

INDEPENDENT STATE OF PAPUA NEW GUINEA.

STATUTORY INSTRUMENT.

No. of 2015.

Unconventional Hydrocarbons Regulation 2015,

Being a Regulation,

MADE by the Head of State, acting with, and in accordance with, the advice of the National Executive Council under the Unconventional Hydrocarbons Act 2015.

PART I.—PRELIMINARY.

1. Definitions.

(1) In this Regulation, unless the contrary intention appears:—

“Act” means the *Unconventional Hydrocarbons Act 2015*

"API" means the American Petroleum Institute;

"approved" in relation to drilling equipment and materials, means approved by the American Petroleum Institute (hereinafter in this Regulation referred to as 'API'), or other testing agency or authority recognized by the Director;

"AS" means Standards Association of Australia Standard;

"ASEG-GDF" means the Australian Society of Exploration Geophysicists-General Data Format;

"authorized person" means a person appointed by the Person-In-Charge to carry out a specific duty;

"barrel" means 34.9726 imperial gallons or 42 US gallons at a temperature of 60oF and an absolute pressure of 14.73 pounds per square inch or 158.988 litres under similar conditions of temperature and pressure;

"blooey line" In relation to air or gas drilling, means a system of pipes arranged to carry the air or gas returning to the surface away from the drilling rig;

"cable" means an electrical conductor or system of conductors for the transmission of electrical power or communications;

"Chief Inspector" has the same meaning given in the *Oil and Gas Act 1998* and means the Chief Inspector appointed under Section 151(1) of the *Oil and Gas Act 1998*;

"circulation" means the passing of fluid down the drill pipe, casing or tubing in a well and up to the surface or in the reverse direction;

"classifying authority" means an approved authority qualified to classify ships, barges or mobile platforms;

"clean oil" means oil free from water and sediment;

"condensate" means a mixture mainly of pentanes and heavier hydrocarbons that exists in a gaseous phase in its virgin reservoir state, but is a liquid in the conditions in which its volume is measured or estimated;

"construction platform" means a ship, barge or other vessel or floating structure from which construction or installation operations for or in connection with the exploration for or recovery of unconventional hydrocarbons are or are to be carried out;

"contractor" means a person or body corporate engaged or appointed by the licensee to perform a specific work or service at a certain price or rate;

"cubic foot" means the amount of gas or liquid in one cubic foot of space at a temperature of 60oF and an absolute pressure of 14.73 pounds per square inch;

"date of completion" means the date on which a well is first ready to produce reservoir fluids or if planned for some other purpose, the date on which it is left in a suitable condition to fulfill that purpose;

"Deputy Person-in-Charge" means a person appointed by the Person-in-Charge in accordance with Section 6;

"derrick" means a fixed framework over a well used in supporting, hoisting and lowering operations;

"directional drilling" means the intentional changing of the direction of the well when drilling;

"Director" means the person appointed as Director under Section 11 of the Act;

"drilling rig" means machinery and ancillary equipment used for drilling wells and/or for working over wells;

"dynamic positioning" means the positioning or repositioning of a vessel in or to a chosen location by automatic means and without recourse to any physical mooring arrangements;

"enhanced recovery" means the increased recovery from a pool achieved by artificial means or by the application of energy extrinsic to the pool, which increases the recovery of petroleum to more than that obtainable by the action of natural reservoir energy, gravity or secondary recovery methods as commonly defined within the petroleum industry.

"enhanced recovery scheme" means a scheme designed to increase the recovery of unconventional hydrocarbons to more than that obtainable by the action of natural reservoir energy, gravity or secondary recovery methods as commonly defined within the petroleum industry;

"explosive" means:—

(a) any substance or articles capable of producing an explosive, incendiary or pyrotechnic effect; or

(b) any substances prescribed under the Explosives Act (Adopted) (Chapter 309); or

(c) any containers that—

- (i) have contained a substance or articles referred to in Paragraph (a) or (b); and
- (ii) have not been certified in the manner prescribed under the Explosives Act (Adopted) (Chapter 309) to be free from explosives;

"extra-low voltage" means voltage not normally exceeding 32 volts alternating current or 115 volts direct current;

"field" means the general surface area underlain by and including one or more pools of oil or gas or both as defined in the *Oil and Gas Act 1998*;

"firewall" means a wall of concrete, earth or other material surrounding a tank or tanks that confines the spillage of petroleum and prevents the spread of fire or the passage of flammable liquids or vapours;

"fixed platform" means a structure (including a floating structure) fixed or connected to the sea-bed otherwise than only by a part of the structure lowered to the sea-bed for the purpose of supporting the structure, from which unconventional hydrocarbons exploration operations or operations for the recovery of unconventional hydrocarbons are or are to be carried out and that is not or is not to be capable of being readily moved from one position to another as such a structure;

"flame-type equipment" means any equipment that through its design or use is able to cause ignition to flammable materials, liquids and/or gases;

"flowing well" means a well from which oil, gas or water is produced naturally without artificial lifting equipment;

"gas" means any natural gas, hydrocarbon or other, or any mixture thereof;

"gas oil ratio" means the ratio of total gas (expressed in cubic feet) to clean oil (expressed in barrels) concurrently produced during any stated period;

"geophysical exploration" means geophysical investigation by any generally recognized method including seismic, gravimetric, magnetic, electrical, radioactive and geochemical methods in the study of the subsurface;

"ghost hole" means an uncased section of a well that once drilled, is unable to be reentered due to mechanical or formation conditions;

"good oilfield practice" means practice generally accepted as good and safe within the petroleum industry;

"hazardous area" means an area in which flammable gases or vapors are, or may be, present in the air in sufficient quantities to produce explosive or ignitable mixtures;

"helideck" means a deck or platform designed to accept a helicopter for landing or take-off;

"helipad" means a surface designed to take a helicopter for landing or take-off;

"inspector" or "inspection company" means a person or corporation with recognized qualifications accurately to inspect and evaluate equipment as meeting its intended specifications and its requirements of use;

"licensee" means the registered holder of an unconventional hydrocarbon licence;

"licence area" means the area constituted by the blocks that are the subject of an unconventional hydrocarbon licence;

"licensed electrical worker" means a person holding a certificate of competency issued by the Papua New Guinea Electricity Commission;

"magazine" means a place for the storage or keeping of any explosive;

"main operational site" means a location at which work occurs for extended periods of time or a location at which continuous operations are carried out;

"mast" means a portable or collapsible framework over a well used in supporting, hoisting and lowering operations;

"mobile platform" means a construction platform, floating service platform or mobile drilling unit that is capable of being moved readily from one position to another;

"mobile drilling unit" means a ship, barge or other vessel or floating structure including a structure any part of which may be lowered to the sea-bed for the purpose of supporting the structure that carries or includes equipment for drilling or carrying out other operations on a well from the vessel or structure;

"MSDS" sheet means the manufacturer's safety data sheet for a product provided to the petroleum industry;

"mud" means a drilling fluid consisting of any suitable mixture of water, oil, clay or other material (or any admixture of all or any of such materials) commonly used in the petroleum industry which will remove the drill cuttings from the hole and which will also control rock and reservoir pressures, stabilize disturbed formation conditions and seal formations into which fluid from the hole is escaping;

"multiple completion well" means a well for the segregated production from, or injection to, more than one pool;

"NATA" means the National Association of Testing Authorities, Australia;

"permit to work" means a system of approving/monitoring of other than normal work operations in a restricted area by use of approval permits authorized by the person in charge;

"Person-in-Charge" means a person appointed by the Licensee in accordance with **Section 5**;

"Petroleum Inspector" means a person appointed to be an inspector pursuant to Section 115 of the *Oil and Gas Act 1998*;

"plant" includes drilling equipment, derricks and masts, power units, pumps, units, separators, storage tanks, pipelines, vehicles and all other equipment, materials and tools used in a field operation;

"platform" means a construction platform, fixed accommodation, process, production or shipping platform, service platform or mobile drilling unit;

"PNGS" means a National Technical Standard established under the National Institute of Standards and Industrial Technology Act 1993;

"pool" means a discrete underground accumulation of oil or gas or an admixture of such substances;

"process vessel" includes a heater, dehydrator, separator, treater or any vessel used in the processing or treatment of produced petroleum;

"production" means the volume of oil, gas or water produced;

"production facility" means a system or arrangement of surface equipment receiving the effluents of one or more wells prior to delivery to market or other disposition, and may include equipment or devices for separating the effluents into oil, gas condensate or water, and for measurement;

"production potential" means the capacity of a well to produce oil, gas or water, calculated or measured in accordance with generally accepted procedures;

"reservoir" means a porous and permeable rock capable of storing fluids and yielding them to a well;

"reservoir pressure" means the static or stabilized pressure existing or presumed to exist in a reservoir at a given datum;

"reservoir measurements" means measurements of reservoir pressure and temperature and of the movements of fluids and fluid interfaces within a reservoir;

"seismic source" means the energy source used to create shock waves in the earth, the reflections of which are recorded in investigating underground strata;

"separator" means an apparatus at the surface for separating fluids produced from a well;

"service platform" means a ship, barge or other vessel or floating or fixed structure that, in connection with unconventional hydrocarbons exploration operations or operations for recovery of unconventional hydrocarbons, provides a base from or on which service such as diving, fire-fighting, accommodation, processing or storage are controlled, mounted or performed;

"service rig" means rig machinery and ancillary equipment specifically for the use of working over, completing, recompleting and/or servicing wells;

"shot hole" means a hole drilled for the purpose of firing an explosive charge as a seismic source;

"shot point" means the surface location and area immediately surrounding a shot hole or point of initiation of a seismic source;

"site person-in-charge" means a person appointed by the Person-in-Charge to manage an operation at a main operational site or area and is responsible to ensure approved, proper and safe procedures and programs are followed;

"spud date" means the date a new well has spudded or the date when commencement of drilling operations has begun for the sidetracking of a wellbore or the commencement of actual operations on a well for a workover, completion or abandonment;

"spudding in" means the commencement of drilling a well;

"standard handrail" means a permanent and substantial railing, smooth and free from protruding nails, bolts, or splinters, and consisting of a horizontal top rail not less than 900mm or more than 1050mm above floor level, mounted on posts or uprights spaced not more than 2.5m apart centre to centre and with an intermediate rail spaced midway between the top rail and floor level or top of the toeboard if a toeboard is provided;

"storage tank" means a tank containing flammable fluids;

"suspend" means to discontinue operations temporarily;

"suspended well" means a well, previously used for production or injection, in which all operations have been suspended prior to recompletion or abandonment, for a considerable period of time, with, however, the intention of operations being resumed at a later date;

"swing well" means a well that is intermittently produced;

"toeboard" means a vertical guard, not less than 100mm in height and fastened to the outer edge of a platform in order to prevent tools and other objects from falling therefrom;

"velocity log" means a recording of the travel time of sound waves through the strata penetrated in the well;

"verifying body" means an approved body qualified to—

- (a) verify the design, construction and installation of structures fixed or intended to be fixed to the sea-bed; and
- (b) carry out such verification as the Director may require;

"waste" in addition to its ordinary meaning, means—

- (a) the locating, spacing, drilling, equipping, completing, operating, or producing of a well in a manner that could be shown to result in reduction of the quantity of oil, gas or water ultimately recoverable from a pool under sound engineering and economic principles; or
- (b) the locating, drilling, equipping, completing, operating or producing of a well in such a manner that excessive surface loss or destruction of oil, gas or water is caused; or
- (c) any inefficient, excessive, or improper use or dissipation of reservoir energy; or
- (d) the failure to use suitable and timely enhanced recovery methods in a pool where it is demonstrated on the basis of available information, that any of such methods would result in increasing the quantity of oil, gas or water ultimately recoverable from a pool under sound engineering and economic principles; or

- (e) the escape or flaring of natural gas where the Director considers that by the application of sound engineering principles the natural gas could be gathered and, if necessary, processed so that the gas or its by-products could be marketed or stored for marketing or beneficially injected into an underground reservoir; and
- (f) the inefficient and improper storing of oil, gas or water whether on the surface or underground; or
- (g) the production of oil, gas or water in excess of proper storage facilities or transportation and marketing facilities or of marketing demand; or
- (h) the use of natural gas for purposes other than gas lift re-pressuring, recycling, drilling, pressure maintenance, or for chemical manufacture, light and fuel, unless the Minister considers such use is efficient and beneficial in the public interest;

"well" means a hole in the ground made, being made or proposed to be made for the purposes of searching for or producing unconventional hydrocarbons, for reservoir, for disposal of waste fluids resulting from production operations, or through which any unconventional hydrocarbons is obtained or is obtainable, but does not include a water bore or seismic shot hole;

"well log" means a recording of one or more physical or stratigraphic measurements as a function of depth in a well;

"workover operation" means a maintenance operation carried out on a well in order to improve productivity or to remedy some defect.

"workover rig" means rig machinery and ancillary equipment specifically for the use of working over, completing, recompleting and/or servicing wells.

(2) In this Regulation, a reference to the relevant requirements or recommendations of any Act, PNGS, Standards Association of Australia Standard or Code, any API Standard, Bulletin or Recommended Practice is a reference to those current standards, requirements or recommendations.

PART II.—ADMINISTRATION.

2. Responsibility of licensee.

(1) Subject to Subsection (2), a licensee shall ensure that all operations carried out in the licence area are in accordance with this Regulation and in the case of any operation in respect of which an operator has been appointed, that operator and the licensee shall be jointly and severally responsible for ensuring the observance of this Regulation.

(2) The liability of the licensee and the operator of a licence area shall be in addition to, and shall not affect or be affected by, the liability of any other person for any contravention or failure to comply with this Regulation.

3. Exemption.

(1) Where the Director is satisfied that compliance with a provision of this Regulation is impracticable, or undesirable in any particular circumstances, or that a satisfactory alternative

procedure, action or installation may be adopted, taken or installed, he may, at his discretion, exempt a person or class of persons from the duty to comply with such provision.

(2) An exemption under Subsection (1) may be granted subject to such conditions and limitations as the Director considers necessary.

(3) The Director may cancel an exemption under Subsection (1) where any condition thereof is contravened, or not complied with, or where he is satisfied that the circumstances under which it was granted have altered.

4. Posting of the Regulation.

A copy of this Regulation shall be kept on all drilling rigs, service rigs and at other main operational locations and shall be available at all reasonable times for perusal by employees, contractors and Petroleum Inspectors.

5. Person-in-Charge.

(1) The licensee shall, before commencing operations, appoint a competent person, to be known as the Person-in-Charge, to be in charge of all operations in the licence area and shall forthwith give to the Director—

(a) notification of the name and address of the Person-in-Charge; and

(b) where the Person-in-Charge has not previously held a position of Person-in-Charge in Papua New Guinea, a copy of the curriculum vitae of the Person in Charge; and

(c) a copy of the acceptance by that person of the appointment.

(2) A written notification of a change in appointment under Subsection (1) shall be forwarded to the Director forthwith.

(3) The Person-in-Charge shall ensure to the best of his ability that he and all workmen in his charge know and comply with all relevant provisions of this Regulation, applicable current laws of Papua New Guinea and with any corporate operations or safety manual that is applicable to the operations under his control.

(4) The Person-in-Charge shall comply with any conditions and/or directions which the Director considers appropriate in regards to any operation, notice, program or application.

(5) It shall be the responsibility of the Person-in-Charge to ensure that the equipment, program of operations, procedures and the working conditions provide for the safety of the personnel engaged in the operations, for the protection of the environment and equipment, and for the conservation of resources.

6. Deputy Person-in-Charge.

(1) The Person-in-Charge may delegate to a competent person who shall be known as the Deputy Person-in-Charge such specified duties (other than this power of delegation) as he may think fit.

(2) The Person-in-Charge shall notify the Director of the name and address of any Deputy Person-in-Charge, the duties so delegated to him, and the acknowledgment by that person thereof.

7. Name of Site Person-in-Charge to be Displayed.

The name of the site person-in-charge, and/or deputy site person-in-charge, of any site operation shall be clearly displayed on the site of that operation.

8. Accident, Incident and Employment Reporting.

(1) The licensee shall:—

(a) report forthwith to the Director:—

(i) all accidents which:—

(A) cause loss of life; or

(B) are of a serious nature resulting in injuries requiring urgent attention by a medical practitioner; and

(ii) all incidents involving fire, explosion, blow-out, spillage of hydrocarbons in excess of 10 barrels (1600 litres) and/or serious structural damage; and

(b) within seven days send a written report to the Director detailing the nature and cause of the accident or incident and of the injuries sustained by any person and any damage caused to plant, property or the environment; and

(c) within 30 days submit a written report to the Director detailing the preventative measures that have been instigated to prevent further accidents or incidents of a similar nature from occurring.

(2) Where a fatal, serious or potentially serious accident occurs, no person shall, except with the consent of a Petroleum Inspector, or for the purpose of—

(a) saving human life; or

(b) relieving human suffering; or

(c) rendering the well or site safe,

move, interfere with or destroy any article or thing at the place of, or connected with, the accident.

9. Monthly Accident and Employment Return.

(1) The Person-in-Charge shall complete, or ensure the completion of, a monthly accident and employment return in a form acceptable to the Director to reach the Director by the tenth day of each month, covering the previous month.

(2) A monthly accident and employment return under Subsection (1) shall provide—

(a) the total number of man hours worked including operator, contractor and subcontractors employed on the project; and

- (b) the total number and relevant details of lost time injuries; and
- (c) the total lost time for the month including any cases carried over from previous month(s), and shall include details of any potentially serious accidents or incidents even if not involving lost time.

10. Waste or Contamination.

- (1) Where, in the opinion of the Director, a possibility exists of waste or contamination of oil, gas or water, he may require that designated tests be made by the Person-in-Charge, to detect whether or not waste or contamination is present, and shall notify the Person-in-Charge accordingly, who shall forthwith carry out such tests.
- (2) Where a test required under Subsection (1) establishes that there is waste or contamination, the licensee shall forthwith carry out such measures as may be necessary to remedy or prevent the waste or contamination.
- (3) On completion of any measures taken under Subsection (2), to remedy or prevent any waste or contamination, the Director may require that such additional tests, as he may consider necessary, be made to establish the effectiveness of such remedial measures.
- (4) The results of any additional test required under Subsection (3) shall be forwarded forthwith to the Director.

11. Evaluation of an Occurrence of Oil or Gas.

Where the Director considers that insufficient coring, logging or testing is being carried out to evaluate an occurrence of oil or gas in a well, a potential occurrence of oil or gas or demonstrate a stratigraphic correlation in a well, he may require the Person-in-Charge to carry out any specified coring, logging or testing operations which are practical and reasonable under the circumstances existing and are of a kind generally recognized and used in the petroleum industry.

12. Entry onto Private Land.

- (1) A licensee shall, before he or his agents or servants enter on any private land, submit a completed Form 24 to the Director notifying of the licensee's intentions at least two weeks prior to making such entry and the Director shall immediately inform the person appointed under Section 73 of the Organic Law on Provincial Governments and Local-level Governments in relation to the Province in which the subject of the licence is situated.
- (2) The licensee, or his agent or servants, immediately prior to entering on private land, shall consult with the Senior District Official in the District in which the subject of the licence is situated to ensure that landowners are adequately informed of the type of operation to be undertaken, the approximate duration of the operation and potential damage that could be caused to property.

13. Protection of Public Utilities and Existing Pipelines.

Unless otherwise approved by the Director, no interference with any existing pipeline or with any road, airstrip, telephone or power transmission line or cable, radio mast or other public

utility or facility shall take place during the performance of any operation in the search for and the production of petroleum.

14. Interference with Facilities and Equipment.

A person who interferes with any work, facility or item of equipment constructed, installed or used pursuant to a licence area, such that the integrity or utility of that work, facility or item of equipment is lessened, is guilty of an offence.

Penalty: A fine not exceeding K5,000.00.

Default Penalty: A fine not exceeding K500.00.

15. Release of Information.

(1) Where a licence area is in force, or has been in force, the Director may make public any technical data, report, analysis, sample or material supplied to the Minister, Director or any Petroleum Inspector after a period as specified in the Act.

(2) An analyses of core or cuttings material and a reprocessing of seismic or other geophysical or geo-chemical surveys carried out on material or data obtained pursuant to Subsection (1) shall be reported to the Director within six months of substantial completion of the work, and the Director may make any such report available as specified in the Act.

PART III.—SAFETY.

Division 1.—General.

16. Responsibilities of Supervisors.

Without affecting the responsibility of the Person-in-Charge, every supervisor, foreman, tool pusher, and driller shall so supervise the workmen under his supervision that such workmen are not working in an unsafe manner, in unsafe circumstances and/or without proper protective equipment, and all supervisors shall comply with the provisions of the Industrial Safety, Health and Welfare Act (Chapter 175).

17. Responsibility of Workmen.

(1) A person shall use the safeguards, safety appliances, personal protective equipment or devices required by this Regulation.

(2) A person shall not use any equipment, or behave in a manner, that endangers himself or any other person.

