU open the supply valve and monitor as the 1-inch Hotline and the MUX section of the PODs builds up pressure.** If there are any signs of leaks, close the valve and fix the leak.	
10	**At one of the Cameron panels, verify that both PODs solenoid pilot supply pressures are reading around 3,000 psi. Adjust manual pilot regulator as necessary.**	
11	**Open air valve feeding the Hotline reel.**	

	MUX REELS PRE-RUN CHECK LIST	Verify (sign)
1	**Inspect all bolt mountings as well as welded connections.**	
2	**Ensure that the periodic maintenance has been performed.**	
3	**Open the hydraulic supply valve at the bottom of the sheave extend/retract console and verify the correct pressure on the gauge of the console panel**	
4	**Verify the good alignment of the level winds with the cable or the hose on the drum. Adjust if necessary.**	
5	**Prepare the reels for a remote control panel operation**	