GOVERNMENT OF THE REPUBLIC
OF TRINIDAD & TOBAGO

MINISTRY OF ENERGY

Code Of Practice

For

Drilling And Production Rigs

Operating In Trinidad & Tobago

INSTRUCTIONS ISSUED BY THE MINISTER OF ENERGY

UNDER REGULATION 42 (2) (k) CHAP. 62:01

CODE OF PRACTICE

FOR

DRILLING AND PRODUCTION RIGS

OPERATING IN

TRINIDAD AND TOBAGO

MINISTRY OF ENERGY
JULY, 1990.

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M I N I S T R Y O F E N E R G Y

The purpose of the Ministry of Energy is to ensure through regulation, supervision and encouragement where required, that the petroleum and other mining industries and related operations in Trinidad and Tobago are developed, operated and expanded to their maximum potential consistent with the optimum contribution to the nation.

CODE OF PRACTICE

Introduction

I am pleased to introduce to the petroleum industry a Code of Practice for Drilling and Production Rigs which is made under the Laws of the Republic of Trinidad and Tobago, Regulation 42 (2) (k) Chapter 62:01. The objective of the Code, which is the first of its kind made under the Petroleum Act, is to secure the health, safety and welfare of persons employed in the petroleum industry.

The Code seeks to provide a framework for a safe working environment, which is a prerequisite for the prevention of accidents and their consequences. Accordingly, the responsibility is placed on every petroleum company (operator) and drilling and production rig owner (rig owner) to ensure that drilling and workover operations are carried out in accordance with the provisions of the Code. To this end, operators and rig owners are advised to provide supervisory staff with copies of this Code and ensure that all workers are familiar with the sections related to their respective work activities.

It is recognized that advances in technology will result in changes in the design of equipment and operational practices which may require amendment to this Code. To accommodate such changes, where necessary, all notifications and applications for approval of exemption of any clause of the Code must be submitted in writing to the Minister who shall be responsible for making interpretations of the approvals and exemptions requested.

I trust that operators and rig owners would be unstinting in their efforts to ensure adherence to the Code, which was developed with their assistance, and thus continue to contribute to the development and preservation of a safe and healthy working environment for workers in our oil and gas fields.

Herbert Atwell
Minister of Energy

July, 1990

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PETROLEUM COMPANIES

- Amoco Trinidad Oil Company
- Chevron Overseas Petroleum Inc.
- Premier Consolidated Oilfields plc
- Trinidad and Tobago Oil Company Limited
- Trinidad and Tobago Petroleum Company Limited
- Trinmar Limited

RIG OWNERS

- Iere Contractors Limited
- Lennox Petroleum Services Limited
- Oilwell Contractors Limited
- Pool Santana Limited
- Republic Oilwell Limited
- Santana Services Limited
- Skinner Drilling Contractors Limited
- Terra Mar Limited
- Territorial Services Limited
- Trinidad Gulf Drilling Limited
- Trinidad Oilfield Production Services Limited
- Trinity Well Services Limited
- Well Services Limited

OTHER ORGANIZATIONS

- Oilfields Workers Trade Union
- Society of Petroleum Engineers

In addition, the Minister notes that valuable information was obtained from both the American Petroleum Institute's Recommended Practices and Standards and the Institute of Petroleum's Code of Practice related to drilling the production operations.

Finally, acknowledgement is made of the staff of the Ministry who worked untiringly during the drafting, collation and finalization of this Code. Special mention is made of Mr. R. Martin and Mr. S. Reid of the Mechanical Engineering Section who were responsible for the initiation and completion of this Code. During the preparation of the Code, they were ably guided by the Chief Technical Officer Mr. F. Look Kin and the Permanent Secretary Mr. R. Mends. Lastly, this Code would not have been possible were it not for the commitment and dedication of the Clerk-Typist Mrs. P. Goolcharan.

DEFINITIONS

This Code of Practice (hereinafter referred to as the Code) and made under this Petroleum Act and Regulations, Chapter 62:01 as amended, may be cited as the Code of Practice for Drilling and Production Rigs, 1990.

In the Code:-

(a) "Minister" means the Minister to whom responsibility for the administration for the petroleum industry is assigned unless the context otherwise indicates.

(b) "Ministry" means the agency charged with the general administration of the petroleum industry.

(c) "Operator" means a petroleum company engaged in drilling and/or production operations.

(d) "Rig owner" means a company that owns a rig used in drilling and/or production operations in the Petroleum Industry.

1. NEW RIGS ENTERING TRIIDAD AND TOBAGO

1.1 NOTIFICATION, INFORMATION AND INSPECTION REQUIREMENTS

1.1.1 Prior to commencing operations in Trinidad and Tobago, all new and foreign contracted land and marine drilling and production rigs shall be made available for a safety inspection by the Ministry. All such rigs must receive approval from the Ministry before they are allowed to operate.

1.1.2 The operator shall be responsible for submitting all specifications on the rig and associated equipment, including safety and firefighting equipment and other information that may be requested by the Ministry.

1.1.3 Submission of the above information and notification of the availability of the rig for inspection shall be at least two (2) weeks prior to transportation of the rig or its components to location.

2. MAJOR MODIFICATIONS AND REPAIRS

2.1 It shall be the responsibility of the rig owner to notify the mast manufacturer of any major modifications, structural damage and/or repairs to the mast or its components.

2.2 All major modifications and/or repairs to the mast and/or its erecting system shall be in accordance with specific repair procedures and recommendations of the manufacturer.

2.3 All major modifications and/or repairs and damage to a mast and/or its erecting system shall be supervised and certified in writing by a competent person, experienced in the performance characteristics and operation of the equipment, and knowledgeable of the risks involved, as designated by the owner of the rig.

2.4 Prior to resuming operation with the rig, every mast and/or its erecting system which has been substantially altered and/or repaired, shall be made available for inspection by the Ministry. The rig owner shall be responsible for submitting a report specifying the details of modifications and repairs, and for notifying the Ministry of the rig's availability for inspection at least two (2) weeks prior to transportation of the mast to location, and prior to its resumption of operation.

2.5 All critical welds shall be subjected to an approved non-destructive test, a complete description of which shall be entered in the driller's log. The results of the non-destructive inspection shall on request be made available to the Ministry.

2.6 In the case of mobile offshore rigs (both bottom-supported and floating rigs), the provisions of paragraphs 2.1 – 2.4 shall include major structural modifications and/or repairs to the installations.

3. RIGS IDLE FOR A PERIOD EXCEEDING SIX (6) MONTHS

3.1 A rig's mast and its erecting system, carrier unit and substructure which has been idle for more than six (6) months shall be made available for a safety inspection and shall require approval before being returned to service.

3.2 The operator shall be responsible for notifying the Ministry as to the availability of the rig for inspection at least two (2) weeks prior to transportation of the rig to location, and prior to its resumption of operation.

3.3 In the case of offshore rigs, the provisions of paragraphs 3.1 and 3.2 shall also apply.

4. DERRICKS AND MASTS

4.1 Derricks, masts and their auxiliary components shall be constructed to conform to good engineering practice, and maintained in a safe condition.