(3) A person shall comply with the provisions of the Industrial Safety, Health and Welfare Act (Chapter 175).

18. First Aid.

(1) A stretcher and at least one clean, lockable, adequate first-aid kit, containing sterile dressings, antiseptics, splints, tape, scissors, sling and wrapping material shall be readily available on all drilling rigs, service rigs, well testing operations, seismic field crews, geological and geophysical field crews, production facilities, construction sites and other operational locations and all associated camps.

- (2) Personnel with recognized first aid training shall be available on all main operational sites while work is in progress at the specific site.
- (3) A comprehensive first-aid kit, containing, as a minimum, that described in Subsection (1), including a stretcher, shall be available on remote locations where skilled medical attention is not readily available.
- (4) Procedures shall be established at all main operational locations for the transportation of persons needing prompt medical attention.
- (5) Wherever possible, a seriously injured person, while being transported, shall be accompanied by, in addition to the driver or pilot, at least one person having valid first aid qualifications.
- (6) Each main operational location other than a geophysical, geological or related operations camp, shall maintain or readily have access to a clean room equipped as a First-Aid room, with an adequate supply of hot and cold water, bed, instruments, dressings, bandages, drugs, splints, stretchers, oxygen breathing apparatus and other requirements for administering first-aid.
- (7) Effective and reliable safety showers and/or eye wash stations shall be located within immediate access to any area where personnel may come in contact with materials which are injurious to the skin and/or eyes.
- (8) A First-Aid room referred to in Subsection (6) shall be manned by at least one person who is—
 - (a) a registered general nurse; or
 - (b) a member of, or qualified for membership of, the Institute of Ambulance Officers (Australia); or
 - (c) trained and currently certified by an approved institution as a paramedic.

19. Contaminated Atmosphere.

- (1) A person shall not enter or remain in the vicinity of a work area where there is a deficiency of oxygen or a danger of exposure to gases, fumes or vapours in sufficient quantity to create a health hazard, unless appropriate precautions are taken, as stipulated in the licensee's operations/safety manual, including but not limited to the use of proper respiratory apparatus that provides protection from the hazard which exists.
- (2) Where a person may be exposed to injurious gases, there shall be kept at a readily accessible place at the site of the operations, at least two units of appropriate respiratory apparatus which shall be maintained in good working order at all times.
- (3) Where a person is, or may be, required to use respiratory protective equipment, it shall be ensured that he has been medically approved to use the equipment and has received instruction and practice in its use.
- (4) It shall be ensured that the respiratory protective equipment required by this section is used as intended by the manufacturer and that it provides the user with the essential respiratory protection against the hazardous atmospheres which may be encountered.

(5) Approved respiratory protective equipment shall include:—

- (a) self-contained breathing apparatus; or
- (b) oxygen-generating apparatus; or
- (c) supplied-air apparatus; or
- (d) filter-type respiratory protective equipment.

(6) Persons required to wear supplied air apparatus of the air-line type in an area as described in Subsection (1) shall be provided with and shall wear an auxiliary air supply, such supply to be of sufficient amount to allow the worker to escape from the area in an emergency.

(7) On all drilling and servicing rigs there shall be at least six sets of self-contained respiratory protective equipment in good working order and readily available at the well site.

(8) Filter-type respiratory protective equipment shall be used where the atmosphere is contaminated or in danger of being contaminated by solid particles of a type and in sufficient quantities that create a health hazard.

(9) There shall be available at every drilling or workover location, well servicing location, production facility and pipeline facility, two portable instruments capable of detecting flammable vapours and measuring their concentrations, and such instruments shall be used to test the atmosphere of any area where flammable vapours may be reasonably expected to be present before the site person-in-charge allows a workman to enter.

(10) Adequate detection and monitoring equipment, for hydrogen sulfide gas will be provided and used in any area where H₂S may exist in concentrations exceeding 10 PPM and, at concentrations exceeding 20 PPM, full respiratory equipment shall be made available and used by all personnel working in the affected area.

20. Fire Fighting Equipment.

(1) Adequate, easily accessible, properly maintained fire fighting equipment shall be provided at all operational locations where the potential of fire does or may exist.

(2) Only fire extinguishers that have been manufactured for the purpose intended shall be used and all units shall be maintained, tested and recorded according to manufacturer's specifications.

(3) The operator shall ensure that sufficient personnel are trained in the effective use of fire fighting equipment which they may be called upon to operate at their place of work.

(4) Fire fighting contingency procedures shall be published and displayed around the site and such procedures shall include the provision of a trained fire-fighting team for first line action from each crew and the provision of muster points for those personnel not assigned to the fire-fighting team.

(5) All extinguishers and other fire-fighting equipment shall be maintained in good working condition in accordance with PNGS 1218 Parts 1 and 2.

21. Communications.

- (1) Reliable and continuously available communication facilities shall be provided at main operational locations and at all main tank farms, main pumping stations and main compressor stations.
- (2) Reliable communication facilities shall be continuously available at all drilling rigs and all workover or well servicing rigs and at their associated camp facilities if not in proximity to the rig.
- (3) Radio communications shall be provided at remote geophysical survey camps and fly-camps.
- (4) Where helicopter transport is utilized to support operations, radio communication between the helicopter and the operational site shall be required.
- (5) Where the camp site is situated more than 1km from the well site, a means of communication between the well site and the camp shall be installed.

22. Clothing.

- (1) All personnel shall wear clothing and footwear suitable for the operational conditions and the work being performed.
- (2) No person shall unnecessarily expose any part of the body to substances which are injurious to the skin.
- (3) Where there is a danger of contact with moving parts of machinery or in any work process where a similar hazard exists—
 - (a) close fitting and close fastened clothing shall be worn; and
 - (b) head and facial hair shall be completely confined or cut short; and
 - (c) dangling neckwear, jewelry or other similar items shall not be worn.
- (4) Where a person's clothing or skin becomes contaminated with any flammable or harmful substance, the clothing shall be removed at the first practical opportunity and the affected part of the body cleansed and, when necessary, medically treated as soon as possible.

23. Personal Protective Equipment.

- (1) Industrial protective wear shall meet standards which are not less than the applicable requirements of—
 - (a) PNGS 1088 (industrial safety helmets); and
 - (b) PNGS 1092 (industrial eye protectors); and
 - (c) AS 1338 (protective filters against optical radiation in welding and allied operations); and
 - (d) PNGS 1089 (industrial safety gloves and mittens); and
 - (e) PNGS 1085 (safety footwear).
- (2) Industrial protective headgear shall be worn by a person engaged in any operation at any location where potential hazards exist that could result in head injuries.

(3) Properly fitting goggles, face-shields or other eye protective equipment, appropriate to the work being done, shall be worn by a person who is or could be exposed to injury or irritation of the eyes.

(4) Industrial protective safety footwear shall be worn by all personnel engaged in any operation at any location where any hazard to the feet may exist.

(5) A person engaged in the handling of harmful substances which are injurious to the skin shall wear suitable protective clothing and equipment.

(6) All personal protective equipment and safety equipment, required by this Regulation, shall be kept in a safe and sanitary condition and maintained to properly perform the function for which it was designed.

24. Noise Levels.

All personnel exposed to noise levels, which may be injurious to their hearing, shall be issued with appropriate hearing protection equipment, and/or the equipment shall be designed, modified or constructed in such a manner as to reduce noise levels to an acceptable level.

25. Radioactive Substances.

All operations entailing the storage, handling and use of radioactive substances shall be carried out in accordance with current applicable regulations and in such a manner as to provide full protection against contamination of personnel, equipment and the environment.

26. Notices.

(1) The site person-in-charge shall cause to be displayed at an operational site, where appropriate, notices warning all personnel of any potential dangers that exist or may exist, and notices of the associated safety requirements needed for the protection of the personnel, equipment, environment and resources

(2) Notices under Subsection (1) shall be in accordance with PNGS 1086, and shall be in English and Tok Pisin and the prevalent common language of the area of operations or shall be of a type using internationally accepted pictorial formats and/or easily recognizable symbols.

27. Pressure Vessels.

All boilers and unfired pressure vessels used in conjunction with unconventional hydrocarbons operations shall be designed, manufactured, installed, tested, inspected and maintained in accordance with Part V of the Industrial Safety, Health and Welfare Act (Chapter 175).

28. Machinery.

(1) A workman assigned by his supervisor to operate any tool, machine or equipment, or to carry out any work, process, or procedure shall be competent to carry out the assignment in a safe manner.

(2) All equipment and drive assemblies used for the transmission of power, such as belts, ropes, chains, gears, sprockets, clutches, cranks, connecting rods and any other exposed

moving part of machinery (except equipment operated from catheads and/or supported or driven by the rotary table) shall have guards installed of sufficient strength to withstand the breaking of said equipment and the guards shall be positioned such that personnel cannot unintentionally come in contact with the moving parts.

- (3) Pinch points of all types of machines and the cutting edge of all power-driven tools shall, where practical, be guarded.
- (4) Every abrasive wheel shall, where practical, be guarded.
- (5) Where power-driven machinery is used, each machine shall have a stopping device located within easy reach of the workman operating the machinery.
- (6) Every machine not individually motor-driven shall be equipped with a clutch or other efficient means of stopping the machine.
- (7) Starting devices shall be arranged to prevent accidental starting.

29. Winching, Lifting Equipment.

- (1) The working load on winch mechanisms, lines, slings, hooks and fittings shall not exceed the safe working load recommended by the manufacturer and equipment shall be used only in the manner for which it is designed.
- (2) Damaged, frayed or worn hoisting lines, slings and/or hooks shall be taken out of use immediately and replaced with new or competent replacements.

30. Repair and Maintenance of Machinery.

In order to protect personnel from potential injury, the site person-in-charge shall ensure that safety procedures are in place, and used by all personnel, for the repair and maintenance of equipment in all operational areas under his control.

31. Mobile Equipment.

All powered mobile equipment shall be suitably equipped to protect the operator, safely operate in the designated area, maintained in proper running order, and operated in such a manner as to prevent undue danger to personnel working in the same area.

32. Responsibility of Driver.

- (1) The driver of any mobile equipment shall be directly responsible for the safe operation of his unit and its associated equipment.
- (2) No person shall remain on or ride on any load or part of a load being raised or lowered.
- (3) A tag line of sufficient length shall be used when required to ensure that any movement of the load cannot strike the person controlling the tag line.
- (4) A person shall not work, stand or pass under or near a suspended load, or between a winch mechanism and a load being winched.

33. Aircraft Operations.

- (1) For the purposes of this section, "aircraft operations" means aircraft operations in connection with unconventional hydrocarbons exploration operations or operations for recovery of unconventional hydrocarbons.
- (2) Except as provided in this section, all aircraft operations shall be conducted in accordance with existing laws of Papua New Guinea relating to civil aviation.
- (3) An order given by a pilot of an aircraft—
 - (a) while the aircraft is airborne or moving shall be obeyed immediately by all passengers; and
 - (b) affecting the loading of the aircraft, the method of approaching the aircraft and the embarkation or disembarkation of the aircraft while the aircraft is stationary; shall be obeyed.
- (4) All persons shall exercise extreme care when approaching a helicopter when its rotors are in motion.
- (5) Whenever practicable, a pilot of a helicopter shall adopt a flight path which avoids over flying a rig, camp or field facility, production facility and/or unconventional hydrocarbons processing facility.
- (6) Where helicopters are used, the following procedures shall be adhered to—
 - (a) one person shall be designated as responsible for hooking on or unhooking an externally slung suspended load;
 - (b) when the person referred to in Paragraph (a) has carried out his task, he shall stand clear and signal the pilot that his task has been completed;
 - (c) all other persons shall stand clear of the externally slung suspended load;
 - (d) at an onshore rig location where all transportation is by helicopter, a helipad shall be constructed at a safe distance from the rig so that personnel can be safely evacuated in case of an emergency;
 - (e) when not in use, a helipad shall be kept clear at all times;
 - (f) stocks of appropriate aviation fuel shall be maintained at a drilling location and shall be situated at a safe place;
 - (g) during well testing, helicopter operations shall be conducted in such a manner as to be consistent with flying safety and to minimize the effect of rotor down wash on any flare or heat shield.
 - (h) at an onshore rig location, each helipad shall be equipped with adequate fire fighting equipment so that a fire inside or outside the helicopter can be safely and effectively fought and so that rescue and other personnel can be effectively protected during such fire or helicopter evacuation.

34. Debris Constituting a Fire Hazard.

(1) Rubbish, debris, or refuse that might constitute a fire hazard shall be removed to a safe distance of not less than 50m from all buildings, installations, wells or production facilities, and shall be expeditiously and safely disposed of in an environmentally acceptable manner.

(2) All hydrocarbon based refuse shall be collected in adequate containers and disposed of in an environmentally acceptable manner.

35. Flame Type Equipment and Process Vessels.

(1) No person shall create or cause to be created any unprotected flame or source of ignition within 50m of a well, oil storage tank or other source of flammable vapour unless under approved work permit conditions.

(2) No flame type equipment shall be placed or operated within 50m of any well, storage tank or process vessel unless the flame type equipment is fitted with an adequate flame arrester and air inlets are adequately flame proofed unless under approved work permit conditions.

(3) No process vessel containing flammable material shall be placed within 25m of any well or storage tank unless otherwise approved by the Director.

(4) Where the size of the location prevents the spacing specified in Subsections (1), (2), and (3), the distances may be reduced to the maximum attainable, but not so as to relieve the licensee from constructing a location of as adequate in size as practical.

36. Venting of Flammable Vapours.

(1) All process vessels, instruments and equipment, from which any flammable vapour may issue, shall be safely vented to atmosphere.

(2) All vent lines from process vessels or storage tanks which are vented to flare pits or flare stacks shall be provided with a flame arrester or other equivalent safety devices.

(3) When venting flammable vapours from a well, the operator shall ensure that any dedicated recovery tank/blow down tank is located—

(a) a minimum of 25 from the well center; and

(b) so that vapours are carried off location by the prevailing winds of that area,

and where the provisions of Paragraphs (a) or (b) cannot be met, the tank shall be a closed type with a vent line that meets the conditions of Paragraphs (a) and (b) or is directed to a flare as specified under Section 40.

(4) In all cases of venting of flammable vapours, gas detection equipment shall be utilized to determine vapour levels with specific reference to possible ignition sources.

37. Internal Combustion Engines.

(1) An internal combustion engine within 50m of a well, process vessel, storage tank or other potential source of flammable vapour shall be fitted with effective spark-arresting equipment.

(2) An internal combustion engine, operated within 25m of well, a process vessel, storage tank or other potential source of flammable vapour—

- (a) shall be of the compression ignition type; and
- (b) the engine and all ancillary components shall be rendered externally spark proof; and
- (c) exhaust pipes, manifolds and turbo chargers shall be insulated, cooled, and/or otherwise constructed so as to preclude the ignition of flammable vapours.

(3) A compression ignition engine within 25m of a well, separator, storage tank or other source of flammable vapour shall be provided with one of the following:—

- (a) an air intake shut-off valve operated by engine overspeed, remotely controlled from the rig floor or readily accessible location;
- (b) a system for injecting an inert gas into the cylinders operated by engine overspeed, remotely controlled from the rig floor or other readily accessible location;
- (c) a duct so that air for the engine is obtained at least 25m from the source of flammable vapour;
- (d) such other device as may be approved in writing by the Director; or
- (e) temporary equipment powered by compression ignition engines that do not meet the requirements of Paragraphs (a), (b), and (c) may be used under a permit to work system as outlined in the approved operations manual.

(4) Where a system has been installed in accordance with Subsection (3)(a) or (b), no part shall be sited within 6m of the vertical centre-line of the well or in a hazardous area, and the operation of the shut down system shall be tested at the following times:—

- (a) where the engine forms part of a drilling rig—before the surface casing shoe is drilled out and thereafter at intervals of not more than seven days;
- (b) where the engine forms part of a well servicing/workover rig and/or associated equipment—before commencing operations on any well, and thereafter at intervals of not more than seven days;
- (c) where the engine is part of a production facility—at the commencement of operations and thereafter at intervals not exceeding one calendar month.

(5) Tests specified under Subsection (4) shall be recorded—

- (a) where the engine forms part of a drilling or well servicing/workover rig and/or associated equipment, on the tour report; or
- (b) where the engine does not form part of a drilling or well servicing/workover rig and/or associated equipment, in the log book required to be kept pursuant to Section 43(7).

(6) Notwithstanding Subsections (2) and (3), a compression ignition engine, meeting the design requirements of Subsections (1), (2) and (3), may be used on a permanent well

pumping installation providing it is not within 6m of the wellhead, process vessel or storage tank and it is inspected on a regular basis.

38. Smoking, Naked Lights, Welding and Cutting.

(1) Subject to Subsection (3) smoking, open fires or naked lights shall not take place or be located within a distance of 50m from any well, separator, storage tank, temporary production facility, or other potential source of flammable vapour.

(2) Wellsite geological and/or mud logging units located closer than 25 from the well centre shall be suitably equipped for hazardous area use and where any electrical or gas fueled equipment, which does not meet hazardous area classification, is used inside these units, the units shall be pressurized and obtain their source of air supply at a distance greater than 25 from the well centre.

(3) Electrical and gas or other fuel circuits, to which unprotected equipment is connected, shall be controlled by a master switch or shut-off, readily accessible to the occupant of the caravan or unit, so that in the case of a hazard arising, the supply from any such circuit can immediately be shut off.

(4) In the case of routine operations or emergencies requiring the use of welding or flame cutting equipment, the site person-in-charge, using the permit to work procedures that have been outlined in the Operations Manual submitted to and approved by the Director, may authorize the use of such equipment within the limits stated in Subsection (1), providing that he has taken all reasonable precautions to ensure that the area is, and will remain, in a safe condition for such operations.

39. Siting of Production Facilities.

(1) Separators, tanks, heaters and other production facilities shall not be constructed within 50m of a preexisting non-associated surveyed road or building.

(2) Similar production facilities may be grouped, but dissimilar facilities shall not be located within 50m of each other unless otherwise approved by the Director.

(3) A separator shall not be enclosed within a bund or firewall surrounding a tank or group of tanks.

40. Siting of Flares.

(1) A flare pit or end of flare line shall not be located within a distance of 50m from any point on the outside of a well, separator, below ground pipeline, storage tank, temporary production facility or other unprotected source of flammable vapours and any exemptions from this minimum distance must be obtained from the Chief Inspector.

(2) A flare pit or end flare line shall not be located within a distance of 50m from a surveyed road, above ground pipeline or non-associated building, provided that topographical conditions allow for such distances and any exemptions from this minimum distance must be obtained from the Chief Inspector.

(3) The flare line shall be securely staked down and as free of bends, tees or elbows as possible.

(4) Where it is practicable to do so, a flare pit, of a sufficient size and design, shall be constructed to contain the produced fluids and protect the producing facility, property, natural vegetation and personnel from the flare and resulting heat.

(5) Where large volumes of gas and/or oil are to be burnt and topographic conditions do not allow the flare line to be extended further than the 50m referred to in Subsection (1), a flare shield shall be constructed in a manner and of a standard acceptable to the Chief Inspector.

(6) A safe, reliable and continuous method of igniting flares, acceptable to a Petroleum Inspector, shall be provided.

(7) All permanent flare installations shall be fenced off and surrounded by a low retaining wall.

(8) Adequate supervision and fire fighting equipment shall be provided to meet an emergency during flaring operations.

41. Fuel Tanks.

(1) Gasoline or other liquid fuel shall not be stored within 50m of a well unless it is stored in an appropriate operating storage tank with facilities in place to prevent any leakage or spillage from contacting the ground.

(2) Spillage or leakage referred to in Subsection (1) shall be directed away from the well location and disposed of in an environmentally acceptable manner.

42. Lighting.

Lights that conform to the requirements of Part IV shall be located at all operational sites so that adequate illumination provides for safe working conditions.

43. General Safety Precautions.

(1) Any equipment, that does not afford reasonable safety from accidents, shall not be used.

(2) All work areas and pedestrian areas shall be kept reasonably clear of hazards.

(3) All hand tools shall be kept in a good state of repair and neatly stored when not in use.

(4) Fixed platforms, walkways, stairways and ladders shall conform with PNGS 1081.

(5) All buildings, structures, machinery and equipment shall be of sufficient size and strength to withstand safely the imposed loads and to perform safely the functions for which they are used.

(6) Inspections of all buildings, structures, machinery and equipment shall be made by a qualified person, as often as the character thereof and the type of operation being conducted requires, to ensure the safety of the unit and compliance with Regulations and relevant laws.

(7) The person performing the inspection shall make a written report of the inspection and shall forward a copy of a report to the Director and the site person-in-charge as soon as possible after its completion.

(8) A log-book shall be kept and there shall be recorded therein, in a form and manner acceptable to the Director, a report of each inspection under Subsection (6) and the result thereof, and such report shall be signed by the person performing the inspection and by the site person-in-charge.

(9) Any defective equipment or unsafe condition, found on an inspection, shall be corrected, repaired, or replaced, and each such correction, repair or replacement shall be noted on the report.

