

เอกสารแนบที่ 52

ขั้นตอน Rigging and Lifting Procedure

Rigging and Lifting Procedure		
COR-PRO-0713	Corporate - Marine Operations	Ver: 3
Owner: Marine Manager		Approver: Chief Operating Officer

1 Introduction

1.1 Intent

Proper rigging and lifting methods and controls are crucial to a safe and efficient working environment. The intent of this manual is to assist those involved with rigging and lifting in accomplishing the goal of zero accidents associated with rigging and lifting thereby providing a safe working environment and improving operational efficiency on Borr Drilling installations.

1.2 Scope

The policies set forth in this manual apply to all personnel on Borr Drilling facilities world-wide. These policies communicate Borr Drilling's minimum standards for Rigging and Lifting. It is not the intent of this manual to override or supersede local regulatory requirements. This corporate document shall be supported by divisional standard operating procedures whenever regulatory, or client requirements dictate a higher level of risk mitigation than outlined herein.

1.3 Responsibility

Rig Manager and OIM to ensure that all necessary measures are taken to ensure compliance to requirements.

1.4 Glossary

Competent Person

Someone who has the requisite knowledge and experience, both theoretical and practical, of the type of material under examination to certify with confidence whether it is free from defects and suitable in every way for the duty for which the material is required.

Safe Working Load (SWL)

The maximum load which an item of lifting equipment may raise, lower or suspend under particular service conditions.

Factor of Safety

The ratio of the load that would cause failure of an item of lifting equipment to the load that is imposed upon it in service i.e. SWL.

Color Code

Marking equipment to give a visual indication of its certification status. The color code is normally changed every six months.

I.D. Number

A unique number given to an item of lifting equipment for registration purposes and to facilitate traceability.

Headroom



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The maximum vertical distance between the item to be lifted and the point of suspension of the hoisting machine.

Drawn-up Dimension

The minimum distance between the suspension level and the bottom hook saddle, also known as closed-height.

Load Sensors

A piece of equipment used for detecting the actual loading at a rigging point e.g. load cell shackle, test gauge or compression load cell, etc.

Lifting Equipment

Lifting equipment comprises of lifting appliances and lifting gear.

Flagger (Banksman)

Person in constant communication with the Crane Operator while a lift is taking place. This person may be a lead roustabout (most experienced roustabout on the crew) or a designated Banksman.

Routine Lifting and Hoisting Operations:

- o Standard operations with crane(s)
- o Simple operations with portable lifting appliances
- o Stable load with known and evaluated weight, shape and centre of gravity
- o Standard rigging arrangements
- o Suitable environmental conditions

2 Procedure

Definitions And Principles Of Equipment

Lifting Appliances

Any mechanical device capable of raising or lowering a load e.g. Cranes, Forklifts, Lifts, Suspended Cradles, Powered Hoists, Manual Hoists, Sheave Blocks, Winches, Chain Block, Pull-lift, etc.

Lifting Gear

Any device which is used or designed to be used directly or indirectly to connect a load to a lifting appliance and which does not form part of the load, e.g. Wire Rope Slings, Chain Slings, Synthetic Fiber Slings, Hooks and Fittings, Swivels, Rigging Screws, Wedge Sockets, Beam Clamps, Plate Clamps, Scissors Clamps, Shackles, Eyebolts, Lifting Beams, Beam Trolleys, etc.

Principles

Lifting equipment must be of adequate strength, sound material, of good construction and suitable for the duty, which it has to perform.

It must be tested in accordance with accepted methods and a test certificate must be issued with the equipment before it can be used.

Where lifting equipment is under Borr Drillings control, all inspection data and current inspection certificates must be maintained for a minimum of three years on the particular installation.

Where appropriate, lifting equipment must be marked with current color code.

Good practice requires that any lifting equipment must have an adequate factor of safety incorporated in its design.



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Care must be taken to avoid circumstances which can cause overload, e.g. impact, shock.

The use of 'home-made' lifting equipment is strictly prohibited.

It will be apparent when reading certain specific sections of this manual that reference is made to the angle at which the equipment is used e.g. the angle between the legs of a multi-leg sling.

It is most important that an allowance is made for the variation in SWL, which will result from using the equipment at an angle.

A final point to be considered when selecting equipment for a particular operation is compatibility between the various items required.

A number of different grades of material are used for lifting equipment and in particular it will be found that hooks, links, rings and shackles vary considerably in size for a given capacity according to the grade of material used.

Care must also be taken to ensure that each item of equipment seats and aligns correctly with adjoining equipment.

Where necessary an intermediate link or shackle must be used to ensure this takes place.

Examination Of Lifting Equipment

Pre-Use Examination:

Lifting gear must be examined prior to use to ensure it is in good condition and suitable for the task to be carried out.

In addition, ensure the lifting gear is clearly marked with the following:

- SWL – Safe Working Load.
- Identification number.
- If applicable, a current Color-Code or Inspection Label.

The current color code is prominently displayed at the worksite and can be confirmed by referring to the Crane Operator/Rigging Supervisor.

To ensure that all lifting equipment is well maintained and fit for its purpose, the following shall be applied:

Each rig maintains a register of lifting equipment that contains the latest inspection data and valid inspection certificates of lifting equipment.

All lifting equipment shall be color coded to identify that the equipment is inspected / examined in accordance with the required inspection frequency.

To ensure that an inspection regime is maintained for all lifting equipment, lifting equipment shall be color-coded and the color changed every six months upon inspection. As a minimum, inspections shall consist of an annual third party inspection / recertification of all lifting gear and appliances (i.e. at least every second color code change). All third party vendors contracted to inspect lifting equipment shall be a "Borr Drilling approved" vendor for the scope of services undertaken. Vendor approvals shall be granted by the Corporate Vendor Negotiating Team.

The OIM/Rig Managers shall ensure their rig follows the color-coding program established by their respective Division. The valid color code shall be displayed in prominent areas throughout the rig.

The color code red shall be used to identify defective equipment.

Independent Examination of Lifting Appliances / Gear

Every lifting appliance and piece of lifting gear must be thoroughly examined and where necessary, tested:

Before it is used for the first time.

Annually at a minimum (with the exception of a six monthly man-riding winch inspection)

As dictated by local regulations



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An independent competent person must carry out this examination and testing.

Lifting equipment shall be stored in designated areas.

Lifting equipment shall never be altered and repairs shall only be done by the manufacturer or authorized representative.

Marking of Lifting Appliances and Gear

Every lifting appliance and piece of lifting gear used as or forming part of the lifting equipment on an offshore installation shall be marked with its SWL, current color code and I.D.

Lifting equipment shall never be used to lift a load exceeding its SWL.

SELECTION OF EQUIPMENT

The most important fact to establish prior to preparing for a lift is the weight of the item to be handled. Once the weight has been established, the next consideration may be the available 'head-room' which could have a bearing on sling angles thus possibly increasing the actual tension in the sling legs.

The weight of the lifting gear must be added to the weight of the load to be lifted and the total weight considered when selecting the lifting equipment.

Check the compatibility of the various components as sizes vary according to grades of materials used in its manufacture.

Once the equipment is selected, it shall be examined prior to use.

If lifting equipment appears to be damaged or otherwise defective it must be withdrawn from service immediately, marked with red paint and quarantined to a secure locker or destroyed.

SAFE APPROACH TO LIFTING

Personnel using lifting equipment must be trained to operate it and also have a working knowledge of its capabilities and any defects likely to arise in service.

In all lifting operations care must be taken to ensure that the load imposed on any part of the lifting equipment does not exceed its SWL.

Weight of the load shall be confirmed prior to making the lift.

Care must be taken to ensure the stability of the load.

In general the load may be unstable if at any time:

The center of the load is not directly below the crane boom tip; always ensure crane is correctly positioned prior to taking up slack on slings.

The center of gravity of the load is not directly below the crane boom tip or is higher than the point of attachment of slings to the load.

The lifting equipment must only be used for the specific purpose for which it is designed and not be adapted for any other purposes.

With certain lifting operations the load should only be raised a short distance to allow the checking of the balance, stability, and general security of the load whilst it is still in a relatively safe position.

If load is not secure or correctly balanced, it must be lowered and the slings repositioned with the sequence of trial lifts and adjustments' being repeated until the load is balanced, stable and secure.

Always ensure the crane boom tip is directly above the center of gravity of the load and that all personnel are standing clear before the load is lifted.

The person flagging must never become involved in physically handling the load. His role is to supervise the lift and give instructions to the Crane Operator and ensure that all personnel are in, and remain in, a safe position.

All lifts will be controlled by a minimum of two tag lines.

All boat to deck lifts that do not have a tag line attached will be landed on the rig with all personnel

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well clear (for guidance the term “well clear” should be interpreted as more than 9 meters / 30 feet away). Tag lines will then be attached and the lift will be treated as “deck to deck”.

All tag lines shall be as per the Borr Drilling standard.

When using a tag line the person involved shall position himself no closer than 3 meters/ 10 feet from the load. At no time shall a person stand under a suspended load to retrieve a tag line. This practice can be avoided by skillful body positioning or by the use of a built for purpose hooking device to retrieve the tagline from beneath the load.

Hands Off: At no time shall a crane line or the load be touched unless the line is fully slack and there is no motion of the crane or load. A line is not considered slack if it is supporting the weight of the fast line ball or main block. The Crane Operator must approve prior to touching the line. The Crane Operator will only approve touching the line when the crane is secured and the line is fully slack.

Hands Off: This also applies to the crane blocks when they are being lowered for service or maintenance. The Crane Operator must approve prior to touching the block or line. The Crane Operator will only approve touching the block or line when the crane is secured and the line is fully slack.

Hands Off: The hands off policy shall apply to any line under tension from any lifting device. Only when the line is slack (not under tension) and permission received from the operator may the line and / or load be touched.

Deviation of Hands Off

If for any reason a load is encountered that requires ‘hands on’ manipulation, approval must be obtained prior to moving the load. Approval will come from the Rig Manager after careful consideration of the situation. The approval process will be recorded as follows:

Prior to commencing the lift, a pre-task toolbox talk shall take place that shall include creation of a new or review of an existing Job Safety Analysis (JSA).

Documentation of the Rig Manager’s approval will be recorded on a STOP Card. The card is to be completed by the Rig Manager while supervising the lift to record observations that can be shared with other crews.

Personnel must never walk under a suspended load and must ensure they never position themselves where a load could trap them if the unexpected were to occur.

Avoid climbing on containers and stacked materials and never stand between crane loads and bulkheads, handrails, containers, etc.

Plan the route the load will be travelling on the way to the lay-down point and ensure any obstructions are cleared away prior to the lift commencing.

Warn any personnel working in the area to stand clear prior to commencing and never lift loads over personnel.

Before landing a load ensure that the landing area is of adequate size and capable of taking the weight of the load. This is especially important where scaffold platforms are used to store equipment.

In addition, it may be necessary to provide suitable spacers (i.e. timber) on which to land a load to enable the slings to be removed. Never allow slings to become trapped between loads and landing areas or material on the deck.

When lowering certain loads it may be necessary to bring them to a halt a short distance above the landing site to check the position of the landing spacers.

Personnel must keep hands and feet clear of the load as it is inched into position and must never position themselves where they could become trapped by any unexpected movement of the load as it is landed and when tension on slings is released.

The flagger must ensure all personnel are always in sight, never allowing them to go to the blind side

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of the load where neither he nor the Crane Operator can see them.

Before slacking off the slings, ensure the load is safe and stable. If not, it must be lifted slightly to allow landing spacers to be adjusted and then lowered into position again being repeated as often as is necessary.

Land loads in such a manner that slings can be easily removed. Never use the crane to pull slings free as this will not only damage slings but will endanger personnel in close proximity.

When undertaking a multi-point lifting operation using two or more pieces of lifting equipment, a JSA shall be created and reviewed. Steps must be taken to ensure that no item of lifting equipment or lifting point is at any time subjected to a load in excess of its SWL.

Where the total lifting capacity is limited, the use of load sensors will provide continuous guidance on individual lift-point equipment loading as the operation proceeds.

An alternative is to calculate the loads, which will be imposed on each component with, care being taken to ensure that no false assumptions are made with regard to the weight and the center of gravity. However, unless load sensors are used, the SWL of each lifting point and its associated equipment should not be less than 1.5 times the share of the load, which it is intended to take.

As the lift commences it is essential to ensure that none of the links of the lifting equipment are twisted or otherwise distorted and that all have a share of the load.

As the lift proceeds, a constant check must be kept on the angles of the lifting equipment and the load as these provide an indication of the load distribution.

Prior to offloading or back-loading of a marine vessel a Job Safety Analysis (JSA) should be accomplished. When possible the Vessel Master should be included by radio or other means.

Misuse of Equipment

Personnel must never use lifting equipment beyond its SWL.

Personnel must never override or remove crane safety devices (i.e. boom stop) without obtaining approval from the Rig Manager via a Cold Work Permit.

Particular attention must be given to avoiding:

- Over-loading
- Incorrect slinging
- Trapping of slings between load(s) and / or the deck

Should lifting equipment become damaged or otherwise defective, report it to your Supervisor immediately, never attempt to repair any item of lifting equipment. Only the manufacturer or their authorized representative shall carry out repairs. Equipment must be tested and re-certified after repair.

Critical Lifts

All critical lifts made must be notified to the Rig Manager (RM) and complete a Critical Lift Permit-To-Work Form (HSE_6882.0) prior to making the lift or once a lift has been identified as a critical lift.

Critical Lifts are defined as:

- Any lift involving personnel (work baskets/personnel transfer etc)
 - o For man riding requirements see HSE_7473: Man-riding
 - o For use of Elevated Hydraulic work platforms, including fixed cherry-pickers, see 2.6.03

Addendum to Rigging and Lifting Manual (Europe)

- The load exceeding 80% of the SWL/Capacity at any boom angle.
- Any lift exceeding 20 tons or 40,000 lbs.
- Any piece of equipment that if lost or damaged could shut down the rig.
- Extreme or harsh weather conditions.
- Non-routine or complex lifting and hoisting operations.



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- The use of Synthetic Fiber Slings.
 - Using two or more lifting appliances in tandem for one lift
 - Operator under training or new to the asset (for at least a few shifts for familiarization)
 - Over- or in sensitive areas – active or energized hydrocarbon – containing equipment
- Europe: see 2.6.03 Addendum to Rigging and Lifting Manual for Lift Plan requirements in Europe

Prior to a Critical Lift

The lifts will be identified and the weights will be verified visually.

The Crane operator is to lift the equipment enough to verify, by the weight indicator, that the weight is equal to or less than the amount noted on the equipment. If the weight is greater than the amount noted on the equipment it is to be set back down. The RM is to be notified of the difference in weight and a determination is to be made if the actual weight will be within the safe working load capacity of the crane.

The RM will verify that the crane's maximum safe working load capacity is not exceeded.

The placing of the load on the rig will be physically verified by measuring the safe working load radius of the crane according to the Original Equipment Manufacturer's (OEM) safe operating limits.

The RM will ensure that the crane's mechanical components are inspected by the Barge Engineer or Mechanic. Any deficiencies identified will be remedied immediately prior to any lift.

A job-specific JSA will be reviewed by all personnel involved in the operation.

Critical Lift Permit

The permit will only be valid for a single planned lift that will occur within the 12 hour tour of the Crane Operator and Rig Manager listed on the permit.

Multiple lifts under a single permit may only be undertaken if the loads are identical in weight and dimensions (i.e. drilling riser or synthetic fiber slings used for chrome tubing). Note: Heavy skips of waste drill cuttings does not meet the criteria of identical weight and dimensions.

CRANES

Crane Servicing and Inspection

Daily Crane Inspection

At the beginning of every shift, the Crane Operator must:

- Inspect the crane for potential failures or malfunctions.
- Report any discrepancies found during the inspection and log them in the crew maintenance log book.
- Test all controls before operating the crane.
- Crane Operator must ensure the crane is lubricated as per manufacture recommendations.

Weekly Crane Inspection

Crane Operator, Electrician and Mechanic must give the crane a weekly inspection with all maintenance carried out being recorded in the weekly Crane Report.

This inspection will include reeling of the crane line from drum, inspecting it for possible damage and testing the weight indicator for sensitivity.

Crane Inspection

All crane lines shall be inspected as per API RP2D with a record of such inspections maintained on the rig. At a minimum, all "running lines" (boom, main and auxiliary hoist lines) on the crane shall be replaced annually and all "standing lines" (pendent lines) shall be replaced every five years.



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Safe Operation of Cranes

Crane boom and load lines must only be activated by 'power up' and 'power down' controls.

If available the boom and swing gear should be equipped with a 'dog' to prevent load creeping. This is to be engaged at all times other than during lowering of the boom.

Moving parts of the power train must be properly guarded due to the close proximity of areas where personnel are required to maneuver.

Boom stops must be fitted to prevent pulling the boom past high center and any alarm fitted must be operating effectively.

Lubrication fittings must be positioned to ensure personnel cannot come in contact with moving equipment while servicing the unit.

Engine exhausts must be routed or covered to prevent burns to personnel.

Fuel tanks and lines must be positioned where spills/leaks will not run onto the exhaust manifold or the engine.

Crane walkways must have handrails and toe boards fitted as per Borr Drilling Standards.

Moving parts of the crane must be stopped before any adjustment; repair or servicing is carried out.

Borr Drilling Planned Preventative Maintenance programs must be followed with all replacement parts used meeting original specifications. Use of non-OEM (Original Equipment Manufacturer) parts or equipment is not permitted unless approval is granted by the Corporate Engineering Department.

Personnel performing repair work on cranes or related equipment should be provided with a safe work platform with scaffolding being erected as appropriate.

When working without handrails a safety harness must be worn, either fitted with double or twin lanyards or attached via an inertia reel to a secure point (To ensure 100% fall protection).

Only personnel certified to operate Cranes are permitted to operate the cranes. Note: Designated trainees are to operate crane with the presence of a certified

Crane Operator.

Unauthorized personnel must not go onto cranes and the Crane Operator must always be contacted before anyone approaches the crane.

Personnel must wait until crane movement has stopped before climbing up to the crane and then only use the authorized means of access.

The Crane Operator is responsible for safe operation of the crane and must follow specific procedures for the particular crane in use.

When operating cranes detailed precautions must be observed to ensure the safety of the Operator and all other personnel in the vicinity.

The Crane Operator Must Never:

- Attempt to pick up a load beyond the Safe Working Load (SWL) of the crane for any given radius.
- Operate the crane in adverse weather conditions.
- Operate the crane to move a load unless a flagger is present.
- Operate the crane in areas where wireline operations are taking place.
- Operate the crane with automatic safe load indicator or other safety devices switched off, or not working effectively.
- Allow any person to ride on a load other than a certified personnel basket.
- Leave a load suspended for longer than is absolutely necessary and must never leave the crane controls during this time.
- Before Leaving the Crane, the Crane Operator must ensure:
- Suspended load has been landed.



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- Swing and / or load drum brakes have been set.
- Master clutch has been disengaged.
- Control levers are in 'neutral' or 'off' position.
- Crane boom is returned to its rest, if possible.
- Prime mover has been stopped. (Crane is shut down)

The Crane Operator Must:

- Ensure personnel are standing clear of loads before taking or releasing tension on the slings.
- Avoid suspending or moving loads above personnel, with a warning signal being given to personnel in the area.
- Always raise and lower loads carefully and smoothly.
- Position the crane in a safe position prior to helicopter landing and take-off.
- Crane Operator must be informed of imminent helicopter operations.
- Conform to Diving Permit conditions when diving operations are in progress.
- Have a lifejacket available at all times when they are working in the crane cab or around the crane superstructure.

General

Weather conditions such as high wind or gusty conditions can cause overloading of the crane by blowing the load out of radius limit.

When lifting over water, high winds reduce the lifting capacity of the crane due to dynamic factors caused by increased wave height and sea swell.

Load, radius and sea state charts must be available in the crane cab to show the cranes capabilities under varying conditions.

Before any lift commences, the Crane Operator should know the gross weight of the load.

When lifting a load from a vessel, it is the joint responsibility of the crane operator and the vessel deck crew / master to ensure all sea-fastenings are released and lifts are accomplished safely with the minimum amount of slew and shock loading.

Note: Under no circumstances shall the crane be used to take up slack on the mooring line of the supply vessel tied to the rig.

When the lifting operation is between two floating vessels, the effects of pitch and roll are more critical as they can double the normal dynamic factors.

When preparing for a lift, confirm the weight of the load, determine the maximum radius required for pick-up, transfer and lay down and then if necessary consult the crane load radius chart to ensure that the lift can be carried out safely.

Prior to making a lift, check all slings and associated equipment for security and balance and ensure slings are correctly located in the crane hooks.

Tag lines must be used on all loads.

Care must be taken when lifting loads of large surface area, which can act as a sail in windy conditions.

Hand signals should always be used as our primary means of communication between the crane operator and the flagger and radios as our secondary.

Should radio contact with flagger be lost or should flagger not be in the crane operators vision, the lift must be halted until communication is re-established.