4.2 Derricks and masts shall have a permanent name plate attached to the structure in a conspicuous place indicating the following:

(a) manufacturer's name and address

(b) model and serial number

(c) year of manufacture

(d) mast height

(e) mast ratings including maximum static hook load for stated number of lines to the travelling block and including maximum wind resistance.

(f) the standard or specification to which the structure was designed and constructed.

(g) manufacturer's guying patter, or API Standard 4A, 'Specification for Steel Derricks", if applicable.

Markings shall be either raised or stamped, must be clearly legible and must be a minimum of 3mm (1/8") high.

4.3 Wherever possible, rigs should be set up so that the prevailing winds do not tend to blow gas or oil spray from the wellhead towards the combustion engines or the remote controls for the wellhead equipment. All internal combustion engines (rigs and lighting units) must be equipped with suitable spark arrestors.

4.4 Rig up and rig down operations of the mast or derrick shall be supervised solely by competent authorized personnel (designated by the rig owner) who are thoroughly familiar with rig up and rig down procedures for the particular rig.

4.5 A copy of rig up and rig down procedures shall be kept on location on every rig.

4.6 Specific care and attention must be taken to ensure that the hydraulic and or mechanical systems for the tilting and raising of a portable derrick or mast are in good condition and are operated in accordance with the manufacturer's instructions.

4.7 The locking devices or lugs for holding the top section of the derrick or mast should be inspected initially, and then on a weekly basis so that the rig operator is sure they are seated before any additional work on the structure is performed.

4.8 DERRICKMAN'S EMERGENCY ESCAPE

4.8.1 On all land rigs, the derrick or mast shall have an auxiliary means of escape installed prior to the first trip being made. This may be a specifically rigged and securely anchored escape line attached to the derrick or mast so as to provide a convenient means of escape from the derrickman's platform.

4.8.2 The escape line on derricks and masts shall all be 13mm (1/2 inch) minimum diameter wireline equipped with a safety buggy and braking device, or any other method approved by the Ministry. The device should be kept at the derrickman's platform.

4.8.3 The ground anchor point of the escape line shall be located at a minimum lateral distance from the derrick or mast equal to the height above ground to the point of connection of the escape line to the derrick or mast but in no case shall it be less than 15m (50 feet).

5. LADDERS, STAIRWAYS AND PLATFORMS

5.1 Permanent ladders fastened to a derrick or mast shall be securely held in place at the top, bottom, and other points in between according to manufacturer's specifications.

5.2 A stairway is required for access to and egress from elevated work areas where the frequency of use is daily.

5.3 When the rig floor height is 0.75 metres (2.5 feet) or more, least two (2) properly constructed stairways shall be installed on drilling and workover rigs to provide alternate exits from the rig floor to ground level.

5.4 Guardrails, consisting of a top rail, intermediate rail, and posts shall be installed at the outer edge of any floor, platform or walkway which is 0.75 metres (2.5 feet) or more above ground level or another floor or working level. The height of the guardrails shall be of a standard height of 1.07m (42").

6. LAND RIG LOCATION AND FOUNDATION PREPARATION

6.1 Well location and access road shall be so prepared and maintained by the operator so as to:

(a) allow reasonable passage and manoeuverability of the rig's carrier or trailer unit and other materials and equipment transport vehicles.

(b) allow oil, water and other fluids to effectively drain away from the surface in accordance with the provisions of paragraphs 19.1.2 – 19.1.5 of the Section on Pollution Prevention.

(c) allow the intended rig's mast to be guyed according to the manufacturer's guying specifications or API Standard 4A "Specification for Steel Derricks."

6.2 To avoid exceeding the safe bearing capacity of soils on the location, supplemental footing – wooden mats, concrete pads or the like – shall be provided when necessary, to distribute concentrated loads from the mast or its base support, carrier and substructure to the ground.

6.3 The area and type of foundation for the mast, carrier and substructure shall be capable of distributing the gross weight of the mast under maximum anticipated hook loads coupled with the maximum anticipated pipe set-back weight which the proposed operation shall entail.

6.4 Foundation pads for drilling and production rigs shall be properly graded and adequately drained.

7. GUYING OF LAND PORTABLE MASTS

7.1 The guying system for derricks and masts shall be constructed in accordance with the manufacturer's guying specifications or API Standard 4A, "Specification for Steel Derricks" except where otherwise specifically required in this Code of Practice.

7.2 The masts of <u>all</u> portable carrier or trailer mounted drilling and production rigs involved in pulling, running and racking drill pipe, tubing and rods shall be installed with at least two (2) properly tensioned and anchored racking platform stabilizing guylines. (This does not apply to trailer mounted free standing masts mounted upon the substructure).

7.3 It is recommended that the use of 5 cm x 1.8 metre or similar steel stakes for guyline anchoring of external and racking platform stabilizing guylines employed on portable rigs be discontinued and permanent or temporary type anchors as in paragraph 7.6 utilized.

7.4 All guyline anchors, permanent or temporary shall have a minimum breaking or pullout strength at least equal to twice the maximum total calculated anchor load in the direction of the resultant load. Where the manufacturer does not specify an anchor load or strength, the anchors shall have values as listed

in TABLE A..2 Supplement 3 to Appendix A or API Std. 4E, API Specification for drilling and well servicing structures, 2nd edition or the latest edition.

7.5 Permanent anchors shall be visually inspected prior to each use; if damage or deterioration is apparent, the anchor shall be pull tested as per TABLE A..2 of Supplement 3 API Std. 4E or the latest edition.

7.6 Guyline ground anchors shall be expanding type anchors, concrete or buried pipe deadmen, auger anchors or any other type that provides the holding strength required in 7.4 for the soil condition at the location.

7.7 Rig employees shall be instructed to make the following checks daily or after subjecting the mast to heavy pulls:

(i) check travelling block alignment with the wellbore.

(ii) check mast footings and adjust if required to correct for settling. Settling of mast footings indicates an inadequate foundation and may need immediate remedial action.

(iii) check guylines and anchors for proper tension and holding strength.

7.8 Rig crews shall be instructed to conduct their operations in such a way to minimize uneven racking of drill pipe or tubing in the derrick.

8. RIG ASSOCIATED EQUIPMENT

8.1 GENERAL

8.1.1. Moving parts, such as chains, belts, sprockets, shafts, couplings, clutches or the like which are liable to cause an accident or injury, shall be effectively guarded.

8.1.2 No safety device or safeguard shall be removed or rendered ineffective while the equipment is in use.

8.2 HOISTING LINES

8.2.1 All wire rope used for hoisting purposes shall be of designed strength to safely lift and otherwise handle anticipated loads under the conditions of service.

8.2.2 Maximum allowable hoisting line working loads shall be based on a minimum safety factor of three (3) for normal operations and for infrequent operations such as working stuck pipe and setting casing.

8.2.3 When a ton-mile calculation indicates or a visual inspection reveals that the hoisting line safety factor has been reduced, the line shall be slipped and cut or replaced. A record of any slipping and/or cutting of the masts drilling/pulling line shall be kept on the rig for a period of one (1) year.

8.2.4 All hoisting lines shall be visually inspected daily and thoroughly inspected monthly when in use. The monthly inspection, noting any defects shall be recorded and kept on the rig.

8.3 DRAWWORKS

8.3.1 The drawworks shall have a guard in front of the drum to prevent rig personnel from falling into the drum or lines.