(10) A person having custody of a log book under Subsection (8) shall produce it on demand by a Petroleum Inspector, who may review it, make entries and give written instructions.

44. Procedure Manuals.

(1) The Operator shall—

- (a) prepare a manual of instructions for the safety of operations; and
- (b) prepare a manual of response to emergencies which may occur; and
- (c) prepare a manual of procedures, equipment and instructions for the maintenance of well control; and
- (d) when applicable, prepare a manual of procedures, equipment, instructions and training for safe operations in any area where hydrogen sulfide gas may exist at dangerous concentration levels; and
- (e) submit such manuals to the Director for his review and approval prior to the commencement of operations.

(2) A manual under Subsection (1)(a) shall—

- (a) detail procedures to be taken to safeguard the health and safety of all personnel associated with all foreseen operations to be performed and to safeguard the environment in which the operations are situated; and
- (b) contain provisions relating to special precautions at any operational site; and
- (c) take into account any potential adverse condition arising from the operations.

(3) A manual under Subsection (1)(b) shall detail procedures to be followed and actions to be taken and shall identify the persons to be responsible for following these procedures and taking these actions in the event of an emergency arising during the operations by reasons of—

- (a) the escape or ignition of petroleum or unconventional hydrocarbons; or
- (b) serious injury to a person; or
- (c) the failure of a vessel or aircraft to arrive at its destination when it is expected to arrive, unless a report has been made as to the reason for the non-arrival; or
- (d) a vessel or aircraft sending a distress signal; or

- (e) conditions requiring the evacuation and/or abandonment of an operational site or camp; or
- (f) a person overboard; or
- (g) damage to or failure of equipment that adversely affects the operations; or
- (h) any other emergency associated with the operations.

(4) A manual under Subsection (1)(c) shall detail the procedures, equipment, personnel and facilities that will be utilized to maintain well control or regain well control in the event of a kick or blowout situation.

(5) All personnel at an operational site are to be made aware of the procedures detailed in the manuals and shall have access to copies of the manuals at all reasonable times, and the site person-in-charge shall be fully conversant with the procedures related to the operation under his control.

45. Medicinal and Therapeutic Drugs.

(1) A person who brings onto an operational site any medicinal or therapeutic drug, whether prescribed or not, shall, on arrival, report to the person referred to in Section 18(8) the nature and quantity of each such drug in that person's possession or control and, where it is prescribed, by whom it was prescribed.

(2) The person referred to in Section 18(8) shall maintain a record of the information given to that person pursuant to Subsection (1).

(3) On each operational site, the person referred to in Section 18(8) shall maintain a register which records each use of medicinal or therapeutic drugs—

- (a) the date and dosage of every such use known to that person; and
- (b) the name of the person to whom the drug was administered; and
- (c) the name of the person who authorized the use of the drug.

(4) Any person on an operational site who is taking medication, whether prescribed or not, which impairs his ability to safely perform his duties, shall not remain on duty.

46. Unauthorized Use of Drugs and Intoxicants.

(1) A person on an operational site shall not (otherwise than in the course of his duties) have in his possession or control any drug (which he is prohibited by law from having in his possession or control) or any intoxicant.

(2) A person on an operational site, who (otherwise than in the course of his duties, or as a result of any medical treatment or therapy administered to him) has in his possession or control, or is adversely affected by, any intoxicant or drug, which he is by law prohibited from having in his possession or control, shall immediately be relieved of his duties and removed as soon as practical and a report of the incident shall be sent to the Director forthwith.

47. Helicopter Operations.

- (1) When a helicopter is arriving at or departing from a manned site, there shall be a person or persons on the site who shall ascertain and advise the helicopter pilot whether all requirements as to safety have been complied with and provide other pertinent information to ensure safety of helicopter operations, personnel and the recording of manifest, load and flight data.
- (2) A person shall not be on the helideck/helipad on which or from which a helicopter is about to land or take off except for the purpose of handling an external load on the helicopter prior to landing or take off.
- (3) All personnel shall be advised and/or trained in the proper procedures of helicopter embarkation, disembarkation and flight procedures.
- (4) When a helicopter is about to land on or take off from a helideck/helipad, a revolving crane on or near the helideck/helipad shall not be operated and the jib of any such crane shall be placed in such a position as not to interfere with the landing or taking off of a helicopter.
- (5) A person operating a crane referred to in Subsection (4) shall be advised in advance of the landing or taking off of a helicopter.

48. Oil Spills.

- (1) Where an escape or ignition of petroleum or unconventional hydrocarbons occurs, such action as is necessary to minimize the loss of petroleum or unconventional hydrocarbons, the pollution of the area and to protect persons and property shall be taken.
- (2) No chemical dispersant shall be used on an oil spill without approval from the Director.

Division 2.—Offshore.

49. General.

- (1) The provisions of Division 1 shall apply with equal force to operations both onshore and offshore.
- (2) Where any minimal distances specified in Sections 34 to 41 (inclusive) are impractical on a marine facility, the site person-in-charge shall ensure that the intent of this Regulation is observed so that sources of ignition are kept as far as possible from potential sources of flammable liquids and/or gas.
- (3) Where there is an inconsistency between the provisions of this Division and Division 1, the provisions of this Division shall prevail.

50. Communications.

- (1) Where there is a manned platform in the licence area, there shall, at all times, be maintained a shore station from which radio or telephone communication is made to and received from the platform.
- (2) Radio or telephone communication shall be made from the shore station to the platform at least once in each period of eight hours, except when the site person-in-charge of

the platform has ordered that, due to restrictive operations, such communication shall not be made.

(3) Where the site person-in-charge has made an order under Subsection (2) the shore station shall be informed before the order is put into effect.

(4) A stand-by vessel shall be stationed in the immediate vicinity of the platform and shall remain so stationed except if required for the purpose of dealing with a serious emergency.

(5) When communication cannot be made by radio or by telephone between the shore station and the platform or its stand-by vessel, arrangements shall be made forthwith for communication to the platform by sea or air methods.

(6) Each support vessel or aircraft, in use during operations, shall be controlled and monitored from a shore station and/or a platform.

51. Rescue Craft.

(1) A suitable helicopter service shall be maintained between a platform and the shore station.

(2) Where it is not possible to maintain a suitable helicopter service, pursuant to Subsection (1), there shall, where weather conditions allow, be provided a suitable surface craft able to come to the assistance of that platform within a minimum amount of time.

(3) A surface craft referred to in Subsection (2) shall be so designed, equipped and crewed as to be able safely to retrieve all platform personnel from the sea under adverse sea and weather conditions and administer adequate first aid as necessary.

52. Helicopter Operations.

(1) Prior to a helicopter landing or taking off, the site person-in-charge shall ensure a fully trained fire fighting crew is mustered to the helideck.

(2) The fire-fighting crew shall man the fire-fighting equipment and one member of the crew shall wear a close proximity fire fighting suit.

(3) When a helicopter is about to land on or take off from a platform, any handrails on the helideck shall be folded onto the deck.

53. Lifejackets and Buoyancy Vests.

(1) Unless otherwise approved, a person shall wear a lifejacket, certified by a recognized institution, when engaged in an emergency drill or when evacuating a platform.

(2) A person who is in an unguarded area over water shall wear an approved buoyancy vest.

(3) A person on an open deck of a fixed platform, which open deck is at a level close to the maximum wave height, shall be accompanied by at least one other person and both shall wear an approved buoyancy vest.

(4) A person being transferred between a platform and a vessel shall wear an approved buoyancy vest or lifejacket.

(5) A person being transported to or from a platform, either by sea or by air, shall wear an approved lifejacket as directed by the captain of the vessel.

54. Vessels Near Platforms During Diving.

Where diving operations are being carried out from a platform, the person in command of a vessel shall not cause it to approach or depart from the platform, or cause its propellers or thrusters to be engaged, without notifying and receiving approval from the site person-in-charge of the diving operations.

55. Other Operations During Diving.

Where diving operations are being carried out from a platform, a person shall not—

(a) weld on the platform, unless approved by the site person-in-charge, and such welding is carried out under a permit to work system as outlined in the Procedure Operations Manual, as detailed in Section 44, which has been forwarded to and approved by the Director; or

(b) carry out any activity at a place from which sparks or slag could fall upon any item of diving equipment being used for diving operations; or

(c) operate a crane or other equipment not associated with diving operations or carry out any activity where diving personnel or diving equipment engaged in or being used for the diving operations could be struck by any material moving or falling as a result of the use of the crane or other equipment or the carrying out of the activity; or

(d) transfer methanol, diesel fuel or other flammable or combustible substances between a supply vessel and the platform; or

(e) carry out any operations involving explosives on or near the platform; or

(f) carry out operations associated with de-pressurizing vessels or pipelines as a result of which hydrocarbons could be released on or near the platform.

56. Emergency Drill Exercises.

All persons on a platform shall participate in escape drill exercises and fire drill exercises, which shall be carried out under the control of the site person-in-charge, at random times not exceeding seven days between each time, and a record shall be kept of such drills.

57. Notices.

(1) All exits from the accommodation, office and other enclosed areas will be clearly marked.

(2) Emergency assembly location notices shall be prominently displayed on all platforms.

58. Waste Disposal.

(1) No waste materials other than food scraps, sanitary effluents, drilling fluid or formation water conforming to the requirements of Section 190 shall be released into the sea.

(2) All waste materials, other than those as stated in Subsection (1), shall be stored on the platform in a safe and environmentally suitable manner and returned to shore for proper disposal.

59. Record of Arrivals and Departures.

(1) A written record, relating to one platform, in accordance with this section shall contain—

(a) the name of each person traveling to or from the platform and the name of his employer; and

(b) the date and time at which each person arrives at, or leaves from, the shore station; and

(c) the date and time at which each person arrives at, or leaves from, the platform; and

(2) A record in accordance with Subsection (1) shall be kept at each platform and at each shore station.

60. Radio Operators.

A radio operator on a platform shall hold at least a restricted radiotelephone operator's certificate of proficiency or equivalent and shall have experience in radio operations associated with offshore operations and be proficient in the English language.

61. Cutting, Heating and Welding.

(1) No cutting, heating or welding shall be carried out on a platform unless—

(a) the operation is carried out in accordance with PNGS 1115 (Fire Precautions in Cutting, Heating and Welding Operations); and

(b) the site person-in-charge of the platform has determined that it is safe to carry out the cutting, heating or welding operation, and has issued a 'work permit' that complies with the procedures manual referred to in Section 44; and

(c) any shielding or screening used in the hot work operation is of a material which is combustion resistant.

(2) The safety manual referred to in Section 44 shall contain provisions relating to the special precautions to be taken during cutting, heating or welding near—

(a) drilling operations; and

(b) well-head and production areas; and

(c) tanks containing flammable or combustible liquids; and

(d) diving operations.

(3) Electric welding neutral returns shall be connected directly to the equipment being welded.

(4) The issue of a work permit shall take into account any adverse conditions arising from the ongoing operations.

62. Storage of Dangerous Substances.

(1) No flammable liquids with a flash point below 38oC, as determined by the method PNGS 1449 set out in "Standard Methods for Testing Petroleum and its Products" or any other approved specifications, shall be kept on a platform without approval.

(2) Drum stocks of fuel or lubricating oil on a platform shall be stored as far as reasonably possible from areas where drilling operations are being carried out.

(3) A gas cylinder on a platform shall be properly secured in an upright position.

(4) No gas cylinder shall be transferred between a platform and a vessel, unless that cylinder is contained within an approved container.

(5) Potassium and sodium nitrates shall be stored in leak-proof containers, away from combustible materials.

PART IV.—ELECTRICAL INSTALLATIONS.

63. Wiring Rules.

(1) Subject to the requirements of any other law, all electric wiring, earthing and installations used in the exploration and drilling for, and the production of petroleum or unconventional hydrocarbons, whether in or outside hazardous locations as described in Subsection (2), shall be in accordance with PNGS 1022 (Wiring Rules) or other codes or standards as approved by the Director.

(2) Hazardous locations in which the provisions of Class 1, Zone 1 and Class 1, Zone 2 of the SAA Wiring Rules shall apply, shall be—

(a) Class 1, Zone 1—all areas classified as division 1 in API RP500B, "Classification of Areas for Electrical Installations at Drilling Rigs and Production Facilities on Land and on Marine Fixed and Mobile Platforms"; and

(b) Class 1, Zone 2—all areas within 20m of a wellhead, temporary or permanent production facility and all areas within 20m of an area classified as Class 1, Zone 1.

(3) Within an area classified as Class 1 Zone 2 as above—

(a) the Director may approve the use of electrical equipment of vapor tight construction that is totally enclosed and gasketed to exclude or resist the passage of vapor; and

(b) all electrical connectors such as plugs and sockets shall have a mechanical device acceptable to a Petroleum Inspector to prevent inadvertent breaking of any electrical circuit capable of producing arcing or sparking.

64. Electrical Generators, Alternators and Motors.

(1) Subject to Subsections (2) and (5), no permanent electrical generator or electrical alternator shall be operated within 25m of a wellhead, temporary or permanent production

facility or within 25m of an area classified as Class 1, Zone 1, unless the generator or electrical alternator has approved flame protection.

(2) Temporary electrical generators or alternators without approved flame protection may be operated within 25m by use of a permit to work system, under control of the site person-in-charge, that is outlined in the company's Operation Manual which has been presented to and approved by the Director.

(3) Subject to Subsections (4) and (5), no cooling or purge air for an electrical motor shall be drawn from a point within 25m of a wellhead, temporary or permanent production facility or within 25m of an area classified as Class 1 Zone 1, unless the motor has approved flame protection.

(4) Temporary electrical motors without approved flame protection may draw cooling or purge air within 25m by use of a permit to work system under control of the site person-in-charge, as outlined in the company's Operation Manual which has been presented to and approved by the Director.

(5) An electrical motor or electrical alternator or electrical generator may be used on a permanent well pumping installation providing it is not within 6m of the wellhead, process vessel or storage tank, and it meets the requirements as set out in Subsection (1) and Subsection (3).

65. Rig Electrical Systems Equipment.

(1) All electrical equipment shall be maintained in accordance with the original design.

(2) Flexible electrical cables intended for hard usage shall have inherent resistance to dampness, abrasion and petroleum products.

(3) All power cables shall be installed so that they are protected, as much as practical, from damage.

(4) Cables shall be repaired or replaced when insulation damage is detected, and makeshift wiring components and installations shall not be used.

66. Protection of Electrical Circuits.

(1) Every circuit shall be protected against overload and short circuit in accordance with the PNGS 10223 (Wiring Rules).

(2) Except where approved otherwise by the Director, circuits above extra-low voltage shall be protected against leakage of current to earth by the use of approved circuit breakers and such protection systems shall be provided with means by which a function test of the effectiveness may be made.

67. Earthing and Lightning Protection.

(1) The structure of permanent oilfield facilities for handling flammable liquids shall be protected against lightning in accordance with the ASI 768 "Lightning Protection" or other approved code of practice for the protection of such structures from damage by lightning.

(2) The structure of a temporary drilling rig need not be so protected against lightning if it is earthed so that the maximum resistance to earth is not greater than 10 ohms.

68. Control of Static Electricity.

(1) All metal parts of masts and rig substructures within a hazardous location shall be earthed for the safe removal of static electricity so that the maximum resistance to earth is less than 10 ohms.

(2) The well casing may be used in the case of masts, provided that it is electrically connected to all tools and other equipment being used in operations such as drilling, servicing and pulling.

(3) Metallic parts of containers of flammable liquids shall be earthed for the safe removal of charges of static electricity, but shall not be connected in such manner as to form part of the earth circuit.

(4) Where transferring flammable liquids or finely divided flammable or explosive materials from one container to another, the containers shall be in firm contact with each other or be continuously electrically bonded throughout the transfer so as to prevent the accumulation of static charges.

(5) Where tanks, mixers or processing vessels are used for flammable or explosive liquids or compounds, they shall be electrically bonded and earthed while being filled or emptied.

69. Portable Lights and Tools.

(1) Subject to Subsection (2), a portable light or tool used in a hazardous location shall be of flameproof construction.

(2) The Person-in-Charge, utilizing approved permit to work procedures, may authorize the use of a portable tool having a vapor tight or general purpose enclosure by ensuring that the area is, and remains, in a safe condition with the continual use of approved gas detection equipment.

(3) The voltage of a hand-held portable light and tool shall not exceed 32 volts unless there is installed and adequate system of earth leakage protection or other adequate protective device, and in such case the voltage of a hand held tool shall not exceed 250 volts.

(4) An electrically operated hand tool shall be tested and examined at regular intervals by a suitably qualified person, any defect shall be corrected and results recorded.

70. Maintenance, Repair or Alterations.

(1) Maintenance, repair or alteration of any conductor or apparatus shall not be carried out while such conductor or apparatus is alive.

(2) Switches opened to permit work on lines or equipment shall be prominently marked to warn against closure.

(3) Before any item of electrical equipment, except a portable lamp or tool, is moved, it shall be disconnected from the power supply.

(4) The rewiring and replacement of an electrical fuse may be carried out by an authorized person, but shall be checked as soon as possible thereafter by a licensed electrical worker.

(5) An electric welding return conductor shall be connected directly to the equipment being welded as well as to the earthing system of the rig or operational unit.

71. Electricians and Inspection of Electrical Equipment.

(1) Subject to Subsections (2) and (3), a person other than a licensed electrical worker shall not, on any drilling rig, production facility or associated plant—

- (a) install electrical apparatus or circuits; or
- (b) maintain electrical apparatus or cables including any automatic or other protective device; or
- (c) carry out a routine examination or test of any electrical apparatus or cables; or
- (d) carry out a routine test of the effectiveness of the earthing system, the continuity of the earthing conductors or the conditions of the electrical insulation; or
- (e) carry out an examination or test of electrical apparatus or cables newly connected, or dismantled and reconnected in a new position.

(2) Subsection (1)(c), (d) and (e) shall not apply to apparatus carrying voltages not exceeding extra low voltage.

(3) Subsections (1) and (2), shall not apply to any apparatus in and ancillary to electric logging units, gas detection units and electronically equipped production control and gauging installations.

(4) A test or examination referred to in Subsection (1) shall be carried out—

- (a) in the case of a drilling rig—prior to spudding in each well and at intervals not exceeding two months thereafter; and
- (b) in the case of a temporary installation—at intervals not exceeding two months; and
- (c) in the case of a permanent installation—at intervals not exceeding six months.

(5) The results of a test or examination under Subsection (1) shall be recorded by the electrical worker on the tour report or in a log book provided for the purpose, shall be countersigned by the site person-in-charge, and a copy shall be maintained, and upon request by a Petroleum Inspector, made available for review.

72. Control Equipment.

(1) Switch gear and starting equipment for motors shall include an isolating switch interlocked with the cover of the equipment so as to prevent the opening or removal of that cover whilst the apparatus within is alive or the isolator is in the closed position.

(2) All live parts within the switch gear and starting equipment, which are exposed when such equipment is opened, shall be effectively screened to the satisfaction of a Petroleum Inspector.

PART V.—EXPLOSIVES.

Division 1.—General.

73. Application of Division 1.

The provisions of this Division shall apply wherever explosives are used in connection with the exploration for and the production of unconventional hydrocarbons, but compliance with this Division shall not excuse a person from compliance with the Explosive Act (Adopted) (Chapter 308).

74. Competence of Workmen.

A person shall not use, handle, prepare or fire explosives unless he is—

- (a) the holder of an appropriate permit issued under Section 7 of the Explosives Act (Adopted) (Chapter 308); or
- (b) under the direct personal supervision and direction of a person referred to in Paragraph (a).

75. Storage of Explosives, Magazines, etc.

Explosives shall be stored in accordance with the provisions of the Explosives Act (Adopted) (Chapter 308) and be under the supervision of an authorized site person-in-charge and magazines shall be made intrinsically safe from potential sources of ignition.

76. Detonators.

Except where approved by the Director, detonators other than electric detonators shall not be used.

77. Application for Use of Explosives.

(1) Prior to an operator commencing a geophysical or geological program of operations, that utilizes explosives in Papua New Guinea, a manual shall be submitted to the Director for review which includes operational, procedural and safety issues including, but not limited to the following items:—

- (a) storage;
- (b) transportation—land, marine and/or air;
- (c) handling;
- (d) personnel safety;
- (e) detonating near surface facilities;
- (f) loading shot holes;
- (g) misfires;

- (h) training of personnel;
- (i) environmental issues.

(2) The Person-in-Charge shall submit the manual as outlined in Subsection (1) to the Director with the current notice of intention of a survey and shall update the manual as required for following surveys.