If the Crane Operator is in any doubt whatsoever regarding the instructions given or is unsure of the position of the flagger and Deck Crew he must halt the lift and confirm it is clear to proceed.

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Where more than one crane is operating at any time, there must be clear communication between the respective Crane Operators, their flagger and Deck Crew. Each Crane is to have its own dedicated flagger.

All instructions to the Crane Operator, whether through radio contact or via signals, shall be from the person controlling the lift (flagger).

Any person observing a hazardous situation developing during a lifting operation is authorized to give the "Emergency Stop" command or signal.

Under normal circumstances cranes must be returned to their rests once lifts are completed.

Note: Supervisors are responsible for ensuring that there are adequate numbers of sufficiently trained flaggers and deck-crew for all crane operations. Any time more than one crane is operated at one time a JSA shall be created / reviewed.

CHAIN HOISTS

Chain hoists include chain blocks, and pull-lifts (come-a-longs).

Selection

When selecting a hoist, the first consideration is the required SWL of the equipment to suit the load being lifted.

Weight of the load shall be determined prior to making the lift.

The second consideration is the minimum 'drawn-up' dimensions as lack of headroom is often a problem in confined spaces. This dimension varies with different manufacturers and / or models and may well influence the selection of the hoist.

The third consideration is the height of lift (HOL). Chain blocks normally have a standard 9 ft/ 3meter HOL, pull-lifts 4.5ft/1.5m HOL but either can be fitted with longer chains to suit the operational requirements.

Pre-Use Examination

Before using a chain hoist, ensure the hoist is in working order and safe to operate.

Check that:

- The SWL of the hoist is adequate for the load to be lifted.
- The color coding (where applicable) is current and the hoist has an ID mark.
- Safety catches are fitted and in good working condition.
- There are no signs of misuse, i.e. stretched hooks, cracked casings, stretched or distorted chain, etc.
- In multi-fall hoists, ensure there are no twists in the chains between the bottom block and the hoisting unit.
- The ratchet sounds crisp when spinning the hand chain wheel / operating the lever.

NEVER:-

Load the tips of the hook.

Never use the load chain as a sling, wrapped around items to be lifted and hooked back on itself.

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Ensure that the structure from which a hoist is suspended is adequate for the load it is intended to carry.

Always include the weight of the hoist itself and other lifting equipment, when considering the weight of the load.

When using a hook suspended hoist, the top hook must be attached to its support in such a manner that the support fits freely into the seat of the hook and does not exert any side thrust upon the point. All hooks must be fitted with safety catches, which are in good working order.

After installation ensure that the operating and load chains hang freely and are not twisted or knotted. When using multi-fall blocks, ensure that the bottom block has not been turned over between the falls of chain twisting the load chain.

The length of the load chain must be checked to ensure that the bottom hook will reach the lowest point required without running the load chain fully out.

The hoist must only be used for raising and lowering loads and loads must never be left suspended from hoists for any length of time.

ALWAYS:

- Ensure the lifting gear seats correctly in the bowl of the bottom hook and allows the safety catch to close.
- Ensure the load is correctly balanced.
- Position the hoist directly above the center of gravity of the load.
- Ensure all restrictions and tie down points have been removed.

NEVER:

- Load the tips of the hook.
- Use the load chain as a sling, wrapped around items to be lifted and hooked back on it.
- Travel a load above personnel.
- Use an extension pipe on pull lift levers for extra purchase.
- Leave a suspended load unattended without back-up rigging.
- Subject a hoist to shock loading.
- Drop a hoist onto the deck.

Should the hoist be air powered, ensure an air service unit including filter, lubricator and regulator is fitted, to supply air at the correct pressure, lubricate the motor and protect it from contamination.

Function test the hoist through its entire lifting height and check the operation of the over-hoisting limits (where applicable).

Spark proof hoists are available for use in hazardous areas.

Occasions sometimes arise where operations of hoists are required by divers sub-sea.

Care has to be taken when selecting hoists for this purpose, as not all hoists are suitable due to the material of their brake discs. The relevant manufacturers must be consulted to confirm the suitability of their equipment.

Hoists used underwater must, on completion of the job, be returned to an approved workshop and be completely stripped, purged of salt water, re-lubricated, re-assembled and tested prior to further use.

BEAM CLAMPS

Beam clamps provide a simple and portable means of attaching a hoist to a runway or lifting beam.

Selection

The main consideration when selecting the clamp is the required SWL i.e. the load to be lifted plus



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the weight of the hoisting unit.

If the clamp is to be used to suspend a sheave block, the additional loading caused by the downward pull on the effort rope must be taken into consideration when determining the SWL requirement. (See Section 11 - Sheave Blocks)

The width and thickness of the beam must also be considered and may well lead to the selection of a clamp in excess of the desired SWL to be compatible with the beam dimensions.

The range and adjustability are indicated on the clamp's identification plate.

The majority of clamps are designed for "in-line" use only i.e. the line of force must be at right angles to the beam to which it is attached.

Line of Force

Line of Force

It is therefore important to ensure that for "angled" applications, a clamp of suitable design is selected.

Examples of reduction in Working Load Limits when side loads are applied are as follows:

REDUCTION IN WORKING LOAD LIMITS WHEN SIDE LOADS APPLIED

Angle from vertical	0°	15°	30°	45°
Reduction factor	Nil	17%	34%	50%

Before using a beam clamp ensure that the clamp is in good working order and in a safe condition.

The following checks should be made:

- The SWL is adequate for the total load.
- The color-coding is current and the clamp has an ID number.
- Examine suspension shackle and check for wear, stretch or distortion.
- Examine load bar and check for wear, stretch or distortion.
- Examine inner clamp half and check for wear distortion and cracking - check jaws for deformation.
- Examine outer clamp half and check for wear distortion and cracking - check jaws for deformation.
- Where swivel jaws are fitted, ensure they are free to rotate.
- Operate adjusting bar, ensuring it is straight, functioning correctly and threads are not worn or stretched.
- Examine female screwed spigots (in each clamp half) and ensure they are not deformed due to over / under tightening of clamps on the beam.
- Ensure "Tommy bar" handle is not bent or otherwise damaged, and moves freely.

Positioning of Beam Clamps

Where possible, position the beam clamps on a beam directly above the load to be lifted to avoid or minimize any angular loading.

Hand tighten the clamp onto the beam by means of the Tommy bar ensuring it has seated correctly.

Never use an extension pipe on the Tommy bar as over tightening puts undue pressure on the clamp



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knuckles which may result in the clamp failing.

Under tightening results in the load being transferred to clamp knuckles and can also result in the clamp failing.

ALWAYS:

- Ensure the correct clamp is selected to suit the beam and the weight of the load to be lifted.
- Ensure the beam or structure from which the clamp is to be suspended is adequate for the loading.
- Ensure the associated lifting equipment is correctly seated in the suspension shackle.

NEVER:

- Subject the clamp to side loading in excess of the manufacturer's recommendation.
- Overload the clamp beyond its SWL.
- Throw or drop clamps onto the floor or deck.

BEAM TROLLEYS

Beam trolleys must only be used on beams specifically designed, tested and marked as runway beams.

Runway beams must be indicated with the Work Load Limit (WLL) and ID number. Color of the runway beam should be of a contrasting color to the rig structure

The beam must be level under all loading conditions to ensure the trolley will not run away under gravity.

Beam trolleys are normally, adjustable to suit a specific range of beam widths.

Adjustment is achieved either by means of a screwed adjusting bar (Figure 1) or by positioning of spacer washers on the load bar between the side plates (Figure 2).

There are two types of beam trolley available, push travel and geared travel.

Push travel trolleys are normally used for loads of up to 2 tons and movement is achieved by pushing against the load.

Geared travel trolleys are preferred when loads in excess of 2 tons are to be handled or accurate positioning of the load is required.

The SWL of the trolley must be adequate to take the load to be lifted plus the weight of the hoist, and the control lines (where fitted) which should be long enough to hang approximately 1.5ft/0.5m above the operating level.

Beam trolleys are designed for 'in-line' use only. The load must always be picked up, traveled and landed directly below the runway beam.

Pre-Use Examination

As with all lifting gear, ensure that the beam trolley is in a safe condition to operate. The following checks shall be made:

- The SWL is adequate for the total load.
- The color-coding where applicable is current and the trolley has an ID number.
- Examine side plates and check for wear, distortion and cracks.
- Examine wheels, axles, bearings, wheel flanges and drive sprocket of hand chain wheel shaft for alignment.
- If geared travel, check the condition of gear teeth on wheel and ensure the chain seats



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properly in the sprockets.

- Examine hand chain and hand chain wheel and ensure chain seats properly in the chain sprockets.
- Check hand chain guides are not deformed and are correctly positioned to ensure smooth feed of chain onto chain wheel.
- Examine load bars and check for deformation.
- Examine suspension plates, yokes and shackles for wear distortion or cracking.
- Where an adjustment screwed bar is fitted, check for straightness and examine threads for stretch or other damage and check function of locking device.
- Ensure both the female threaded knuckles mounted on the side plates are not damaged or deformed.

ALWAYS:

- Ensure the beam is clear of any obstructions and debris.
- Ensure the chains will not foul or snag during the operation.
- Ensure the hoisting unit is correctly seated in the suspension yoke.

NEVER:

- Subject the beam trolley to side loading.
- Overload the beam trolley.
- Throw or drop trolleys onto the floor or deck.

The following covers the installation and adjustment of beam trolleys to fit particular beams. Experienced personnel trained in beam trolley installation adjustment must only carry this out.

Where adjustment is by the use of space washers, measure the beam on which the trolley is to be fitted and while the trolley is still on the deck, transfer the spacer washers from the outside to the inside of the side plates, or vice versa, as required, to achieve the desired width setting.

Ensure that, between the side plates, the spacer washers are correctly positioned on the yoke or suspension plate(s) to ensure that the loads imposed are directly in line with the web of the beam

Remove one side plate, mount the trolley on the beam and reposition the side plate taking care to tighten all bolts and lock nuts. Should the trolley be of the screwed adjustment bar type, open out to just over the beam flange width, hook on one side of the trolley and close again until the desired width is attained.

Ensure the adjusting bar is locked when the trolley is correctly fitted.

Ensure that the clearance between the edge of the beam flange and the wheel flange is in accordance with manufacturer recommendations.

PLATE CLAMPS

Plate clamps are available in two basic designs.

Horizontal plate clamps used in pairs and usually suspended by a two-leg sling from a lifting beam for handling plates in the horizontal position only.

Universal plate clamps for handling plates in the vertical position.

Universal clamps can be used to lift from horizontal to vertical and vice-versa, but must never be used to transport plates horizontally.

HORIZONTAL CLAMPS

UNIVERSAL (VERTICAL) CLAMPS

Selection



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There are three main considerations when selecting plate clamps:

- Whether the plate are to be transported and stacked vertically or horizontally.
- The weight of the plates to be handled which will determine the SWL of the clamp to be used.
- The plate thicknesses, which will determine the correct size of clamp with, appropriate jaw opening.

Pre-Use Examination - General

The SWL is adequate for the load.

The color-coding where applicable is current and the clamp has an ID number.

Pre-Use Examination - Horizontal Clamps

Examine hook ring and look for wear or stretching in crown of link.

Check for lateral movement of hook ring on load bolt connection to serrated jaws and or rocker arms as excessive movement could indicate wear or distortion.

Check lateral movement of serrated jaws and or rocker arms on load bolt connection to main body as excessive movement could indicate wear or distortion.

Examine the serrations on the jaws or swivel toe and check for wear or distortion.

Where a toe is fitted, check for lateral movement of swivel toe on load bolt connection to rocker arms as excessive movement could indicate wear or distortion.

Pre-Use Examination - Vertical Clamps

Examine hook ring and check for wear or distortion in the crown of ring.

Ensure the hook ring is not too slack in the clamp as this could indicate internal wear.

Check operation of cam-assembly locking lever and jaw spring.

Examine serrated jaw and serrated pad and check for wear or distortion.

Examine main body shell and check for wear, cracks or distortion, which may affect the operation of internal components.

Fitting of the Clamp

To attach the universal clamps, unlock the movement cam jaw and push down the lifting ring to retract the moveable jaw.

Position the clamp over the edge of the plate and ensure the plate butts against the jaw stop.

When using two clamps to lift the plate, they must be suspended from a spreader beam to prevent the clamps being at an angle in excess of Manufacturers recommendations. (Usually 10 degrees).

Lock the jaw in the closed position and ensure the jaws have a firm bite on the plate.

ALWAYS:

- Check that the plate is clean and free from oil and grease.



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- Ensure that the jaws are locked.
- Use an adequate number of clamps to balance the load.
- Lift slowly to allow the jaws to obtain a good grip.
- Lower plate slowly to ensure clamp does not open on impact.

NEVER:

- Attach clamps to the side of the plate.

- Lift horizontally with a vertical clamp.
- Lift more than one plate at a time.
- Use large capacity clamps to lift light loads.
- Use endless slings with clamp pairs as this can overload the clamps.
- When using horizontal plate clamps, do not exceed the sling angles recommended by the manufacturer and do not lift more than one plate at a time.

SHEAVE BLOCKS

Sheave blocks are available in the form of single sheave blocks or multi-sheave blocks with a selection of head fittings, the most popular being swivel shackle or swivel oval eye.

The main function of a single sheave block is to change the direction of the hoisting or pulling rope. Multi-sheave blocks reduce the pull required on the lead rope to lift the load as the number of falls increases.

Sheave blocks of the snatch block variety must be designed to ensure that the side plate-securing bolt cannot be fully withdrawn.

Selection

The main consideration when selecting single sheave blocks is the load to be lifted and the resultant load on the head fitting. The load plus the line pull will be slightly greater than the load, due to friction in the sheaves. The resultant load increases as the angle between the ropes decreases.

Angular Pulls

R = Resultant (Head Load)



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W = Weight to be Lifted
P = Line pull (W + % for friction)

The percentage to be added for friction is generally accepted to be:

Sheaves with roller bearings - 4% per sheave i.e. $W \times 1.04$

Sheaves with bronze bushes - 8% per sheave i.e. $W \times 1.08$

Note: Only sheaves with roller bearings are to be used in the derrick.

To calculate the resultant load (R), firstly obtain the pull (P) by multiplying the load to be lifted (W) by 1.04 (bearing sheaves) or 1.08 (bushed sheaves), then multiply by the factors indicated in the table above according to the angle between the ropes.

When selecting multi-sheave blocks, you must consider the load to be lifted (W) plus the line pull capacity of the winch (P) which will dictate the number of sheaves or falls required to perform the lift. This will affect the resultant load (R) on the head fitting.

When using a single sheave block as a top block, the resultant load imposed on the structure to which you attach the block can be more than double the weight of the load being lifted.

W = Weight to be lifted

F = Friction

Pre-Use Examination

- The SWL is adequate for the total load.
- The block has an ID number mark and current color-coding where applicable.
- Examine sheaves for wear in the rope groove, cracks or distortion.
- Check sheave bearings and bushes for wear ensuring it operates smoothly.
- Examine swivel head fittings and check for wear.
- Examine upper load pin and spigots and check for wear.
- Examine head fitting check security of shank and nut and examine for stretch or distortion.
- Examine head fitting shackle or eye, checking for wear or cracking.
- Examine side plates or straps and check for distortion, wear or cracking.
- Ensure there are no sharp edges or burrs in the side plates, which may damage the wire rope.
- If fitted, examine becket and check for wear, stretch or cracking.
- Check all spacers and tie bolts ensuring they are not deformed.
- Using sheave gauge, check rope groove for compatibility with winch rope.

Installation

When attaching the sheave block to the support structure, ensure all split pins, locking and securing pins are in place. Should the block be a "snatch" block, ensure the side plate locking pin is replaced. Ensure the support structure is of adequate strength to support the resultant loading. Consult your Supervisor if in doubt.

Ensure the sheave block is correctly aligned with the lead rope to prevent the rope abrading on the side plates.

HYDRAULIC JACKS / RAMS



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Hydraulic lifting equipment is available in two basic formats:
Ram and cylinder with an integral pump unit.

Ram and pump set, which consists of a ram and cylinder with a remote pump unit, connected by a high-pressure hose.

Selection

When selecting equipment, the most important consideration is its 'capacity'.
The second consideration is the number of jacking positions and the distance between them.
Where more than one jack is in use there must be one operator per unit.
If rams with remote pumps units are used, the pumps can be used together or connected to a manifold and operated by one operator.
Certain jacks are fitted with a "CLAW" attachment, which is normally rated at 40% of the jack's capacity.
When using the claw attachment, remember to obtain a jack with a capacity at least 2.5 times the load to be fitted.
Ensure the claw attachment is the correct type for your particular model of jack.

To monitor the loading on the jacks or rams, they must be fitted with pressure gauges.
If load has to be held in position, jacks or rams must be fitted with locking collars.

As a further safety measure, a lock off safety valve can be fitted to the ram to maintain pressure in the event of a hose failure.

Pre-Use Examination

- Ensure jack or ram capacity is adequate for the load.
- Ensure Cylinder or jack has an ID number and current color coding where applicable.
- Examine body and couplings of cylinder or jack and check for impact damage, cracks or oil leaks.
- Operate cylinder or jack, pumping the ram to full stroke.
- Examine the ram and check for bellling, scoring and corrosion.
- If the ram is threaded externally and fitted with a locking collar, examine threads and check for wear.
- Examine seals and check for oil leaks.
- Ensure the ram goes down smoothly. Jerkiness could indicate distortion to the ram not visible to the eye and sponginess indicates air in the system, which will have to be bled.
- Examine all hoses and fittings and ensure they are not degraded, cut or in any way damaged.



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- With the ram in the lowered position check the oil level of the jack or pump unit.
- Function test the pump and ensure the valve does not leak when closed and under pressure.
- Where claw attachments are fitted examine for distortion or cracks.
- Where gauges are fitted, check for leaks, function test and ensure needle returns to zero.

Jacking Procedure

Jacks and rams must only be used on a strong base of sufficient area to distribute the load. When operating jacks on deck plates, spreader plates must be used to transfer the loading to deck support beams.

As the load is jacked up, packing must be put in place to safeguard against the jacks failing and similarly when lowering a load, the packing must be removed piece by piece (i.e. Jack stands or equivalent).

Unless jacks are fitted with locking collar a load must not be left supported solely by jacks or rams and packing must be left in position.

Wherever possible, use non-slip packing between the ram head and the load being raised.

ALWAYS:

- Check pressure rating of hoses, gauges and fittings ensuring jacks or rams are operated within rated capacity.
- Check oil capacity of pump before using jacking system ensuring all fittings are secure.
- Apply the jack or ram centrally under load.
- Fully support the base of the jack or ram to prevent unit overturning while pumping.
- Ensure jacks used with a claw attachment have an extended base.
- Open release valve slowly when lowering load.
- Fully retract ram before disconnecting hoses ensuring rams and pistons are kept clean.

NEVER:

- Work under a load supported solely by jacks.
- Use equipment if there are signs of oil leaking.
- Exceed 40% of the jack capacity when using claw attachments.
- Use a claw attachment unless the jack has an extended base.

WIRE ROPE SLINGS

Wire rope slings are by far the most commonly used slings as they are versatile and comparatively lightweight in relation to their strength. They can be made up as single leg or multi leg slings. Chain slings shall not be used for any application (See 2.6.03: Addendum to Rigging and Lifting Manual for European exceptions). Wire rope slings shall be used in every application where chain slings were previously used. Four leg slings must be connected with a quad link (two intermediate links and a master link).

SINGLE AND ENDLESS SLINGS

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MULTI-LEG SLINGS

Where wire rope slings are part of a permanent rigging arrangement the slings shall be fitted with thimbles as the strength of the sling is greatly reduced if the sling soft eye is supporting a load via a shackle pin or body.

With multi-leg slings, the SWL marked is applicable to working angles up to 90° included. Do NOT exceed this angle unless the sling has been rated and specifically marked for a greater angle.

When using single slings in pairs or endless slings, be aware of reductions in sling capacity due to angles and sling configurations.

When wire rope slings are fitted with hooks the only types permitted are the lockable 'closed' design. Application of the load closes the hooks and they will not release on 'no load' and their design is such that they do not snag on protrusions. The SWL's of wire rope slings shall be limited as follows:

- Single leg sling = SWL of one leg
- Double leg sling = SWL of one leg x 1.4
- Three and four leg slings = SWL of one leg x 2.1

There is no difference in SWL between three and four leg slings as for calculation purposes, it is assumed that two legs share 75% of the load, the third leg carries 25% and the fourth leg is redundant.

The strength of a wire rope is dependent on three factors:

- Diameter
- Construction - type of core
- Tensile strength of wire - 180 grade is standard for slings but crane ropes are often 200 / 210 grade or higher.

The construction of the wire rope is normally chosen to suit the specific application.

Wire ropes with a steel core are preferred for winch operations as they have a greater resistance to crushing and flattening on the drums, whereas both steel core and fiber core wire are suitable for sling manufacture.