8.3.2 Shut-down switches for drawworks prime movers shall be installed at the drawworks drum control console and maintained in an operable condition.

8.3.3 The driller or other authorized person on the brake shall not leave the drawworks brake without tying down the brake or securing it with a catch lock.

8.4 CATHEADS, CATLINES, SPINNING LINES

8.4.1 Rope made of synthetic material such as nylon or polyethylene, or any other material whose strength deteriorates appreciably with heat, shall not be used on friction catheads.

8.4.2. Rig personnel shall not be allowed to operate the catheads or spinning line before being instructed by a competent person in the correct use of such equipment. Rig personnel shall receive adequate training within the first two (2) weeks of employment. Such training shall be as identified in Section 16.1.

8.4.3 Catheads on which a rope is manually used shall have a rope guide to keep the rope alignment with its normal running position against the inner flange.

8.4.4 Catheads shall be periodically inspected for grooves, and rebuilt and machined when necessary to prevent fouling of the rope. Cathead groove depth shall not exceed 6.3 mm (1/4 inch).

8.4.5 The driller on any authorised person shall remain at the drawworks control while a manually operated cathead is in use.

8.4.6 A headache post or guard shall be provided for protection of the rig employee at the drawworks controls when the line passes near the operator during use of a catline, jerkline or spinning line.

8.5 TRAVELLING BLOCKS, CROWN BLOCK, HOOK, ROTARY HOSE

8.5.1 All travelling blocks and their components shall be constructed to conform with good engineering practice and maintained in a safe condition.

8.5.2 The hoisting hook shall be equipped with a safety latch or other equivalent device to prevent accidental release of its load.

8.5.3 Travelling blocks shall be properly guarded and shall not be operated unless guards are in place.

8.5.4 Crown block assemblies shall be properly secured in place with means to prevent the sheaves from jumping out of their bearings and falling to the rig floor.

8.5.5 All rigs shall be equipped with a device such as a Crown-O-Matic to prevent the travelling block from hitting the crown. These devices must be maintained and tested on a regular basis. Records of tests and maintenance must be kept on the rig for at least one (1) year.

8.5.6 The pump end of the rotary hose shall be securely fastened to the derrick or mast upright (rather than transverse girth) by a cable or chain clamped to the hose near to, but not touching the hose coupling. The swivel end of the hose shall be secured by a similar cable or chain affixed to the swivel body.

8.6 TONGS

8.6.1 All tongs shall be securely attached and anchored with wire rope or a stiff arm.

8.6.2 Tong safety lines shall be of sufficient length to obtain full benefit of the pull from the breakout cathead, but short enough to prevent complete rotation of the tongs.

8.6.3 The ends of tong safety lines shall be secured with at least three (3) wire-line clamps and they should be seized or welded to eliminate projecting wickers. Spliced eyes and thimbles on the ends of tong safety line are acceptable, provided approved splices are made.

8.6.4 All tongs and tong heads including dies shall be regularly inspected for size and condition. Worn or broken dies and missing die keepers shall be immediately replaced.

8.6.5 Power tongs shall be equipped with safety lines similar to those used on conventional tongs. Power tong pressure systems, shall be equipped with a safety relief valve whose set pressure shall never be higher than the rated working pressure of the weakest component in the system.

8.7 WEIGHT INDICATORS

8.7.1 A weight indicator shall be installed and used on all operating drilling and production rigs. The indicator shall be so constructed, installed and maintained that it will register a close indication of the hook load suspended (within + 5% at the maximum hook loading).

8.7.2 The weight indicator shall be field checked periodically for calibration; by comparing its reading with the calculated string weight with adjustments made as necessary. Records of the field tests shall be kept at the rig site for at least one (1) year.

8.7.3 All weight indicators shall be maintained in proper working condition.

8.8 PUMPING EQUIPMENT

8.8.1 Relief valves shall be installed in the discharge line immediately beyond the pump to protect the pump and discharge lines from extreme pressures caused by inadvertent closing of valves or related problems.

8.8.2 When shear relief valves are used, supervisors shall ensure that shear pins are of the correct type and are not oversized.

8.8.3 Shear relief valves shall be equipped with protective covers to prevent contact with the stem and to prevent the shear pin from becoming a missile when sheared.

8.8.4 Relief by-pass lines shall be short, rigidly anchored and should allow the escape fluid to flow back to the tank instead of going to waste.

8.8.5 A pulsation dampener (surge bottle) should be installed in the discharge line as near to the pump as possible to absorb pressure variations, reduce peak pressures, permit slightly higher pump output, and to increase pump discharge life.

8.9 PRESSURE VESSELS

8.9.1 Air pressure vessels shall be tested and inspected annually in accordance with the requirements of the Factories Ordinance. The test date and working pressure shall be stencilled on these vessels.

9. BLOWOUT PREVENTION

Every operator and rig owner shall have written and conspicuously posted procedures for well control operations. The document should indicate the procedures for planning the job and for controlling kicks in the following cases where applicable:-

- shallow wells
- deep wells
- thermal wells

9.1 GENERAL

9.1.1 Any proposal to drill a well without the use of appropriate blowout prevention and associated well control equipment shall require approval from the Ministry.

9.1.2 The working pressure of all blowout prevention equipment, associated pipe fittings, valves, etc. connected with it, and wellhead assembly shall be suitable for the maximum anticipated well surface pressure to which they may be subjected.

9.1.3 Wellhead outlets shall not be employed for choke or kill lines except for low pressure wells. These outlets may be used for auxiliary or back-up connections in the event of failure of the primary well control system. The procedures as outlined in API Bulletin D-13 "Recommended Kill-Line Fittings" should be followed.

9.1.4 Ram type preventers shall be equipped with manual, hydraulic or other means of locking in the closed position.

9.1.5 Where they are required, the wheels and stems for manually closing the BOP's must be kept in place.

9.1.6 On all drilling and all offshore production rigs where a BOP stack is employed, at least one (1) operable BOP control station, in addition to the one (1) near the driller, shall be provided in a readily accessible location remote from the rig floor, preferably on an escape route.

9.2 AUXILLIARY WELL CONTROL EQUIPMENT

The following equipment shall be provided and maintained in a working condition on all land and offshore rigs engaged in drilling, workover or production operations employing blowout prevention equipment:

(a) Upper and lower kelly valves shall be installed. The lower kelly valve shall be a full bore valve of such design that it can be run through the blowout preventers. The wrench to fit each valve shall be located on the drill floor, in a location which is known and readily accessible to the crew.

(b) An inside blowout preventer with manual lock shall be kept on the rig floor at all times in the open position. In addition, a full bore drill string safety valve shall also be kept in the open position on the rig floor during drilling or workover operations involving the use of drillpipe. The valve(s) must be able to fit all connections in the drill/work string.

(c) The accumulator and choke systems must be adequate for their intended use, well maintained, and their controls properly labelled.

9.3 BLOWOUT DETECTION AND CONTROL

9.3.1 On every drilling rig, adequate and efficient means of warning the driller of lost circulation or the occurrence of a kick shall be installed. The equipment shall give visual and audible warning at the driller's position. It is recommended that such equipment should include:-

(a) a flowline sensing device, visual indicator and alarm.