78. Electrical Firing in the Vicinity of a Radio Transmitter.

Electrical firing shall not take place in the vicinity of a live radio broadcasting transmitter unless the distance from the shot point to the base of the nearest mast is not less than that set out in the following table of minimum distances based on the power of the transmitter:—

Transmitter Power (WATTS) Minimum Distance (m)

5 - 25	50
25 - 50	70
50 - 100	100
100 - 500	220
500 - 1,000	300
1,000 - 5,000	700
5,000 - 10,000	1,000
10,000 - 50,000	2,200
50,000 - 100,000	3,000

79. Preloading.

(1) Where in seismic prospecting in populated areas, shot holes are preloaded, the detonator wires shall be short-circuited and concealed until they are connected to the firing circuit, and notices in accordance with Section 26 shall be displayed warning people of danger from explosives.

(2) All preloaded holes shall be fired as soon as practicable after charging.

Division 2.—Use of explosives in wells.

80. Application of Division 2.

The provisions of this Division shall apply where explosives are used in a well for the exploration for or production of petroleum or unconventional hydrocarbons, and where there is an inconsistency between the provisions of this Division and the provisions of Division 1, the provision of this Division shall prevail.

81. Personnel Handling Explosives.

The use, handling, preparation and firing of explosives for the purposes specified in Section 80 and the disposal of any misfires resulting therefrom shall be done by or under the direct

personal supervision of a competent person, experienced in the use of explosives for such purposes.

82. Safety of Rig Personnel.

During rig floor operations involving equipment charged with explosives, only work that is essential to that operation shall take place utilizing only those persons necessary to carry out that work and all other persons shall remain at a safe distance.

83. Safety from Accidental Detonation.

The site person-in-charge is responsible for ensuring the safety of the operation against accidental detonation from all sources that may include stray electrical currents, electrical charges and radio transmissions.

PART VI.—EXPLORATION.

Division 1.—General.

84. Application of Part VI.

Unless otherwise specified to the contrary, the provisions of Part VI shall apply to geophysical, geological and/or their related operations carried out in the search for unconventional hydrocarbons.

85. Notice of Intention to Commence Operations.

(1) No operation referred to in Section 84 shall commence without the written approval of the Director.

(2) The Director may impose conditions of approval and any such conditions shall be observed.

86. Notice of Intended Survey.

(1) At least 14 days before commencing a geophysical, geological and/or a related unconventional hydrocarbons exploration program, the Person-in-Charge shall submit to the Director, in duplicate, a Notice of Intention to carry out the program.

(2) A Notice of Intention submitted under Subsection (1) shall include, but not be restricted to, the following information:—

- (a) licence area;
- (b) name of the licensee;
- (c) name of survey;
- (d) objective of survey;
- (e) prime survey method and techniques;
- (f) any secondary survey method;
- (g) name and address of contractor;
- (h) details of equipment to be used;

- (i) estimated commencement date;
- (j) estimated duration;
- (k) line kilometres;
- (l) estimated cost;
- (m) line plans in duplicate, one at 1:250,000, one on A4 size paper;
- (n) notice of Intended Entry on Land;
- (o) name and address of site person-in-charge;
- (p) manual, if required, as outlined in Section 77, unless previously submitted.

87. Operations near Mines and Quarries.

- (1) No seismic operations shall take place within 300m of any operating mine or quarry, unless the Person-in-Charge notifies the Director accordingly and has received permission in writing from the Person-in-Charge of the said mine or quarry, a copy of which shall be forwarded to the Director.
- (2) The operations to which Subsection (1) refers shall be conducted according to any special requirements as outlined by the Person-in-Charge of the mine or quarry and/or the Director.

88. Operations on Roads and in Inhabited Areas.

- (1) Where shot hole drilling or other geophysical or geological exploration is to be carried out on a road or track used by the public, or in the vicinity of an inhabited area, the site person-in-charge shall consult with the senior officer at the District or Sub-district Office nearest to the area of intended operations, or if in a township declared under the Town Boundaries Act (Chapter 8), the commander of the nearest Police Station.
- (2) A wooden stake, spike, pin or other pointed metal object shall not, in the performance of any exploration program, be driven into the carriageway of any road or track.
- (3) Where a seismic survey is conducted in the vicinity of buildings or public utilities, all practical precautions shall be taken to ensure that no damage or inconvenience is caused by the operation.

89. Marking Seismic Lines.

A permanent marker shall be set in place at points of intersection of survey lines, at intersections of a survey line with any road which has been formed or graded and at intervals on each survey line of not more than 5km.

90. Shot Points near Buildings and Public Utilities.

- (1) Unless otherwise approved by the Director in writing, a shot point shall not be located within the following distance of a building, a public utility of any description or a water well—
 - (a) 150m — in the case of shot holes;

- (b) 100m — in the case of vibratory or other surface seismic sources.
- (2) The site person-in-charge, if he considers it impracticable to fire a shot hole outside the distances specified in Subsection (1), may make application to the Director to fire a shot within such distances and the Director may grant such permission.

91. Temporary Shot Hole Plugs.

Where a drilling crew is in advance of a firing crew to the extent that a shot hole will not be fired on completion of drilling, a temporary plug or cover shall be placed in or over the shot hole until the firing crew is ready to fire the charge.

92. Permanent Shot Hole Plugs.

Unless otherwise approved by the Director, a shot hole shall be suitably plugged with earth after firing and the disturbed area shall be restored, as far as practical, to the original state.

93. Uncontrolled flow of water.

Where a flow of artesian water is encountered in the course of drilling operations, or detected subsequently, it shall be controlled, and the site person-in-charge shall report forthwith the flow of water to the Director advising him of the steps taken to control it.

94. Six Monthly Reports on Operations.

(1) A licensee shall submit to the Director a report on operations carried out within the area subject to an unconventional hydrocarbons prospecting licence during each six monthly period after the date of issue of the licence, within one month after the end of the period to which the report relates.

(2) A report under Section 31(2)(c) of the Act shall include, in addition to a general review of the operations which have been carried out during the previous period, the following:—

- (a) where there is an intention to carry out major geological or geophysical surveys during the next six monthly period, the notice of that intention;
- (b) regional interpretation of the subsurface structure in all areas over which any combination of geophysical, geological, geochemical surveys and special studies have been conducted during the past period and any revised interpretations of adjacent areas resulting from the exploration in question.

(3) Each alternate such six monthly report is to be of a more comprehensive nature, and to include a general discussion of operations carried out, the conclusions derived therefrom and the main results obtained, mention of reports submitted during the year and an outline of work plans for the next year.

(4) Each second such six monthly report shall include seismic maps of key horizons at appropriate scales and details of annual expenditure covering time periods as agreed to by the Director.

(5) Where no operations are carried out in any six monthly period, a statement to this effect is to be submitted to the Director.

95. Submission of Data.

- (1) The licensee shall submit to the Director, within four months of completion of any seismic, gravimetric or airborne geophysical survey operation, a report, in duplicate, in a form and content acceptable to the Director.
- (2) A report submitted under Subsection (1)—
 - (a) shall contain, but shall not be restricted to, the topics listed in Section 238; and
 - (b) where so recorded, basic geophysical field data shall be supplied in digital form and in a format agreed to between the licensee and the Director.
- (3) The licensee shall submit to the Director within four months of completion or any other type of geophysical survey, geochemical survey of any major geological survey, a full report on the findings of such survey including geological maps, measured sections and other basic data obtained by such survey.
- (4) The licensee shall submit to the Director at weekly intervals during the course of any geophysical survey progress reports including, as soon as they are available, preliminary plots of data, such as shot hole location plans, cross-sections, gravity profiles and magnetic profiles.
- (5) As part of a completion report submitted under Subsections (1) or (3), there shall be supplied either a film negative (35mm) or other transparent copy of each plan larger than 380mm by 250mm, or a usb, cd or 8mm tape of the seismic sections in SEG Y format.

96. Submission of Data on Relinquishment.

- (1) The licensee shall submit to the Director within 30 days of relinquishment of any portion of an unconventional hydrocarbons prospecting licence all basic data derived from field operations on the relinquished area which have not previously been submitted to the Director.
- (2) Data submitted under Subsection (1) shall include but not be restricted to the field records, aerial photography negatives, magnetic tapes (or any other digital information storage system), seismograms, film of final record sections, surveyor's notes, plane table sheets, shot-point location map, observers' tickets and shot hole logs.
- (3) Where results of geological surveys are submitted under this section, they shall include all maps, sections and other data.

Division 2.—Offshore.

97. General.

The provisions of Sections 84, 85, and 86 (with the exception of Subsection (2)(n)), 94, 95 and 96 and of this Division shall apply to offshore exploration.

98. Notice of Intended Geophysical Survey Offshore.

Where it is intended to carry out a geophysical survey offshore, in addition to the information required by Section 86 there shall also be submitted—

- (a) a copy of current vessel classification; and
- (b) evidence that the vessel and crew comply with the requirements of the Merchant Shipping Act (Chapter 242).

99. Commencement of Survey Offshore.

A survey offshore shall not commence unless at least 48 hours notice of the date and time of commencement, the survey duration, the survey area coordinates and, in the case of a seismic survey, the length of streamers to be towed by the survey vessel has been given to—

- (a) the Director or a Petroleum Inspector nominated by the Director; and
- (b) the Department responsible for administering legislation relating to fisheries in the licence area; and
- (c) Marine Search and Rescue Division of the Department of Transport, Port Moresby.

100. Seismic Energy Sources.

(1) Explosives shall not be used for an offshore seismic survey without the approval of the Director.

(2) An energy source used in a seismic survey shall be operated in accordance with good safety practices, the manufacturer's recommendations, and the requirements of Subsections (4), (5), (6) and (7), as applicable.

(3) A charge shall not be detonated underwater within—

- (a) one nautical mile of the platform; and
- (b) five nautical miles of the platform where diving operations are in progress; unless adequate notification to the person in charge of the diving operations has been given of—
 - (i) the type of energy source to be used, its frequency and intensity; and
 - (ii) the times at which the energy source is to be used; and
 - (iii) any other pertinent information.

(4) Where an air gun is used in a seismic survey, system components shall be maintained in a clean and safe condition to comply with the manufacturers' specifications and safety procedures shall be implemented to ensure the proper and safe maintenance, testing and operation of the system and its associated components.

(5) Where gas exploders are used in a seismic survey full safety precautions shall be implemented to prevent accidental ignition and/or explosion of the gas and gas cylinders due to heat, electrical charges, open flame or other sources of ignition.

(6) Where steam sources are used in a seismic survey, high pressure and high temperature valves, lines and vessels shall be adequately protected and shall be clearly marked with

warning signs and testing of the source shall be only done when the gun is fully immersed in water.

(7) Where sparker and boomer electrical systems are used in a seismic survey, circuits shall be equipped with circuit breakers, electrical cables shall be protected, adequately insulated and grounded and the operation of the sparker or boomer shall be only tested when the gun is fully immersed in water.

PART VII.—DRILLING, COMPLETION, FRACGING RECOMPLETION, SIDETRACK, MAJOR REPAIR, SUSPENSION AND ABANDONMENT OF WELLS

Division 1.—General.

101. Notification before Drilling a Well.

(1) Subject to Subsection (2) and Section 104, the Person-in-Charge shall not commence to drill a well before—

- (a) he has submitted to the Director a proposed well program for that well; and
- (b) he has received written approval of the proposed well program from the Director.

(2) Where—

- (a) the Person-in-Charge has submitted a proposed well program to the Director under Subsection (1); and
- (b) the Director has failed to reply concerning the proposed well program to the Person-in-Charge within 15 working days of the receipt by the Director of the proposed well program,

the Person-in-Charge may carry out the proposed well program without approval.

102. Notification before Deepening, Redrilling, Fraccing etc.

(1) Subject to Subsections (2) and (3) and Section 103, the Person-in-Charge shall not commence to deepen, sidetrack, complete, re-complete, fracture, workover, plug back or materially alter an existing approved well program or suspend or abandon, before—

- (a) he has given a proposed program of operations to the Director; and
- (b) he has received written approval from the Director to carry out the program.

(2) Where—

- (a) the Person-in-Charge has given a program to the Director under Subsection (1); and
- (b) the Director has failed to reply concerning the program of operations within 72 hours of the receipt of the program of operations,

the Person-in-Charge may carry out the work specified in the program of operations without approval.

(3) Where, for any unforeseen reason, minor changes in the approved well program are required to be made to reach the well objective, approval for such changes is not required, but a notice of intention to carry out the necessary work shall be sent to the Director at the earliest opportunity.

103. Emergency Action.

The site person-in-charge shall, in the case of emergency, take such immediate action as is necessary to protect a well, personnel and/or the environment under the prevailing conditions, and shall, as soon as possible thereafter, notify the Director of the action taken.

104. Proposed Well Program.

(1) A Proposed Well Program shall include the following information as applicable:—

(1) Drilling Program:—

- (a) licence area;
- (b) licensee;
- (c) operator;
- (d) well name and number;
- (e) location coordinates and graticular block number;
- (f) elevation, ground and KB or DF;
- (e) water depth (if applicable);
- (g) total depth;
- (h) estimated spud-in date;
- (j) estimated completion date;
- (k) geologic prognosis (accompanied by appropriate maps and cross-sections);
- (l) drilling contractor;
- (m) drilling rig designation;
- (n) hole sizes and depths, complete with directional drilling program and well trajectory plot;
- (o) casing sizes, weights, grades, coupling types and setting depths complete with design parameter assumptions, rationale and calculations based on Section 122 requirements;
- (p) cementing program;
- (q) mud program;
- (r) sampling and mud logging program;
- (s) coring program;

- (t) logging program;
- (u) testing program including surface equipment descriptions and its working pressure, placement of equipment relative to hazardous areas;
- (v) fracing program including fracing fluids to be used;
- (w) service companies to be employed together with a brief description of the equipment to be provided;
- (x) communication facilities;
- (y) transportation facilities;
- (z) medical facilities, including provisions made for evacuating sick or injured persons;
- (aa) estimated costs;
- (ab) a well control program and details of financial cover for regaining lost control and the clean up of any oil spills or damage caused;
- (ac) names of wellsite supervisors and copies of current well control certification;
- (ad) copy of water use permit;
- (ae) plans for any potential flaring.

(2) A Rig Supported Completion/Workover Program shall include the following information as applicable:—

- (a) licence area;
- (b) licensee;
- (c) operator;
- (d) well name and number;
- (e) location coordinates;
- (f) elevation, ground and KB or DF;
- (g) water depth (if applicable);
- (h) total depth;
- (i) estimated spud date;
- (j) estimated completion date;
- (k) current and/or proposed perforation details, measured depth and depth SS;
- (l) existing top of cement behind casing and details on how determined;
- (m) well deviation data over zones of interest;

- (n) well completion diagrams of existing status and proposed completion/workover status;
- (o) details of planned operations and equipment to be used;
- (p) listing of contractors and services;
- (q) estimated well cost;
- (r) details of procedure to kill the well prior to workover;
- (s) details for venting/flaring of vapors;
- (t) well history, present producing status and workover justification with emphasis on maximization of recovery of hydrocarbons;
- (u) for each reservoir to be worked over— unconventional hydrocarbons in place, estimated ultimate recovery from workover, estimated cumulative recovery from zone, original and current pressures, original and present fluid contacts.

(3) Non Rig Supported Workover Program shall include such items as listed in Subsection (2) as may be applicable to the operation.

105. Notice of Intention to Abandon.

A notice of intention to abandon a well shall give full details of the method of abandonment, withdrawal of casing, placement and confirmation of quality and position of plugs and capping, and a copy of electric or other type of log, not previously supplied to the Director, shall be supplied with the notice of the intention to abandon a well.

106. Location Survey.

(1) As soon as practicable after the location of any well has been established, either on or offshore, and not later than three months after the well has been spudded, the location and elevation of the well shall be determined by a person and method that meets current Papua New Guinea legislation requirements and is approved by the Director.

(2) As soon as practicable, and not later than one month after completion of the survey for the location and elevation of a well, the licensee shall submit to the Director a plan certified as to accuracy by the person who made the survey.

(3) A plan under Subsection (2) shall, as applicable—

- (a) show the location of the well relative to the control point; and
- (b) show the well name and number; and
- (c) show the control point and bench mark together with particulars thereof; and
- (d) show any other wells, roads, public utilities and any substantial structures or buildings within 300m of the well; and
- (e) indicate the coordinates of the well in the Papua New Guinea Map Grid and the latitude and longitude of the well computed within the accuracy limits of the survey previously specified, the direction of true north, the elevation of the natural

surface and any permanent reference marks established in accordance with this Regulation; and

(f) shall be accompanied by a copy of the field notes and other data pertinent to the survey, unless the Director otherwise approves.

107. Suspension of Operations.

(1) A Person-in-Charge, who has commenced drilling, completing or working over a well, shall not suspend operations nor move major drilling items from the well without first having completed operations as approved by the Director.

(2) A program detailing the suspension operations and justification for the suspension shall be forwarded to the Director for his approval if prior approved well programs cannot be completed due to mitigating circumstances.

(3) All wells that have previously been active producers and/or injection wells—

(a) may be shut-in/suspended for a period of time not exceeding six months upon approval of the suspension program and justification forwarded to the Director; and

(b) applications for extension to the suspension period, including justification, shall be forwarded to the Director, by the Person-in-Charge, prior to the expiry date of the previous period.

(4) The Person-in-Charge shall forward a list of all shut-in and/or suspended wells to the Director on a yearly basis and include the reason for well status, suspension period dates for each well and forward plans for each well.

(5) The Person-in-Charge shall be responsible for ensuring the safety and integrity of all shut-in or suspended wells and shall abide by Section 139(1) of the Act.

108. Failure to Fulfill Conditions.

Where a program of operations is not carried out as approved by the Director, he may cause the program to be carried out in accordance with his requirements.

109. Restoration of Site.

On the completion, suspension or abandonment of a well, the Person-in-Charge shall, as soon as possible, restore the well site and any surrounding area or areas giving access, as near to the original state as can reasonably be done, unless he has already reached a mutually acceptable agreement in writing with the owner or occupier of the land affected (a copy of which must be forwarded to the Director), in accordance with the provisions of the Act and of this Regulation.

110. Oil or Gas Lost or Used During Well Operations.

Unless otherwise approved by the Director, the quantities of all oil or gas lost by burning, venting to atmosphere, flaring or admixture with other circulating fluids in the course of any well completion, recompletion, or workover operations, shall be reported forthwith to the Director.

111. Well Records.

Careful and accurate records, relative to the drilling, completing, workover, recompleting, stimulating, suspending or abandoning of every well, shall be kept.

112. Daily Reports.

- (1) The site person-in-charge shall prepare an accurate daily report on each well being drilled, suspended, completed, repaired, tested, stimulated, recompleted or abandoned and dispatch a copy of each report to the Director as soon as practicable after its preparation.
- (2) A report under Subsection (1) shall include those items as indicated in Section 239.

113. Reports Originating at the Wellsite.

- (1) Typed copies of the operator's daily drilling reports, leak off test reports, BOP test reports and casing pressure test reports shall be forwarded to the Director weekly to reach the Director within one week of the period covered.
- (2) Four reports in a form as specified by the International Association of Drilling Contractors (IADC) shall be retained by the operator or licensee and submitted to the Director upon request or upon expiration, relinquishment or other termination of the licence in which the well was drilled and/or worked over.

114. Well Completion Report.

- (1) Within two months from the date of rig release of a well, there shall be forwarded to the Director—
 - (a) a completion report, or end of well report, in duplicate; and
 - (b) an electronic copy of that report on computer disc in a format agreed to by the Director.
- (2) A completion report under Subsection (1) shall include, where applicable, but not be limited to, items listed in Section 240, but where those items involve third party analysis and final preparation they can be submitted under separate cover within three months.
- (3) In the case of a well repair, recompletion or other operation in which the previous completion of the well is in any way modified, a revised down hole drawing detailing the final well and well equipment status shall be delivered to the Director within one month of the completion of the operation.
- (4) On completion or recompletion of a well, transparent and/or computer retrievable (in a format approved by the Director) copies of all logs obtained from the well shall be delivered to the Director as soon as possible.

115. Special Studies.

A report of technical studies on samples and cores obtained from wells including, but not limited to, paleontology, permeability, porosity, fluid saturation, relative permeability, capillary pressure, fluid analysis and well test analysis shall, where for any reason not included in the completion report, be delivered to the Director as soon as they are available.

116. Prohibited Drilling Areas.

(1) A well shall not be drilled within 75m of any road, pipeline or flowline, high voltage power line, or other right of way, dwelling, industrial plant, airdrome, building, school or church, unless otherwise approved in writing by the Director.

(2) A licensee who drills near an aerodrome shall comply with the requirements of the Department responsible for civil aviation matters.

(3) A well shall not be drilled within 3km of known subsurface mine workings without the prior approval of the Director and then only under the conditions determined by the Director.

117. Operations Close to Communities.

(1) Where drilling operations are to be carried out close to communities, the Person-in-Charge shall advise the Local-level Government, in whose area such operations are to be carried out or whose area is likely to be affected by such operation, of his intention to carry out such work.

(2) In the case of a serious blowout occurring during drilling operations in an area referred to in Subsection (1), the Person-in-Charge shall advise the police in that area so that proper measures can be taken to safeguard the general public.