6 x 36 6 x 19

MORE FLEXIBLE

LESS FLEXIBLE

LESS RESISTANT TO WEAR

MORE RESISTANT TO WEAR

Pre-Use Examination

- Prior to using any sling, the following checks shall be made:
- SWL is adequate for the load and is clearly marked.
- Color-coding is current and the sling has an ID number.
- Examine each sling and check for wear, corrosion, abrasion, mechanical damage and broken wires.



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- Ferrule must be free from cracks or other deformities.
- Examine each thimble and check for correct fitting, snagging damage and elongation.
- Examine wire rope around thimbles as it is often abraded due to sling being dragged over rough surfaces.
- If fitted, examine master link or quadruple assembly and check for wear corrosion and cracking.
- If fitted with hooks, check for wear corrosion and cracking and ensure safety latch functions correctly.
- Ensure SWL is clearly indicated on the sling.

Transit Slings

Transit Slings are not color-coded and are used to move equipment from the shorebase to the rig. On the rig, the Transit Slings must be removed and either used for immediate backload, in a like for like manner or stored in a secure quarantine area. Transit Slings must not be re-used for slinging equipment to be lifted around the rig (i.e. general rig use).

SYNTHETIC FIBER SLINGS

The use of synthetic fiber slings (including nylon) is not permitted unless approved by the Division Manager in writing for each occasion (e.g. running chrome tubing with synthetic fiber slings over 2 days is one occasion)

A critical lift permit is required to use synthetic fiber slings. The risk assessment part of the permit should address:

- Justification why steel slings can't be used;
- The compatibility of the sling with the intended load
- Verification of certification and integrity of the slings
- Completion of the synthetic fiber sling checklist (See appendix III)

If one of the checks is answered with yes, i.e. 'ticked', the sling shall be removed from service and destroyed immediately

All synthetic fiber slings shall be properly stored (cool, dry and dark) under lock and key in a secure quarantine area until a Critical Lift permit approves their issue and intended use.

Synthetic fiber sling types:

TYPE LIFTING MODES

With soft becketed eyes Multi-purpose

With 'D' links Straight or basket lifts

With 'D' link and reeveable link Straight, basket and choke lifts

Endless (Flat webbing) Multi-purpose

Generally the width of a web sling governs the SWL.

When selecting the type of fiber sling, you must consider the lifting mode as this affects the capacity of the sling. To calculate the capacity of the sling, the SWL should be multiplied by the mode factor 'M'. Webbing / Round Slings (Fibre Slings)

Vertical

M = 1.0

Choker



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M = 0.8 Basket
 M = 2.0 Basket 90°
 M = 1.4 Basket 120°
 M = 1.0

Multiple the SWL of one leg by the Mode Factor – M to obtain the SWL of the configuration.

For general use, soft eye and endless slings are more suitable due to their versatility but if slings are going to be in constant use it is preferable to use slings with 'D' links which are more wear resistant.

Pre-Use Examination

- Prior to using fiber slings they should be visually examined along their entire length and the following checks made:
- The SWL of the sling is adequate for the load to be lifted.
- The color coding (where applicable) is current and the sling has an ID number.
- Cuts, tears, chaffing or burst stitching shall not be present.
- Check for signs of chemical or heat damage and ingress of foreign bodies into the fibers.
- Distortion or wear in the metal eyes where fitted.
- Fiber round slings shall not be used due to inability to inspect the core.
- Hand-made fiber slings shall not be used.
- Great care must be taken to avoid positioning the slings around sharp edges, which could cut or tear the sling when the load is raised.

Always use packing around sharp edges

WORK BASKETS

General

A critical Lift Permits must be raised and a Job Safety Analysis (JSA) completed prior to commencing operations involving the use of Work Baskets.

The JSA must cover the work requirements, including a check on the work area for any possible obstructions and should involve those personnel who are to be carrying out the work.

All crewmembers involved must be fully briefed prior to commencing the work and during subsequent shift handovers.

Only certified Work Baskets are to be used and the Crane Operator must check the condition of the Work Basket prior to commencing the work and at subsequent shift handovers.

Work Baskets must be fitted with an internal handrail bar and a external bumper bar to prevent personnel being caught between Work Basket and Rig structure.

Where Work Baskets are fitted with a door / gate this must always open inwards and be fitted with a secure latch mechanism.

The Crane Operator must also ensure all applicable crane safety devices (ie. positive locking latch secured) are operating effectively prior to raising personnel in the Work Basket.

Communication must be established prior to and maintained throughout the operation. A radio shall



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be made available in the Work Basket; however hand signals shall remain the primary means of communication.

Crane Operator must always acknowledge instructions from the person flagging prior to repositioning Work Basket.

Tools and equipment must be properly secured inside the Work Basket and no loads are to be attached to the Work Basket as it is raised or lowered.

When a person is required to perform work from a workbasket the following methods of fall protection shall be utilized:

While over a solid surface (i.e., deck, land, etc.)

Prior to placing the basket in motion a full body harness and shock absorbing lanyard shall be utilized to connect the full body harness to the basket.

Once the basket reaches the intended work area and is no longer in motion fall protection shall be achieved by connecting a full body harness to a Self Retracting Lifeline or shock absorbing lanyard.

The fall protection utilized shall be attached to an anchor point on a fixed structure independent of the basket.

Prior to transferring from one method of fall protection to the other (SRL or lanyard) ensure that the alternate method is in place thereby ensuring "100% tie-off". Never use a lanyard in combination with a Self Retracting Lifeline.

While over water

Reference Working Over Water (HSE_7400.0)

Never attach a safety harness to the basket while over water.

Crane Operations

When suspended in Work Baskets over the side of the Rig, personnel must wear life vests. Refer to HSE_7400.0 Working Over Water".

Where the Work Basket is out of sight of the Crane Operator a stand-by man must be positioned at a point where he can maintain visual contact with the personnel in the Work Basket.

If working over the Rig the affected area below must be barriered off with a PA announcement being made and repeated as necessary to inform personnel of ongoing operations.

Operations involving the use of Work Baskets must be kept under constant review and should weather conditions deteriorate the operation must be halted and re- assessed to determine whether it is safe to continue.

Rig Floor

Work Baskets in use on the rig floor shall only be hoisted by the rig's dedicated load limited man-riding winches. " See HSE_7465.0: Man -riding

All work basket operations on the rig floor shall be treated as a man-riding operation following man-riding policies and procedures listed below.

Only Borr Drilling approve derrick baskets shall be used for man riding operations above the rig floor.

SHACKLES

The two types of shackles most commonly used are the anchor (Bow) shackle and the chain (Dee) shackle both of which are available with screw pin or safety pin.



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BOW SHACKLES

DEE SHACKLES

Screw pin Safety type Screw pin Safety type
Anchor shackle anchor shackle chain shackle chain shackle
Selection

Safety type shackles shall be used on all permanent type installations and/or static loads. Note: Screw pin type shackles shall only be used for lifting operations at the OIM/Rig Managers discretion. Shackles must be selected to suit the load being lifted allowing for any increased loading due to sling angles.

The hole diameter and the thickness of the material of the lifting eye will often govern the dimensions of the shackle.

The selection between Bow type and Dee type will depend on the number of components being connected.

TWO COMPONENTSTHREE OR MORE COMPONENTS

When used, safety pins shall be of the split pin or R-clip type.

Pre-Use Examination

- The SWL of the shackle is adequate for the load being lifted.
- The color-coding is current and the shackle has an ID number.
- Remove shackles pin and examine for wear, deformation and cracking.
- Ensure it is the correct pin for the shackle. Never separate shackles and pins.
- Check pin threads for wear or deformation.
- Examine shackle body for deformation and cracking and check for wear in the crown and pinholes.
- Check alignment of pinholes and ensure the pin fits correctly.
- In the case of safety pin shackles, ensure split pins / 'R Clips' are installed prior to making a lift.

Always center the load on the shackle pin to avoid angular pulls against the leg of the shackle.

Packing

Hook

Poor Practice

Good Practice

Avoid using the shackle in such a manner that movement of the load rope could unscrew the shackle pin.

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Only use the original shackle pin. Never replace a shackle pin. If any part of the shackle is damaged or deformed, discard immediately.

Crosby is the preferred make of Shackles

Never use any object to "lock" a shackle pin in place that is not designed to do so (i.e. a welding rod). Any time it is deemed necessary to lock a shackle pin in place a safety type anchor shackle shall be used with the proper locking device installed rather than a screw pin shackle.

EYEBOLTS

Eyebolts are available in three basic configurations namely dynamo, collar and collar with link.

DYNAMO

COLLAR

COLLAR WITH LINK

Dynamo eyebolts are not to be used for angular pull. Angular pulls will bend the screwed shank and lead to failure.

Dynamo eyebolts are often factory installed on electric motors to transport the motor during various stages of production. The eyebolts are supposed to be removed prior to leaving the factory but are sometimes missed. Never lift an electric motor with an eyebolt, always wrap it with slings unless it has certified lift points installed.

Selection

The three main considerations when selecting eyebolts are:

- The weight of the load being lifted.
- The number of eyebolts sharing the load, and
- Whether or not an inclined loading will be effected.

VERTICAL LOADING

INCLINED LOADING

The choice between collar eyebolts and eyebolts with links should be made in accordance with angle of lift, as the percentage reduction in SWL varies as the lift angle increases.

Lift angle 0° vertical - collar eyebolts are rated 60% higher than eyebolts with links.

Lift angle up to 15° - both eyebolts have the same rating.

Lift angle up to 30° - eyebolts with links are rated 28% higher than collar eyebolts.

Lift angles up to 45° - eyebolts with links are rated 56% higher than collar eyebolts.

0° Up to 15°

Use Collar Eyebolt

Over 15°

Use either eyebolt

Use eyebolt with link

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If equipment is supplied with certified integral eyebolts or lifting eyes, they must be removed and stored for later use and the sockets should be protected. The eyebolt socket must be re-examined prior to reuse of eyebolts.

Pre-Use Examination

- The SWL of the eyebolt is adequate for the load being lifted.
 - The eyebolt has an ID number and the color-coding where applicable is current.
 - Examine threads of eyebolt and socket checking for wear, stretch or impact damage. The threads must be complete and full.
 - The threads must be concentric and fit neatly in a standard nut. If stretch is suspected, a thread gauge should be used to confirm the condition.
 - Examine the eye of the bolt and check for wear, stretch or distortion and look for hairline cracks at the crown of the rings. This also applies to the link, if fitted.
 - Check squareness of the shank against the shoulder.
 - Eyebolts must always be loaded in the same plane as the eye and never against the plane of the eye.
-
- Eyebolts shall always be screwed down tight so that the collar is in full contact with the surface of the item being lifted.
 - When lifting with a pair of eyebolts always use a two-leg sling. Never use a sling in a basket format as this can drastically overload the eyebolts.
-
- As an alternative to eyebolts, hoist rings may be used. The design of these hoist rings is such that they can be constructed as swiveling, pivoting or collar eyebolts.

Their two main advantages are that:

1. They will swivel to the correct orientation with no requirement for packing with shim washers.
2. They pivot to suit the sling angle between 0° and 90° and do NOT require being de-rated.

As with collar eyebolts, ensure the bushing flange is in full 360° contact with the surface of the load.

Tighten the bolt in accordance with the appropriate torque value.

TURNBUCKLES

Turnbuckles can be obtained with various types and combinations of end fittings, the most popular being the “Jaw and Eye” type.

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Selection

The first consideration when selecting turnbuckles is the SWL. (Refer to manufacturer literature)
The second consideration is the adjustability or 'take-up' of the turnbuckle.

Pre-Use Examination

- Prior to using a turnbuckle, visually examine it and ensure that:
- The SWL of the turnbuckle is adequate for the load being placed on the turnbuckle.
- The turnbuckle has an ID number and the color code where applicable is current.
- The threads are free from wear, stretch and impact damage.
- The eyes / hooks are not worn or stretched.
- The clevis pin and pinholes are free from distortion or wear.
- The threads are suitably lubricated.

Turnbuckles must always have the threaded shank protruding into the body to ensure that the load is borne over the correct length of the threaded shank.

Closed body turnbuckles shall not be used.

When using a turnbuckle in an application where vibration is present it is extremely important to lock the end fittings to the frame or body to prevent them from unscrewing and possibly releasing the load. The most popular and preferred method is to wire the eye or jaw to the body or alternatively a split pin has to be removed to facilitate adjustment. Only lock wire designed for such use shall be used. Should lock nuts be used, care must be taken not to over tighten them as this can put undue stress on the threaded shank.

PREFERRED ACCEPTABLE

CAUTION REQUIRED

When turnbuckles are to be left under load for any length of time they should be visually checked on a daily basis to ensure they are still secure.

WIRE ROPE CLAMPS / GRIPS

There are various wire rope clamps / grips available for terminating a rope 'in situ', the three most common being:

Fist Grips (Efficiency - 80%).

Eureka Wirelocks

Bulldog Grips (Efficiency - 100%).



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(Efficiency - 80%).

Fist Grip

Eureka Clamp

Bulldog Grip

Note: Wire rope clamps/grips shall never be used to manufacture winch lines or lifting slings.

In general rigging situations the use of any clamps / grips for terminating ropes in lifting or pulling applications is forbidden. They may only be used in 'dead ending' situations when terminating a wire rope in situ.

Fist Grips

When using fist grips they can be fitted to the rope either way as both halves have a saddle.

The quantity required increases with the rope diameter and the torque value increases with the bolt diameter.

The distance between grips should be six rope diameters.

Fist Grip Table

NOMINAL ROPE DIAMETER (INCHES)	MINIMUM NUMBER OF FIST GRIPS		REQUIRED TORQUE
	Nm	lb. ft.	
3/16 - 1/4	2	40.7	30
5/16	2	40.7	30
3/8	2	61	45
7/16	2	88	65
1/2	3	88	65
9/16	3	176.3	130
5/8	3	176.3	130
3/4	3	305	225
7/8	4	305	225
1	5	305	225
1 1/8	5	488	360
1 1/4	6	488	360
1 3/8	6	678	500
1 1/2	7	678	500

The tightening torque values shown above are based upon the threads being clean, dry and free from lubrication.

Eureka Wirelocks

When using Eureka Wirelocks only one needs to be fitted to make a termination.

They must be fitted as shown below either way on the rope and the bolts tightened in accordance with the torque values indicated in the table below.

The bolts supplied with the wirelocks are of a high quality to meet the torque values and should



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NEVER be replaced with standard bolts. Always tighten using a torque wrench.

Eureka Wirelock Table

DIAMETER OF ROPE (MM)		BOLTS		REQUIRED TORQUE
NO.	MM	Nm	lb. ft.	
5	2	5	5.8	4.3
6	2	6	14.6	10.8
8	2	6	17.8	13.1
10	2	8	29.4	21.7
11	2	8	29.4	21.7
13	2	10	68.6	50.6
14	2	10	68.6	50.6
16	2	12	112.8	83.2
18	4	12	112.8	83.2
19	4	12	112.8	83.2
20	4	16	276.6	204
22	4	16	276.6	204
24	4	20	540	398
26	4	20	540	398

The tightening torque's quoted in the table apply to the threads having been greased.

Bulldog Grips

There is a right way and a wrong way to fit bulldog grips as pictured below.

Note: Wire rope clamps/grips shall never be used to manufacture winch lines or lifting slings.

The saddle must always be fitted to the 'live' part of the rope.

The distance between grips should be six rope diameters.

The quantity of grips required increases with the diameter of the rope. See table below for both quantity and relevant torque values.

Bulldog Grip Table

SIZE NOMINAL ROPE DIAMETER (MM)		MINIMUM NUMBER OF WIRE ROPE GRIPS		REQUIRED TORQUE
		Nm	lb. ft.	
5	3	2.0	1.5	
6.5	3	3.5	2.6	
8	4	6.0	4.4	
10	4	9.0	6.6	
13	4	33.0	24	
16	4	49.0	36	
19	4	68.0	50	



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22	5	107	79
26	5	147	108
30	6	212	156
34	6	296	218
40	6	363	268

Bulldog grips applied in accordance with the above table will have an efficiency of 80%; i.e. they will maintain their grip for up to 80% of the breaking load of a single part of the wire rope.

For intermediate nominal diameters of rope, the next largest grip size should be used.

The nominal size 5 grip should only be used on a 5mm nominal diameter rope.

For 11mm diameter rope, use four 10mm nominal grips with a tightening torque of 14 Nm (10.3 lb.ft.).

The tightening torques quoted in the table apply to the threads and bearing surfaces of the nuts having been greased.

During assembly, and before the rope is taken into service, the nuts must be tightened to the prescribed torque. After application of the load, the torque must be re-checked and, if necessary, corrected. This action should be repeated within 24 hours of installation.

Further periodic checking and re-torqueing of the nuts is essential during service, preferably more frequently during the early stages of operation to ensure that a satisfactory terminal efficiency is being maintained.

SLINGING GUIDELINES

These are general guidelines, the majority of which are pertinent to all types of slings.

Whichever type of sling you are using, refer to the previous relevant section for additional information.

Storage

Whenever possible, all slings should be stored in a warm dry atmosphere either coiled or hanging on purpose made racks.

Slings Tubulars

One of the most common lifting operations in offshore activities is the handling of tubulars.

When used to handle bundles of tubulars, slings must be positioned approximately 25% in from either end.

The slings must always be double wrapped with a choke hitch and if possible do not cross over the wires on the underside of the bundle.

When the sling is tightened on the load, a bulldog grip and tie wrap must be fitted to prevent the eye of the sling from slipping over the bulldog should the bundle loosen in transit.

Load should remain resting on deck while bulldog grips are fitted.

Slings Tubulars



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Single wrap slings must not be used to pull tubulars together prior to fitting double wrap slings.

Double wrap slings must always be installed directly when bundling tubulars.

Refer to Appendix 1 – Load Charts which give guidance on maximum number of pipes per bundle.

Note: Appendix 1 shall be used as a guide only. When possible, tubulars shall be bundled in odd amounts in order to ensure the tightest possible bundle is achieved.

Slings are subjected to stresses, which reduce their SWL when choked, lifted at angles, etc.

Therefore, when slinging tubulars, and other similar loads, each sling must have a SWL of at least the gross weight of the load.

Personnel must stand well clear when the crane takes tension on bundles of tubulars, and also when the crane slacks off, as tubulars may roll or move unexpectedly.

Where bundles of tubulars are stacked in a pipe rack, ends of slings must be left in such a way that they can be easily retrieved when bundles have to be removed from pipe bay for backloading.

ALWAYS:

- Ensure crane boom tip is directly over bundle of tubulars.
- Prepare landing site to enable the bundles to be landed without crushing the slings.
- When stacking tubulars, insert spacers to prevent damage.

NEVER:

- Sling tubulars of different diameters or combinations of tubulars and bar as in both cases the smaller items will slip out.
- Tighten the choke by hammering, as this will increase the effective sling angle thus weakening the sling.
- Pull jammed slings free using the crane; (instead position the load to where the slings can be easily freed by hand.)

- Stack other equipment on top of bundles of tubulars as they may slip and injure personnel.

Sling Angles

When lifting with multi-leg slings, they are rated at a certain load from 00 to 900 and this SWL must never be exceeded.

When using single slings in pairs always be aware of the increased loading in the slings when lifting at an angle.



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The SWL of a pair of single (slings) decreases as the angle between them increases.

Examples

If both slings are vertical with no angle between them (0°) there is no reduction in the SWL, i.e. 2 slings each with a SWL of 1 ton can be used to lift a load of 2 tons.

If the angle between the 2 slings is between 0° and 90° each sling SWL is reduced to a factor of 0.7, i.e. 2 slings each with a SWL of 1 ton can be used to lift a load of 1.4 tons.

If the angle between the 2 slings is between 90° and 120° each slings SWL is reduced by a factor of 0.5. I.e. 2 slings each with a SWL of 1 ton can be used to lift a load of 1 ton.

Always consider the variation in sling capacity when slinging in various configurations.

Mode Factor (M)

Straight pull:	Choke hitch:	Basket hitch	Basket hitch
M = 1	Max. 90°	parallel	
M = 0.8		M = 1.4	M = 2.0

Two-legged sling	Four-legged sling
Max. 90°	Max. 90°
M = 1.4	M = 2.1

Multiply the SWL of one leg by the Mode Factor – M to obtain the SWL of the configuration.

Protection of Slings / Loads

Irrespective of the sling construction - it is imperative to avoid bending the sling around sharp corners or edges. This will severely weaken the sling and often result in sling failure. Suitable packing must be used to prevent this situation arising.

As well as protecting the slings, certain loads may need protection from the slings.

Timber packing in most cases is suitable where fiber slings cannot be used.

HANDLING BARRELS

All barrels shall only be transported by Borr Drilling approved barrel lifting devices.

Barrel lifting devices shall be designated specifically for lifting barrels and shall have no other use.

Choke slings or synthetic fiber slings shall not be used to lift barrels.

Before using barrel lifting devices, ensure they are in good condition and the barrel is of sound construction. Before the lift continues, ensure the lifting equipment is correctly located and held in position until it is under slight tension. Once tension is achieved in the rigging, move away from the load to a safe location.