(b) a pit level detector, volume indicator or recorder for determining pit volume gains and losses, and alarms.

(c) A mud-volume measuring device for accurately determining mud volumes required to fill the hole on trips. This may take the form of an accurately calibrated small volume trip tank and pump, pump stroke counter or other accurate means.

9.3.2 For each casing string, the maximum allowable casing shut-in pressure below the blowout preventer (casing seat test pressure) shall be posted near the driller's position and recorded in the driller's log.

9.4 TESTING OF BOP SYSTEMS (PRESSURE AND FUNCTION TEST)

9.4.1 BOP stacks, the choke line, choke manifold and associated valves and fittings shall be pressure tested as follows:-

(a) when installed;

(b) before drilling out the cement after each casing string is set; last casing string will also be pressure tested on this occasion;

(c) following repairs that require disconnecting a pressure seal in the stack;

(d) at least once every seven (7) days on long duration wells.

9.4.2 A suitable BOP test plug and test joint shall be provided for periodic testing of preventer stack without testing the casing string.

9.4.3 The kelly valves, kelly, full bore drillstring safety valves and inside blowout preventers shall be tested to the same pressure as the BOP stack at the same time the preventer assembly tests are made. These should be tested with pressure applied from below.

9.4.4 BOP FUNCTION TEST

A preventer function test shall be performed on each round trip, but not more than once a day, while tripping the drillpipe with the bit just inside the casing. Such a test shall include:

(a) operation of the choke line valve;

(b) operation of the pipe rams; and,

(c) operation of adjustable chokes and flushing of the choke manifold.

9.4.5 (Closing Unit) Accumulator Closing Test.

This test shall be conducted on each new well prior to first pressure test of the blowout preventer stack. Guidelines for this test are given in Section 5-A of API RP 53: "Recommended Practices for Blowout Prevention Equipment Systems."

9.4.6 All BOP and Closing Unit pressure and function tests and the results thereof shall be recorded in the driller's log.

9.5 INSPECTION AND MAINTENANCE OF BOP SYSTEMS

All BOP systems and associated equipment shall be regularly inspected and maintained to ensure proper functioning of the

equipment. The manufacturer's recommended inspection and maintenance procedures shall be used as guidelines.

9.6 BLOWOUT PREVENTER DRILLS

9.6.1 All rig crews shall be instructed in BOP drills and be thoroughly familiar with the BOP equipment employed on their rig.

9.6.2 A well control drill plan, applicable to the particular location, shall be prepared by the rig owner, outlining the assignments of each crew member and the prescribed time for the completion of his part of the drill. A copy of the well control drill plan shall be posted on the rig floor and/or the notice board.

9.6.3 It shall be the responsibility of the rig owner, through his toolpusher and in consultation with the operator's representative, to conduct these drills weekly taking rig activity into consideration. These drills shall be directed towards training the rig crews to detect an impending blowout and to close in the well safely.

9.6.4 A well control drill may be required by the Minister's authorized representative after consulting with the operator's representative.

9.7 MUD/GAS SEPARATION FACILITIES

Suitable mud/gas separation equipment, capable of removing both free and entrained gas, shall be installed in the mud system of drilling rigs prior to commencing drilling operations. This equipment shall be maintained for use throughout the drilling and completion of the well.

9.8 SOLIDS CONTROL EQUIPMENT

Adequate solids control equipment shall be provided for each rig. This equipment must be properly connected and well maintained.

9.9 MUD QUANTITIES

Adequate quantities of mud and mud materials must be maintained at the drill site to ensure effective well control. Mud quantities must be recorded daily and records kept at the well site.

10 DRILLING AND PRODUCTION RIG ELECTRICAL SYSTEMS

10.0 CLASSIFICATION OF AREAS

10.1.1 DEFINITIONS

For the purposes of this Code the following definitions apply:

(a) Hazardous (Classified) Area: an area where fires or explosion hazards may exist due to flammable gases, vapours or liquids.

(b) Safe (Unclassified) Area: any area on location, no part of which is classified as a hazardous area.

(c) Electrical Equipment: a general term including materials, fittings, devices, fixtures, apparatus and the like used as part of or in connection with an electrical installation.

10.1.2 To determine the type of electrical installation required on a well location, the location is subdivided into two broad categories according to the degree of

probability of the presence of a hazardous atmosphere.

(a) Hazardous (Classified) Areas

(b) Safe (Unclassified) Areas

10.1.3 For the purpose of this Code, the classification of areas on drilling and production rig locations shall be in accordance with

(a) The American National Electrical Code (NFPA No 70 – 1984) or latest edition – Article 500 and

(b) The American Petroleum Institute API RP 500B (latest edition) – Recommended Practice for Classification of Electrical Installations at Drilling Rigs and Production Facilities on Land and Marine Fixed and Mobile Platforms.

Thus hazardous area on a land or offshore well location shall be Class I, Division I or 2 containing atmosphere listed under Group D.

10.2 WIRING FOR DRILLING AND PRODUCTION RIGS

10.2.1 Rig wiring shall be installed in a manner which protects it from burns, abrasions, cuts, being trampled by vehicular and foot traffic and damage from other sources. Additionally, it shall be insulated to resist weather, oil, chemicals, (and salt water induced corrosion if operated near to or in a marine environment).

10.2.2 Wiring methods in Divisions 1 and 2 areas shall be in accordance with methods specified in Article 501 of the American National Electrical Code (NFPA No 70 – 1984) or the latest edition, or API Recommended Practice 14F, “Recommended Practice for Design and

Installation of Electrical Systems for Offshore Production Platforms."

10.2.3 When flexible cord or cable is utilized on drilling and production rigs in Division 2 areas they shall be of the extra hard service type, oil and weather resistant, and provided with approved bushed fittings. Flexible cord and cable shall be connected in an approved manner and should be supported by clamps or by other suitable means such that there will be no tension on the terminal connections. An additional conductor for grounding shall be included in the flexible cord or cable unless other acceptable means of grounding are provided.

10.2.4 Power and lighting cables from the generators to the derrick shall be located where they cannot be damaged when the rig is operating or while heavy tools are being moved.

10.2.5 Splices in cables or cords shall be mechanically strong and insulated to provide the mechanical and dielectric strength of the original cord. Splices shall be made by a competent electrician only.

10.2.6 All electrical plug receptacles shall be of the three (3) wire, grounded type, compatible with the amperage and to the voltage of the electrical circuit in which they are used.

10.2.7 Switches opened to permit work on lines or equipment shall be secured with a lock out device and shall be tagged with a suitable warning sign to alert personnel that the switches must not be closed.

10.3 ELECTRICAL EQUIPMENT FOR DRILLING AND PRODUCTION RIGS

10.3.1 All electrical motors, generators, lighting systems, switches, circuit breakers, receptacles, attachment plugs and other equipment located in hazardous (classified) areas shall be of a type as recommended by Section 2, API RP 14F or other industry recognized publication documenting use of this equipment for Class I, Division 1 or 2 and appropriate.

10.3.2 All rig lighting fittings in the derrick or mast and on the rig floor, shall be either explosion proof (if in Division 1) or of the vapour tight type i.e. enclosed and gasketed and approved as such by a recognized agency.