118. Deviation Survey.

(1) Unless otherwise approved by the Director, surveys on a well being drilled shall be taken in sufficient number and at appropriate intervals to provide an accurate deviation profile of the wellbore from surface to total depth.

(2) Where the vertical projection to the surface of the point at which a well intersects a producing zone is nearer to a licence area boundary than 300m, the well shall not be brought into production without the prior approval of the Director.

Division 2.—Operational Requirements.

119. Equipment to Comply with Certain Standards.

(1) Unless otherwise authorized by the Director, materials and equipment used in the drilling or rig assisted workover operations in a licence area shall conform to such current standards as are listed in this section.

(2) Masts and sub-structures shall be in accordance with the relevant requirements of API Specifications for Drilling and Well Service Structures, Spec. 4E.

(3) Rotary drilling equipment shall be in accordance with the relevant requirements of API Specification for Rotary Drilling Equipment, Spec. 7.

(4) Well casing and tubing, (other than structural or drive casing and high strength casing and tubing) and drill pipe shall be in accordance with the relevant requirements of API, Specification for Casing and Tubing, Spec. 5CT, and for drill pipe, Spec. 5D.

(5) High strength well casing and tubing shall be in accordance with the relevant requirements of API Specification for High Strength Casing and Tubing, Spec. 5CT.

(6) Wellhead equipment shall be in accordance with the relevant requirements of API Specification of Wellhead Equipment, Spec. 6A.

(7) Hoisting equipment shall be in accordance with the relevant requirements of API Specification for Drilling and Production Hoisting Equipment, Spec. 8A.

(8) The recommendations of API Recommended Practice for Hoisting Tool and Maintenance Procedures, RP 8B, shall be observed in the operation and maintenance of hoisting equipment.

(9) Wire rope shall be in accordance with the relevant requirements of API, Specification for Wire Rope, Spec. 9A.

(10) The recommendations of API, Recommended Practice for Application, Care and Use of Wire Rope for Oil Field Service, RP 9B, shall be observed in the operation and maintenance of wire rope.

120. Inspection of Drilling Equipment.

(1) In the case of the first well to be drilled or worked over by a unit in Papua New Guinea, the drilling or workover rig and associated equipment shall be inspected by a qualified inspection company, approved by the Director, and the subsequent inspection report shall be forwarded to the Chief Inspector for review.

(2) Any deficiencies in the equipment, as highlighted by inspection report under Subsection (1), shall be remedied prior to spud or start of operations on the well.

(3) Following the remedying of deficiencies, the rig and associated equipment shall be re-inspected and approved by a Petroleum Inspector appointed under the Act, prior to the commencement of drilling.

121. Casing of Wells.

(1) The design and placement of all casing strings shall take into account known or predicted formation characteristics and strength, temperature, known or predicted formation pore-fluid type and pressures, kick influx volumes, required anticipated maximum mud weights, estimated maximum circulating pressures formation fracture and propagation pressures, lost circulation and loads exerted by other casing strings, wellhead and blowout prevention equipment.

(2) The maximum performance properties used in the design of casing strings shall be those indicated as minimum performance properties in API Bulletin 5C2 on Performance Properties of Casing, Tubing and Drill Pipe.

(3) Where practical, surface casing (which is defined as that casing which is set subsequent to the conductor pipe or casing) shall be set 25m into a competent formation and sufficient casing shall be run to cover shallow aquifers, prevent the release of well fluids to the environment and be set at the approximate depth as set out in the approved program.

(4) All casing and liner strings shall be designed to withstand the maximum anticipated burst, collapse and tensile loads at the temperatures and wellbore environments expected to be encountered.

(5) Where a casing liner is run in a well, there shall be an overlap of at least 30m between the top of the liner and the shoe of the previously run string of casing.

122. Pressure Testing of Casing Strings.

(1) Prior to drilling the plug after cementing, all casing strings, except the conductor casing, shall be pressure tested to either 70% of the programmed design burst pressure or 70% of the manufacturer's minimum internal yield pressure, whichever is lower, but no less than the pressures as shown in the following table:—

Casing String	Minimum Pressure Test—PSI
Surface	200
Intermediate	1000
Liner/Production	1500 or 0.2 PSI/Ft, whichever is greater

(2) A test under Subsection (1) shall not exceed the rated working pressure of the casing and well head equipment, and where the pressure declines more than 10% in 15 minutes, or where there is other indication of a leak, corrective measures shall be taken until a satisfactory test is obtained prior to drilling out the shoe.

(3) The results of a test under Subsection (1) shall be entered in the daily drilling report and the tour report.

(4) Casing recovered from a well shall not be reused in another well unless—

(a) it has been inspected in accordance with API RP 5C1, "Recommended Practice for Care and Use of Casing and Tubing"; and

(b) its physical characteristics established by such inspection ensure compliance with Subsection (1).

(5) Unless otherwise approved by the Director, a well completed to produce oil or gas or to inject any fluid shall have the annulus between the second casing string and the surface casing vented to atmosphere.

123. Cementing of Casing.

(1) The conductor and surface casings shall be cemented to surface or as indicated in the drilling program that has been approved by the Director.

(2) All ensuing casing strings shall be cemented with sufficient cement of sufficient compressive strength to ensure that all aquifers and zones containing movable hydrocarbons are competently covered and/or isolated by cement and that the top of cement is at least 150m above the cementing point.

(3) The overlap between a liner and the next larger casing previously set shall be cemented with sufficient cement to fill at least 30m of the annular space between the liner and the next larger casing, or the overlap is sealed in some other approved manner.

(4) If the cementing requirements of this section have not been achieved, the site person-in-charge shall meet those requirements by remedial cementing, unless otherwise approved by the Director.

(5) Drilling shall not be commenced until a time lapse of—

(a) 24 hours; or

(b) 8 hours under pressure for all other casing strings or until surface cement samples are set.

(6) For the purposes of Subsection (5), the cement is considered to be under pressure if it is restrained from movement by the use of float valves or surface valves in the casing string.

124. Formation Integrity Tests.

(1) Unless otherwise approved by the Director, a formation integrity test shall be conducted after drilling out the casing shoe of surface and intermediate casing strings to ensure well integrity during the subsequent drilling operations.

(2) The results of a test under Subsection (1) shall be reported in the daily report and entered on the tour report and where the result of a test requires that the drilling and casing programs previously approved by the Director be amended, any such amendments will be submitted to the Director for approval.

125. Samples.

(1) Unless the prior approval of the Director has been obtained the site person-in-charge shall, where applicable, take, preserve and maintain a series of cutting samples of not less than 100g (dry weight) of the various formations which the drill penetrates in drilling the well, taken every 3m or at intervals as required by or approved by the Director.

(2) The samples referred to in Subsection (1) shall be washed, dried and packed, and labeled with the name of the well and interval of depth and shall be delivered as soon as practicable, but within one month of rig release, to the Director at the licensee's expense.

126. Cores.

(1) Cores shall be placed in core boxes, or other suitable containers, accurately labeled as to the well number, number of core, top and bottom of core, interval cored and percentage recovery of core and shall be suitably stored until delivered at the licensee's expense, within one month of the date of completion of the well, to the Director.

(2) Where vertical splitting of a core is required by the Director, a continuous section comprising at least a half slice of the core will be provided, but otherwise the core shall be apportioned into representative sections.

(3) In either case referred to in Subsection (2), the core shall be divided as follows:—

(a) licensee — 50%, if desired;

(b) State — 50%.

(4) Notwithstanding anything in Subsections (2) and (3), the licensee may retain all cores from productive intervals, potential or actual, providing that—

(a) the Director may, if he so desires, require that 25% of such cores be delivered to the Core Library of the Department of Petroleum and Energy; and

(b) the core retained by the licensee shall be used for reservoir or other allied investigations, and shall not be in any other way disposed of or destroyed; and

(c) all results of such investigations shall be reported promptly by the Person-in-Charge to the Director; and

(d) when the licensee desires to send such cores out of Papua New Guinea for any purpose whatsoever, he shall advise the Director of his intention so that the provisions of Paragraph (a) may be invoked.

127. Age Dating of Samples.

The licensee shall, as early as practicable, use his best endeavors to ascertain, by palaeontological, radiometric or other suitable means, the ages of all undated rocks penetrated by the well.

128. Fluid Samples.

(1) Recovery from formation tests shall, when practicable, be sampled in accordance with API RP44 "Recommended Practice for Sampling Petroleum Reservoir Fluids".

(2) A sample under Subsection (1), shall be labeled and analyzed and liquid samples shall be preserved for at least six months.

(3) Analyses of a sample under Subsection (1) shall be forwarded to the Director as soon as possible.

(4) Where required by the Director, a one (1) litre portion of each sample under Subsection (1), shall be forwarded to the Director suitably labeled as to well number, condition of well when sampled, date, productive interval, type of test, nature of sample and sampling point. Such samples shall be supplied in sealed containers that meet all appropriate regulations of the Civil Aviation Act 2000, Harbours Act (Chapter 240) and Inflammable Liquid Act (Chapter 311) for the product it contains and the form of transport of such sample.

129. Formation and Inflow Tests.

(1) The site person-in-charge shall make every reasonable effort to advise the Director of his intention to conduct a formation test or inflow test.

(2) The site person-in-charge shall notify the Director as soon as possible of the results of a formation test and shall not make public the results until the Director has been so notified.

(3) The site person-in-charge shall, where requested by the Director, supply to him as soon as possible, a copy of the relevant operational report, fluid recovery rates, choke sizes, pressure and temperature readings and pressure recorder charts for each drill stem test or other test taken at the well and an interpretation and analysis of the test.

130. Electric or Other Well Logs.

(1) The site person-in-charge shall, before a drilling well is cased (other than surface casing), completed, fraced, suspended or abandoned, ensure that a suite of open hole wire line logs, as considered necessary by the licensee and approved by the Director, is run and recorded.

(2) Cased hole logs for well evaluation, as required by the Director, shall be run and recorded.

(3) Copies, stable base transparencies, magnetic tapes or other digital log data of all logs run, and computer processed interpretive logs made, shall be dispatched forthwith to the Director.

131. Protection of Aquifers.

During operations on a well, every practical precaution shall be taken to prevent communication between, leakage from or pollution to aquifers that are or may be used for any purpose.

132. Abandonment Principles.

Where a well or portion of a well is to be abandoned, the following provisions shall be observed:—

(a) the operator shall submit an abandonment program to the Director and said program shall not be carried out prior to receiving approval from the Director;

(b) abandonment programs shall be designed so as to ensure zonal isolation of any or all aquifers, lost circulation zones and other zones capable of fluid production and the programs shall specifically address the prevention of inter-zonal pressure transfer, pressure transfer from formations to the wellbore or tubulars and operational safety;

(c) ghost holes shall be abandoned or isolated by use of cement plugs unless otherwise approved by the Director;

(d) abandonment plugs shall be tested for quality and placement as directed by the Director;

(e) a steel well marker plate, having the well name and operator's name bead-welded onto it, shall be installed 2m above ground level and permanently affixed to the abandoned well equipment;

(f) where at some future time, in the opinion of the Director, the abandonment has proven to be ineffectual, the licensee at the time of abandonment, shall be operationally and financially responsible for rectifying the situation as directed by the Director.

133. Well Completion.

(1) A completed well shall be completed in such a manner as to allow measurement of pressure and temperature under static or dynamic well conditions.

(2) The surface equipment shall be provided with sampling connections.

(3) The Person-in-Charge of a well shall, on completion of such well, keep and make readily available to a Petroleum Inspector an accurate record of all subsurface equipment and junk in the well.

(4) Before opening a well to production or injection and after every major repair, recompletion or workover, the well head and christmas tree shall be adequately pressure tested and the flow line shall be inspected to ensure satisfactory makeup.

(5) All produced and injected fluids shall be through tubing unless prior approval is received from the Director.

134. Disposal of Produced Oil and Gas.

(1) All oil or gas, that is circulated out of, or produced from a well during a drilling, testing or repair operation and that is not flowed via the well's flowline to a gathering facility, shall be flowed to a vented storage tank or flare on location.

(2) Clean up operations or testing of a well using temporary well site facilities may be continued during the hours of darkness subject to the condition where oil and gas are being produced together, they shall be flowed through a separator and the gas flowed to a flare.

(3) The flare referred to in Subsections (1) and (2), shall be equipped with a reliable, continuous ignition source.

135. Disposal of Other Liquid Waste.

(1) All waste liquids, used during the drilling or workover of a well, or that have been produced from a well as it cleans up, shall be drained to a waste sump or otherwise disposed of in a manner approved by the Director.

(2) A waste sump referred to in Subsection (1) that is permanently maintained on any location shall be adequately fenced or otherwise protected.

(3) Every practicable precaution shall be taken to prevent pollution of the environment by a waste sump referred to in this section.

136. Disposal of Other Waste.

(1) All worn drilling equipment, damaged or surplus drilling supplies and other rubbish shall be removed from site to an approved waste disposal site and no drilling waste of any description is to be buried on site.

(2) All food scraps and kitchen waste are to be disposed of in an environmentally and hygienically acceptable manner.

(3) Effluent from the toilet facilities provided at the rig and camp is to be treated or discharged in an environmentally and hygienically acceptable manner.

137. Replacement of Wellsite Fencing.

Where installed, the wellsite fencing protecting the wellhead from outside interference shall be replaced upon completion of a repair operation.

138. Penetration Rate.

Every drilling rig shall be equipped to provide continuous recording of the rate of penetration.

139. Detection of Petroleum.

- (1) Suitable equipment shall be continuously available and/or installed on or near every drilling rig, prior to the drilling out of the surface casing, to permit the detection of hydrocarbons in cuttings, cores and mud.
- (2) Equipment shall be readily available for adequate formation testing and sampling, both in open hole and through perforated casing.

Division 3.—Safety in Drilling and Workover Operations.

140. Operations.

Operations carried out at or about a well site and the associated equipment shall be in general accordance with API RP 54.

141. Masts and Derricks.

- (1) All masts and derricks exceeding 30m above ground level shall be equipped with a mast head light.
- (2) No structural change or addition to a derrick or mast shall be made unless approved beforehand by the Director, who shall require a written submission from the manufacturer or a qualified professional engineer as to the effects of such structural change or addition.

142. Spudding-in.

A well shall not be spudded or a rig assisted well reentry shall not start until the rig and its associated equipment are completely rigged up and reliable communications have been established as required in Section 21.

143. Blowout Prevention.

- (1) The site person-in-charge of a well that is being drilled, tested, completed or worked over shall, at all times, employ adequately designed blowout prevention equipment.
- (2) Prior to drilling below the surface casing string, or before re-entering a completed well, hydraulically operated blowout prevention equipment shall be installed, operated and tested, generally in accordance with the relevant requirement of API RP 53, "Recommended Practices for Blowout Prevention Equipment System for Drilling Wells", and shall be maintained ready for use subject to Section 147 until abandonment, completion or recompletion operations have been completed.
- (3) The blowout prevention equipment referred to in Subsection (2) shall comprise a minimum of—
 - (a) three remotely controlled hydraulically actuated blowout preventers each with a working pressure which exceeds the maximum anticipated surface pressure and which preventers consist of—

- (i) one set of pipe rams appropriate for the size of pipe being run in the hole; and
 - (ii) one set of blind rams; and
 - (iii) one annular preventer; and
 - (iv) extension hand wheels or hydraulic locks on all ram type preventers; and
- (b) a drilling spool with side outlets for the attachment of choke and kill lines, or side outlets in the blowout preventer body, for choke and kill lines, which side outlets shall be connected to pipe lines which have a pressure rating not less than the blowout preventer assembly to which they are connected, except that part of the choke line which is down stream of the last valve on the choke manifold; and
- (c) one kill pump facility connected to the kill line; and
 - (d) one fill up line.
- (4) Where the pressure rating of the blowout preventers is—
- (a) less than 2000 PSI, both the choke and kill lines shall contain related fittings of a minimum diameter of 2 inches and shall be equipped with at least one control valve; or
 - (b) greater than 2000 PSI, the choke line shall contain related fittings of a minimum diameter of 3 inches, and both kill and choke line outlets on the blowout preventer stack shall be equipped with two control valves, one of which on the choke line shall be hydraulically controlled.
- (5) Where the Director has approved the setting of deep surface casing, he may require the installation of an adequate diverter system to the conductor in accordance with API RP 53.
- (6) All valves, fittings and lines between the closing unit and the blowout prevention stack shall be of steel construction.
- (7) Approved fire resistant hose with a rated working pressure at least equal to the working pressure rating of the stack may be used on equipment rated at 5000 PSI or less.
- (8) Where manual controls for blowout preventers are provided they shall be located outside the rig substructure at a maximum practicable distance from the well-head.
- (9) An inside blowout preventer assembly and a full opening safety valve in the open position, with crossovers as needed to fit all tool joints in the drill or tubing string, shall be maintained on the rig floor while drilling or work-over operations are being conducted.
- (10) An upper kelly cock shall be installed below the swivel and, where high pressures are anticipated, another at the bottom of the kelly of such design that it can be run through the blowout preventers.
- (11) Choke and kill lines of flange, weld or clamp connected steel or approved fire resistant hose shall be fitted and equipped generally in accordance with API RP 53 and apart

from the choke there shall be no reduction in diameter from the primary choke line to the flare.

(12) The choke manifold shall be fitted with not less than two adjustable chokes and it is recommended that a hydraulically controlled choke be fitted as one such choke, where the pressure rating of the blowout preventer equipment exceeds 3000 PSI.

(13) Each choke manifold shall have the following equipment clearly visible to the choke operator when standing in his normal operating position for either of the adjustable chokes—

- (a) a pressure gauge which indicates the drill pipe pressure at the drilling floor; and
- (b) a pressure gauge which indicates the casing/drill pipe annulus pressure at a known point upstream of the choke.

(14) The choke manifold shall be sited away from the rig substructure so that the choke and flare lines contain a minimum number of bends and, so far as is practicable, the driller has a clear view of a person operating chokes and monitoring pressures.

(15) An adequately constrained flare line shall extend at least 50m from the well, oil storage tank, separator, temporary production facility or other unprotected source of flammable vapors.

144. Blowout Equipment Certification.

All drilling contractors shall have their blowout preventer stacks inspected by a qualified inspection organization or tested and certified by a qualified facility that is authorized by the manufacturer and such inspections or certifications shall be performed according to the manufacturer's recommended procedure and schedule, but not less than once every five years.

145. Blowout Preventer Closing Units.

(1) Blowout preventer activating accumulator units generally in accordance with the requirements of API RP 53, shall be located a minimum of 20m from the wellhead and, without accumulator pump assistance, shall have sufficient capacity to—

- (a) open or close the hydraulically operated choke line valve; and
- (b) close or open the annular type blowout preventer; and
- (c) close or open all blowout preventer pipe rams.

(2) After the functions specified in Subsection (1) have been carried out, the accumulator pump shall be capable of rebuilding fluid pressure in the accumulator within a period of three minutes to a sufficiently high level to—

- (a) open the hydraulically operated choke line valve; and
- (b) close the annular type blowout preventer.

(3) Accumulators shall be connected to the blowout preventers with lines of safe working pressure at least equal to the working pressure of the accumulator, and where these lines are located adjacent to and within the substructure they shall be of steel construction unless

completely sheathed with adequate fire resistant material, installed and maintained to the manufacturer's specifications.

(4) Accumulator pumps shall have two independent sources of power which shall not be connected to the same circuit.

(5) During drilling and work-over operations there shall be a control manifold for operating the blowout preventers accessible to the driller on the rig floor and another located at least 20m from the well, so that where the rig floor controls are rendered inoperable the distant master control unit shall be able to operate all blowout preventer functions.

146. Testing Blowout Prevention Equipment.

(1) The blowout prevention equipment shall be tested in the manner and at the times set out in Subsections (2), (3), (4), (5) and (6) in the event that a test indicates that the equipment is not operating correctly, the equipment shall be made serviceable before operations are recommenced.

(2) The ram type preventers, the annular preventer, the choke and kill lines and valves, the choke manifold and the kelly cock shall be pressure tested on installation and following the setting of each string of casing in the wellhead, prior to drilling out or commencing completion operations or at any time any part of the BOP stack has been altered in any way that compromises the pressure integrity results of the preceding test.

(3) A test under Subsection (2) is to be conducted using water and to pressure consistent with the rating of the equipment, the recommendations of the manufacturer and the casing installed in the well, and the results of any such test shall be reported in the daily report and entered on the tour report.

(4) Under normal operating conditions, at least once every two weeks, the blowout preventers and choke manifold shall be pressure tested and the results shall be recorded in the daily report and on the tour report.

(5) Where well conditions preclude the safe testing of the BOP stack and manifold, the pressure test may be postponed until normal operating conditions are regained, at which time the test shall be immediately carried out and the reasons for the postponement shall be entered into the daily report and the tour report on the day the test was originally due.

(6) The blowout preventers are to be inspected or checked on a daily basis and the rams operated as required to ensure functional competence and such function tests shall be recorded in the daily report and the tour report.