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Mechanical handling aids should be used where possible to move barrels, however, if it is necessary to manhandle barrels a short distance always use correct kinetic handling technique and never attempt to manhandle barrels up or down stairways.

CONTAINERS, TANKS, ETC.

Containers, tanks and similar equipment are offloaded onto installation decks and are likely to be moved at a later date. Congestion may become a problem and potentially hazardous situations can be created if the deck loading is not handled properly – cargo baskets are considered containers (i.e. sub handling baskets.)

When placing containers and other loads on the decks, never get into a position where you can become trapped by the load if the unexpected were to occur and stand clear before containers, etc., are lifted from the deck.

When handling containers, the flagger must have clear communication, either visual or via radio with the crane operator at all times. The flagger must position himself to ensure he has clear sight of his assistants at all times and must not become involved in landing or handling the load.

Double stacking of containers is not permitted on a Borr Drilling installation. Exemption to this are empty mud (cutting) skips and Nitrogen tanks (Jack-Up only) if adhered to the following requirements:

- o Skips / containers are designed for double stacking
- o Maximum deck load is not exceeded
- o Lifting bridals are of sufficient length. No working at height
- o A Written approval from the Division Manager is obtained for each occasion

Only get on top of loads to hook them on if absolutely necessary. If you have to get on top of a load use a ladder ensuring it is held securely in place by another crewmember. Always use proper fall protection when working at heights of 6ft/1.8m or more above the deck.

Check condition of hatch covers and grating on the top of equipment prior to climbing onto it.

Ensure there are no loose objects on top of containers and similar equipment which is about to be lifted by crane.

Ensure the lifting assembly is not twisted and the shackles are correctly positioned before allowing the lift to continue.

Container doors must always be closed after use to prevent the possibility of personnel being injured should a gust of wind cause them to swing round suddenly.

If you see containers or tanks leaking, inform your Supervisor immediately and take suitable precautions, as the leaking substance may be hazardous.

Never land or store a container or any other object on top of tubulars.

Pre-Use Examination

- As with all other lifting equipment, containers must be visually examined prior to loading and the following checks made:
 - Ensure the overall structure is sound and there are no signs of mechanical damage.
 - Check the function of the door locking mechanism and ensure the doors close and lock without having to apply undue force.
 - Check that the sling assembly is of the correct length for the size of the container and of an adequate SWL.
 - Ensure the sling assembly is not twisted and is long enough to ensure the angle between slings does not exceed 90°.
 - If the container is of the open top design, ensure all drainage holes are free from blockage.
 - Before loading or unloading cargo boxes with hinged lids, ensure that the lid is secured in



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place by a lock bar or other suitable positive restraint.

Loading

When loading a container, plan where the relevant items are to be placed to evenly distribute the load and minimize possible transit damage should the items become loose.

Where the actual weights of individual items are unknown, they should be weighed and manifested as they are loaded to ensure the SWL of the container is not exceeded.

If contents have to be loaded and unloaded manually, keep height of contents to a reasonable level which will allow safe handling.

Always use correct manual handling techniques when loading or unloading containers by hand.

It is essential that the contents of closed containers are properly secured as a major cause of cargo handling incidents are loads falling out when the doors are opened. Ropes or nets may not be adequate as the contents of the container will move during transit slackening ropes and bursting nets allowing contents to fall against container doors. Where possible, contents should be packed on a pallet and secured in position by banding.

When loading containers pay particular attention not to mix substances which when combined could become hazardous to those who unload the container.

Any items with sharp edges or protrusions should be made safe by packing or other suitable means before handling and loading into containers.

Do not allow items to protrude over the side or be in a position where they are liable to roll or fall from open top containers.

Supervisors must ensure container doors are correctly secured prior to making the lift. If the container is to be backloaded ensure the latch mechanism is secured in place.

Unloading

When unloading the containers with the forklift follow the procedures for Forklift Vehicles; know the weight and position of the container contents.

Before opening the doors on containers find out what is inside and what precautions should be taken to handle the contents, wearing suitable PPE as required.

When opening the doors of the container do so carefully ensuring you are in such a position that the door will not strike you should the contents be resting against the doors.

Stack materials in an orderly fashion to prevent them from toppling over. Leave walkways and exits clear. Do not block emergency equipment and walkways with containers.

HANDLING RIG FLOOR EQUIPMENT

Transferring equipment to and from the rig floor must be a coordinated effort between deck and rig floor crews.

Crossover subs and or special tools and equipment must be moved to the catwalk using the crane.

Lifting equipment must have an adequate clearly marked SWL, be certified for use, color coded where appropriate, and be in good condition to ensure the tubulars or equipment can be handled safely.

Beware of places that might pinch personnel or equipment. e.g. jars, bumper subs, loaded scabbards, slips, elevators etc.

When moving slips with a crane, the sling must be passed through pad eyes where provided, or if



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necessary through all of the slip handles.

Ensure loads do not snag when being lifted from baskets or off the deck and ensure personnel do not trap hands when loading equipment into baskets.

Extreme caution must be exercised when power equipment is being removed from or put onto the rig floor. They have many pinch points and personnel must only grasp the proper handles when assisting to move them.

Personnel must ensure slings are, and remain tight, on the load prior to them being lifted from the rig floor by winch or crane. Particular attention must be given to slick assemblies, which are being lifted to or from the rig floor.

Personnel must never stand in a position where they may be trapped as equipment is lifted clear of or lifted onto the rig floor or V-door ramp.

FORKLIFTS

Only authorized certified personnel are permitted to operate forklifts and they must only be operated within the designated areas (Certification shall include a written and operational test).

Only authorized personnel are to carry out maintenance on forklifts.

Pre-Use Examination

- Prior to operating forklift it is the Operator's duty to carry out a visual check on the forklift to ensure it is in a safe condition. The following checks should be made:
 - Examine forks and ensure they are not bent or damaged.
 - Ensure lateral locks on the forks are working.
 - Examine lifting chains and check for worn / damaged links. Ensure the lifting chain anchors are secure.
 - Check lift and tilt rams and hydraulic hoses for leaks.
 - Check the condition of tires and ensure wheel nuts are tight.
 - Check condition of operators protection frame or cab.
 - Check all lifting functions - hoist, lower, tilt sideshift, etc.
 - Check steering, footbrake and handbrake.
 - Ensure all other safety devices are working effectively.
 - Specific installation procedures for starting forklifts must be followed.
 - Where electric forklifts are in use, specific procedures for re-charging them must be followed.
 - Before attempting any lift establish the weight and center of gravity of the load.
 - This must be checked against the capacity chart on the forklift to ensure it has the capacity to lift the load.
 - The SWL of the forklift must never be exceeded.
 - When using fork attachments and fork extensions the SWL must be de-rated accordingly.
 - Forklifts must always be parked with the fork tips on the ground.
 - Therefore, before moving off, you must tilt back the forks and raise the mast to give clearance for forward travel.
 - Adjust the distance between the forks to the maximum that the load can accommodate or to suit the fork pockets if fitted and approach the load with forks low and parallel to the ground.
 - Drive toward the load until it is almost against the back face of the forks then stop, raise the forks to take the load and tilt back to stabilize.
 - Travel with the load as low as possible ensuring your line of vision is not impaired and should your vision be impaired due to a high or bulky load, have a colleague guide you.

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ALWAYS:

- Work within the capacity of the forklift.
- Look behind you to ensure all is clear before reversing.
- Check your mast height if driving through doorways.

NEVER:

- Allow other personnel to ride on the forklift or load.
- Operate the forklift while the overhead protective frame is removed.
- Leave the forklift running while not in use. The handbrake must be applied if the forklift is left unattended.
- Stack materials where walkways or emergency exists will be blocked.

Forklifts must be fitted with a suitable warning device to alert personnel working in the surrounding area that the forklift is in operation. A JSA will determine whether it is necessary to erect barriers around the area in which the forklift is operating.

Pallets

Many materials brought offshore are on wooden pallets that vary in design and strength and are constructed to suit specific tasks.

Pallets must only be used for the purpose for which they are designed and materials must never be loaded onto the wrong type of pallet.

Pallets must be inspected for damage and wear before use, and must never be used if in poor condition.

Pallets must be stacked only in designated storage areas, and only if the top of the preceding pallet load provides a firm base.

Empty pallets must not be left in the stack as this not only wastes valuable space but also reduces the stability of the pallets stacked above them.

The height of stacks must take account of the load-bearing characteristics of the pallets and the materials stacked, and must never exceed the maximum height specified for the particular installation.

Material, including other pallets, must never be stacked on top of pallets containing plastic drums. This applies to both full and empty plastic drums.

Exercise extreme caution when moving towards container and reversing back from container, taking into account the possibility of other personnel walking into the danger area.

When loading or unloading containers ensure the mast does not come into contact with the container.

Stacking with a Forklift

When stacking loads, drive as close to the stack as possible and apply brakes before raising the load.

Once the load is raised to the desired height, drive forward slowly until the load is above the stack.

Apply brakes, tilt the mast forward until it is vertical and lower the load onto the stack.

Reverse out slowly ensuring the load is stable and the forks are free.

Lower the forks to travel height before moving off.

Stacking Loads

Pallets are not to be stacked any more than two high!

1. Approach stack and stop.
2. Reduce tilt before raising load to desired height.



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3. Drive forward slowly.
4. Tilt mast until vertical and place load.
5. Reverse out slowly.
6. Lower forks and travel with mast vertical.

Removing Loads from a Stack

Pallets are not to be stacked any more than two high!

PADEYES

All lifting padeyes used on Borr Drilling rigs shall conform to the following standards and use requirements

Standards:

All padeyes shall be constructed of AH-36 steel with yield strength of 51 KSI or greater (in cold regions use ABS-DH/EH/FH-36 steel with yield strength of 51 KSI or greater).

Padeyes shall be positioned so that all loads will be in the plane of the padeye. Do not apply side loads.

All welds on padeyes require NDT. Welds on padeyes with a standard working load of 25T or greater require Volumetric NDE.

All newly installed padeyes shall undergo N.D.T. prior to use. Load testing shall be to 150% of SWL (as a minimum) with MPI to take place post load test.

Load testing of padeyes shall be to 150% of SWL

Use Requirements:

Wire ropes used in lifting should be rated at 5 times the standard working load of the padeye.

Lifting lugs used through the padeye shall have a safety factor of 3 or greater.

Use only approved shackles on Borr Drilling rigs.

Padeyes shall not be fabricated on the rig. For construction details of new padeyes refer to Borr Drilling Structural Guidelines

All padeyes shall be prefabricated and shall have supporting design calculations and appropriate certificates.

Never:

- Use a padeye that appears to be bent
- Use a padeye that appears to have slag or burn marks on or around the eye.
- Use a padeye that appears to have been rough flame cut (i.e. home made).
- Exceed the design parameters of a padeye.
- Side load a padeye.

Always:

- Ensure that the padeyes certification is current.
- Verify the SWL of the padeye, which should be clearly marked near the padeye.



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- Check to ensure the Color Code if applicable is evident and current.
- Use the correct size of shackle to avoid high stress due to point loading.
- Verify the integrity of the entire rigging prior to loading the padeye.

General Padeye Notes

Padeyes shall be drilled where tight tolerances are designated.

This includes Padeyes with attached boss plates.

The padeye holes may be "controlled burned" in a fabricating shop where tight tolerances are not required. This process or any other similar process where tight tolerances can not be achieved, shall be subject to the following conditions:

The holes must be free of sharp edges (of a smooth texture when touched). Chamfer as required and as noted on the above referenced standard drawing.

Removal of more than 1/16 inches of material is not allowed. Strict compliance is mandatory to ensure structural integrity.

HANDLING FLEXIBLE INTERMEDIATE BULK CONTAINERS (FIBC's)

Storage of FIBCs and liners should be kept clean and stored undercover in such a manner that accidental damage, exposure to sunlight and extreme climatic conditions are avoided.

Filling FIBCs are preferably filled with the base of the bag supported by the ground or a pallet, and the body of the bag supported by the top lift device.

Stability of filled FIBCs; when filled, the ratio of the height of the bag to the width/diameter of the bag should not be greater than 2:1. The stability of the bags could be improved by vibration during or after filling.

When lifting FIBCs with a fork lift truck, be sure that the fork lift lines are spaced correctly. All lifting loops, sleeves, or other lifting devices should be vertical, so that no lateral forces will be created in the FIBC. Be sure that the lifting loops are not twisted. Fork lift lines should have rounded edges and/or protective covers. FIBCs should be raised or lowered smoothly.

When horizontal carrying with fork lift truck, the fork lift truck must be suitable for the load to be carried. The FIBC should be held close to the mast and as low as possible with the mast tilted slightly backwards. Make sure that the FIBC body will not be damaged by the wheels of the truck. The load should not restrict the view of the driver.

Note: FIBCs must not be dragged. The truck should be brought to a stop before the FIBC is raised or lowered.

Handling with cranes or hoists, the hooks, spreader bars or other devices used for lifting, should have rounded edges and / or protective covers. Borr Drilling requires the use of safety hooks with an integrated safety latch to prevent the hook from accidentally slipping off the loop. Hooks should have a sufficiently large radius to prevent squeezing the loop.

Note: when the FIBC is suspended, the loops must be vertical, without twists or knots.

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To right an FIBC that has toppled on its side, a nylon strap shall be placed through all the lifting loops. Any attempt to lift the FIBC using fewer loops than those provided, may result in the loops being torn off.

FIBCs are usually emptied by gravity, but can also be emptied by suction. When emptying by gravity through a bottom discharge spout, the rate of discharge can be controlled by restricting the outlet. Flow can be stopped by lowering the FIBC onto the discharged load. FIBCs with a plain/solid bottom can be emptied by cutting the base of the bag. Again, the flow can be stopped by lowering the bag onto the discharged load.

No one should stand under an FIBC during discharge. A bottom discharge spout should be opened only when the FIBC is suspended over a safety support that will prevent injury to the operator in the event of a failure of the lifting device. Under no circumstances should anyone stand underneath a suspended FIBC; or place their arm beneath an unsupported FIBC.

When stacking filled FIBCs two or higher, every effort should be made to ensure that the stack is stable. Where possible, the stack must be formed against at least two retaining walls, preferably three, to achieve maximum stability. Generally, the higher the stack, the greater the number of retaining walls required. Where only free stacking is possible, a pyramid method should be used. FIBCs should not be pushed into a stack as this can cause damage to the sides or back of the FIBC.

If FIBCs are stored outside, attention should be paid to the top closure. Be sure the top closure is properly tied off. FIBCs should be covered with waterproof, U.V. protected material to avoid water collecting on the top of the FIBC and to prevent damage from sunlight. Be sure that FIBCs are not standing in water.

FIBC Do's & Don'ts:

Do

Don't

- Do observe the handling instructions on the label.
- Do check that the discharge spout is closed off before filling.
- Do ensure that the filled FIBC is stable.
- Do close the top inlet correctly.
- Do inflate the liner prior to filling.
- Do take appropriate measures in regard to dust control.
- Do use lifting gear of sufficient capacity to take the suspended load.
- Do ensure that the edges of the fork lift lines are smooth, or protected.



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Do adjust fork lift tines to the correct width for the FIBC being handled
Do keep the fork lift tines on the fork lift level.
Do ensure that crane hooks are of adequate size and well rounded.
Do consider the possibility and effects of static electricity.
Do protect the FIBCs from rain and prolonged sunlight.
Do ensure that FIBCs are adequately secured in transportation.
Do dispose of FIBCs in accordance with ecological requirements.

Don't exceed the Safe Working Load under any circumstance.
Don't fill FIBCs unevenly.
Don't stop or start suddenly during transportation.
Don't subject FIBCs to sudden lifts or stops.
Don't allow personnel under a suspended FIBC.
Don't allow the FIBC to project over the side of a vehicle or pallet.
Don't tilt the mast of the fork lift forward.
Don't withdraw fork lift tines prior to relieving the entire load on the lifting device.
Don't stack FIBCs unless sure of stabilities.

APPENDIX I

The number of tubulars per bundle is based on the maximum that can be safely lifted using 3.5 ton slings or, where appropriate, 6 ton slings.
This is based on the SWL of each sling in use being at least equal to the maximum total weight of the bundle.
As double wrapped slings have to be directly installed when bundling tubulars, the particular slings in use may not be long enough to allow the maximum number to be bundled; therefore, the actual number will have to be reduced accordingly.

Refer to the following charts for detailed information:
LOAD CHART I

NOTE: SWL OF SLING USED MUST BE EQUAL TO OR GREATER THAN THE VALUES BELOW.

Rigging and Lifting Procedure		
COR-PRO-0713	Corporate - Marine Operations	Ver: 3
Owner: Marine Manager		Approver: Chief Operating Officer

* Maximum considered to be practical.

LOAD CHART II

NOTE: SWL OF SLING USED MUST BE EQUAL TO OR GREATER THAN THE VALUES BELOW.

TUBULAR CARGO BUNDLES : IN TONS (2000 LB) (Contd.)
 DRILL COLLAR AVERAGE LENGTHS 31ft. (9.44m)

Description

Range Lbs. per foot including tool joint Weight of joint in lbs. Maximum No. per bundle
 Weight of bundle in tons

Each Sling

31/8"	1 1/4"	22.0	683.5	9	3.1	SWL 3.5 Tons
4 3/4"	2 1/4"	47.0	1460.2	4	2.93	SWL 3.5 Tons

6 1/4"

2 3/4"

84.0

2609.4

4 2.61

5.22 SWL 3.5 Tons

SWL 6 Tons

6 1/2"

1 1/2"

107.0

3324 1

3 1.67

5.00 SWL 3.5 Tons

SWL 6 Tons

6 3/4"

1 1/2"

116.0



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Rigging and Lifting Procedure		
COR-PRO-0713	Corporate - Marine Operations	Ver: 3
Owner: Marine Manager		Approver: Chief Operating Officer

3603.5 1
3 1.80
5.4 SWL 3.5 Tons
SWL 6 Tons

8"
213/16"
150
4659.7 1
2 2.33
2.46 SWL 3.5 Tons
SWL 6 Tons

8½"
3¼"
165.0
5125.8 1
2 2.57
5.13 SWL 3.5 Tons
SWL 6 Tons

9"
3"
192.0
5964.6 1
1 2.99
2.99 SWL 3.5 Tons
SWL 6 Tons
9½" 3½" 209.0 6492.7 1
1 3.25
3.25 SWL 3.5 Tons
SWL 6 Tons

FOR GUIDANCE ONLY

LOAD CHART III

NOTE: SWL OF SLING USED MUST BE EQUAL TO OR GREATER THAN THE VALUES BELOW.

Rigging and Lifting Procedure		
COR-PRO-0713	Corporate - Marine Operations	Ver: 3
Owner: Marine Manager		Approver: Chief Operating Officer

* Maximum considered to be practical.

LOAD CHART IV

NOTE: SWL OF SLING USED MUST BE EQUAL TO OR GREATER THAN THE VALUES BELOW.

TUBULAR CARGO BUNDLES : IN TONS (2000 LB) (Contd.)

LINER / CASING - AVERAGE LENGTHS 40ft. (12.31m)

Description	Range	Lbs. per foot	Weight of joint in lb.	Maximum No. per bundle	Weight of bundle in tons	Each Sling
7" N80 NEW VAM	3	29.0	1162.5	5		
9		2.91				
5.24		SWL 3.5 Tons				
SWL 6 Tons						
7" SM155G VAM	3	29.0	1162.5	5		
9		2.91				
5.24		SWL 3.5 Tons				
SWL 6 Tons						
7" N80 VAM	3	29.0	1162.5	5		
9		2.91				
5.24		SWL 3.5 Tons				
SWL 6 Tons						
7" L80 NEW VAM	3	29.0	1162.5	5		
9		2.91				
5.24		SWL 3.5 Tons				
SWL 6 Tons						
75/8" L80 FL4S	3	29.7	1190.5	5		
9		2.98				
5.36		SWL 3.5 Tons				
SWL 6 Tons						
75/8" N80 FL4S	3	39.0	1563.3	4		
7		3.13				
5.47		SWL 3.5 Tons				
SWL 6 Tons						
95/8" L80 NEW VAM	3	43.5	1743.7	3		



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Rigging and Lifting Procedure		
COR-PRO-0713	Corporate - Marine Operations	Ver: 3
Owner: Marine Manager		Approver: Chief Operating Officer

6 2.62
 5.24 SWL 3.5 Tons
 SWL 6 Tons
 95/8" P110 NEW VAM 3 43.5 1743.7 3
 6 2.62
 5.24 SWL 3.5 Tons
 SWL 6 Tons
 95/8" P110 VAM 3 47.0 1883.9 3
 5 2.83
 4.71 SWL 3.5 Tons
 SWL 6 Tons
 95/8" N80 VAM 3 47.0 1883.9 3
 5 2.83
 4.71 SWL 3.5 Tons
 SWL 6 Tons
 95/ " L80 NEW VAM
 8 3 47.0 1883.9 3
 5 2.83
 4.71 SWL 3.5 Tons
 SWL 6 Tons
 95/8" N80 BUTT 3 47.0 1883.9 3
 5 2.83
 4.71 SWL 3.5 Tons
 SWL 6 Tons
 95/8" SM155G VAM 3 53.5 2144.5 3
 5 3.22
 5.36 SWL 3.5 Tons
 SWL 6 Tons
 95/ " XT155 NEW
 8
 VAM 3 53.5 2144.5 3
 5 3.22
 5.36 SWL 3.5 Tons
 SWL 6 Tons

FOR GUIDANCE ONLY

LOAD CHART V

NOTE: SWL OF SLING USED MUST BE EQUAL TO OR GREATER THAN THE VALUES BELOW.