10.3.3 Safe (Unclassified) Areas

For reasons of corrosion resistance, minimized parts inventory, and flexibility to accommodate changes in site location, it is recommended that the wiring methods and electrical equipment, including lighting systems, used in unclassified outdoor locations be similar to those employed in Division 2 areas.

10.4 GROUNDING

The metallic frames of all electric motors, generators, switchgrear, control panels and other electrical equipment operating at a voltage exceeding 50 volts between conductors and either 30 volts a.c. or 50 volts d.c. between any conductor wire and earth, shall be properly grounded.

All metal-framed doghouses or offices supplied with electric power at a voltage exceeding that specified above shall be properly grounded.

11 FIRE PREVENTION AND PROTECTION

11.1 FIRE PREVENTION

11.1.1 Drilling and production rig operations on land and offshore well locations shall comply with the requirements of regulations 13-17 of the Drilling Regulations of the Mines, Borings and Quarries Act.

11.1.2 Smoking, the ignition of any material, or the use of naked lights shall be prohibited on well locations except in areas designated by the rig owner (in consultation with the operator) to be safe for such activity.

11.1.3 At no time shall smoking, the use of open flame heaters or the like be permitted within 30m (100 feet) of a well bore unless it is conducted in a 'purged' sealed enclosure such as a doghouse or office in which the entry of hazardous atmosphere is prevented by means of positive pressure ventilation from a clean air source.

11.1.4 Doghouses and other buildings where smoking or naked flames may be permitted shall be located in areas designated safe for smoking, or be effectively rendered purged enclosures with the appropriate safeguards for ventilation failure provided. Such doghouses or buildings must be marked "Area Safe for Smoking" by the rig owner.

11.1.5 Prior to the commencement of any welding or other hot work operations on land or offshore rigs on well locations, a written Hot Work Permit shall be obtained from the operator's/and rig owner's supervisors or another designated representative. (See Section 12).

11.1.6 Combustible materials, such as oily rags and waste, shall be stored in covered metal containers.

11.2 **FIRE PROTECTION**

11.2.1 Every drilling and production rig shall, to the satisfaction of the Ministry, keep in readiness for immediate use, appropriate firefighting equipment.

11.2.2 Every land and offshore drilling production rig shall be equipped with suitable portable fire extinguishing equipment which is approved by a recognized testing agency, strategically located, readily accessible, and plainly labelled as to their type and method of operation.

11.2.3 Portable fire extinguishers shall be tagged or marked to show the date of the last inspection or maintenance check, and the initials or signature of the person or the name of the agency performing the service. When the maintenance check includes recharge of the cylinder, such shall be indicated on the tag. These fire extinguishers shall be inspected at least every six (6) months.

11.2.4 Portable fire extinguishers shall be hydrostatically tested in accordance with the following test schedule, or whenever an inspection or maintenance check reveals doubt as to the cylinder's integrity.

Extinguisher Type	Test Interval (Years)
Foam	5
Dry chemical with stainless steel shells	5
Carbon Dioxide	5
Dry powder or chemical cartridge or cylinder	

operated with mild steel shells	12
Halon	12

11.2.5 Whenever a portable extinguisher or compressed gas catridge is hydrostatically retested, the following information shall be recorded on the extinguisher or catridge.

(1) Month and year of test

(2) Test pressure and

(3) Name or initials of person or agency performing the test.

Guidelines for hydrostatic testing may be obtained from the U.S. National Fire Protection Agency's NFPA No. 10 which covers requirements for portable extinguishers.

11.2.6 Duplicate inspection and maintenance records shall be kept in office files for all portable fire extinguishers located on or associated with a rig.

11.2.7 Every offshore rig engaged in well drilling or production operations shall be provided with a firewater system consisting of rigid pipe mains with fire hose stations located at strategic positions to provide coverage to the rig and its associated equipment.

This requirement may be waived for small platform rigs if adequate protection is afforded by the platform's firewater system, or equivalent fire protection measures approved by the Ministry are employed.

11.2.8 All fixed and portable fire protection equipment shall be periodically inspected and maintained in operating condition at all times.

11.2.9 Rig crews shall be trained in the use of the rig's firefighting equipment and be familiarized with the location of such equipment. Records of the type of training offered and those subjected to training shall be maintained on the rig.

11.2.10 Firefighting drills shall be conducted once every month with each crew member. Records of this type of training and those attending shall be maintained on the rig.

11.3 FIREFIGHTING EQUIPMENT PLANS

11.3.1 On all offshore drilling and production rigs, a plan showing the location of all firefighting equipment on the rig shall be prominently displayed. Copies or extracts from this plan are to be displayed to enable a person in any accommodation or working space to readily ascertain the position of all firefighting equipment in the vicinity.

12. WELDING AND FLAME CUTTING

12.1 SCOPE

These requirements are applicable to any welding or flame cutting in the following areas:

(a) all land well locations within an operating oilfield except those areas which have been designated safe welding areas by the rig owner (in consultation with the operator); a safe welding area shall at no time extend within 30m (100 feet) of any wellbore;

(b) an offshore mobile drilling unit in the drilling phase;

(c) an offshore platform or other installation during any drilling, completion, workover or production operation.

12.2 **'HOT WORK' PERMIT**

12.2.1 No welding or flame cutting operation shall be undertaken in the above areas until:

(a) an operator's representative, the rig owner's representative (where applicable), and the welders have personally inspected the work area for potential fire or explosion hazards and have taken the necessary precautions; gas testing with a combustible gas indicator must be conducted in an area prior to carrying out any hot work;

(b) the operator has issued a written hot work permit.

12.2.2 All necessary precautions to be taken shall be included on the permit, copies of which shall be kept by the welder (on the job) and the operator's representative. While a hot work permit is valid, no vessels, lines, fittings or valves are to be opened to the atmosphere. Operations must be sealed off if they are within 30m (100 feet) of hot work. If production equipment or other equipment containing hydrocarbon is within 30m (100 feet) of the hot work the pressure must be maintained well below the relief valve or rupture disc's bursting pressure.

12.2.3 Before a hot work permit is issued, the intended work area shall be cleared of all combustible material including rags, paper, spilled oil, oil in drip trays and drums of flammable liquid whether open or closed.

12.2.4 A hot work permit issued for a job exceeding twenty-four (24) hours duration shall be re-validated or re-issued (after taking the necessary precautions) by the

operator's representative every twenty-four (24) hours. A new hot work permit must be issued anytime work is suspended and the area is vacated by personnel.

12.3 **GENERAL**

12.3.1 All welding and flame cutting equipment shall be personally inspected by the welder prior to commencing any welding or flame cutting.

12.3.2 Welding leads shall be completely insulated and in good condition; oxygen and acetylene bottles shall be secured in a safe place and hoses shall be leak-free and equipped with proper fittings, gauges and regulators.

12.3.3 Where welding machines are powered by internal combustion engines, the engines shall be equipped with proper spark arrestors. If a gasoline engine is used, shielded or aircraft type ignition shall be used.

12.3.4 During all welding or flame cutting operations one (or more) person(s) designated as a fire watch shall be in attendance and have fire extinguishing equipment at hand.

12.3.5 On offshore locations, welding screens shall be employed, where possible, to control the spread of flying slag.

12.3.6 All welding equipment and leads shall be inspected by the operator on a regular basis (At least once per quarter).