(7) Every closing of the blowout preventer system and the reasons for the closing shall be included in the daily report and the tour report.

147. Installation and Removal of Blowout Prevention Equipment.

During the period of operations when blowout prevention equipment is installed and maintained it shall not be removed until proper plans to safely seal the wellbore, approved by the Director, have been carried out.

148. Well Control Records.

- (1) All on-site supervisors and rig personnel holding the position of driller or above, shall maintain valid well control certification.
- (2) A certificate issued under Subsection (1) is to be produced when so requested by the Director or a Petroleum Inspector.
- (3) Blowout prevention drills shall be conducted weekly for each crew to ensure that crews are properly trained to carry out emergency procedures and the response times shall be recorded in the tour reports and the daily drilling report.
- (4) Proper trip sheet records shall be maintained until rig release date of the well, and shall be produced when requested by the Director or a Petroleum Inspector.
- (5) Detailed well control procedures shall be displayed at the location.
- (6) A well kill work sheet shall be maintained current with respect to the drilling conditions.

149. Drilling Fluid Facilities.

- (1) Drilling fluid facilities, materials and procedures shall be established and maintained to minimize the potential of a blowout on any well.
- (2) The drilling fluid facilities system shall include—
 - (a) recording and alarmed mud pit/tank level indicators; and
 - (b) an appropriate sized trip tank; and
 - (c) a mud return or full hole indicator; and
 - (d) pump stroke counters; and
 - (e) mud degasser.
- (3) When pulling drill pipe or tubing from an uncased or perforated well, the annulus shall be filled with a fluid of appropriate density before the change in the fluid level decreases the hydrostatic pressure by 75 PSI, or every five stands of tubular, whichever gives the lower decrease in hydrostatic pressure.

150. Well Testing.

- (1) Any formation test in which formation fluids are produced into the test string shall have—
 - (a) provision to avoid pulling the test string full of produced fluids; and
 - (b) provisions to kill the well in case of an emergency; and
 - (c) any other provision as may be prescribed by the Director.
- (2) During formation testing, or the removal of pipe after a formation test, a competent supervisor shall remain at the rig site to supervise the operations.

- (3) During formation testing flow periods, motors engines and lights not required in the operation shall be shut off and water sprays, fitted to the exhausts of the engines that are required to be run, shall be turned on during all flow periods.
- (4) During formation testing flow periods, no motor vehicle shall be operated within 25m of the well bore.
- (5) During formation testing, the testing string annulus shall contain sufficient fluid of a density adequate to control formation pressure.
- (6) Produced fluids at surface shall be safely routed through an appropriate independent test manifold and choke facility.
- (7) Blowout prevention equipment shall not be used for flow control during a formation test.
- (8) The site person-in-charge during an open hole formation test shall—
 - (a) make every endeavor to estimate the rates of flow of oil and/or gas and/or water produced; and
 - (b) ensure that the volumes of liquids contained in the drill pipes at the conclusion of a test are measured; and
 - (c) ensure that samples are taken of all fluids produced or recovered from the drill pipe.
- (9) Unless otherwise approved by the Director, all formation flowing tests shall utilize appropriate equipment located to accurately measure both flowing and shut in pressures and temperatures of the formation being tested.
- (10) During a production test, the fluid flow shall be diverted through an adequate separator and the resultant flows of oil, gas and water shall be measured.

151. Swabbing.

- (1) While swabbing operations are being conducted, all engines, motors, and other possible sources of ignition, not essential to the operation, shall be shut down.
- (2) During swabbing operations the fluids shall be routed through a closed flow system to a production facility or tank located not less than 25m from the well bore and any flare/vent line from the tank shall incorporate a flame arrester.
- (3) Swabbing operations shall not be conducted during the hours of darkness.

152. Equipment and Procedures.

Equipment used on a rig, whether permanently attached or temporarily installed, and all working procedures shall be designed such that the safety of personnel, equipment, resources and the environment is assured.

Division 4.—Rig and Associated Equipment.

153. Drilling and Workover Rigs—General

- (1) Where practical, three exits from the floor of a rig shall be provided.
- (2) All work areas and walkways that are elevated by more than 1.8m, and stairs, shall be provided with secure and safely designed handrails or other appropriate safety facilities and shall comply with PNGS 1081 "Code for Fixed Platforms, Walkways, Stairways and Ladders".
- (3) Unless otherwise approved by the Director, the substructure of a rig shall not be enclosed.

154. Derrick and Mast Platforms.

Every derrick and mast shall have a safely designed, secured and adequately sized landing platform level with each principal working platform of the derrick.

155. Ladders and Stairways.

Ladders and stairways shall comply with PNGS 1081 "Code for Fixed Platforms, Walkways, Stairways and Ladders".

156. Hoisting Lines.

- (1) A wire-line service record shall be kept on all drilling and workover rigs and shall be in accordance with the provisions of API RP9B or such other form as may be acceptable to the Director and shall be produced to a Petroleum Inspector when required.
- (2) All hoisting lines and hoisting line equipment shall be designed, operated and maintained in safe and serviceable condition.
- (3) All overhead sheaves or pulleys shall be securely fastened to their support.
- (4) All hooks used in single point hoisting shall be equipped with a device to prevent the accidental release of the load.

157. Pressure Lines and Hoses.

All fluid system pressure hoses, high pressure pneumatic flexible lines, high pressure pipe used in fluid pumping systems including those fitted with flexible joints shall be equipped with restraint devices of sufficient strength, secured to an adequate support, to effectively prevent dangerous movement in the case of coupling or near coupling failures.

158. Safety Valves and Pumps.

- (1) A pressure relief device shall be installed on all power driven high pressure fluid pumps and there shall be no valve between the pump and the pressure relief device.
- (2) The pressure relief device shall be set to discharge at a pressure not in excess of the manufacturer's recommended maximum working pressure of the pump and all connecting pipes and fittings.
- (3) Shear pins used in pressure relief devices shall be of a design and strength specified by the manufacturer.
- (4) A guard shall be placed around the shear pin and spindle of a pressure relief device.

(5) The fluids discharged from a pressure-relieving safety device shall be directed to a place where they will not endanger any person.

(6) There shall be no valve of any kind in the discharge opening of a pressure-relieving safety device or in the discharge pipe connected to it.

(7) The pipe connected to the pressure side and discharge side of a pressure-relieving safety device shall not be smaller than that of the normal pipe size openings of the pressure-relieving safety device.

(8) The piping on the discharge side of a pressure-relieving safety device shall be secured.

Division 5.—Offshore Operations.

159. General.

(1) Certain minimal distances specified in Part VII may be impractical on a marine facility, but the Person-in-Charge shall ensure that the intent of the provisions of Part VII is observed.

(2) A provision in respect of casing, blow-out preventers, blow-out preventer closing units, and abandonment in Part VII shall apply with equal force to operations both onshore and offshore

160. Mobile Drilling Unit.

(1) Any mobile offshore drilling unit shall be in possession of a current MODU certification and a current certification of seaworthiness from a recognized and authorized classifying authority such as the American Bureau of Shipping.

(2) In the case of the first well to be drilled or worked over by a unit offshore Papua New Guinea, the mobile offshore drilling unit and associated equipment shall be inspected by a qualified inspection company, approved by the Director, and the subsequent inspection report shall be forwarded to the Chief Inspector for review.

(3) Any deficiencies in the equipment, as highlighted by this inspection report, under Subsection (2) shall be remedied prior to spud or start of operations on the well and the rig and associated equipment shall then be re-inspected and approved by a Petroleum Inspector appointed under the Act, prior to the commencement of drilling.

161. Offshore Drilling Program.

An offshore drilling proposal shall address the following items (drilling unit applicable) prior to or in conjunction with the details as stated in Section 104:—

- (a) anchoring of the drilling unit;
- (b) shallow gas drilling procedures for conductor and surface holes; and
- (c) site pull off plans during drilling and/or completion operations in case of emergency;
- (d) site repositioning and well reconnect;

- (e) disposal of drilling fluid and drill cuttings;
- (f) initial site survey and seafloor evaluation for bottom supported drilling units;
- (g) details for the containment of hydrocarbon spills into the sea, complete with a copy of the financial responsibility;
- (h) details of the chemicals to be used in the drilling and fracking fluids, copies of the MSDS sheets and the treatment procedure for rendering the drilling fluids harmless prior to disposal to the sea;
- (i) details of safety facilities contracted for offshore personnel safety.

162. Offshore Casing Design.

- (1) For drilling operations carried out from a mobile offshore drilling unit, except for the conductor hole, all casing or subsea equipment shall be designed to return drilling fluids to the drilling unit and such design shall take into account all lateral loads that may be exerted on the casing or riser system.
- (2) For the design of casing strings used in offshore wells, the design shall be governed by Section 121.

163. Offshore Blowout Preventers.

- (1) Prior to drilling below the surface casing string, blowout prevention equipment as generally recommended in API RP 53, shall be installed and tested.
- (2) The blow-out preventer assembly shall include at least one blind/shear ram and one annular type.
- (3) A sub-sea blowout preventer shall be provided with duplicate sets of control lines, designed to allow for sub-sea disconnect at the stack.

164. Offshore Blowout Preventer Closing Units.

In the case of a well drilled from a mobile drilling unit (other than a jack-up platform), the accumulator unit shall be capable of opening the riser connector in addition to the requirements specified in Section 145.

165. Disposal of Drilling Fluids Offshore.

Offshore disposal of water based drilling fluids and cuttings into the sea shall be in accordance with the prevailing laws of Papua New Guinea, and drilling fluids and cuttings containing oil or other hydrocarbons shall meet the requirements of Section 190.

166. Abandonment of Offshore Wells and Platforms.

All casing strings and pilings from offshore wells or platforms being permanently abandoned shall be severed at least 5m below the seabed and removed, and the sea floor surrounding the well location, to an area extent as determined by the Director, shall be surveyed to determine debris and obstructions and cleared as directed.

Division 6.—Air Drilling.

167. General.

The provisions of this Division shall apply whenever air is used as a circulating fluid in rotary drilling operations in the search for and production of unconventional hydrocarbons and where there is any conflict between any of the provisions of this Division and of any other provision of this Regulation, the provisions of this Division shall prevail.

168. Delivery Lines.

- (1) The main air supply line shall be located so that it does not interfere with pedestrian or vehicular movement.
- (2) A check valve shall be installed on the delivery line at or near the standpipe.
- (3) All high pressure air lines on the drilling location shall be suitably marked or posted with warning notices and a supervisor shall ensure that all workmen working under his supervision are aware of the method of marking of the high pressure lines.
- (4) All main valves in the supply system that may require quick closure in the event of an emergency shall be clearly labeled and shall be readily accessible.

169. Motor Vehicles.

Every vehicle that is not directly engaged in operations on the well shall not approach within a distance of 50m from the well.

170. Fire Precautions.

- (1) Adequate fire extinguishing equipment, properly positioned at or under the substructure, shall be pointed directly at the rotating blowout preventer assembly. The line between the mud pump and that mud gun shall be controlled by a single valve situated at the pump end of the line.
- (2) Where the mud pump referred to in Subsection (1) is not kept in continuous operation, pump starting controls shall be located at the pump and at the driller's control panel.

171. Siting of Compressors.

- (1) Where practical, compressors and boosters used for drilling shall be sited at least 25m away from the rig and the gas separator, and shall be placed so as to be visible from the driller's position.
- (2) Oil and diesel fuel storage shall be sited at least 25m away from the compressors.

172. Blooey Line.

- (1) Blooey and bleed-off lines shall extend at least 50m from the wellhead and shall, where practical, be laid downwind of the well or at a right angle to the direction of the prevailing wind.
- (2) A geological sample catcher installed on a blooey line shall be designed to avoid flashback and to provide protection to personnel from dust.
- (3) Sufficient space shall be cleared around the end of the blooey line to prevent ignition of vegetation.

(4) Where dust discharged by drilling causes a hazard to health on the drilling location, provision shall be made to inject water into the blooey line to suppress such dust.

(5) Any gas discharged from the blooey line shall be immediately ignited by a reliable, safe and continuous method acceptable to a Petroleum Inspector.

173. Supply Line Valves.

At least two valves shall be installed in the main air supply line, of which one shall be on the standpipe accessible from the derrick floor and one shall be at a distance of at least 25m from the well.

174. Drillstring Fittings.

A downhole float valve shall be installed in the drill string and both top and bottom kelly cocks shall be employed in a manner similar to that provided for in Section 143(9) and (10).

175. Mud Stocks.

Drilling fluid, readily available and in adequate volume to fill and circulate the hole, shall be maintained on location in satisfactory condition at all times.

176. Gas Detection Equipment.

Sufficient gas detection equipment, of a type and number acceptable to a Petroleum Inspector, shall be provided and used at all drilling locations when air drilling is in progress.

Division 7.—Special Services.

177. Definition.

Special services are those usually provided by a contractor other than the drilling contractor and shall comprise all logging, formation testing, formation stimulation, cementing and other services of a like nature that are carried out in support of the drilling, completion, abandonment, suspension and workover of a well.

178. Operations.

(1) Special services shall be conducted in accordance with this Regulation and the applicable recommended practices set forth in API RP 54 "Oil and Gas Well Drilling and Servicing Operations".

(2) All safety and operating requirements contained in this Regulation are applicable.

179. Stimulation Operations.

In any stimulation operation in which high pressure pumping equipment is used—

(a) all equipment shall be pressure tested to a pressure greater than the maximum anticipated treating pressure; and

(b) where crude oil is to be used in such operations, it shall be weathered in a facility for a sufficient period to ensure that the more volatile components have escaped before the crude is so used and, for any operation using petroleum based

products, sufficient fire protection shall be available on site to contain any fire and provide personnel protection; and

(c) pump vehicles and other pumping equipment shall be located at least 25m from the well, whenever possible, and shall be stationed in such a position as to provide the persons operating such vehicles with a clear view of the wellhead; and

(d) injection lines or manifolds shall not be laid beneath vehicles or pumping equipment; and

(e) all unnecessary electrical equipment shall be shut down during a stimulation operation that uses petroleum based fluids; and

(f) only persons, vehicles and equipment necessary for the operation shall be permitted within 50m of the well; and

(g) in any acidization, an adequate source of fresh water shall be available for personnel safety purposes; and

(h) before pumping flammable liquids, all components of the system shall be grounded.

PART VIII.—PRODUCTION.

180. Identification of Wells and Production Facilities.

The licensee shall mark each well and production facility with a notice in large, legible letters, of a type and size acceptable to a Petroleum Inspector, stating the name of the field and the well or production facility number.

181. Protection of Completed Wells.

All completed wells shall be reasonably protected and a notice, in accordance with Section 26, warning persons of the danger that exists, shall be prominently displayed.

182. Construction Approval.

The licensee shall not commence the construction of a facility without the written approval of the Director.

183. Application for Approval.

(1) An application for approval of the location, construction and operation of a production facility shall include the following information:—

(a) the name, location and coordinates of the facility;

(b) a listing of the well names and pools planned to be producing to the facility complete with a listing of unconventional hydrocarbons in place, ultimate recovery and remaining reserves for each pool;

(c) estimated minimum, maximum and average oil, gas and water rates for each well and justification for these rates in respect to the maximum ultimate recovery to be achieved at these rates in comparison to maximum recovery of alternate rates;

- (d) a plan showing the intended location of all gathering lines forming part of the production facility, together with pipe sizes;
 - (e) a statement of the main specifications to which the facilities have been designed and are planned to be constructed and operated, and a statement of the proposed operating pressures;
 - (f) the specifications of the separation equipment including pressure rating, minimum and maximum flow capacities and operating pressures and temperatures;
 - (g) a discussion of—
 - (i) the well testing frequency and duration intended; and
 - (ii) the measurement capabilities of the facility; and
 - (iii) any off-lease disposal;
 - (h) a list of the common flow lines intended and the method of testing the wells on each common line;
 - (i) a schematic flow diagram showing—
 - (i) the location of all major equipment including separation, dehydration, treating and storage facilities if any; and
 - (ii) the location and type of measurement equipment with each measurement point properly identified; and
 - (iii) emergency relief valves, lines, tanks or emergency shut down system; and
 - (iv) location and size of pits, dikes, flare lines and flare stacks; and
 - (v) location and capacity of pumps or compressors delivering oil, gas or water to a pipe line or injection;
 - (j) a sample set of field production reports for the facility with each entry explained using the identified measurement points from the schematic flow diagram;
 - (k) a plan showing the land surface contours, type of vegetation, bodies of water and surface improvements within 200m of the facility and the size and location of the facility site;
 - (l) operational and equipment details of any trucking facilities;
 - (m) where production from more than one pool is received at the facility, a statement of the method intended for allocating production between pools.
- (2) An application for approval to modify a production facility shall be accompanied by the applicable information required by Subsection (1) where the modification affects the general measurement and flow capability aspects of the production facility.

(3) Where maintenance or preventative maintenance is carried out that does not affect the existing flow capability, an informational notice that does not require approval, is requested to be submitted to the Director.

(4) An approval for the location and construction or modification of a production facility shall be subject to any conditions set out in the approval.

184. Gauging and Metering Facilities.

(1) Tanks or meters shall be provided to measure continuously the quantities of oil, condensate, water, and gas from each producing field.

(2) Unless otherwise approved by the Director, the oil, gas and water production rate of every uniquely completed zone on extended production, in every well, shall be determined by test at intervals not exceeding one month during such production.

(3) A test referred to in Subsection (2) shall be—

(a) of sufficient duration so that—

(i) the volume of gas and liquid produced can be metered within the manufacturer's specified accuracy tolerance for the measurement devices in use; and

(ii) the rate of production determined for the test period is representative of the producing characteristics of the well; and

(b) normally once per month except in the case where the oil rate, GOR or WOR vary significantly from that of the previous test, in which case two or more tests per month shall be performed at reasonably consistent time intervals and the results of said tests shall be submitted to the Director as soon as practical.

(4) In the case of a swing well, the same test requirements apply although the variation parameters may differ.

(5) Unless otherwise approved by the Director, the production rate of every gas well on extended production shall be measured separately and continuously from each flowing string in each well.

(6) All meters and devices used to measure production of oil, water and gas shall be proved and certified as to accuracy in a manner and frequency acceptable to the Director.

185. Measurement of Production for Royalty Purposes.

(1) The Director may, for the purposes of measuring production for royalty, seal with a metallic seal, a valve or meter selected by him and installed at a well or on a pipeline, tank or other receptacle used for the storage or transportation of oil, gas or other fluid produced or withdrawn from the well.

(2) The site person-in-charge shall be notified orally in advance by a Petroleum Inspector of his intention to affix a seal under Subsection (1) stating his reasons therefor and such oral notification shall be confirmed in writing.

(3) Except in case of emergency, a seal affixed under Subsection (1) shall not be tampered with or removed without written permission from the Director.

186. Production Lines and Equipment.

Production lines and equipment shall be in accordance with relevant Australian or API Standards, or to specifications acceptable to the Director.

187. Monitors, Control Mechanisms and Safety Devices.

(1) A monitor and control mechanism, whose specifications are acceptable to the Director, shall be used to—

- (a) control the rate of recovery of unconventional hydrocarbons or water from a well; and
- (b) control the pressure in pressure vessels and associated piping so that the safe working pressure of the vessels and piping is not exceeded; and
- (c) prevent the escape of unconventional hydrocarbons; and
- (d) shut down an artificial lift device and close in a well in the event of—
 - (i) a break in a pressure vessel or associated piping receiving or conveying unconventional hydrocarbons or water flowing to or from the well; or
 - (ii) a failure of any control mechanism associated with the well which might result in an unsafe condition being caused by the escape of unconventional hydrocarbons or water; or
 - (iii) a fire or explosion in the vicinity of the well; and
- (e) activate fire control mechanisms in the event of the outbreak of fire or an explosion.

(2) A well that is capable of producing unconventional hydrocarbons by natural flow or by gas lift shall be equipped with a surface controlled subsurface safety device whose specification is acceptable to the Director.

(3) A surface controlled subsurface safety device shall be—

- (a) designed so that it closes off automatically the flow of unconventional hydrocarbons or water from the well where the wellhead or production equipment is damaged in such a way that would allow the escape of unconventional hydrocarbons or water from the well; and
- (b) operated at regular intervals not exceeding six months and tested at intervals according to manufacturer's recommendations; and
- (c) where a test indicates that it may not operate correctly, repaired or replaced forthwith.

(4) An existing wireline retrievable, non-surface controlled subsurface safety device that was installed and in service prior to the coming into operation of this Regulation shall be—

- (a) pulled, serviced and tested during all planned wireline operations on the well; and
- (b) replaced with a surface controlled subsurface safety device during the first rig assisted workover operation on the well after the coming into operation of this Regulation.

(5) A surface controlled subsurface safety valve or injection valve that is capable of preventing back flow from a well shall be installed in all injection and/or disposal wells, operated at regular intervals not exceeding six months and tested at intervals according to manufacturer's recommendations, unless the Person in Charge can prove that the well is incapable of flowing.