TUBULAR CARGO BUNDLES : IN TONS (2000 LB) (Contd.)

CASING - AVERAGE LENGTH 40ft. (12.31m)

Description	Range	Lbs.per foot	Weight of joint in lb.	Max No.per bundle	Weight of bundle in tons
Each Sling					
10¾" L80 NEW VAM	3	55.5	2224.7	2	
4 2.23					
4.46 SWL 3.5 Tons					
SWL 6 Tons					



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Rigging and Lifting Procedure		
COR-PRO-0713	Corporate - Marine Operations	Ver: 3
Owner: Marine Manager		Approver: Chief Operating Officer

133/8 " K55 BUTT
 3 54.5 2184.6 3
 5 3.28
 5.46 SWL 3.5 Tons
 SWL 6 Tons
 133/8" N80 BUTT 3 68.0 2725.8 2
 4 2.73
 5.46 SWL 3.5 Tons
 SWL 6 Tons
 133/8" K55 BUTT 3 68.0 2725.8 2
 4 2.73
 5.46 SWL 3.5 Tons
 SWL 6 Tons
 133/8" SM155G 3 72.0 2886.1 2
 3 2.89
 4.34 SWL 3.5 Tons
 SWL 6 Tons
 133/8" P110 BUTT
 3 72.0 2886.1 2
 3 2.89
 4.34 SWL 3.5 Tons
 SWL 6 Tons
 133/8" N80 BUTT 3 72.0 2886.1 2
 3 2.89
 4.34 SWL 3.5 Tons
 SWL 6 Tons
 133/8" P110 NEW VAM 3 72.0 2886.1 2
 3 2.89
 4.34 SWL 3.5 Tons
 SWL 6 Tons
 16" K55 BUTT 3 75.0 3006.3 2
 3 3.01
 4.51 SWL 3.5 Tons
 SWL 6 Tons
 185/8" J55 NEW VAM3 87.5 3507.4 1
 3 1.76
 5.26 SWL 3.5 Tons
 SWL 6 Tons
 185/8" K55 BUTT 3 87.5 3507.4 1
 3 1.76
 5.26
 2.25 SWL 3.5 Tons
 SWL 6 Tons
 185/ " P110 BIG
 8
 OMEGA 3 112.0 2036.4 1
 2 2.25



Rigging and Lifting Procedure		
COR-PRO-0713	Corporate - Marine Operations	Ver: 3
Owner: Marine Manager		Approver: Chief Operating Officer

4.49 SWL 3.5 Tons

SWL 6 Tons

20" X58 RLAS 3 113.0 2054.5 1

2 2.26

4.54 SWL 3.5 Tons

SWL 6 Tons

FOR GUIDANCE ONLY

APPENDIX II

GUIDELINES FOR FLAGGERS

- Hand signals should always be used as the primary means of communication between the crane operator and the flagger and radios as our secondary.
- Ensure that both he and the Crane Operator are familiar with the signals to be used.
- NEVER become involved in handling the load.
- Use enough assistants to safely handle the load.
- If using hand signals, stand in a position where the load is clearly visible at all times and the Crane Operator can clearly see him.
- Ensure his assistants are always in sight, never allowing them to go to the blind side of the load where neither he nor the Crane Operator can see them.
- Be aware of the wind speed and direction, sea-state and any other environmental conditions that may affect the lift.
- Be familiar with the line capacities of the crane and know the weight of all loads.
- Check that the lifting gear being used is in good condition, certified for use, correctly color coded and of sufficient capacity to carry out the lift.
- When handling tubular check that there is not an excessive number in the bundle and thus that the SWL of the slings is not exceeded.
- Ensure that taglines are attached to all loads.
- Be aware of any obstructions, or other activities, within the crane's radius and working area.
- Check that the area around the load to be lifted is clear and that the load is not attached to the deck, transportation cradle or adjacent equipment.
- Make it clear to the Crane Operator, and the assistants, where the load has to be moved to and landed.
- Ensure that he and his assistants never position themselves where they could become trapped should the unexpected occur.
- Ensure he and his assistants stand well clear before instructing the crane operator to take the strain and likewise when the crane operator is about to slack off tension, after landing the load. Assistants must be outside a basket when lifting a load in or out of the basket.
- When lifting awkward loads, stop the lift just clear of the deck to check balance and security of the load (Unless this practice may introduce extra risk such as when making lifts on a boat).
- Warn other personnel in the area to stay clear during the movement of the load.
- Stop the lift immediately if anything occurs which could affect the safe completion of the operation.

เอกสารแนบที่ 53

ตัวอย่างแผนการยก (Lifting Plan)

Lift Plan

COR-FRM-0582	Corporate - Marine Operations	Ver: 1
Owner: Marine Manager		Approver: Chief Operating Officer

Rig / Installation		Location	
References			
Lift Plan No.		Procedures Ref.	
Risk Assessment No.		Drawing(s) Ref.	
Permit-to Work No.			
Weight of Load (Assessed)			
Description of Lifting Operation			
Classification: (Routine / Non-routine / Complex)			
Routine			
Non-routine			
Complex			
Communications			
Communication Available	<input type="checkbox"/>	Primary (Hand Signals)	<input type="checkbox"/> Secondary (VHF Radio)
Communication Checks	<input type="checkbox"/>	Primary Checked	<input type="checkbox"/> Secondary Checked
Step-by-Step Details of Lifting Operations		(Person Responsible)	
Sketch / Drawing Detailing the Rigging Up of the Lifting Equipment and Lifting Accessories (If sketch / drawing is too large – specify “refer to sketch / drawing attached”)			
Lifting Equipment and Lifting Accessories to be Used (Specify type and SWL)			
Debrief and Learning Points (Did the lifting operation go as planned or are changes to the Lift Plan required?)			
Approvals	Print Name	Signature	Date
Competent Person			
Lift Supervisor(s)			

Lift Plan		
COR-FRM-0582	Corporate - Marine Operations	Ver: 1
Owner: Marine Manager		Approver: Chief Operating Officer

LIFT PLAN (Sketch / Drawing Example)

Rig / Installation		Lift Plan No.	
Sketch / Drawing Detailing the Rigging Up of the Lifting Equipment and Lifting Accessories (If sketch / drawing is too large – specify “refer to sketch / drawing attached”)			

เอกสารแนบที่ 54

ตัวอย่างเอกสารการตรวจสอบปิ่นจั่น อุปกรณ์ที่ใช้ยก และสายเคเบิล

Hoisting and Lifting Equipment Inspections

2.6.09 | Rev. 02 | (26-Aug-2018)

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1 Introduction

1.1 *Intent*

The purpose of this procedure is to describe the method and co-ordination of Lifting and Hoisting equipment inspections.

1.2 *Scope*

This procedure applies to all Borr Drilling mobile drilling units.

1.3 *Responsibility*

SVP of Operations is responsible for the content of this document and it is approved by the Regional Director.

Hoisting and Lifting Equipment Inspections

2.6.09 | Rev. 02 | (26-Aug-2018)

The Barge Engineer / RMS is responsible for:-

- Overall coordination of Hoisting and Lifting Equipment inspections and maintenance activities.
- Administration of Hoisting and Lifting Equipment, relative Certificates, inspection reports and documentation.
- Reviewing inspections are performed as per area of operation specific Borr Drilling Standard Inspection Interval Matrix.

The third party competent person, or body performing Hoisting and Lifting Equipment inspections, is responsible for ensuring: -

- the inspectors are certified as competent.
- Inspections are performed as per Borr Drilling and local legislative requirements.
- All inspection results are forwarded to Borr Drilling in requested format.

The Technical Superintendent is responsible for: -

- Assessing and suggesting preferred competent third-party hoisting and lifting equipment inspectors or bodies.
- Monitoring overall quality and consistency of third party inspections performed on hoisting and lifting equipment.

2 Procedures

Borr Drilling performs in-house inspections and maintenance activities, as well as regular independent inspections by competent third parties, on its hoisting and lifting equipment.

Hoisting and lifting equipment are to be examined to recognized standards and codes, including cranes.

Independent third-party hoisting and lifting equipment inspections (referred to as “third party lifting equipment inspection”) are performed on a 6 monthly interval basis, to ensure the hoisting and lifting equipment is fit for purpose as per Borr Drilling and Statutory requirements.

The rig's line management will indicate when third party lifting equipment inspections are due.

The Superintendent will assess, indicate and arrange the competent third party lifting equipment inspection persons and bodies to use and overall work scope.

The Barge Engineer / RMS will co-ordinate and indicate specific work scope on the rig to the third party.

Hoisting and Lifting Equipment Inspections

2.6.09 | Rev. 02 | (26-Aug-2018)

Requirements for the third party lifting equipment inspection persons and bodies are described in the Dropped Objects - Hoisting and Lifting Equipment - Statement of Requirements.

The third party will perform its activities according to this SOR.

Maintenance Reporting System will generate Work Orders indicating specific inspections and testing to be performed on set intervals on hoisting equipment and selected lifting equipment.

The Barge Engineer / RMS will co-ordinate execution and closure of these tasks.

The Barge Engineer / RMS will ensure Certificates and inspection reports are filed according to 4.3.06 – Administration Management.

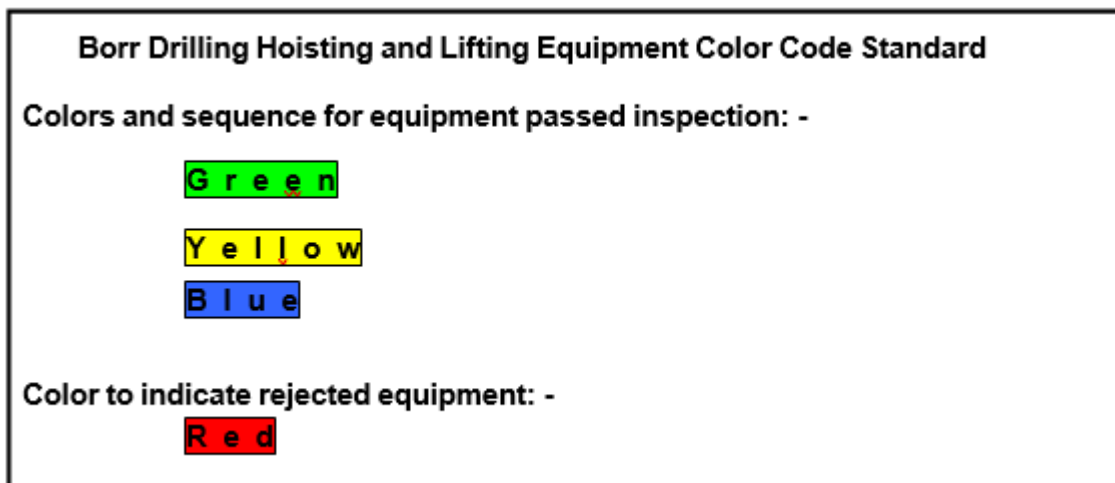
The Barge Engineer / RMS will ensure registers, including applicable certificates, are held on all hoisting and lifting equipment received and commissioned on the rig from the day of the previous third party lifting equipment inspection.

The Barge Engineer / RMS will ensure all hoisting and lifting equipment is properly and clearly identified and registered.

The Barge Engineer / RMS will ensure equipment is available for inspection (collection, etc., as required) and arrange required labor for cleaning, disassembly and preparation of equipment, or access to equipment. This will ensure that the assigned third party is effectively and efficiently used.

The third party lifting equipment inspection persons and bodies, will inspect and examine all hoisting and lifting equipment as per work scope, and upon completion: -

- Record findings.
- Color code the equipment as per Borr Drillings color code scheme.



As applicable, hoisting, lifting and other equipment can be sealed after last third party inspection. When the equipment is properly stored, protected from the environment and possible damage and

Hoisting and Lifting Equipment Inspections

2.6.09 | Rev. 02 | (26-Aug-2018)

deterioration, the inspection does not have to be performed when the equipment has not been used since last inspection.

Rejected equipment can be repaired, or scrapped. Equipment to be repaired:

The Barge Engineer / RMS will ensure that for all equipment requiring repair, Work Orders are raised against the specific equipment in Maintenance Reporting System for tracking and recording purposes, and ensure the repairs are performed.

Equipment to be scrapped:

The Barge Engineer / RMS will ensure equipment to be scrapped is immediately taken out of service, or removal is tracked via raising and closing Work Orders.

The third party lifting equipment inspection persons and bodies will provide, at the end of its inspection, a final report including:

- Register of all hoisting and lifting equipment inspected / examined.
- Register of outstanding defaults found.
- Test and examination certificates or reports.


Attachments

None

Reference Documents

- Dropped Objects - Hoisting and Lifting Equipment - Statement of Requirements.
- Borr Drillings area specific hoisting and lifting inspection interval matrix.
- Maintenance Reporting System Work Order data.
- Filed Certificates, overhaul reports or inspection reports.

Revision Log

Rev.	Date	Brief description of changes	Author	Owner	Approver	Signature (approver)
02	26-Aug-2018	Migration to Borr Template	Perf. Engineer	SVP Ops	Regional Director	

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เอกสารแนบที่ 55

ตัวอย่างเอกสารขั้นตอนการจัดการ Loading/Discharging of Base Oil/OBM/SBM

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322	Skald - Misc. Marine Operations	Ver: 1
Owner: Barge Engineer	Approver: Rig Manager	

Task Information

Safety and Environment Critical Element (SECE) involved or impacted?		No	Permit Required?	Yes/No	Isolation Required?	Yes/No
Task Location	Main Deck Port Side or Starboard side		Minimum Level of Supervision	Barge Engineer		
Personnel Required						
Equipment Required	Crane Hands Free Tools Keys Loading Hose Portable VHF/UHF Radios Sounding Tape					
PPE Required <i>(in addition to the basic PPE)</i>	Basic PPE requirement					
Pre-job Preparations	Hold pre-job safety meeting, toolbox talk, review Work Instruction. Correct configuration of hoses, to be verified. Correct float collar configuration, to be verified. A breakaway coupling shall be put into the hose configuration. The breakaway coupling is designed in such a way that it will only break apart if the pull is along the horizontal axis of the hose. The position of the coupling will be in such a way, that a straight pull can be obtained regardless of the position of the vessel.					

Step-by-Step Hazard Analysis

Hazards <i>(To be considered but not limited to)</i>							<div>Pre-job Review</div> <div><i>(Filled in during toolbox talk)</i></div>	
Motion – e.g.: equipment movements, body movements			Pressure – e.g.: hydraulic lines, compressed gas					
Mechanical – e.g.: rotating equipment, stored energy			Temperature – e.g.: work areas and surface temperatures					
Chemical – e.g.: reactive chemicals, toxic			Gravity – e.g.: dropped objects, trips, and falls					
Biological – e.g.: insects, blood borne pathogens, viruses			Radiation – e.g.: welding arcs, sun burns, NORM					
Noise – e.g.: High noise levels			Electrical – e.g.: potential electrical energy				Date:	
							Time:	
Step No.	Task Steps	Hazards and Hazard Effects	Initial Risk	Control Measures	Responsible	Residual Risk	Changes in Hazards, Risks	Changes to Control Measure
			L/M/H			L/M/H		

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322

Skald - Misc. Marine Operations

Ver: 1

Owner: Barge Engineer

Approver: Rig Manager

	Break down task into sequential steps.	What could cause harm in this step? For each step list all applicable hazards and describe who could be affected and how? Each hazard to be stated in a separate row.	Risk level before control	How is the risk controlled?	Position responsible for the controls?	Risk level after control	Change to risk at the time of toolbox talk (if any)?	Change required to controls (if any)?
1	INSPECTION - Lift the hose fully and visually inspects the hose for any defects i.e. chafing, cracking or any signs of wear and tear.	Drop object Pinch Point Struck By - Equipment failure leading to dropped objects, Potential crush injuries to hands and head if struck by hose.	L	Hose inspected by personnel while under drops protection at loading station. Correct PPE for the task, Impact gloves require.	Deckpusher Roustabout	L		
2	Check the couplings (is it the correct color code for Base Oil?).	Contamination - Cross contamination of products.	L	Hose to be visually traced from hose end to valve, valve closed and padlocked, and only correct key issued under PTW.	Deckpusher Roustabout	L		
3	Check the float collars are properly mounted and are in the correct position.	Drop object Struck By Equipment Damage - Potential for dropped object and Hose section in the water has the potential to be dragged to the supply vessel propulsion system.	L	Each Float to be checked during the hose inspection.	Deckpusher Roustabout	L		

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322	Skald - Misc. Marine Operations	Ver: 1
Owner: Barge Engineer		Approver: Rig Manager

4	Check TODO/ Avery Hardol coupling is free to operate.	Uncontrolled release - Potential for spills / leakage to vessel deck and overboard.	L	Dry break couplings to be in good condition and inspected before and after deployment.	Deckpusher Roustabout	L		
5	After the visual inspection, using the crane pick the hose up and lower it to sea level (safety precautions).	Drop object Struck By - Equipment failure leading to dropped objects, Potential crush injuries to hands and head if struck by hose.	L	Hose inspected by personnel while under drops protection at loading station. Correct PPE for the task, Impact gloves require.	Deckpusher Roustabout	L		
6	Establish communications between all personnel involved in the task.	Poor Communication - Inability to stop the operations due to communications failure	L	Communication should be done by the use of VHF CH 6 Radios and all areas should have a good reception between Barge, Crane Op, and the Pumpman Radio traffic monitored by radio operator.	Barge Engineer Crane Operator Pumpman	L		

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322	Skald - Misc. Marine Operations	Ver: 1
Owner: Barge Engineer		Approver: Rig Manager

7	Unlock the loading valve (keep closed)	Contamination - Product cross contamination by incorrect valve line up	L	Key for loading valve kept in OIM office. When the permit was issued the key for the manifold should have been drawn.	Barge Engineer	L		
8	Verify volumes and capacities of product and tanks, Complete loading plan. Confirm with vessel captain volume, who calls the planned stop, complete Hydrocarbon transfer checklist (Borr) and vessel transfer checklist (vessel)	Uncontrolled release - Over filling of tanks leading to spills and structural damage of compartments	L	The Barge Master will have already confirmed the amount of product to be taken to those involved in the task including the Supply Boat. Manual soundings to be taken of product tanks taken before loading commences.	Barge Engineer	L		
9	The crane op will lower the hose down to the supply boat and when the supply vessel.	Collision Struck by - Collision points on the rig structure, hand and body injury if struck by the hose / components.	L	Hands free lifting method to be used when hose handling, all personnel clear of potential drops.	Crane Operator Deckpusher Roustabout	L		

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322	Skald - Misc. Marine Operations	Ver: 1
Owner: Barge Engineer	Approver: Rig Manager	

				Crane operator and standby watchman to observe the hose during the transfer of the hose to monitor for any potential hang offs that may cause damage to the h				
10	Vessel to Connect hose on the vessel.	Uncontrolled release - Potential for spills and leaks.	M	Rig team to observe, manifold valve to be kept closed during connection. Vessel crew to have environmental spill kits ready for immediate use	Barge Engineer Crane Operator Vessel Crew	L		
11	Open the required valves in the room for Base oil and open the required manifold valve at loading station	Uncontrolled release - Uncontrolled release of product, cross contamination of product.	L	Ensure manifold loading valve at opposite side loading station is closed and locked.	Barge Engineer Deckpusher Roustabout	L		
12	Once the lineup for the system has been confirmed the supply	Uncontrolled release	L	A dedicated watchman to be positioned	Barge Engineer Deckpusher	L		

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322	Skald - Misc. Marine Operations	Ver: 1
Owner: Barge Engineer	Approver: Rig Manager	

	vessel may commence the transfer.	- Uncontrolled release of product to the sea, vessel and deck.		at the take on manifold keep a close watch on the take on hose whilst Base Oil is being bunkered just in case a leak appears whilst the transfer of Base Oil is taking place. He should also have good Radio Communicatio	Roustabout			
13	Barge engineer confirm that he has the system lined up and ready to receive Base Oil into the correct tank and also have a copy of the COSSH/MSDS sheet with him for the fluid that is being bunkered.	Contamination Uncontrolled release - Incorrect line up, cross contamination of product, overfilling of tanks	L	Radio check prior to commencing task step	Barge Engineer Deckpusher Roustabout	L		
14	A base oil sample will be taken at the take on manifold as soon as the supply boat starts the transfer of Base Oil. This will be handed to mud engineer for testing.	Uncontrolled release - Uncontrolled release of product to the deck at the loading station	L	Deck drain valves closed to overboard. Environmental spill kits readily available.	Barge Engineer Deckpusher Roustabout	L		
15	The Barge Engineer is to monitor the levels in the Base oil in the tank that Base oil is being bunkered into at all times. As soon as bunkering starts, the Barge Engineer will confirm to the	Contamination Uncontrolled release - Incorrect line up, cross contamination of product, overfilling of tanks.	L	Manual soundings taken to confirm the product is being received	Barge Engineer	L		

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322	Skald - Misc. Marine Operations	Ver: 1
Owner: Barge Engineer	Approver: Rig Manager	

	vessel master that he is receiving Base oil to the correct tank.			to the correct tank, cross reference with Base oil tank levels on the VMS screen The Barge Engineer and standby watchman are not allowed to perform any other duties whilst taking on Base oil.				
16	On completion of taking on Base oil the Deckpusher shall inform the supply vessel to stop pumping, and the hose drained back to the supply vessel if possible.	Poor Communication Uncontrolled release - Loss in communications, over filling tank / over pressurizing of hose.	L	Radio operator to relay message in the event of radio failure by any other team member involved in the task.	Radio Operator	L		
17	Once the hose has been drained back it can be disconnected from the boat and lifted clear by the crane, if it was not possible to drain the hose it should be now lifted so it can gravity drain to the rigs tank.No prezurised air to be use to flush the line	Loss of containment Struck by - Loss of containment, potential for spills to vessel deck and over-side and presurized line.	L	Ensure no pressure is in the line, task steps to be carried out by competent person	Deckpusher	L		
18	Hoses shall be retrieved and stowed in the correct manner. All the valves double checked that they are closed and locked.	Contamination - Cross contamination due to incorrect line up during internal transfer	L	All valves to be lined up as per normal operation.	Barge Engineer	L		

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322	Skald - Misc. Marine Operations	Ver: 1
Owner: Barge Engineer		Approver: Rig Manager

	Loading valves to tanks realigned after transfer							
19	Complete all documentation, the permit shall be closed out and keys returned to the office.	Poor Communication - Communications breakdown. Lack of evidence / history of the loaded product	L	The Barge Master will file all bunkering notes and fill in the Oil Record Book as per MARPOL 73/78 requirements. Record of Sulphur content to be filed in barge office (delivery note)	Barge Engineer	L		
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
Photographs / Illustrations (If required)								
Step No.			Step No.					