13 PERSONAL PROTECTIVE EQUIPMENT

13.1 WEARING APPAREL

13.1.1 Safety hats and steel toe safety footwear, constructed to recognized standards, shall be worn by all members of rig crews and visitors to the rig. This does not apply to accommodation or living quarters.

13.1.2 Wherever practical, appropriate, fitting gloves shall be worn by rig crews to prevent minor injuries when handling rough materials or skin irritants.

13.1.3 When handling chemicals that may irritate or be injurious to the skin, employees shall wear suitable approved rubber gloves, a protective apron, or other protective equipment as appropriate.

13.1.4 Loose sleeves, baggy or thorn pants, loosely hanging objects, or anything that will snag on tools or get caught in moving equipment, shall not be worn by rig employees.

13.1.5 Rig employees shall not work in clothing which is saturated with any flammable, hazardous or irritating substances. Such clothing shall be immediately replaced with suitable clothing after the affected skin area has been properly washed and treated, if necessary.

13.2 EYE PROTECTION

13.2.1 Rig personnel shall wear suitable goggles or face shields constructed according to recognized standards, when handling injurious chemical liquid, powders, vapours, or engaged in any work in which the eyes may be injured or affected by flying objects, excessive dust from powdered material or hazardous light or heat rays.

13.2.2 When engaged in welding or flame cutting operations, welding personnel shall wear helmets or goggles with shade lenses.

13.3 SAFETY BELTS AND LIFELINES

13.3.1 When continuously engaged in work 3m (10 feet) or more above the rig floor or other working surfaces, every rig employee shall wear a safety belt with an attached lifeline, of not more than 1.8m (6') in length except during rig up and rig down operations and work requiring freedom of bodily movement.

13.3.2 Safety belts shall be attached by means of a lifeline to an anchor point or structural member capable of withstanding a strain caused by a weight of 90kg (200 lbs) dropping a distance of 2.4m (8 feet). The lifeline shall be adjusted to permit a maximum drop of 2.4m in case of a fall.

13.3.3 Safety belts used shall be in good condition and suitable for the particular job. When any defect or wear on the belt indicates that further use is unsafe, the belt shall be replaced.

13.3.4 Every derrickman or other employee required to use a safety belt shall be responsible for inspecting the belt for unsafe defects prior to use. These safety belts shall also be inspected by the operator on a regular basis (at least quarterly).

14 ACCIDENTS, INJURIES, FIRST AID

14.1 ACCIDENTS

14.1.1 The following accidents shall be reported by the operator in writing on the Ministry's prescribed MISC.1 accident report form within seventy-two (72) hours after occurrences.

(a) all accidents to persons on well location leading to death, or bodily injury, which will result in three (3) or more days lost time;

(b) all accidents resulting in major damage to rig and associated equipment;

14.1.2 The following rig-associated accidents shall be immediately reported by telephone or otherwise to the Ministry:

(a) accidents involving death to personnel;

(b) all other serious accidents to personnel i.e. in which serious bodily injury requiring immediate hospitalization, is incurred;

(c) all serious accidents including explosions and fires which result in considerable damage to the rig or associated equipment but not necessarily resulting in personal injury;

(d) all blowouts.

14.1.3 Whenever a serious accident – as stipulated in 14.1.2 – occurs, the operator, and rig owner shall ensure that the scene of the accident – as far as is practical and is reasonably safe – shall not be disturbed until approval is given by the Ministry's investigating officer.

14.1.4 The operator and rig owner shall take all reasonable steps to prevent or minimize the recurrence of an accident on a drilling and production rig.

14.1.5 The rig owner and or operator shall submit a comprehensive report to the Ministry on any accident which may occur as identified in paragraph 14.1.2. The report shall indicate the cause of the accident and prescribe measures to prevent a recurrence.

14.2 FIRST AID

14.2.1 On every rig location, at least one (1) person present on each tour should be trained in first aid and should possess a valid first aid training certificate (mandatory on offshore rigs). The person(s) should have been certified through a recognized or approved course from such agencies as the Red Cross, St. John Ambulance Brigade or other recognized competent organization.

14.2.2 Every land and offshore rig shall be equipped with suitable first aid supplies kept on location in a first aid kit or cabinet. The supplies shall be inspected at frequent intervals, replenished as necessary and be readily available at all times. (See Appendix I for minimum required first aid supplies on land and offshore rigs).

14.2.3 If harmful chemicals (such as caustic and acidizing compounds) are to be handled at any time, suitable means of rapidly flushing the eyes and affected skin areas with uncontaminated water shall be readily available in the event of an accident. On remote land and offshore rigs the use of commercial eye wash bottles containing clean water or acid neutralizer where necessary may be considered for use on the eyes.

14.2.4 At least one (1) stokes litter or suitable safety litter capable of being safely hoisted with an injured person (at least two (2) for offshore rigs) should be available on each drilling rig location.

15 HEALTH AND WELFARE

15.1 DRINKING WATER

15.1.1 There shall be provided and maintained on every rig location, an adequate supply of clean, wholesome drinking water, the supply points shall be clearly labelled "DRINKING WATER".

15.1.2 On offshore rig installations, the supply of drinking water shall be tested by a competent person at intervals not exceeding three (3) months.

15.2 FOOD SUPPLIES

All provisions for consumption by personnel on an offshore rig must be fit for human consumption, palatable and of good quality.

15.3 TOILET FACILITIES

There must be provided and maintained on every operating rig location, one or more sanitary toilets for use by rig personnel. This requirement may be waived if toilet facilities are available for use within a reasonable walking distance from the rig.

15.4 ALL TANKS AND VESSELS

Water tanks, fuel and chemical storage vessels must be properly labelled to indicate their content.

16. TRAINING OF RIG PERSONNEL

16.1 All rig employees shall receive the necessary training in correct work methods to reduce the risk of injury to themselves and or fellow workers. A formal Safety Programme shall be established and maintained by the rig owner and this must include, but not be limited to the following:

(a) Orientation of new employees. Each new rig employee, regardless of previous experience, shall have his job outlined, explained and demonstrated by the tourpusher, driller or other competent personnel trained and experienced in the subject job, with full knowledge of the hazards involved in the job.

(b) Instruction to the bullpusher, tour pusher and driller in their responsibility for the safety of their crew and equipment on location during normal and emergency operations.

(c) Instruction of rig personnel on work details.

(d) Training in the use of maintenance of personal protective equipment.

(e) Good housekeeping practice.

(f) Training in well control equipment, operations and techniques appropriate to the particular rig and nature of operations to be conducted.

(g) Periodic well control drills (on bottom and while tripping) on drilling rigs. The following personnel would be expected to take part in the drill:-

(i) Tourpusher

(ii) Toolpusher or rig supervisor

(iii) Driller

(iv) Headman

(v) Derrickman

(vi) Roustabout

(h) Training in basic firefighting including the use of the rig's firefighting equipment.

(i) Training in safety procedures when hydrogen sulphide is expected to be encountered during drilling operations.

(j) General safety education through regular safety meetings, publications and other educational media.

16.2 **WELL CONTROL TRAINING**

Effective January 01, 1990 the following rig personnel must have valid certificates in Well Control from schools/institutions recognized by the Ministry of Energy.