188. Initial Production Tests.

(1) Each newly completed, recompleted, fraced, or stimulated flowing unconventional oil well shall, prior to being put on production, or within 14 days thereof, be subjected to a production test, which shall include where practical, bottom hole pressure measurements, for not less than four consecutive hours and the Person-in-Charge shall, as soon as practicable after the completion of the test, send to the Director a report showing—

- (a) completion interval and details of perforations; and
- (b) oil, water and gas production with gas/oil ratio; and
- (c) the choke size; and
- (d) the API gravity of the oil; and
- (e) casing and tubing pressures; and
- (f) separator temperature and pressure; and
- (g) duration of test; and
- (h) interpretation of the test.

(2) Each newly completed, recompleted, fraced, or stimulated non-naturally flowing unconventional oil well, being artificially lifted shall, prior to being put on production, or within 14 days thereof, be subjected to a production test that shall include bottom hole pressure measurement if practical for not less than eight consecutive hours, and the Person-in-Charge shall, as soon as is practicable after the completion of the test, send to the Director a report showing—

- (a) completion interval and details of perforations; and
- (b) oil, water and gas production with gas/oil ratio; and
- (c) the API gravity of the oil; and
- (d) casing pressures and fluid levels where applicable; and
- (e) method of artificial lift, depth of device, and operational parameters; and
- (f) duration of test; and

(g) interpretation of the test.

(3) Each newly completed, recompleted, fraced or stimulated unconventional gas well shall, before being placed on production or within three months of its completion, recompletion or stimulation, be subjected to a flow potential test using a multi-point back pressure method, isochronal method, or any other method approved by the Director, and the Person-in-Charge shall, as soon as is practicable after the completion of the test, send a report to the Director showing—

- (a) completion interval and details of perforation; and
- (b) the choke size or sizes; and
- (c) gas, oil and water production rate or rates; and
- (d) gas/oil ratio; and
- (e) the API gravity of the oil or condensate; and
- (f) casing and tubing pressures; and
- (g) separator temperature and pressure; and
- (h) duration of test; and
- (i) any further relevant details; and
- (j) interpretation of the test.

(4) Each newly completed, recompleted, fraced or stimulated water or unconventional gas injection well, prior to being put on line, or within seven days thereof, shall be subjected to an injectivity test for not less than four consecutive hours and the Person-in-Charge shall, as soon as practicable after the completion of the test, send to the Director a report inclusive of—

- (a) completion interval and details of the perforations; and
- (b) water and/or gas injection rate; and
- (c) casing and tubing pressures; and
- (d) pump or compressor outlet pressure; and
- (e) interpretation of the test.

(5) On each well where equipment installation permits, closed in and flowing bottom hole pressures shall be measured during the tests specified in Subsections (1), (2), (3) and (4), unless otherwise approved by the Director.

(6) The Person-in-Charge shall notify the Director as early as is practicable, but in any case prior to the commencement of the test, of his intention to conduct a production or injectivity test, as required by this Regulation.

189. Multiple Completion Well.

- (1) A well shall not be allowed to produce oil, gas or water from different pools at the same time from the same string unless the production from each individual pool can be independently tested and measured or approval in writing has been obtained from the Director.
- (2) The Person-in-Charge shall, when required by the Director, conduct interference tests between the various zones of a multiple completion well to ensure that isolation of the various zones is being maintained to his satisfaction.
- (3) Within one month of the completion of each test required by this section a report of the test containing all relevant data and an analysis and interpretation of the test proving or confirming segregation shall be forwarded to the Director.
- (4) Where at any time a test required by this section or the production characteristics of the well indicate that segregation between the zones is ineffective—
 - (a) a diligent attempt to establish segregation shall be made; and
 - (b) where required by the Director, one of the zones shall be sealed off or abandoned.
- (5) Where proof of segregation of zones is not submitted to the Director as required by this section, the well shall be shut in or produced in such manner as instructed by the Director.
- (6) At least three days notice shall be given to a Petroleum Inspector of the intention to carry out a test required by this section.

190. Disposal of Produced Liquids.

- (1) All formation water and other waste liquids produced from a well or refuse from tanks shall be disposed of by a method that is environmentally acceptable and does not constitute a health or safety hazard.
- (2) The concentration of unconventional hydrocarbons in any formation water discharged into the sea shall not exceed the limits set by the current Papua New Guinea environmental legislation.
- (3) Produced formation water shall not be discharged into the sea unless—
 - (a) there is approved equipment which monitors, records and ensures that the concentration of unconventional hydrocarbons in the discharged formation water specified in Subsection (2) is not exceeded; and
 - (b) an approved test is conducted at intervals not less frequently than weekly to check the performance of the equipment referred to in Paragraph (a), and the test results are recorded; and
 - (c) the records referred to in Paragraphs (a) and (b) are available to a Petroleum Inspector for a period of at least six months from the date on which the record is made.

191. Production Rate Restriction.

(1) The Director may restrict the amount of oil or gas or both that may be produced from a pool by limiting, where such limitation appears to him necessary, the total daily amount of oil and/or gas that may be produced from a pool, having regard to the efficient use of gas for the production of oil, the demand for oil or gas from the pool and/or the ultimate recovery of the oil or gas.

(2) Where the Director is satisfied that the licensee is not complying with any conditions imposed by him, or any requirement of this Part with respect to any pool, he may vary the rate at which unconventional hydrocarbons is being recovered from that pool.

192. Enhanced Recovery.

(1) In order to enhance reserves recovery, and after due consideration of the economic feasibility thereof, the Director may, by written direction to the licensee—

(a) require enhanced recovery operations in any pool or portion thereof, and for or incidental to such purpose, require the introduction or injection of a fluid into any pool or portion thereof; and

(b) require that any produced gas be gathered and processed where necessary, and the gas or products therefrom marketed or injected into an underground reservoir for storage or for any other purpose.

(2) No scheme for—

(a) enhanced recovery, including gas cycling in any field or pool; or

(b) the disposal of any fluid or other substance to an underground formation through a well,

shall be proceeded with unless the Director has approved the scheme upon such terms and conditions as he may prescribe.

193. Use and Consumption of Gas by the Licensee.

The licensee shall not use, flare or consume gas produced from a well, for a purpose other than—

(a) for pressuring, cycling or reservoir pressure maintenance; or

(b) for light or as process fuel,

until he has filed, with the Director, particulars concerning such use, flaring or consumption, in such detail as the Director may require and the Director may, by written direction, require the licensee to use, flare or consume the gas in a particular manner within set rates.

194. Use of Direct Well Pressure.

Direct well pressure shall not be used other than for the operation of gas operated valves or regulators, chemical injection pumps, pressure testing of wireline blowout preventers and lubricators, to aid in unloading fluid to restore production from an adjacent well, equalizing the pressure differential across a subsurface safety device or such other purposes as may be approved in writing by the Director.

195. Tanks and Storage.

- (1) Oil shall not be stored in unprotected earthen sumps except as an emergency measure.
- (2) All permanent tanks for petroleum liquids, or batteries of tanks, shall be designed and constructed in accordance with the applicable API Standard for design and construction, and PNGS 1503, the Flammable and Combustible Liquids Code for installation, or such other Standards or Codes or Specifications as the Director may from time to time approve in writing.
- (3) An oil storage tank shall not be placed within 50m of any well or building, unless otherwise approved by the Director.
- (4) An oil storage tank of a capacity greater than 1000 barrels shall be surrounded by a bund wall capable of holding 150% of the capacity of the tank.

196. Tank Battery Control Valves.

All field tank battery installations shall be so arranged and provided with control valves as to permit the ready shut off of oil or gas in the event of fire.

197. Entering Tanks or Other Production Vessels.

- (1) A tank or other closed vessel shall not be entered by any person until the tank or vessel has been declared free of hazardous substances by an authorized person and the vessel shall have sufficient oxygen present to sustain human life.
- (2) All lines leading to a tank or vessel referred to in Subsection (1) shall be depressured and either disconnected or isolated prior to the entry of any person.
- (3) Where in an emergency it is necessary for a tank or vessel which previously contained flammable or toxic substances to be entered by a person, such person shall—
 - (a) wear breathing apparatus; and
 - (b) shall be supplied with a life-line held by some responsible person outside each tank or vessel, who shall have a breathing apparatus at hand to effect rescue if required; and
 - (c) shall not enter the vessel without being attached to a rescue line that is being held by another responsible person.

198. Monthly Production Report.

- (1) The licensee, in respect of any well that during a given month, produced or was capable of producing crude oil or gas, or into which crude oil, gas, natural gas liquids, water, air or other substance was injected or disposed of during the preceding month, shall not later than the last day of the following month, submit to the Director, in form and content acceptable to him, a full report for the preceding month of the following applicable items—
 - (a) the amounts of crude oil, condensate, gas water or other substance produced from the well; and

- (b) the amounts of crude oil, gas, natural gas liquids, water, air or other substance injected or disposed of into the well; and
- (c) the average separator or treater pressure and temperature if a separator or treater was in use; and
- (d) the wellhead pressure and temperature; and
- (e) the choke size; and
- (f) the number of hours during which the well produced, was injected into, or was used for disposal purposes; and
- (g) where the well is producing from more than one reservoir, the data required in Paragraphs (a) to (f) in respect of each reservoir; and
- (h) particulars of the disposition and deliveries of the crude oil, condensate, gas, water or other substance produced from the well; and
- (i) cumulative production of oil, condensate, gas and water produced from the well; and

(2) Where a well is shut in, the licensee shall, unless otherwise approved by the Director, each month submit a return so stating until production is resumed or the well is abandoned.

199. Routine Production Operations.

- (1) The Director shall be notified of all routine down hole well operations in a supplement to the monthly production report.
- (2) A supplement under Subsection (1) shall indicate only the well number, type of operation or treatment and the date it was carried out.

200. Annual Production Report.

An annual report on total production from a field, in an acceptable form, shall be submitted by the licensee to the Director.

201. Reservoir Data.

(1) Unless otherwise approved by the Director, routine reservoir measurements, conforming to normally accepted practices of producing a field in a sound and efficient manner, shall be taken, and the results shall, within one month thereafter, be reported to the Director.

(2) Routine reservoir measurements under Subsection (1) shall include—

- (a) for gas wells in a producing field—
 - (i) water production from each zone through a separator half yearly; and
 - (ii) salinity of water produced from each zone half yearly; and
 - (iii) a yearly flowing or static bottom hole pressure survey that includes static pressure gradient surveys; and

- (iv) gas and condensate analyses every two years; and
- (b) for oil wells in a producing field—
 - (i) a flowing or static bottom hole pressure survey with static pressure gradient survey yearly; and
 - (ii) salinity of water produced from each zone yearly; and
 - (iii) an oil analysis every two years.
- (3) Unless otherwise approved by the Director, an annual reserves report, in a form acceptable to the Director, shall be prepared for an Unconventional Hydrocarbons Development Licence by the licensee.
- (4) The Director may require that other reservoir measurements, necessary to ensure the establishment of efficient reservoir control, shall be carried out and reported to him.
- (5) All available reservoir data, the results of associated studies and unconventional hydrocarbons reserve estimates of a pool or a field, shall be submitted without delay to the Director.

202. Report on an Enhanced Recovery Project.

- (1) Where approval has been given for an enhanced recovery project, reports in accordance with Subsections (2) and (3) and any variation to those requirements that may be specified by the Director from time to time, shall be submitted to the Director.
- (2) During the first two years, or such other period as the Director may specify, from the date of commencement of the enhanced recovery project, a report detailing the progress and performance, at regular intervals as approved by the Director, shall be submitted to the Director within two months of the expiration of the approved interval.
- (3) A report required by this section shall set out the following information for the approved interval covered by the report:—
 - (a) the daily average rate during each month of oil production of each producing well, and of the whole scheme;
 - (b) the average gas/oil and water/oil ratios during each month of each production well, and of the whole scheme;
 - (c) the monthly cumulative gas, oil and water production for each producing well, and of the whole scheme;
 - (d) for each type of fluid being injected, the average rate of injection per operating day during each month to each injection well, and to the whole scheme;
 - (e) for each type of fluid being injected, the average wellhead injection pressure during each month for each injection well, and for the whole scheme;
 - (f) for each type of fluid being injected, the monthly cumulative volume of fluid injected to each injection well and to the whole scheme;
 - (g) the area-weighted formation pressure for the whole scheme;

(h) for each type of fluid being injected, the average injectivity index during each month for each injection well, and for the whole scheme, which index shall be determined as the daily average injection rate divided by the difference between the sand face pressure and the average formation pressure;

(i) the date and type of any well treatment or workover which shall be indicated, in the case of injection wells, on the report of the injectivity index and, in case of producing well, on the report of the daily average oil production rate;

(j) calculations on a monthly and cumulative basis of the balance between fluids injected to and fluids withdrawn from the part of the pool subject to the scheme;

(k) calculations on a monthly and cumulative basis of the balance between fluids injected to and fluids withdrawn from each injection pattern area or sector specified in the approval;

(l) such other interpretive information as the licensee considers necessary to evaluate adequately the progress and performance of the scheme.

(4) Subsequent to the first two years of the scheme or period as specified by the Director, the report required by this section may be submitted annually in a form acceptable to the Director.

PART IX.—MARINE FACILITIES.

203. Mobile Platform.

A floating structure, tender barge or construction barge forming part of a fixed platform shall be deemed for the purposes of Sections 204 and 205 to be a mobile platform when it is disconnected from the fixed platform.

204. Mobile Platform Approval.

(1) A mobile platform shall not be used unless—

(a) either it complies with such provisions of the Merchant Shipping Act (Chapter 242) as apply to it by virtue of that Act or it meets the requirements of that Act relating to the safety and operation of a vessel or structure performing the functions of the mobile platform; and

(b) it is currently certified, and maintains its certification, by a recognized and authorized classifying authority for mobile platforms of its class; and

(c) all equipment and facilities have been inspected and approved by a qualified inspection company; and

(d) the Director has given consent to the use of the mobile platform.

(2) The documents issued from time to time by the classifying authority under its rules which relate to the use and maintenance of a mobile platform shall be produced when required by the Director or a Petroleum Inspector.

(3) Except in an emergency, a mobile platform and its associated facilities shall not be materially altered or reconstructed without approval of and verification by the appropriate classifying authority.

(4) An emergency alteration or reconstruction shall, as soon as practicable, be reported to the appropriate classifying authority.

205. Movement of Mobile Platform.

(1) Subject to Subsection (4), a mobile platform shall not, without approval of the appropriate Authority under the Merchant Shipping Act (Chapter 242) and the Director, be moved—

(a) into the licence area; or

(b) from a particular place in the licence area to another place in the licence area;
or

(c) to a place outside the licence area.

(2) An application for approval under the Merchant Shipping Act (Chapter 242) to move a mobile platform shall be lodged directly with the appropriate Authority under that Act.

(3) An application for approval by the Director to move a mobile platform shall, unless the Director allows in exceptional circumstances, be made in writing at least seven days before the proposed move and shall include particulars of—

(a) the dates and times at which the move is proposed to be carried out, and the locations concerned; and

(b) any buoy or underwater obstruction proposed to be left at a location from which the mobile platform is to be moved.

(4) Notwithstanding Subsection (1), a person may, in the case of an emergency, make any change in the location of a mobile platform necessary to protect personnel and property.

(5) The movement of a mobile platform made in accordance with Subsection (4) shall, as soon as practicable after that movement has taken place, be reported to the Director and to the Marine Search and Rescue Division of the Department of Transport, Port Moresby.

(6) Before a mobile platform is moved to another location, details of the move, including the present and new locations, the time of departure from the present location, and the estimated time of arrival and expected duration of stay at the new location, shall be reported to the Director and to the Marine Search and Rescue Division of the Department of Transport, Port Moresby.

(7) When a mobile platform has arrived at a new location the actual time of arrival shall be reported to the Director and to the Marine Search and Rescue Division, Port Moresby.

206. Anchoring Vessels near Pipelines.

A vessel associated with operations in a title area shall not, without approval from the Person-in-Charge of a pipeline, drop anchor within 1 nautical mile of that pipeline in the licence area.

207. Consent to Construct or Install a Fixed Platform.

- (1) A fixed platform, prefabricated parts or sections, for installation in the licence area, shall not be constructed or installed unless the consent of the Director has been obtained in writing.
- (2) Prior notice, acceptable to the Director, shall be given of the commencement of construction and the commencement of installation of the platform.
- (3) Arrangements acceptable to the Director shall be made to enable a Petroleum Inspector to examine the platform at any time during its construction or installation.

208. Application for Consent to Construct or Install a Fixed Platform.

An application for consent to the construction and installation of a fixed platform shall include particulars of—

- (a) the location at which it is intended to construct and install the fixed platform; and
- (b) the reason, including the geological evidence, for the selection of that location; and
- (c) copies of reports and recommendations made by persons responsible for ascertaining the criteria determining the design; and
- (d) design criteria including—
 - (i) the depth of the sea and the nature of the sea-bed and subsoil at the intended location; and
 - (ii) the maximum and minimum air and sea temperatures likely to occur at that location; and
 - (iii) the characteristics of the waves (including heights, periods and directions, and their probable distribution) at that location; and
 - (iv) the relevant water current information; and
 - (v) the maximum wind speeds and the direction of winds and the estimated maximum three second gust speed at that location; and
 - (vi) details of estimated marine growth on the fixed platform; and
 - (vii) the worst combination of dead and live loads likely to be applied to the fixed platform; and
- (e) specifications for the construction and installation of the fixed platform; and
- (f) drawings of the structure and of the equipment installed or to be installed on the structure; and
- (g) the parts or sections constructed or proposed to be constructed before installation in the licence area; and

- (h) standards and codes followed or to be followed in the construction and installation; and
- (i) the fire protection and fire extinguishing equipment installed or to be installed on the platform; and
- (j) the communication equipment; and
- (k) the life saving equipment; and
- (l) plans and specifications for the periodic inspection of the fixed platform
- (m) a certificate of the verification of design given by a verifying body in accordance with Section 210(1) and a copy of the contract for that verification.

209. Consent to use a Fixed Platform.

- (1) A fixed platform shall not be used unless the Director has given consent in writing to the use of the fixed platform.
- (2) An application for consent to the use of a fixed platform shall be made in writing and shall be accompanied by a certificate of verification of construction and installation of the platform, given by a verifying body in accordance with Section 210(2) and a copy of the contract for that verification.
- (3) The structure of an installation on a fixed platform of other than the drilling and production equipment, personnel emergency facilities and accommodation shall not be altered or reconstructed without approval and, where applicable, verification by the verifying body.

210. Certificate of Verification of Design, Construction and Installation of a Fixed Platform.

- (1) A certificate of verification of design of a fixed platform referred to in Section 208(1) is a certificate given by a verifying body certifying that the body is satisfied in relation to the design of the fixed platform that—
 - (a) the basic structural concept and configuration are appropriate for the conditions in which the fixed platform is proposed to be used; and
 - (b) a structural analysis has been made for critical loading with particular attention to the interaction between the structure and the piling; and
 - (c) a fatigue analysis has been made of critical joints; and
 - (d) an assessment of steel grades has been made in relation to stress levels, minimum service temperature and other significant parameters; and
 - (e) from an examination of the plans of the structure and the installations, the primary and secondary structures are suitable for the overall and local loading to be imposed and the design is in accordance with good practice; and
 - (f) the welding procedures used or proposed to be used are satisfactory and the design of the principal welds is satisfactory; and

(g) such other matters, as the Director has required, have been taken into account.

(2) A certificate of verification of construction and installation of a fixed platform referred to in Section 209(2) is a certificate given by the verifying body that verified the design, certifying that the body is satisfied in relation to the construction of the fixed platform and its installation in the licence area, that adequate and satisfactory inspection was carried out during the construction and installation and that all construction and installation was carried out as per the specifications.

211. Inspections of a Fixed Platform.

(1) Where the Director has consented to the use of a fixed platform, an inspection shall be carried out from time to time to ascertain whether the structure of and installations on the platform are being maintained in a safe working condition.

(2) An inspection under Subsection (1) shall be carried out by qualified personnel, in the manner and at the intervals at which the Director approves, and shall be certified on completion.

212. Tests on a Fixed Platform.

Where the Director requires that a test in relation to the structural integrity of a fixed platform be carried out, that test shall be carried out in such a manner as will enable the results to be recorded and certified in an endorsed test document within the meaning of the By-laws of the National Association of Testing Authorities, Australia.

213. Records of Tests on a Fixed Platform.

Records of or relating to an inspection, survey, examination or quality surveillance in relation to a fixed platform shall be forwarded forthwith to the Director.