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322	Skald - Misc. Marine Operations	Ver: 1
Owner: Barge Engineer		Approver: Rig Manager

Attachments / References (To be reviewed during toolbox talk)

--

Personnel Involved in Task (To be filled in during toolbox talk)

Team	Name	Position	Have you done this task before? Yes / No	Do you understand your tasks and responsibilities? Yes / No	Signature
Supervisor					
Team Member					
Team Member					
Team Member					

Debrief

Lessons learned, updates to work instructions (if any). Was Stop Work Authority exercised?

--

Supervisor confirms debrief has been conducted

Supervisor confirms work instruction will be revised to incorporate changes if required as per debrief

Signature:

Loading / Discharging of Base Oil, OBM, SBM

SKA-WIN-0322

Skald - Misc. Marine Operations

Ver: 1

Owner: Barge Engineer

Approver: Rig Manager

LIFE-SAVING RULES

Bypassing Safety Controls

Obtain authorisation before overriding or disabling safety controls



Line of Fire

Keep yourself and others out of the line of fire



Energy Isolation

Verify isolation and zero energy before work begins



Safe Mechanical Lifting

Plan lifting operations and control the area



Hot Work

Control flammables and ignition sources



Working at Height

Protect yourself against a fall when working at height.



Confined Space

Obtain authorization before entering a confined space



Work Authorisation

Work with a valid permit when required



Likelihood

RISK MATRIX

Consequence

		A	B	C	D	E
		Never heard of in industry	Heard of in industry	Happened in company or more than once per year in industry	Happened at the location or more than once per year in company	Happened more than once per year at the location
1	People: Slight injury (First Aid) or health effect Environment: Discharge of any Fluid 0 to 40 Litres Asset: NPT less than 1 hour/ Repair Cost upto \$25,000 Reputation: Limited Local Media	Low [1A]	Low [1B]	Low [1C]	Low [1D]	Low [1E]
2	People: Minor injury (Recordable) or health effect Environment: Discharge of any fluid > 40 and < 220 Litres Asset: NPT >1 hour upto 6 hours /Repair Cost > \$25000 and < \$100,000 Reputation: Some Local Media and / Or Political Interest	Low [2A]	Low [2B]	Low [2C]	Medium [2D]	Medium [2E]
3	People: Severe injury (LTI) or multiple minor injuries Environment: Discharge of any fluid > 220 and < 2200 litres Asset: NPT >6 Hours upto 7 Days/ Repair Cost > \$100,000 and < \$1,000,000 Reputation: Regional Interest	Low [3A]	Low [3B]	Medium [3C]	Medium [3D]	High [3E]
4	People: Permanent disability, death, or severe injury Environment: Discharge of any fluid >2200 to 11000 Litres Asset: NPT >7 days upto 28 Days / Repair Cost > \$1000,000 and < \$10,000,000 Reputation: National Attention	Low [4A]	Medium [4B]	Medium [4C]	High [4D]	High [4E]
5	People: Multiple deaths or permanent disabilities Environment: Discharge of any fluid > 11000 Litres Asset: NPT >28 Days / Repair Cost > \$10,000,000 Reputation: International Public Concern	Medium [5A]	High [5B]	High [5C]	High [5D]	High [5E]



STOP WORK AUTHORITY

Everybody on board, has the full authority and obligation to exercise STOP Work Authority (SWA) for any task that appears to be unsafe.

เอกสารแนบที่ 56

ตัวอย่างบันทึกปริมาณสารเคมี โคลนเจาะ น้ำใช้ และน้ำมันเชื้อเพลิงของแท่นเจาะ

Remaining On Board (ROB)

Material (Bulk)		Barite	Cement	Drill Water	POT Water	Fuel Oil	Base Oil	OBM (SDF)	Helifuel	Remark
Rig and Supply Boats		(MT)	(MT)	(M3)	(M3)	(M3)	(M3)	(bbl)	(Ltr)	
RIG SKALD	Capacity 100 %	440	300	1128	522	700	320	700	5000	EXPLORATION WELL (CWT-12A)
	Percentage	79%	77%	35%	%	31%	82%	0%	63%	48 M3 P-Water Rec'd from Rig Water Maker
	ROB Yesterday	349	230.6	411.0	383.0	230.0	263	0	3158	
	Rec'd				48					
	Used			14.0	34.0	14.0			4.00	
	Stock	349	230.6	397.00	397.0	216.0	263.0	0	3154	SLB Silica Blend CEMENT (SLB # 003 = 230.6 MT)
								2196 bbls		
SC BONGKOT On Hired 12 Jun 2021	ROB Yesterday	150	70	0	265	493.209	80	1200	0	SKALD>SKL
	Rec'd									
	Used				5	5.875				
	Discharge									
	Stock	150	70	0	260	487.334	80	1200	0	Silica Blend Cement (SLB B # 003 = 70 Mt)
								80 M3		
BEHTERA MAKMUR On Hired 12 Jun 2021	ROB Yesterday	0	70	0	226	421.810	160.0	0	0	SKALD
	Rec'd									
	Used				5	2.930				
	Discharge									
	Stock	0	70	0	221	418.880	160.0	0	0	Silica Blend Cement (SLB # 003 = 0 Mt)

เอกสารแนบที่ 57

ภาพถ่ายถึงเก็บอุปกรณ์ทำความสะอาดกรณีการหิ้วไหของสารเคมี

ภาพถ่ายถึงเก็บอุปกรณ์ทำความสะอาดกรณีการหกรั่วไหลของสารเคมี



เอกสารแนบที่ 58

ตัวอย่างรายการตรวจสภาพ อุปกรณ์ทำความสะอาดกรณีการหิ้วไหของสารเคมี และน้ำมัน



SKALD SPILL KITS

No.	Product	Location	Contents	Inspection date	Remark
1	Oil spill Kit (Large)	Rig Floor	Full contents		
				18-Dec-21	Top up and secured with easy-break cable tie.
2	Oil spill Kit (Large)	Port Loading Station	Full contents		
				18-Dec-21	Good, with small plastic tide
3	Oil spill Kit (Large)	STBD Loading Station	Full contents		
				18-Dec-21	Top up and secured with easy-break cable tie.
4	Oil spill Kit (Large)	Koomey Unit	Full contents		
				18-Dec-21	Good, with small plastic tide
5	Oil spill Kit (Small x 2, Large x 1)	Engine Room	Full contents		
				18-Dec-21	Good, with small plastic tide
6	Oil spill Kit (Large x 2)	Sackroom	Full contents		
				18-Dec-21	Good, with small plastic tide

เอกสารแนบที่ 59

ภาพถ่ายพื้นที่จัดเก็บน้ำมันชนิดต่างๆ บนแท่นเจาะ



เอกสารแนบที่ 60

ตัวอย่างรายงาน Drill Report



6.3.01 Emergency Drill Report

RIG NAME: **BORR SKALD** DATE: **5-Nov-21**
LOCATION: **CWT-12A** OIM: **Ross Boyle**

This report of emergency drills shall be completed weekly. A copy shall be retained on the rig. Please follow Division procedures for further forwarding of this form.

SCENE/TYPE

Fire Drill	Weekly	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		31-Oct-21

Environmental Drill	60 Days	Time
General Alarm Sounded / Time:		02:00 hrs.
General Alarm Ended / Time:		02:30 hrs.
Date of Last Drill:		5-Nov-21

Injured Personnel / Confined Space Rescue	60 Days	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		17-Oct-21

Ballast Control Drill	60 Days	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		6-Sep-21

Abandon Drill	Weekly	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		2-Nov-21

Man Overboard Drill	60 Days	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		25-Oct-21

Helicopter Drill	60 Days	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		27-Sep-21

Other (i.e. H2S, Collision, Etc.)	Time
General Alarm Sounded / Time:	
General Alarm Ended / Time:	
Date of Last Drill:	31-Oct-21

All contact makers and bells shall be checked periodically for proper operation. (Check two different stations and bells during each drill) General alarm contact maker activated/checked. Identify _____

Scenario : Spill at wire line logging unit.

02:00 hrs. - Drill Scenario: Simulated Spill at STBD cantilever at MPD Unit.
02:01 hrs. - Exercise Personnel found mud leak from MPD line manifold at STBD cantilever.
02:02 hrs. - Inform control room.
02:03 hrs. - B/E notify to ERT and proceed to STBD cantilever and call MPD engineer to verify a source of leaking
02:05 hrs. - MPD engineer informed rig floor to stop pumping the mud then rig floor confirmed mud pump shut down
02:06 hrs. - Simulated Mud stopped leaking from source.
02:08 hrs. - ERT on scene with Spill kit drum, Survey areas and Explain Spill Drill Procedure to team.
02:10 hrs. - ERT Exercise Emergency Team to control spill and cleaning the area
02:20 hrs. - Continue Exercise Spill Drill
02:30 hrs. - End of drill and debrief.

Response Teams

1st Response Team Leader: BE	Actions Performed: _____ On Scene Commander
2nd Response Team Leader: CO	Actions Performed: _____ Follow the instructed by OSC

Life Boats	FRC	Launched:	# 1	No	# 2	No	# 3	# 4	
Was Lifeboat roster checked by lifeboatman?		Lowered:	# 1	No	# 2	No	# 3	# 4	
Were provisions made for shut down of the Rig?			Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>			
Were any capsules/boats/rafts/or escape barges launched?			Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>			
Lifeboat or capsules engines started and run to check operation.			Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>			



Rev. 6 (21-Oct-14)
Page 1 of 1

เอกสารแนบที่ 61

รายละเอียดของแท่นเจาะ SKALD

Skald

Additional information please contact:

Borr Drilling Management DMCC
Level 28 Reef Tower, Cluster O
P.O. Box 36913
Jumeirah Lakes Towers, Dubai United Arab Emirates
+971-04-4487501

marketing@borrdrilling.com - www.borrdrilling.com

High Specification Jackup

General Description

Design / Generation Keppel FELS Super B 400 Bigfoot Class
Constructing Shipyard Keppel FELS
Year Entered Service / Significant Upgrades 2018
Classification..... ABS, A1 Self-elevating Drilling Unit
Flag Vanuatu
Overall Dimensions..... 246ft. long x 226ft. wide x 27ft. deep
Legs 3 x 517ft. long, triangular truss
Drafts 19ft load line draft
Accommodation 150 persons
Displacement..... 43,900 kips at loadline
Variable Deck..... 9,700 kips elevated / 5,500 kips field transit
Operating Water Depth 400ft
Maximum Drilling Depth 35,000ft

Drilling Equipment

Derrick Single NOV SSBN 1000, 170ft. high with 40ft. x 40ft. base.
Hookload Capacity 2,000,000 lbs. static hook load capacity.
Cantilever 75ft. reach, aft of transom, 15ft. port / 15ft. stbd. of Centerline.
Drawworks NOV SSGD 1000, 4 x AC motors 1,500hp each, 1.75" drilling line.
Rotary Table NOV 49-1/2" RST495-3G hydraulic and rated at 1,000st.
Top Drive NOV TDX-1000 modular, 1000st hoisting capacity, with dual AC motors, rated to 91,000ft-lbs. continuous drilling torque.
Tubular Handling HR111 Hydraracker, tubular range 3-1/2" to 14" Catwalk machine, 14,000 lbs SWL capable of handling up to 30" casing.
Mud Pumps 3 x NOV 14-P-220 rated to 2,200hp triplex pumps, each driven by 2 x Baylor AC traction motors.
HP Mud System Rated for 7,500psi.
Solids Control 4 x VSM shale shakers.

Power & Machinery

Main Power 5 x Caterpillar C175 diesel engines rated at 1,930 kW, each driving 1 x AC generator (each 1,833 kW (2,291kVA), 3-phase, 60Hz)
Emergency Power 1 x Caterpillar 3516B diesel engine rated 1889 kW, driving 1 x AC generator (1800kW (2,250kVA), 480V, 3-phase, 60Hz).
Power Distribution NOV/ABB VFD system.

Storage Capacities

Fuel Oil 5,553 bbls
Liquid Mud 4,200 bbls
Base Oil 2,015 bbls
Brine 2,180 bbls
Drill Water 7,100 bbls
Potable Water 3,200 bbls
Bulk Material (mud + cement) 16,000 cu.ft
Sack Storage 5,000 sacks

BOP & Well Control Equipment

BOP Rams 2 X NOV - Shaffer NXT 18 3/4" 15,000psi flan Double "U" type preventers.
BOP Annulars 1 x NOV Shaffer 18 3/4" 10,000psi annular preventer.
BOP Handling 4 x J.D. Neuhaus BOP handling hoists, each rated to 65st.
Diverter Drill Quip diverter 49-1/2" rated at 500psi with 16" flow line.

Mooring Equipment

Mooring Winches 4 x BROHL electric with a capacity of 2,500ft of 1- 3/4" wire rope. 30st pull capacity and 600kN holding capacity (first layer).
Anchor Lines 4 x 1-3/4" IWRC 6 x 36 galvanized wire rope.
Anchors 4 x Delta Flipper anchors rated at 5 MT.

Cranes

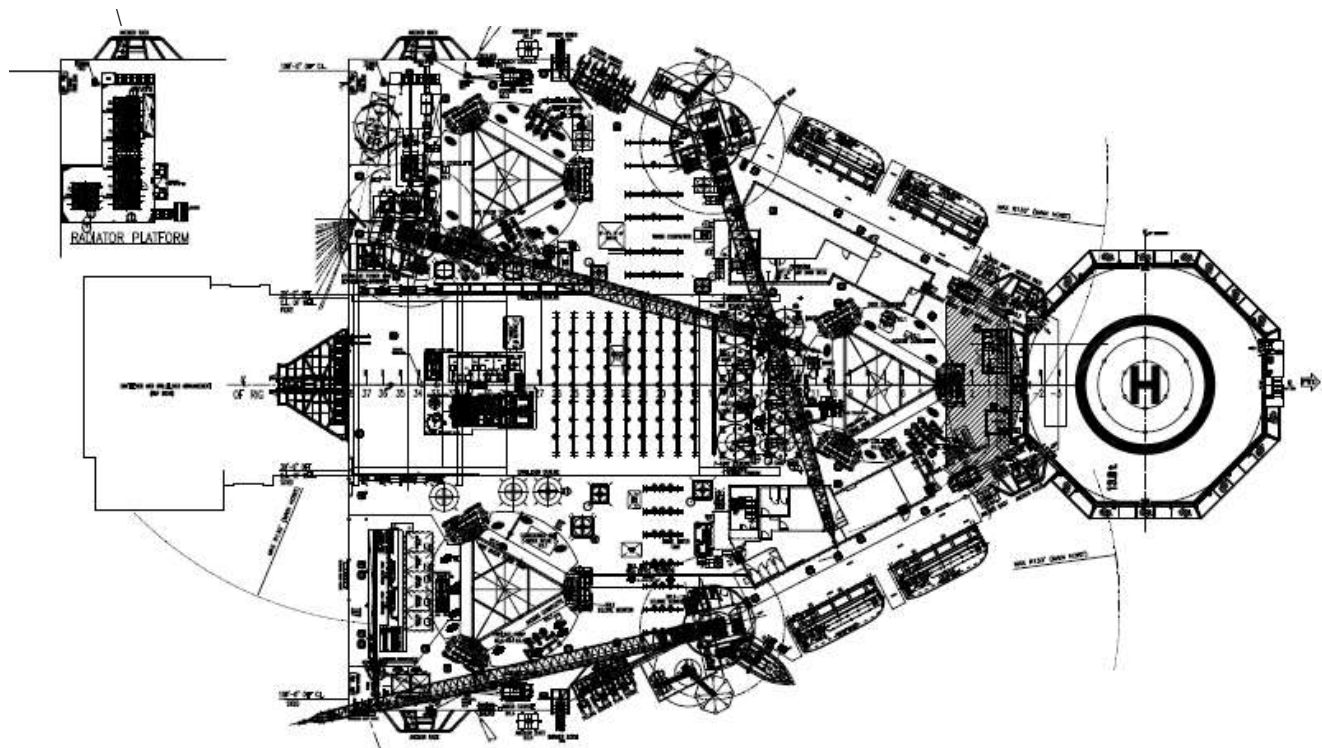
Deck Cranes 3 x Seatrax S7224 cranes rated at 76st at a radius of 40ft with 130ft booms. Located port forward, port aft and starboard forward.

Special Features & Other Information

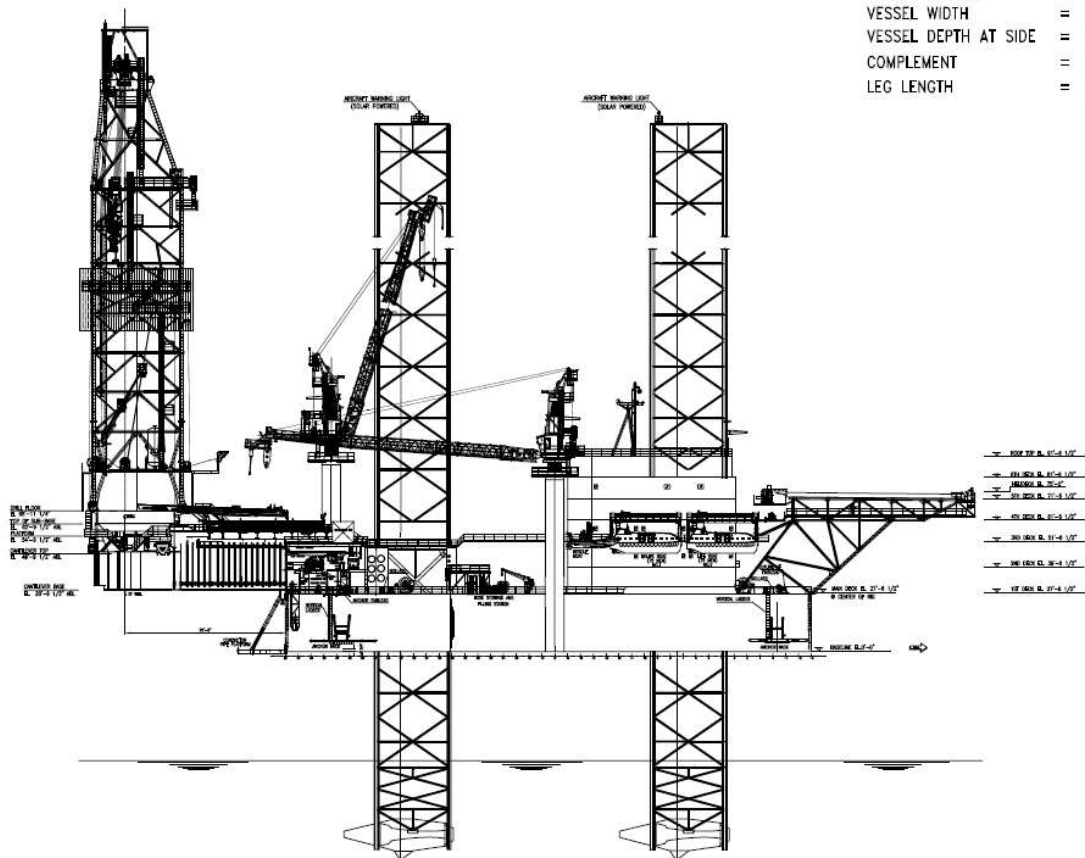
Helideck Rated for Sikorsky S-92 and MI -17 helicopters
Work Offline (WO) Ability to make-up and break-out drill pipe and casing offline. Casing racking capacity in derrick; 3,780ft of 13-3/8", 4,860ft of 9-5/8" or 5,940ft of 7".
Cellar Deck Cran 2 x FORUM Multi-Purpose Cranes rated 7.5st with 30ft boom.
Conductor Tens 30" system rated to 600 kips & under drillfloor system 300kips vertical hydraulic tensioning cylinders.
RPD System Yes
Jacking 6 pinions per chord, 3 x chords per leg, 1,000 kips per pinion normal operation, 1,300 kips per pinion for full preload jacking.
Field Transit Capable of rig move with 660 kips of setback in the derrick. Capable of rig move (infield transit) with 2,000bbls of mud in mud pits.