(a) Tourpusher – operator and rig owner

(b) Toolpusher – operator and rig owner

(c) Driller

(d) Well Servicing Supervisor (land production rig).

Persons who do not have valid certificates shall not be allowed to work on any drilling or production rig engaged in petroleum operations of any of the above mentioned positions.

It is recommended that headmen should seek training in basic well control.

16.3 ADDITIONAL TRAINING FOR RIG EMPLOYEES – OFFSHORE

16.3.1 Offshore rig employees including catering and cleaning staff, visitors and well service personnel required to work or remain on the rig, shall be fully instructed in the following:

(i) Rig abandonment procedures and the location of abandonment stations.

(ii) Other emergency procedures for outbreak of fire, man overboard etc.

(iii) Emergency signals.

(iv) Operation and use of life capsules, life rafts, life jackets, ring buoys and other survival equipment.

(v) Individual water entry procedures.

(vi) Safety procedures to ensure safe transport by helicopter and crew boat where applicable.

(vii) General safety procedures for handling of crane loads – rig crew only.

(viii) Basic First Aid procedures.

(ix) General housekeeping practices on the rig.

17 ADDITIONAL SAFETY REQUIREMENTS – OFFSHORE OPERATIONS ON MOBILE DRILLING UNITS AND PLATFORM RIGS.

17.1 STATION BILLS

17.1.1 On every mobile drilling unit and platform rig a station bill or muster list for general emergencies including fire or explosion, abandonment and man overboard, shall be prepared and posted at least at the following locations:

(a) Living quarters – mess hall, sleeping area, recreation room, main office.

(b) Optional – space permitting – rig floor, pump room.

17.1.2 Information on the station bill shall include:-

(a) The emergency station of every person on the rig, and any duties assigned to particular persons.

(b) The person appointed to be in charge of each station, and the person to whom duties in connection with the following matters are assigned:

(i) firefighting;

(ii) the isolation of any machinery, electrical system or hydrocarbon lines;

(iii) the closing of water tight doors, fire doors, etc where applicable;

(iv) the launching of life capsules and life rafts;

(v) the securing of the safety of visitors to the rig;

(vi) any other activity that may be deemed necessary in emergencies.

(c) The alarm signals for fire, abandonment, man overboard and all clear or return to normalcy.

17.1.3 The rig owner shall designate a person to be responsible for receiving all service personnel and visitors, recording the number of persons and bringing their attention to the Station Bill immediately upon their arrival on the rig.

17.2 RIG ALARM SYSTEM

17.2.1 An electric warning siren or bell or other effective means shall be installed in such locations as to be distinctly audible in all areas of the rig.

17.2.2 On self-contained platform rigs, the rig's alarm system shall be extended to alert the operator's production personnel on other decks, or radio communication provided to immediately alert production personnel. In the case of the latter, it shall be the ultimate responsibility of the person in charge of all rig operations to notify production personnel when necessary.

17.3 DRILLS

17.3.1 Emergency drills (fire, abandonment) under the direction of the person in charge or other designated person shall be conducted at least monthly and a written report kept on the rig. Such drills shall incorporate, as far as practical, all crews, service and visiting personnel.

17.3.2 At intervals not exceeding three (3) months an abandonment drill shall be conducted in which every survival capsule of the totally enclosed, self propelled type (where installed), shall be loaded, swung out and if reasonably practicable, lowered into the water.

17.4 STANDBY VESSEL

A suitable standby boat, capable of accommodating all persons who may be on the rig (or platform) at any time, shall be present within 16km (10 nautical miles) from an offshore rig actively engaged in oil and gas operations. The standby boat should be in radio communication with the rig and shall have suitable rope nets or other devices which can be used in rescue operations. The operator/rig owner may require the standby boat to be closer to the rig depending on the activity on the rig.

17.5 INSPECTION OF FIREFIGHTING AND SURVIVAL EQUIPMENT

17.5.1 Frequent inspections (primarily visual in nature) of all firefighting and survival equipment shall be conducted weekly and their condition found, recorded and kept on the rig. Records of weekly safety inspections of all such equipment shall be provided for examination on request by Ministry inspection personnel. Remedial action shall be promptly taken to correct any defect or conditions found.

17.5.2 Each inflatable life raft shall be sent ashore and serviced by recognized competent personnel every year. The date of manufacture, capacity, date of last service, and instructions for launching shall be affixed on or near the enclosed raft.

17.5.3 Survival capsules and their launching mechanisms shall be inspected and maintained according to the

manufacturer's recommendations. This does not preclude the weekly check specified in 17.5.1.

17.6 LIVING QUARTERS AND DOGHOUSES

17.6.1 Smoking and/or thermal detectors shall be installed in all living quarters, doghouses and other buildings in which personnel regularly and occasionally sleep.

17.6.2 Smoke or thermal detectors must be approved by a recognized testing laboratory.

17.6.3 Smoke or thermal detectors shall be installed in, but not necessarily restricted to, individual rooms where personnel sleep or in corridors at spacings not exceeding the manufacturer's recommendations

17.6.4 Both self-contained and system-operated smoke detectors shall be battery operated or have a back-up battery supply.

17.6.5 All smoke and thermal-detector systems shall have audible alarms.

17.6.6 All living quarters and doghouses containing A GAS SOURCE shall also be provided with an automatic gas detection and alarm system, or the gas should be odorized for quick detection.

17.7 IDENTIFICATION OF RIGS

17.7.1 MOBILE DRILLING UNITS

All mobile drilling units, including drill ships, shall be clearly identified by a sign with letters and figures not less than 30 cms (12 inches) in height affixed to the derrick or the heliport so as to be visible to approaching traffic.

17.7.2 **PLATFORM RIGS**

Conventional rigs located on fixed offshore platforms, usually provide their own helipads over the living quarters. In such cases, the rig shall be clearly identifiable by a sign or helicopter markings as specified in 17.7.1. On small platforms not provided with helicopter landing facilities, there is no identification marking requirement since the platform itself is required to be clearly identified by a suitable sign so located so as to be visible to approaching boats.

17.8 **HELIPORTS**

17.8.1 DESIGN AND CONSTRUCTION

Effective January 01, 1990 all new offshore rigs' heliports shall be designed and constructed to conform with API RP 2L latest edition – API Recommended Practice for Planning, Designing, and Constructing Heliports for Fixed Offshore Platforms.

17.8.2 HELIPORT MARKINGS

(a) Effective January 01, 1990 the allowable gross weight to the nearest metric tonne and available ground cushion area to the nearest square metre shall be marked on all heliports so as to be visible from the primary direction of approach. The numbers shall be of such size as to be readily discernible by the pilot of the approaching helicopter in sufficient time to effect a go-around if necessary.

(b) All necessary helicopter markings shall be periodically maintained so as to be clearly visible to the pilot of an approaching helicopter.

17.8.3 WIND DIRECTION INDICATOR

A wind sock or other effective means of indicating wind direction shall be provided on the rig so as to be visible to the pilot on his final approach to land. Where night flights are anticipated, the wind direction indicator shall be illuminated but not in such a way as to be a hazard to flight.