These specifications are intended for general reference purposes only, as actual equipment and specifications may vary based upon subsequent changes, the contract situation and customer needs. All equipment shall be operated and maintained at all times, in compliance with Borr Drilling standard operating manuals, policies and procedures, and within its stated operational limits or continuous rated capacity, in order to assure maximum operational efficiency.



VESSEL LENGTH = 246 FT
 VESSEL WIDTH = 226 FT
 VESSEL DEPTH AT SIDE = 27 FT
 COMPLEMENT = 150 MEN
 LEG LENGTH = 517 FT



เอกสารแนบที่ 62

แผนการบำรุงรักษาเชิงป้องกัน และทดสอบประสิทธิภาพของ BOP

BOP STACK - FUNCTION TEST - OPERATIONAL - DRILL FLOOR SAFETY VALVES & ADJUSTABLE CHOKES, WEL, D

Component:

Drill floor safety valves

Choke manifold test - adjustable chokes

Function test description:

Function test

Test Acceptance Criteria:

Verification of intended operation

Frequency:

Daily*

*If the test is not complete on any day, record which date and reason for not completing

BOP STACK - PRESSURE TEST - OPERATIONAL, WEL, 3W

Component A:

Annular preventer *b

BOP side outlet valves below annular and above ram preventers (wellbore side)

Pressure Test Description A:

Low Pressure *a

a) 250 to 350 (1.72 to 2.41)

High Pressure *a

a) MASP for the hole section or 70% annular

b) For annular; RWP, whichever is lower

Component B:

BOP side outlet valves below annular and above ram preventers (non-wellbore side)

Fixed pipe, variable bore, blind, and blind shear ram preventers

*b

C&K line and BOP side outlet valves below ram preventers (both sides)

Choke Manifold - Upstream of Chokes *c

Kelly, Kelly Valves, Drill Pipe Safety Valves, IBOPs, etc.

Pressure Test Description B:

Low Pressure *a

- a) 250 to 350 (1.72 to 2.41)

High Pressure *a

- a) Change out of component, elastomer, or ring gasket
 - a. RWP of ram preventer.
- b) No change out of component, elastomer, or ring gasket
 - a. Initial Test Pressure (ITP)

Component C:

Choke Manifold - Downstream of Chokes *c

Pressure Test Description C:

Low Pressure *a

- a) 250 to 350 (1.72 to 2.41)

High Pressure *a

- a) RWP of valve(s), line(s), or MASP for the hole section, whichever is lower

Component D:

Blind and blind shear ram preventers

Pressure Test Description D:

Low Pressure *a

- a) 250 to 350 (1.72 to 2.41)

High Pressure *a

- a) Casing test pressure

Frequency:

Not to exceed 21 days, AND at casing points for blind and blind shear ram preventers.

* Record all measurements taken to provide evidence of components tested, and meeting acceptance criteria

*a Pressure test evaluation periods shall be a minimum of 5 minutes. No visible leaks. The pressure drop shall meet the documented criteria with a stable pressure or decreasing decay rate during the evaluation period. The pressure shall not decrease below the intended test pressure. The documented criteria should take into account fluid types, air entrapment, compressibility, and temperature effects.

*b Annular(s) and VBR(s) shall be pressure tested on the smallest OD drill pipe to be used in well program.

*c Adjustable chokes are not required to be full sealing devices. Pressure testing against a closed choke is not required.

During operations, the drilling fluid in use is acceptable to perform subsequent tests of the BOP stack.

BOP STACK - FUNCTION TEST - OPERATIONAL - RAM (EXC. SHEAR AND BLIND SHEAR), ANNULAR, C&K VALVES, WEL, W

Component:

BOP rams (excluding shear and blind shear)

Annular

Choke and Kill valves

Function Test Description:

Function tested from one designated control station.

Control stations to be alternated between tests. *1

Test Acceptance Criteria:

Visual verification of no leaks.

Verification of intended operation may be in the form of visual inspection, flowmeter volume counts, apply wellbore pressure, or other applicable means. *2

Annular preventer smaller than 18 3/4 in. nominal bore must close in 30 seconds or less. Annular preventer 18 3/4 in. nominal bore and larger must close in 45 seconds or less. *3

Ram preventer must close within 30 seconds or less. *3

Choke valves and kill valves - less than minimum observed ram close response time. *3

Frequency:

Not to exceed 7 days.

*1 Record which components tested, and which control station used

*2 Record which method used to verify intended operation

*3 Record closure time for annular, ram preventer, and choke and kill valves

BOP STACK - FUNCTION TEST - OPERATIONAL - RAM (SHEAR AND BLIND SHEAR, WEL, 3W

Component:

BOP rams (shear and blind shear)

Function Test Description:

Function tested from one designated control station using both the manifold regulator and the high pressure shear circuit. Control stations to be alternated between tests. *1

Test Acceptance Criteria:

Visual verification of no leaks.

Verification of intended operation may be in the form of visual inspection, flowmeter volume counts, apply wellbore pressure, or other applicable means. *2

Must close within 30 seconds or less. *3

Frequency:

Not to exceed 21 days.

*1 Record which components tested, and which control station used

*2 Record which method used to verify intended operation

*3 Record closure time

เอกสารแนบที่ 63

ตัวอย่างผลการบำรุงรักษาเชิงป้องกัน และทดสอบประสิทธิภาพของ BOP

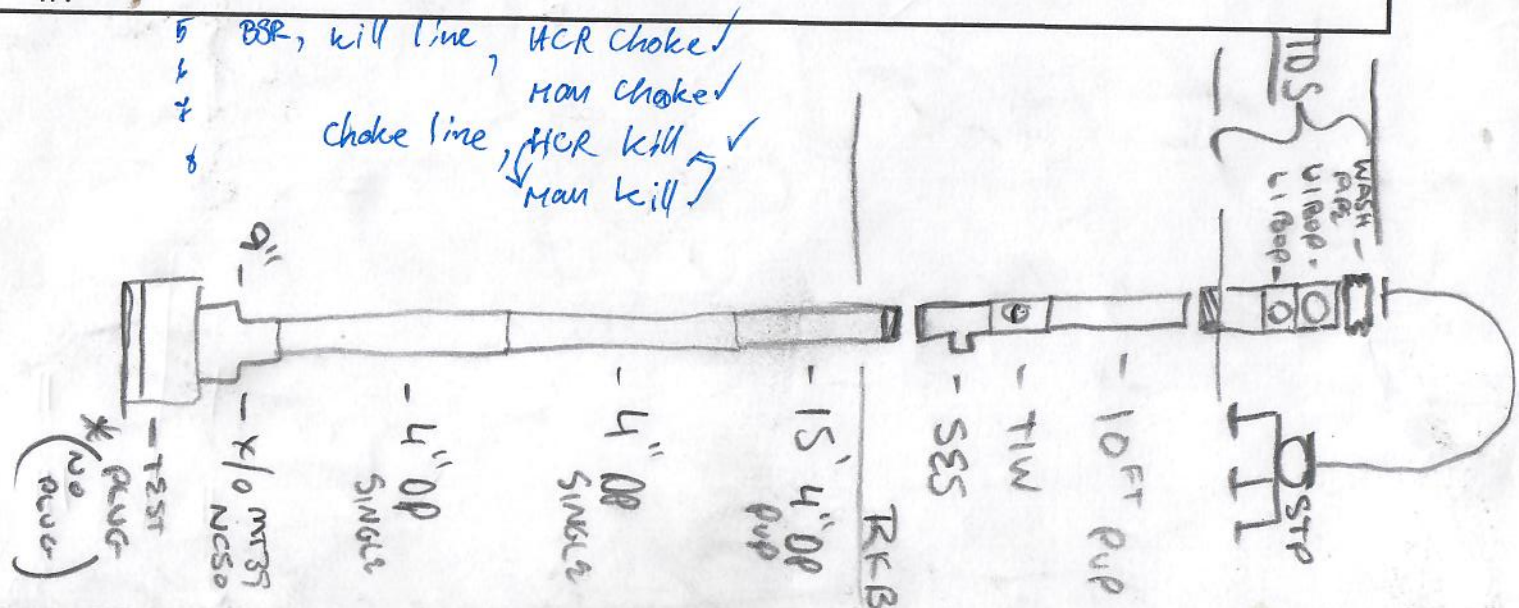


BOP FUNCTION TEST REPORT AND ACCUMULATOR DRILL

Rig Name:-	Skald	Date: 9-11-2021				
Well No.	CWT-12A	13-5/8" Cameron BOP 10000 p				
BOP Stack Specifications:-						
Annular BOP		13-5/8" Shaffer 5k WP.				
1. Top Ram Type BOP:		4-1/2" - 7" VBR's				
2. Blind Shear ram Type BOP:		Blind/Shear				
3. Middle Ram Type BOP :		2-7/8" x 5" VBR's				
4. Lower ram Type BOP:		2-7/8" x 5" VBR's				
Sr. No	Ram	Function	Time (sec)	Accumulator Pressure(psi)	Gals	Remarks
			close Open	Initial Pr Final Pr.	close open	
1	Anuular Preventer	Close Open	10 8	3000 2200	31.7 25.2	Pre-charge 1100psi
2	Middle pipe ram	close	12 0	2200 2075	13.9 0	
3	Middle pipe ram	Open	0 11	2075 2000	0 9.7	Simulate B/Shear
4	Lower pipe Ram	Close	13 0	2000 1900	15.1 0	
5	Lower pipe Ram	Open	0 10	1900 1800	0 9.0	Simulate B/Shear
6	HCR on Choke Line	Open	0 2	1800 1800	0 1.8	
7	HCR on Kill Line	Open	0 2	1800 1780	0 1.5	
8	Pumps on - time taken to reach 3100psi accumulator pressure = 1 min + 8 Seconds					
<p>1) Conduct BOP function Test/Accumulator drill once a week.</p> <p>2) Record Initial Accumulator Pressure.</p> <p>3) Turn off both electric and pneumatic pumps.</p> <p>4) Close Annular and Pipe Rams one by one and record time / press to close each preventer.</p> <p>5) Open the hydraulic valves on choke line and kill line.</p> <p>6) Open the pipe ram to compensate for blind ram.</p> <p>7) Final accumulator pressure should not be less than 1200 psi or 200 psi above pre-charge pressure of accumulator bottles.</p> <p>8) Turn on electrical/pneumatic pump and open all the preventer.</p> <p>9) Carry out Function Test alternately from Rig Floor panel/Auxiliary panel/Main control unit.</p> <p>Special attention to address the following.</p>						
Toolpusher	Graham Hay	Co-Man	Supachai Rakthong			
Signature		Signature				
OIM	Ross Boyle					
Signature						



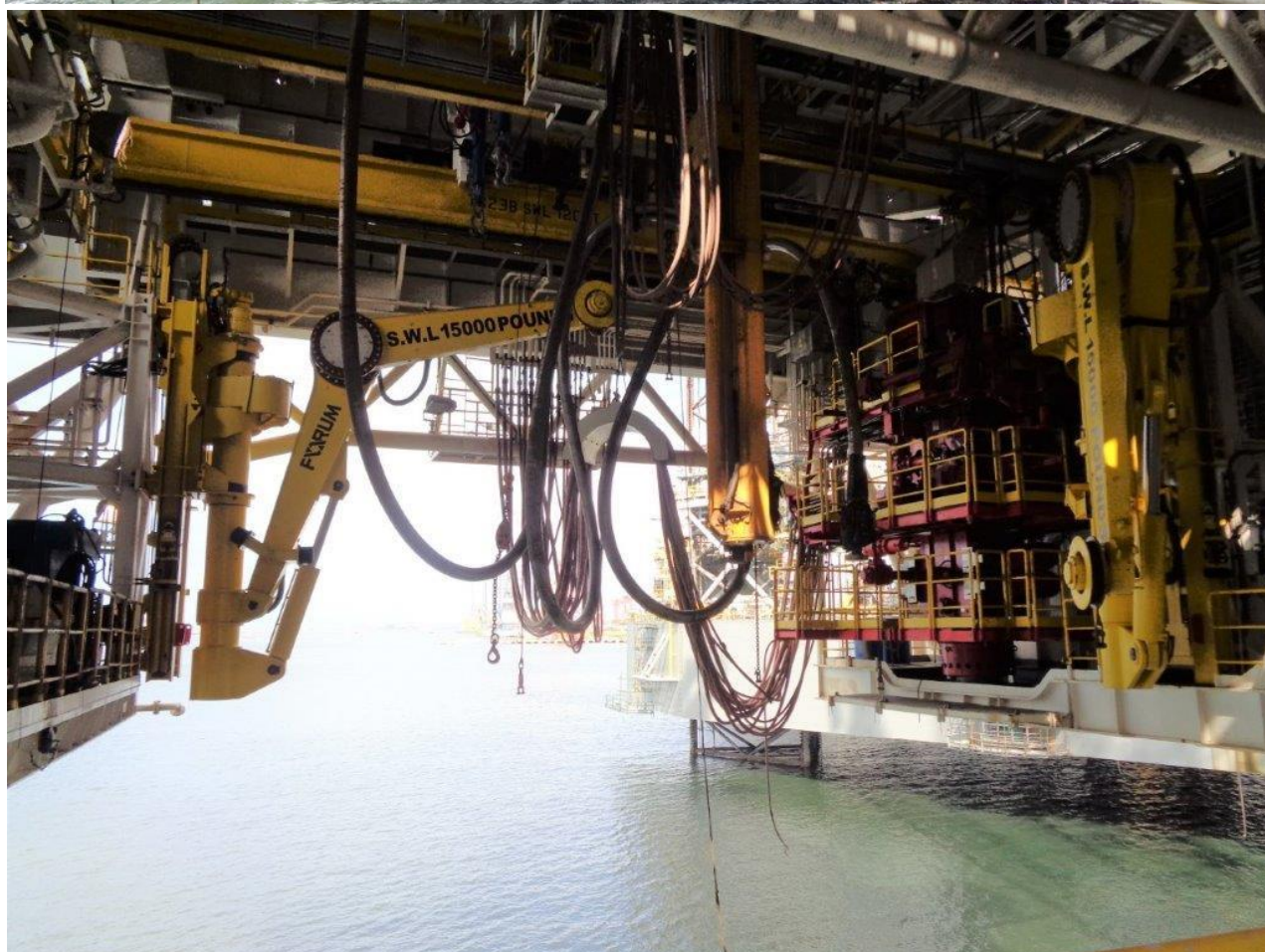
SKALD 13 5/8" BOP ON WELL WITH TEST PLUG 4" PIPE						
Date	Pressure		Test #	10k 13 3/8" BOP	OPERATED FROM	BY WHOM
	Low(psi)	High(psi)				
				Set test plug open Ann valve		
21-11-21	300/5min	7500/5min	1	Cement Line to side entry sub ✓	Cement unit	Cementer
21-11-21	300/5min	7500/5min	2	13.1 gal / Lower 2 7/8" x 5" variable rams & TIW 9.8 ✓	Cement unit	Cementer
21-11-21	300/5min	7500/5min	3	Middle 2 7/8" x 5" Variable rams, Man Kill , Upper iBOP ✓	Cement unit	Cementer
21-11-21	300/5min	7500/5min	4	Middle 2 7/8" x 5" Variable rams, Hcr Kill, Lower iBOP	Cement unit	Cementer
21-11-21	300/5min	3500/5min	5	Annular, Wash pipe kelly hose to stand pipe v/v ✓	Cement unit	Cementer
				Back off from test plug		
21-11-21	300/5min	7500/5min	6	Blind shear rams, Kill line, HCR choke, man kill	Cement unit	Cementer
21-11-21	300/5min	7500/5min	7	Blind shear rams, Kill line, HCR choke, hcr kill	Cement unit	Cementer
21-11-21	300/5min	7500/5min	8	Blind shear rams, Kill line, Choke line to valve 3 choke manifold ✓	Cement unit	Cementer
				Close Ann valve Retrieve test plug		
OIM: Ian Mcpherson TP: Graham Hay DSV :						



เอกสารแนบที่ 64

ภาพถ่าย BOP ที่ติดตั้งบนแท่นเจาะ SKALD

ภาพถ่ายของอุปกรณ์ป้องกันการพลุ่ง ((Blowout Preventor หรือ BOP) ที่ติดตั้งอยู่บนแท่นเจาะ SKALD



เอกสารแนบที่ 65

ตัวอย่างบันทึกข้อมูลโคลนเจาะระหว่างการเจาะ

Date : 17-11-21.

Pump man Report

Time	MW	FV
00:00	1.29	52
00:30	1.29	52
01:00	1.29	52
01:30	1.29	52
02:00	1.29	52
02:30	1.29	52
03:00	1.29	52
03:30	1.29	52
04:00	1.29	52
04:30	1.29	52
05:00	1.29	52
05:30	1.29	52
06:00	1.29	52
06:30	1.29	52
07:00	1.29	52
07:30	1.29	52
08:00	1.29	52
08:30	1.29	52
09:00	1.29	52
09:30	1.29	52
10:00	1.29	52
10:30	1.29	52
11:00	1.29	52
11:30	1.29	52

Time	MW	FV
12:00	1.29	51
12:30	1.29	51
13:00	1.29	51
13:30	1.29	51
14:00	1.29	51
14:30	1.29	51
15:00	1.29	51
15:30	1.29	51
16:00	1.29	51
16:30	1.29	51
17:00	1.29	51
17:30	1.29	51
18:00	1.29	51
18:30	1.29	51
19:00	1.29	51
19:30	1.29	51
20:00	1.29	51
20:30	1.29	51
21:00	1.29	51
21:30	1.29	51
22:00	1.29	51
22:30	1.29	52
23:00	1.29	52
23:30	1.29	52

Note:

- Calibrate Mud Balance ☒ YES / NO

Date : 15-11-21

Shaker Pump-man Report

Time	MW	FV
00:00	1.29	52
00:30	1.29	52
01:00	1.29	52
01:30	1.29	52
02:00	1.29	51
02:30	1.29	52
03:00	1.29	51
03:30	1.29	51
04:00	1.29	52
04:30	1.29	52
05:00	1.29	51
05:30	1.29	51
06:00	1.29	52
06:30	1.29	52
07:00	1.29	51
07:30	1.29	52
08:00	1.29	51
08:30	1.29	51
09:00	1.29	52
09:30	1.29	52
10:00	1.29	52
10:30	1.29	51
11:00	1.29	52
11:30	1.29	52

Time	MW	FV
12:00	1.29	52
12:30	1.29	52
13:00	1.29	52
13:30	1.29	51
14:00	1.29	51
14:30	1.29	51
15:00	1.29	52
15:30	1.29	52
16:00	1.29	52
16:30	1.29	52
17:00	1.29	51
17:30	1.29	51
18:00	1.29	51
18:30	1.29	52
19:00	1.29	52
19:30	1.29	52
20:00	1.29	52
20:30	1.29	51
21:00	1.29	51
21:30	1.29	51
22:00	1.29	52
22:30	1.29	51
23:00	1.29	52
23:30	1.29	52

12A

Note:

- Calibrate Mud Balance ☒ YES / NO

Date : 16-11-21

Pump man Report

Time	MW	FV
00:00		
00:30		
01:00		
01:30		
02:00		
02:30		
03:00		
03:30		
04:00		
04:30		
05:00		
05:30		
06:00		
06:30		
07:00		
07:30		
08:00		
08:30		
09:00		
09:30		
10:00		
10:30		
11:00		
11:30		

Time	MW	FV
12:00		
12:30		
13:00		
13:30		
14:00		
14:30		
15:00		
15:30		
16:00		
16:30		
17:00		
17:30		
18:00		
18:30	1.29	50
19:00	1.29	51
19:30	1.29	52
20:00	1.29	52
20:30	1.29	52
21:00	1.29	52
21:30	1.29	52
22:00	1.29	52
22:30	1.29	52
23:00	1.29	52
23:30	1.29	52

Note:

- Callibrate Mud Balance YES / NO

Date : 10-11-21
 Smoker Pump man Report

Time	MW	FV
00:00		
00:30		
01:00		
01:30		
02:00		
02:30		
03:00		
03:30		
04:00		
04:30		
05:00		
05:30		
06:00		
06:30		
07:00		
07:30		
08:00		
08:30		
09:00		
09:30		
10:00		
10:30		
11:00		
11:30		

Time	MW	FV
12:00		
12:30		
13:00		
13:30		
14:00		
14:30		
15:00		
15:30		
16:00		
16:30		
17:00		
17:30		
18:00		
18:30	1129	52
19:00	1129	52
19:30	1129	52
20:00	1129	52
20:30	1129	51
21:00	1130	51
21:30	1130	52
22:00	1130	51.3
22:30	1130	53
23:00	1130	53
23:30	1130	52

Note:

- Calibrate Mud Balance YES / NO

เอกสารแนบที่ 66

ตัวอย่างรายงาน Mud Report

Operator : PTTEP
Report For : Supachai R./Apsit K.
Well Name : TMK-08A
Contractor/Rig: Borrdrilling / Skald
Report For : Ian M.

Field/Area : G2/61
Description : Exploration
Location : Gulf of Thailand
Water Depth : 74.5
Log-It # :

Depth/TVD : 350.80 m/ 350.80 m
Date : 9/Jan/22
Spud Date : 9/Jan/22
Mud Type : PAC/PHPA WBM
Activity : Nipple up BOP

DRILLING ASSEMBLY		CASING		MUD VOLUME (m³)		CIRCULATION DATA			
		13.375 in csg @ 350.3 m (350.3 TVD)		Hole	Active Pits	Pump Make		NATIONAL 1	NATIONAL 1
				Total Cir Vol 200.00	Reserve 100.00	Pump Liner x Stk		6.0x14in	6.0x14in
						Pump Capacity		0.119 bps	0.119 bps
				Depth Drilled Last 24 hr m		Pump stk/min		@97%	@97%
Volume Drilled Last 24 hr m3				Flow Rate		L/min			
				Pump Pressure		psi			
				Bottoms Up		/ min/ stk			
				Total Circulation		/ min/ stk			
MUD PROPERTIES						PRODUCTS USED Last 24 hr			
Sample From		Active @ 22:00				Products		Size	Amount
FlowLine Temp °C									
Depth/TVD m		350.80 / 350.80							
Mud Weight /Temp sp.gr. @ °C		1.12 @ 32							
Funnel Viscosity sec/qt		45							
Rheology Temp °C		49							
R600/R300		46 / 32							
R200/R100		27 / 20							
R6/R3		8 / 6							
PV cP		14							
YP lb/100ft²		18							
10s/10m/30m Gel lb/100ft²		9/10/10							
API Fluid Loss cc/30min		5.8							
HTHP Fluid Loss cc/30min		@							
Cake APT/HT 1/32"		1 / 32				MUD ENGINEER			
Solids %vol		5.5				SECOND MUD ENGINEER			
Oil/Water %vol		/ 94.5				MUD ENGINEER (Quarantine)			
Sand %vol		0.1				SECOND MUD ENGINEER (Quarantine)			
MBT kg/m³									
pH / Temp / °C		9.50 / 32				SOLIDS CONTROL EQUIPMENT Last 24 hr			
Alkal Mud (Pm)		0.10				Type	Model/Size	Hrs Used	
Pf/Mf /		0.10 / 0.20				VSM 300 Shale Shakers		API20/120	
Chlorides mg/L		19000				VSM 300 Shale Shakers		API20/120	
Hardness (Ca++) mg/L		560				VSM 300 Shale Shakers		API20/120	
						VSM 300 Shale Shakers		API20/120	
						Derrick Centrifuges		DE-1000	
						Derrick Centrifuges		DE-1000	
						SCOMI Cutting Dryer		EXTRACTOR	
						MUD PROPERTY SPECS min-max			
								Actual	
NaCl %vol / kg/m³		0 / 0				Mud density	SG	1.10	1.12
KCl %vol / kg/m³		0 / 0				Funnel Viscosity	sec/qt	45-55	45
LGS %vol / kg/m³		2.28 / 54.83				Plastic viscosity	cP	ALAP	14
Bentonite %vol / kg/m³		0 / 0				Yield Point	lb/100ft2	>12	18
Drill Solids %vol / kg/m³		/				pH	9.0 - 10.5		9.50
Wt Material %vol / kg/m³		2.13 / 89.54				API Fluid loss	cc / 30-min	N/A	5.8
Chem Conc kg/m³									
Inert/React									
Avg SG Solids		3.27							
REMARKS AND TREATMENT					REMARKS				
• Received 200 m3 from 13-3/8" CSG Drill In and diverted for 12-1/4" section. • Engineering cost charged on DMR04-0_TMK-08A_WBM_17-12_20220109_REV00.					• Install WH side outlet valves. N/U and P/T BOP. Install WB.				
E DISTRIBUTION Last 24 hrs		MUD VOL ACCTG (m³)		Product Concentrations (kg/m³)		RHEOLOGY & HYDRAULICS			
Nipple up BOP	6	Base Oil Added				n			
		Water Added				k			
		Chemicals Added				Tauy			
		Mud Received	200.00			Bit loss, psi			
		Mud Returned				HHP, %			
		Tripping				Jet Velocity, m/s			
		Interface				Va Pipe, m/min			
		Pit Cleaning				Va Collars, m/min			
		Centrifuge Active				CVa Pipe, m/min			
		Centrifuge Cutback				CVa Collars, m/min			
		Shaker/Dryer				ECD at Shoe, sp.gr.			
		Seepage				ECD at TD, sp.gr.			
		Formation/ Downhole							
		Evaporation							
		Left in Hole							
		Total Loss							
		End Volume	200.00				PTTEP REQUIRED DATA		
Wireline Data		Cum Built Section				%OOC			
EMW (sq)		Cum Surface Lost				BHCT			
Max BHST		Cum Form Lost				Hole Angle			
Hole size from caliper		Cum Lost Section							
M-I Engineer	Phone	email	Whse Phone	Rig Phone	Daily cost		Cumulative Cost		
Sahadhanapol P.	025374000	RIGSKALD-muden@pttep.com	6 674 890 4050	025374000 Ext. 810-3704			\$26,382.88		
Nutakan C.	Ext. 810-3704	RIGSKALD-muden@pttep.com							



VOLUME ACCOUNTING REPORT No. 4

Operator : PTTEP
Report For : Supachai R./Apisit K.
Ryan M. Borrdrilling / Skald
Report For : Ian M.

Well Name : TMK-08A
Field/Area : G2/61
Location : Gulf of Thailand
Mud Type : PAC/PHPA WBM

Date: 9/Jan/22
Depth/TVD : 350.80 m/ 350.80 m
Water Depth : 74.5
Activity : Nipple up BOP

PIT DESCRIPTION	CAPACITY m³	WEIGHT sp.gr.	VOLUME m³	REMARKS	PIT TYPE	PIT VOLUMES SUMMARY (m³)	
PIT TYPE							TOTAL FLUID
PIT 1	52	1.12	25.00	WBM	Active	Reserve	100.00
PIT 2	84	1.25	50.00	SWEEP	Reserve	Active	100.00
PIT 3	84	1.25	50.00	SWEEP	Reserve		
PIT 4	84	1.12	25.00	WBM	Active	Empty	
PIT 5	84				Other		
PIT 6	84	1.03	30.00	SW	Other		
PIT 7	54	1.12	25.00	WBM	Active		
PIT 8	54	1.12	25.00	WBM	Active		
PIT 9	84				Other	TOTAL FLUID	200.00
SLUG 1	17				Other	Non Transactional Tank Volume m³	
SLUG 2	17				Other	PIT DESCRIPTION	TOTAL FLUID
SAND TRAP 1	12				Other		
SAND TRAP 2	12				Other		
SAND TRAP 3	12				Other		
SAND TRAP 4	12				Other		
SAND TRAP 5	12				Other		
TRIP TANK 1	5				Other		
TRIP TANK 2	5				Other		
						Total Non Trans Volume	
Total Hole Volume							
Volume Not Mud							
Fluid Volume	200.00						
VOLUME ACCOUNTING (m³)							
IN/TO:	ACTIVE	RESERVE	OTHER	TOTAL			
Start Volume							
Oil Added							
Water Added							
Vol Chem Added							
Total Volume Built							
Received	100.00	100.00		200.00			
Return							
Transfer In							
Transfer Out							
Daily Loss							
Final Volume	100.00	100.00		200.00			
Cumulative Lost Section							
Cumulative Built Section							

เอกสารแนบที่ 67

ตัวอย่างบันทึกของผู้ควบคุมการเจาะ


2.217| Rev 0| 26-Nov-2019

DRILLER'S TREND SHEET

DATE		DRILLER #1 ON DUTY					DRILLER #2 ON DUTY												
Time	Depth	WOB	Rot Weight	UP Weight	Down Weight	Rotary RPM	Torque Ft. / Lbs.	Pump SPM	Pump Press	Pump GPM	PVT	Loss / Gain	Flow Out	Max. Gas	MW In	MW Out	Active Pits	Free TQ	OBP
1315	4635					60		43	2630	800			6		1.29	1.29	3	11	
1400	4635		WT	up		60		43	2640	800			6		1.34	1.29	3	12	
1430	4635					60		46	2920	859			6	.01	1.34	1.29	3	12	1.44
1500	4635					62		46	2961	859	300		7	.01	1.34	1.29	3	12	1.45
1530	4590					62		46	3000	859	294		6	.01	1.34	1.29	3	12	1.45
1600	4621					62		46	2726	859	306		6	.01	1.40	1.34	3	11	1.44
1630	4618					62		46	2800	859	308		6	.14	1.40	1.34	3	12	1.45
1700	4625					62		46	3040	859	316		6	.15	1.40	1.34	3	12	1.5
1730	4620					62		46	3060	859	325		5	.26	1.40	1.40	3	12	1.52
1800	4629					62		46	2960	859	327		6	.23	1.44	1.40	3	12	1.52
1830	4621					62		46	3140	859	327		6	.26	1.44	1.40	3	11	1.56
1900	4625					62		46	3240	859	328		6	.28	1.44	1.40	3	12	1.58
1930	4617					62		46	3100	859	339		6	.28	1.48	1.44	3	12	1.56
2000	4620					62		46	3010	859	338		6	.28	1.48	1.44	3	12	1.56
2030	4635					62		46	3230	859	343		6	.28	1.48	1.44	3	12	1.59
2100	4614					62		46	3371	859	337		6	.30	1.48	1.48	3	12	1.59
2145			Flow check / start at 10 min																
2200			DROP Carbide 256 320 216																
2215	3106 test																		
2230	Cir BTM UP																		
2300	4629					60		46	3225	859	326		6	.32	1.48	1.48	3	12	1.60
2330						62		46	3300	859	325		6	.53	1.48	1.48	3	12	1.61
SURVEYS						SURVEYS						SCR AT 4634							
Depth	Inc.	AZ	Depth	Inc.	AZ	Mud Wt.	Viscosity	SPM	Pump 1	Pump 2	Pump 3								
						1.48		10	424										
								20	850										
								30	1610										
Depth	Surface to Bit	Bit to Shoe	Shoe to Surface	B / U	Total	DEPTH =	ft.	MAASP =	psi	MACP =	psi								
						4634													

เอกสารแนบที่ 68

ตัวอย่างบันทึกการฝึกซ้อมที่เกี่ยวกับการควบคุมหลุมเจาะ







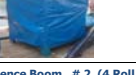











	Month	October 2021																															Total		
Note: Insert comment on the date of each drill with time response / Input "x" if done a drill or test on that day.	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Drilling Drills Matrix	Shift	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM		
BOP Pressure Test	/21 Days													x																			1	21 days	
BOP Function Test	7 Days													x																				1	Function test to be carried out weekly except the shear rams to done biweekly
Shallow Gas Kick/Diverter Drills	Once per well with crew on tour																																	0	Less than 2 minutes to close diverter
Kick Drill - Drilling	Once per week per crew																																	0	Less than 2 minutes to close BOP
Kick Drill - Tripping	Once per week per crew																	x		x														2	Less than 2 minutes with FOSV closed combined
Pit Drill	Once per week per crew																																	0	Less than 1 minute to respond, combined less than 3 minutes to close BOP
Stripping Drill	Once per well with crew on tour																																	0	Record annular friction. Perform prior enter HC zone
Choke Drill	Once per well with crew on tour									x																								2	Perform prior to drilling out casing
H2S Drill	Prior to drilling into H2S zone																																	0	
Drill collar/ Tool joint in BOP	Once per week per crew																																	0	

Each drill or exercise shall be performed either as an individual drill or as a combination of compatible scenarios






เอกสารแนบที่ 69

ตัวอย่างรายการตรวจสภาพ เครื่องมือตอบสนองกรณีการหกรั่วไหลลงสู่ทะเลที่ฐานสนับสนุนบนฝั่ง

Oil Spill Equipment (Inventory) - May 2021

No	Description	Qty	Unit Price	Location	Condition check	Remark
1	Oil containment Boom, Fence Boom : Model SK-F45 Set 1 (8 Roll) 	200 m.	2,300/m.	Berth # 1	Ready to use	
2	Oil containment Boom, Fence Boom : Model SK-F45 Set 2 (8 Roll) 	200 m.	2,300/m.	Berth # 1	Ready to use	
3	Oil containment Boom, Fence Boom : Model SK-F45 Set 3 (8 Roll) 	200 m.	2,300/m.	Berth # 1	Ready to use	
4	Permanet Boom; "SK-Boom" Model: SK-P70 	200 m.	6,200/m.	Berth # 1	Ready to use	
5	Permanet Boom; "SK-Boom" Model: SK-P70 	100 m.	6,200/m.	Berth # 1	Stand by	
6	Permanet Boom; "TAKARA" Model: FB-700 	50 m.	5,850/m.	Store Container	Stand by	
7	Fence Boom # 1 (4 Roll) 	100 m.	N/M	Berth # 1	Ready to use	
8	Fence Boom # 2 (4 Roll) 	100 m.	N/M	Berth # 1	Ready to use	
9	Fence Boom # 3 (4 Roll) 	100 m.	N/M	Berth # 1 strait	Ready to use	
10	Brush Skimmer; LAMOR"; Model: Minimax 12 with Powerpack Pump 	1 set.	1,180,000/ Set	Oil spill Container	Ready to use	
11	Portable Dispersant Sprayer System # 1 	2 set.	49,000/ Set	Oil spill Container	Ready to use	
12	Sand and Sawdust drum # 1 	1 set.	N/M	Berth # 1	Ready to use - Sand : 40Kg , Sawdust : 10kg	
13	Sand and Sawdust drum # 2 	1 set.	N/M	Berth # 3 (Red container)	Ready to use - Sand : 60Kg ,Sawdust : 10kg	
14	Sand and Sawdust drum # 3 	1 set.	N/M	Berth #4	Ready to use - Sand : 20Kg ,Sawdust : 5kg	
15	Sand and Sawdust drum # 4 	1 set.	N/M	Berth # 6 (Chevron container)	Ready to use - Sand : 40Kg Sawdust : 7kg	
16	Sand and Sawdust drum # 5 	1 set.	N/M	Marshalling Yard	Ready to use - Sand : 20Kg Sawdust : 10kg	
17	500 Lts Empty tank 	1 Tank	N/M	Berth # 1	Ready to use	
18	Canvas Oil Tray size 2 X 2 X 0.25m 	1 set.	N/M	Berth # 1	Ready to use	
	Canvas Oil hose					

Oil Spill Equipment (Inventory) - May 2021

No	Description	Qty	Unit Price	Location	Condition check	Remark
19		2 set.	N/M	Berth # 1	Ready to use	
20	Floating frame 	1 set.	N/M	Berth # 1	Ready to use	
21	Electric oil boom winder 	1 set.	N/M	Berth # 1	Ready to use	
22	Leaf Net Skimmer 	3 set.	N/M	Store Container	Ready to use	
23	 Floor Squeegee 30"	3 EA.	N/M	Store Container	Ready to use	

Checked by : Sakon H

Date : 9/May/21

เอกสารแนบที่ 70

แผงผังของแท่นเจาะแสดงพื้นที่จัดวางอุปกรณ์ความปลอดภัย และอุปกรณ์ช่วยชีวิต
ระบบตรวจจับก๊าซรั่ว ระบบการตรวจจับการเกิดเพลิงไหม้ และระบบวาล์วปิดระบบฉุกเฉิน
และระบบและอุปกรณ์ป้องกันและควบคุมอัคคีภัยที่ได้รับการรับรองจาก ABS

FIRE PLAN & SAFETY PLAN

TOTAL COMPLEMENT = 150 MEN

APPROVED
This approval covers only ABS requirements and does not include terms not required by ABS.
Details of this approval are set forth in the ABS letter.

APPROVED
on behalf of the government of this vessel's registry subject to conditions of ABS letter

ABS

ITEM		SYMBOL	DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	12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เอกสารแนบที่ 71

ภาพถ่ายพื้นที่จัดให้สุนัขหรือ

พื้นที่สูบบุหรี่สำหรับพนักงาน ที่จัดไว้บนแท่นเจาะ



เอกสารแนบที่ 72

ตัวอย่างรายงาน Drill Report ที่เกี่ยวข้องกับการเกิดอัคคีภัย



6.3.01 Emergency Drill Report

RIG NAME: **BORR SKALD**

DATE: **20-Jun-21**

LOCATION: **TMA-22A Gulf of Thailand**

OIM: **Ian McPherson**

This report of emergency drills shall be completed weekly. A copy shall be retained on the rig. Please follow Division procedures for further forwarding of this form.

SCENE/TYPE

Fire Drill	Weekly	Time
General Alarm Sounded / Time:		11:37
General Alarm Ended / Time:		11:46
Date of Last Drill:		

Environmental Drill	60 Days	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		

Injured Personnel / Confined Space Rescue	60 Days	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		

Ballast Control Drill	60 Days	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		

Abandon Drill	Weekly	Time
General Alarm Sounded / Time:		10:47
General Alarm Ended / Time:		10:51
Date of Last Drill:		15-Jun-21

Man Overboard Drill	60 Days	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		

Helicopter Drill	60 Days	Time
General Alarm Sounded / Time:		
General Alarm Ended / Time:		
Date of Last Drill:		

Other (i.e. H2S, Collision, Etc.)	Time
General Alarm Sounded / Time:	
General Alarm Ended / Time:	
Date of Last Drill:	

All contact makers and bells shall be checked periodically for proper operation. (Check two different stations and bells during each drill) General alarm contact maker activated/checked. Identify _____

Scenario

10:37 Sounded fire alarm and PA announcement made, simulated fire at cement unit
10:38 Alarm silence and drill continue
10:40 Simulated isolate the cement unit
10:41 Rig floor reported well secure
10:41 Campboss reported accommodation clear
10:43 Response team reported fire at mixer and extinguished by fire extinguisher
10:46 Full muster
10:47 Sounded prepare to abandon rig alarm
10:51 Full muster
10:51 End of drill and debrief

Response Teams

1st Response Team Leader:
Muster at port side

Actions Performed: Directed emergency response team as instructed
Suit up and proceed to fight the fire

2nd Response Team Leader:
No show

Actions Performed: _____

Life Boats

FRC

Launched: # 1 # 2 # 3 # 4
Lowered: # 1 # 2 # 3 # 4

Was Lifeboat roster checked by lifeboatman?

Yes ☒ No ☐

Were provisions made for shut down of the Rig?

Yes ☐ No ☒

Were any capsules/boats/rafts/or escape barges launched?

Yes ☐ No ☒

Lifeboat or capsules engines started and run to check operation.

Yes ☐ No ☒

Are all lifeboats, liferafts or other escape craft operating instructions clearly visible?

Yes ☒ No ☐

Post Drill Meeting



DATE: **20-Jun-21**
OIM: **Ian McPherson**

List drill comments (type of drill if not listed above) and topics discussed below.

**Note: Enter appropriate corrective actions into the regional corrective action system.*

This was first fire drill. The full muster times were good. Good communication between control room and response team.

Fire team 2 and medical team were no show.

After drills we called both fire teams and medical team to explained their roles and responsibilities during off tour, as this was 1st fire drill, so brief to ensure every understand and need more time to read on the station bill to get more familiar with it.

Note: For Complete crew muster *Please Attach Muster Station Attendance Sheets and POB for the Date of the Drill*

Personnel Attending Drill

All P.O.B 143 persons
See attached P.O.B.



6.3.01 Emergency Drill Report

RIG NAME:	BORR SKALD	DATE:	20-Jun-21
LOCATION:	TMA-22A Gulf of Thailand	OIM:	Ian McPherson
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