17.8.4 CRANE OPERATIONS

Helicopter operations shall not be conducted while a crane is operating if the crane constitutes a hazard to aircraft safety.

17.9 CRANES

Cranes shall be operated and maintained in accordance with the provisions of API RP 2D "Recommended Practice for the Operation and Maintenance of Offshore Cranes". Crane operators must be competent to perform their duties.

17.10 ELECTRICAL

Non-conductive floor mats of the proper type (as described in the IADC Accident Prevention Manual) shall be provided in front of the electrical switch panel.

18 INSPECTION AND MAINTENANCE

18.1 GENERAL

18.1.1 Whenever the rig owner or his toolpusher or supervisor becomes aware of any deficiency or undesirable condition that impairs safe operation of any rig equipment or component, such equipment shall be promptly repaired or replaced, or its operation restricted to eliminate the unsafe condition until the

necessary repairs and tests are satisfactorily completed.

18.1.2 Every rig owner shall establish – for use by rig operating and maintenance personnel – a written routine Inspection and Maintenance Schedule to cover all equipment and functions critical to the safety and economics of the operations on his rig. Relevant manufacturer's recommendations shall be used as guidelines in determining inspection and service intervals.

18.1.3 The Inspection and Maintenance Schedule referred to in 18.1.2 shall cover but shall not necessarily be limited to the following:

(a) Land Rig Units

(i) lubrication points;

(ii) fluid levels – hydraulic, lube oil, coolant, fuel etc;

(iii) the rig air system;

(iv) operation of the hydraulic system;

(v) drum brakes and linkages;

(vi) the drilling line or pulling line;

(vii) the mast and its erecting mechanisms including hydraulic rams, all airlines, sheaves or other means of mast extension, pins and latches, derrickman's gallery etc;

(viii) blowout preventor and related well control well control equipment;

(ix) firefighting equipment

(b) Offshore Units

(i) all of the above where applicable;

(ii) major electrical and mechanical equipment and systems;

(iii) cranes;

(iv) the rig's support structure;

(v) emergency survival equipment.

18.1.4 The rig owner shall keep proper office records of all inspections, repairs, replacements and tests relating to items specified in 18.1.3 (a) and (b) for examination by Ministry inspection personnel on request.

18.2 MAJOR INSPECTION OF DERRICKS AND MASTS

All derricks and masts shall be subjected to a detailed structural inspection of the legs, members and critical welds by an independent recognized body; not less than every five (5) years or when field inspections or other circumstances may so warrant. This detailed inspections shall be a combination of visual means and other approved non-destructive techniques e.g. magnetic particle, dye penetrant, ultrasonic or radiography. A copy of the inspection certificate shall be submitted to the Ministry within two (2) weeks of the inspection.

18.2 ADDITIONAL REQUIREMENTS FOR MOBILE OFFSHORE DRILLING UNITS – JACK-UP, SEMI-SUBMERSIBLE AND SHIP SHAPE OR THE LIKE

18.3.1 Mobile Offshore Units, including those engaged in well servicing operations will not be allowed to operate in Trinidad and Tobago unless they possess the following:

(a) A valid certificate of inspection or Classification issued by the Classification Society under which the unit was designed and constructed or classified.

(b) A valid Cargo Ship Safety Equipment Certificate issued under the provision of the International Convention for the Safety of Life at Sea (SOLAS).

18.3.2 All systems on mobile offshore units shall be operated and maintained according to the manufacturer's specifications as well as the requirements of the appropriate classification society.

19 POLLUTION PREVENTION

19.1 GENERAL

19.1.1 No oil, oily products or harmful substances shall be discharged from an offshore rig installation into the sea.

19.1.2 No oil, oily products, drilling fluids, or other harmful substances shall be allowed to escape from a land well location over adjacent lands, to enter streams, or seep into shallow fresh water bearing sands.

19.1.3 Rig waste, such as engine oil, waste oil, grease, etc. shall be accumulated in suitable containers, drip trays, sump tanks or collected by some other suitable means.

19.1.4 Waste water used in cleaning the rig tools, and equipment shall be collected with the aid of an effective drainage system in a storage pit or sump.

19.2 DRILLING/WELL SERVICING FLUIDS AND CUTTINGS

19.2.1 Drilling/well servicing fluids containing harmful substances in toxic concentrations shall be safely treated and/or disposed of on location or transported to an approved disposal site.

19.2.2 Where oil-based fluids are in use, the cuttings shall be effectively cleaned and washed prior to transfer to mud disposal pits or discharge into the sea.

19.3 SANITATION AND GENERAL HOUSEKEEPING

19.3.1 SANITATION

All garbage shall be collected and temporarily retained in suitable containers for proper disposal by:

(a) transporting to an approved garbage collection site;

(b) burning or incinerating;

(c) burial in the drilling site disposal pit if one is used and properly covered with dirt – (applicable to land);

(d) any other means approved by the Ministry.

19.3.2 GENERAL HOUSEKEEPING

(a) Rig main and auxiliary equipment shall be kept clean and painted as far as is reasonably and practically possible.

(b) Following rig-up, all miscellaneous equipment such as boards, tools, etc. which are not essential to ongoing rig operations on the well, shall be removed nor neatly stored.

(c) All well fluid chemicals and materials shall be neatly stacked and as easily accessible to the mud hopper as is practical.

(d) The rig crew must ensure that proper housekeeping is maintained on the location at all times.

20 GENERAL

20.1 WARNING SIGNS

The following signs must be prominently displayed at the entrance to all land drilling and production rig sites.

(a) No smoking, open flames within 30m (100 feet) of well.

(b) Hard hats and safety boots must be worn.

(c) No unauthorized persons allowed.

20.2 COMMUNICATION

Adequate communication must be provided at each rig site to facilitate ease of communication between the rig crew and personnel at their main office.

20.3 PIPE RACKS

Pipe racks must be levelled on a solid base and ends properly chocked.

20.4 GENERAL OBLIGATIONS

Notwithstanding the above requirements, both the operator and the rig owner are required to ensure that the rigs operating under their control are properly maintained and operated by a well trained crew.

20.5 RECORD KEEPING

The following records must be kept on the rig for a period of at least one (1) year, and then transferred to the rig owner's office for a period of at least two (2) years.

- Notes of safety meetings
- BOP pressure and function tests
- Fire, BOP and abandonment drills where applicable
- Ton mileage and dates of slip and cut
- Dates of rig safety inspection
- Fire extinguisher inspection/service dates
- Safety inspections (internal/external)
- Accident reports
- Equipment repairs and inspection reports.

APPENDIX 1

FIRST AID AND PROTECTIVE EQUIPMENT

Minimum First Aid Requirements

The first aid supplies shall be kept in a clearly marked medicine kit/cabinet and an inventory of all supplies within the cabinet shall be maintained. The supplies shall include:-

- cut ointment
- sterile bandages
- sterile eye pads
- eye drops/wash
- insect sting ointment
- adhesive plasters
- lint
- stokes splint type wire basket; one (1) for drilling land rigs, two (2) shall be provided for offshore rigs.

Protective Equipment

Chemical gloves, aprons, goggles and face shields must be kept on location for all drilling rigs and used when required.

In addition, in the case of production rigs the above mentioned protective equipment must be provided and used whenever a job entailing their use arises.