214. Additional Requirements for a Platform.

(1) A platform to be used or constructed or installed in the licence area shall have—

(a) around the unprotected perimeter of the floor or deck areas of, and openings on, the platform (other than a helideck), safety devices, guards or rails properly designed to prevent personnel from falling from the deck; and

(b) the perimeter of the helideck protected with a device of sufficient strength and size to provide an effective safeguard against a person falling from the helideck; and

(c) suitable access ways to helidecks which will ensure the safety of all embarking and disembarking passengers; and

(d) suitable transfer facilities sufficient to ensure safe movement of persons onto and off boats; and

(e) on any deck where there are survival craft, at least two adequately sized walkways running either the full length or the full width of the deck leading to those craft; and

(f) at least two separate stairways between decks; and

- (g) on any deck, at least two adequately sized walkways running either the full length or the full width of the deck and leading to the stairways referred to in Paragraph (f); and
- (h) stairways which comply with PNGS 1081 Code for Fixed Platform, Walkways, Stairways, and Ladders; and
- (i) an appropriately equipped first aid facility for the care of sick or injured persons unless otherwise approved.

(2) In this section "survival craft" means survival craft complying with Section 221.

215. Helideck.

A helideck on a platform shall be designed, constructed and lighted in accordance with the requirements of the Civil Aviation Act 2000.

216. Warning Lights.

(1) A platform other than—

- (a) a construction platform; or
- (b) a mobile drilling unit that is being moved from one place to another,

shall show white warning lights in accordance with Subsection (2) and red warning lights in accordance with Subsection (3).

(2) White warning lights referred to in Subsection (1) shall—

- (a) be not less than 6m and not more than 30m above mean high water; and
- (b) be of such a number and (subject to this subsection) so placed that from any position in the vicinity of the platform at least one light is visible; and
- (c) have an apparent intensity in the horizontal direction of not less than 1400 candelas and shall be such that they are visible for a distance of not less than 10 nautical miles from all points more than 5m above sea level when the meteorological visibility is not less than 10 nautical miles; and
- (d) be operated in unison to show the letter "U" in Morse Code at intervals of not more than 30 seconds.

(3) A red warning light referred to in Subsection (1) shall—

- (a) be carried in such a position on the highest point of the equipment on the platform as to be visible for not less than 2 nautical miles from all points more than 5m above sea level when the meteorological visibility is not less than 10 nautical miles; and
- (b) unless the extremity of the platform carried a white light in accordance with Subsection (2), be carried on each extremity in such a position as to be visible as required by Paragraph (a); and

- (c) have an apparent intensity in all directions, at and above the horizontal, of not less than 10 candelas.
- (4) Each obstruction (other than a buoy) associated with operations carried on in the licence area shall be marked by a buoy unless otherwise approved.
- (5) There shall be—
 - (a) a flashing yellow light showing the letter "U" in Morse Code at intervals of not more than 30 seconds and visible for a distance of not less than 4 nautical miles from all points more than 5m above sea level when the meteorological visibility is not less than 10 nautical miles; and
 - (b) a radar reflector—on each buoy (other than a mooring buoy or buoy marking a mooring associated with a platform).

217. Sound Signals.

- (1) A platform shall be equipped with a device capable of emitting sound signals which satisfies the requirements of the International Association of Lighthouses Authorities (IALA) for two nautical miles usual range fog signals.
- (2) The device referred to in Subsection (1) shall be operated at all times, when the meteorological visibility is less than 0.5 nautical miles, to sound the letter "U" in Morse Code at intervals of not more than 30 seconds.

218. Emergency Energy Source for Signals.

- (1) The warning lights and sound signals referred to in Sections 216 and 217 on a platform shall have a reserve source of energy—
 - (a) that enables them to be operated for a period of four days in the event of the failure of the main energy supply on the platform; and
 - (b) that automatically comes into operation on the failure of the main energy supply.
- (2) A platform shall be equipped with a device—
 - (a) that indicates whether the lights and signals referred to in Subsection (1) are operating on the main energy supply or the reserve source of energy; and
 - (b) that is readily observable by the site person-in-charge of the platform or, in the case of an unmanned platform, by a person at a shore station.

219. Marking of Platforms.

- (1) A platform shall be marked with a name not less than 600mm high such that it can be readily identified during day and night when approached from any direction.
- (2) A platform helideck shall be marked so that it can be identified from an airborne helicopter.

220. Lifejackets and Lifebuoys.

- (1) A platform shall carry lifejackets:—
 - (a) in number 150% of the number of persons on the platform; and
 - (b) complying with the provisions of Merchant Shipping Act (Chapter 242); and
 - (c) kept in approved places that are readily accessible and prominently indicated; and
 - (d) available for inspection at least once in each year by an approved qualified person.
- (2) A platform shall carry at least 8 lifebuoys of a type complying with the provisions of the Merchant Shipping Act (Chapter 242).

221. Survival Craft.

- (1) In this section and in Section 222, "normal complement" means the number of persons who are normally present on a platform.
- (2) Unless otherwise determined by the Director, a platform other than a construction platform or a service platform shall carry survival craft with an aggregate capacity sufficient to accommodate twice the normal complement.
- (3) The survival craft referred to in Subsection (2) shall include—
 - (a) rigid totally enclosed, motor propelled and fire protected survival craft that will accommodate the normal complement; and
 - (b) other survival craft that will accommodate the normal complement which are capable of floating free and/or breaking free in the event of an emergency.
- (4) Unless otherwise determined by the Director, a construction platform or service platform shall carry survival craft, capable of floating free and breaking free in the event of the platform becoming submerged, that will accommodate twice the normal complement.
- (5) Survival craft shall be constructed and equipped so as to comply with the provisions of the Merchant Shipping Act (Chapter 242).
- (6) Survival craft shall be prominently marked with an identifying name or number.
- (7) Survival craft referred in Subsections (3)(b) and (4) shall be provided on at least two opposite sides of the platform.
- (8) Each person on a platform shall be informed, and prominent notices shall show, which survival craft that person is to occupy in the event of an emergency.
- (9) Survival craft carried on a platform shall be inspected at least once in each year by an approved qualified inspector.

222. Exceeding the Normal Complement.

The normal complement—

- (a) may, in approved circumstances, be exceeded by 25%; and

(b) may be exceeded by more than 25% for a period not exceeding three hours during which there is a rostered shift change and there is a standby vessel, so situated, that if summoned, would arrive at the platform within 15 minutes.

223. Alternative Evacuation Facilities.

Alternative evacuation facilities, other than the fixed stairways, ladders or walkways shall be provided on at least two opposite sides of the platform.

224. Fire Fighting Equipment.

A platform shall be provided with items of fire fighting equipment in such number, of such types and capacity and in such locations to safely and effectively to fight any fire that could occur on the platform.

225. Communication Equipment.

(1) A platform shall be equipped with communication facilities which enable contact to be made at all times with the shore station referred to in Section 51 and with vessels and helicopters in transit between the platform and the shore.

(2) The equipment referred to in Subsection (1) shall include equipment which enables operation of an international distress frequency.

(3) There shall be a communication systems available on a platform to enable communications to a person or persons anywhere on the platform.

(4) All communication equipment referred to in this section shall have a source of energy that enables it to be immediately and continuously operated for a period of four days in the event of the failure of the main electricity supply on the platform.

226. Buoys.

(1) A buoy, including a buoy referred to in Section 216, shall be painted yellow and shall be marked with the name of its owner.

(2) Where a buoy comes adrift from its moorings, steps shall be taken to recover it as soon as possible.

227. Electrical Installations.

(1) The classification of hazardous areas, electrical installations, wiring and fittings on a platform shall comply with PNGS 1022, PNG Wiring Rules or other approved code.

(2) A platform shall not be used for neutral returns from electrical installations.

(3) There shall be installed an earthing system connected to the structure at one or more points, all of which are effectively equipotential by nature of the structure or by bonding, and there shall be connected to the system—

- (a) earth conductors from electrical equipment; and
- (b) the frames of motors and generators; and
- (c) metallic housings of all other electrical apparatus; and

(d) armoring of cables.

(4) The earth resistance or impedance of the earthing system shall be such as will permit the passage of a current from any point in a circuit at which a fault may occur equal to three times the current required to operate the circuit protective device or in the case of insulated neutral system, to operate an alarm device.

(5) Provisions shall be made for the dissipation of static charges in accordance with PNGS 1458 Static Electricity Code or other approved code.

(6) Provision shall be made for lightning protection in accordance with PNGS 1288 Lighting Protection or other approved code.

228. Furniture and Furnishings.

In fixed platform offices and accommodation—

(a) all furniture shall be constructed, as much as possible, of non-combustible and/or fire retardant materials; and

(b) all suspended textile materials, upholstery covers and floor coverings shall have flame retardant qualities; and

(c) all combustible materials in Paragraphs (a) and (b) shall be of material that does not give off toxic fumes upon ignition.

229. Flammable and Toxic Gases.

(1) Any area in which operations could lead to the emission or accumulation of flammable or toxic gases shall be provided with suitable means of ventilation.

(2) A drilling or workover installation shall have approved degassing equipment installed in the mud system.

(3) A drilling, workover or production installation on a platform shall have continuous flammable gas detection equipment installed in any enclosed area containing petroleum handling equipment, open parts of the mud system or internal combustion engines.

(4) An operation where an emission of flammable gases can result in hydrogen sulfide gas concentrations of greater than 20ppm shall not be carried out unless continuous hydrogen sulfide gas detection equipment has been installed and is functioning.

(5) The monitoring devices referred to in Subsection (3) or (4), and the control mechanisms referred to in Subsection (7) shall be so arranged that functional tests of the separate components and of the whole system can be carried out efficiently.

(6) The functional tests referred to in Subsection (5) shall be carried out by a qualified person—

(a) at approved intervals; and

(b) immediately after any event indicating that the system or any part of the system is not operating correctly, and the results of any such test shall be recorded in an approved manner.

(7) The central control for the gas detection system required by Subsection (3) or (4) shall—

- (a) be capable of giving an alarm at a point not higher than 60% of the lower explosive limit; and
- (b) automatically activate shut-in sequences at a point not higher than 70% of the lower explosive limit; and
- (c) in the case of hydrogen sulfide detection, be capable of giving an alarm before the concentration exceeds 20ppm.

(8) An internal combustion engine on a platform, other than an engine operating a fire pump, shall be provided with an emergency shutdown device which is automatically activated when flammable gas is detected in the air intake or, where such an engine is installed in pressurized housings, in the air intake of these housings and which is, where necessary, equipped with remote control equipment that is—

- (a) accessible to the driller on a drilling or workover rig; and
- (b) at some readily accessible point on a production platform.

(9) The exhaust piping of an internal combustion engine located on a platform shall be adequately lagged with approved material to prevent the ignition of any hydrocarbons accidentally coming into contact with the exhaust and shall be fitted with an approved spark arresting device.

(10) At least two approved portable explosimeters shall be provided on a platform.

230. Progress Report of Construction and Installation.

(1) There shall be submitted to the Director not later than the 15th day of each month a report on progress made during the preceding calendar month in the construction and/or installation of facilities in the licence area.

(2) A report referred to in Subsection (1) shall contain all relevant information including progress reports of a verifying body, deviations from approved specifications for design, construction or installation, and proposed alternative courses of action.

PART X.—PIPELINES.

231. Compliance with Codes.

(1) Except where this Regulation otherwise requires, the construction and operation of a pipeline, as defined in the *Oil and Gas Act 1998*, (including design, manufacture, testing, maintenance, repair thereof and alterations and additions thereto) shall be in accordance with the *Oil and Gas Act 1998* and—

- (a) AS 2885; or
- (b) or such other code as the Director may from time to time approve in writing.

(2) Wherever the codes and specifications referred to in Subsection (1) require certified test reports to be submitted, such certification shall be in the form of Australian National Association of Testing Authorities endorsed test certificates.

(3) Before construction is commenced, the licensee shall supply to the Director the names of all testing authorities and other inspection services or contractors to be employed in quality surveillance of materials and fabrication and shall confirm that such testing authorities and inspection services meet the requirements of the Australian National Association of Testing Authorities or such other requirements as the Director may approve.

(4) Where a test is required to be carried out, under this Regulation or the Pipeline Licence issued under the Act, that is not included in a class of test in respect of which an endorsed test document of the kind referred to in this section can be given, the result of the test shall be recorded and certified to the satisfaction of the Director.

(5) Where practical, at least seven days notice shall be given to the Director of any proposed hydrostatic or flow efficiency tests.

(6) All test certificates referred to in this section and all radiographs shall at all times be readily available to a Petroleum Inspector and shall not be destroyed or otherwise disposed of except with the permission in writing of the Director.

(7) Unless otherwise agreed to by the Director, two copies of construction plans, including the location of all power lines and their voltages, oil and/or gas pipelines and their operating pressures, roads, stream and river crossings, engineering drawings, specifications and material lists shall be submitted to the Director before construction commences.

232. Signs.

(1) Signs or markers, in accordance with the standards nominated in Section 231, shall be erected and maintained:—

(a) at each abrupt change of direction of the pipeline; and

(b) at each point where a pipeline crosses the boundary of a road; and

(c) at each side of a river or stream crossing; and

(d) at intervals not exceeding 500m where the pipeline parallels a road, within or immediately adjacent to the road easement; and

(e) at each point at which the pipeline crosses a significant service including, but not limited to, telecommunications and electric power cables, major pipelines, including water pipelines, and sewers and buried storm water drains; and

(f) at intervals not exceeding 2km.

(2) The Director may approve variations to the requirements of Subsection (1).

(3) Where aerial markers are to be installed along a pipeline route, the signs required in Subsection (1) may be incorporated in such markers.

233. Construction and Operational Reporting.

- (1) The licensee shall submit to the Director a written report—
 - (a) on the construction of the pipeline during each six-monthly period ending on the 30 June and the 31 December; and
 - (b) upon completion of construction for each year a yearly ending on the 31 December, on the operation of the pipeline.
- (2) Reports referred to in Subsection (1), shall be submitted within one month of the end of the period to which the report relates.
- (3) A report under Subsection (1) shall give—
 - (a) such information on the construction and operation of the pipeline as the Director may require; and
 - (b) particulars of all persons employed by the licensee or his contractors in the construction or operation of the pipeline.
- (4) During the construction of the pipeline, the site person-in-charge shall submit a progress report to the Director at regular intervals as approved by the Director.

234. Commissioning of Pipeline.

A pipeline shall not commence operation unless the Director has approved pipeline safety, operating, commissioning and emergency procedures and has given his consent to the commencement of operations.

235. Discontinuation of Operations.

Where in the opinion of a Petroleum Inspector a condition which may endanger life or property exists in any section of a pipeline, he may direct in writing that the section be taken out of operation or that such other precautions be taken as are approved by him to ensure safety, and the Person-in-Charge of the section shall forthwith obey the direction.

236. Escape of Substances from Pipelines.

- (1) Where any substance escapes from a pipeline, the Person-in-Charge shall take such steps as are necessary—
 - (a) to safeguard human life; and
 - (b) to minimize the loss of the substance from the pipeline; and
 - (c) to minimize the pollution of the surrounding environment by such substance,and shall, as soon as possible, report the escape to the Director.
- (2) After an escape of any fluid from a pipeline has been stopped and any necessary repairs completed, the Person-in-Charge shall forthwith submit a written report, complete with photographs, to the Director containing information upon—
 - (a) the time and place of the escape; and
 - (b) the approximate quantity of fluid lost; and

- (c) the damage to equipment and/or the environment that resulted from the escape and/or ignition of the fluid; and
- (d) the conditions that caused or contributed to the escape or ignition; and
- (e) the methods adopted to carry out repairs; and
- (f) the circumstances generally relating to the escape, its control and any necessary repairs; and
- (g) steps taken to minimize the chances of such circumstances recurring.

237. Pipeline or Flowline Abandonment.

(1) Abandonment of a buried pipeline or flowline shall meet the following requirements:—

- (a) the line shall be depressured and purged of all produced fluids;
- (b) the line shall be filled with clean fresh water;
- (c) operations shall be performed to prevent the entrapment of fluid pressure within the line whether from hydrostatic head or other causes;
- (d) all risers shall be cut off at the line burial level;
- (e) all open accesses into the line shall be covered with a material that will prevent access to the line internals.

(2) Abandonment of a surface pipeline or flowline shall meet the following requirements:—

- (a) the line shall be depressured and purged of all produced fluids using fresh water;
- (b) the line and associated equipment shall be deconstructed, removed and disposed of in a safe manner as approved by the Director;
- (c) the right of way shall be cleaned of debris and returned to as close to original condition as possible.

(3) Abandonment of an offshore pipeline or flowline shall meet the following requirements:—

- (a) an offshore line may be abandoned in place if, in the opinion of the Director and the governing marine body of Papua New Guinea, the line will not present a hazard to marine navigation, fishing and other marine uses;
- (b) the line shall be depressured, flushed and filled with sea water;
- (c) any riser cut off at the sea floor and the ends of the line shall be properly plugged;
- (d) where a line comes to shore, the line will be cut off at a distance from the shore or at a depth below sea level as directed by the Director.

PART XI.—REPORTING REQUIREMENTS.

238. Submission of Data.

Completion reports, in a style and format as approved by the Director, as required by Section 95 shall include—

- (a) for seismic surveys—
 - (i) operations report; and
 - (ii) interpretation report; and
 - (iii) processing report; and
 - (iv) surveyor's report; and
 - (v) shot-point location maps on stable-base transparencies and in digital UKOOA format; and
 - (vi) processed seismic record sections on stable-base transparencies or digitally in SEG Y format; and
 - (vii) seismic horizon structural contour maps (paper prints); and
 - (viii) elevation maps (paper prints); and
 - (ix) weathering maps or profiles on paper prints and digital ASCII format; and
 - (x) refraction records or record sections with shot-to-geophone distance shown on paper prints and in digital format; and
 - (xi) velocity analysis data on paper prints or digital ASCII format; and
 - (xii) experimental data (e.g. filter/noise analyses) (paper prints); and
 - (xiii) any other data relevant to the evaluation or interpretation of the survey; and
 - (xiv) magnetic data tapes in any acceptable format of—
 - (A) location data in AMG plus latitudes and longitudes; and
 - (B) basic field data; and
 - (C) final data; and
- (b) for gravimetric surveys—
 - (i) operations report; and
 - (ii) interpretation report; and
 - (iii) processing report; and
 - (iv) gravity profiles on paper prints and digital ASCII format; and

- (v) bouguer anomaly maps with calculation methods explained; and
 - (vi) station location and line maps on stable-base transparencies or in digital ASCII format; and
 - (vii) elevation data (paper prints); and
 - (viii) meter calibration, drift and lis; and
 - (ix) of base station values, and locations with detailed descriptions; and
 - (x) surveying records as required for corrections to observations; and
 - (xi) tables of principal facts including station number, station coordinates, elevation and observed gravity plus copies of actual field data books; and
 - (xii) for digitally recorded data, magnetic data tapes in ASEG-GDP format or ER-Mapper format; and
- (c) for an airborne geophysical survey—
- (i) operations report, including calibrations, test flight data; and
 - (i) flight log copies; and
 - (ii) navigation, recovery and processing report; and
 - (iii) analogue records of magnetics or other parameters, terrain clearance, position, diurnal/storm monitor; and
 - (iv) flight path plots; and
 - (v) stacked profiles; and
 - (vi) contour maps of TMI or other parameters; and
 - (vii) contour maps of depth-to-magnetic basement or of other parameters; and
 - (viii) magnetic data tapes in ASEG-GDF or ER-Mapper format of—
 - (A) grid data; and
 - (B) located data; and
 - (C) any other data relevant to the evaluation or interpretation of the survey.

239. Daily Report.

The daily report as required under Section 112, shall include—

- (a) the well name and number; and
- (b) the report number and, if drilling, days from the spud date; and
- (c) the depth of the well, current operation progress for the previous 24 hour period, bottom hole assembly and bit performance details; and

- (d) the contractor carrying out operations; and
- (e) details of any casing string run including size, weight, grade, type of coupling and accessories; and
- (f) details of any cementing operations including quantity, additives, slurry density, anticipated top of cement and waiting on cement time; and
- (g) blowout preventer tests, closures and reasons for closure, BOP drills and response times; and
- (h) core recovery, core and cuttings description together with a statement of evidence of gaseous and liquid hydrocarbons in cores and cuttings; and
- (i) results of deviation surveys; and
- (j) mud properties, rates of penetration and loss of circulation; and
- (k) details of formation or other tests carried out including production at the surface, drill pipe recovery, recorded pressures (field readings), bottom hole temperatures, flow and shut-in periods, surface choke size, API gravity of liquid hydrocarbons recovered and resistivity of water recovered; and
- (l) evidence of high formation pressures encountered; and
- (m) details of shooting, fracturing, acidizing, or other stimulation treatment; and
- (n) details of plugging operations; and
- (o) details of well logs run; and
- (p) details of fishing or repair operations; and
- (q) details of completion fluids, the depth of all perforations and the type of guns used; and
- (r) details of well completion including well head, packers, tubing string and any artificial lift equipment installed; and
- (s) details of liquid evaluation tests, multi-point and single point back pressure tests, subsurface pressure surveys, flow potential tests, separator tests and pre- and post-stimulation tests; and
- (t) details of all formation integrity tests.

240. Well Completion Report.

The well completion report required under Section 114 shall include—

- (a) the well name and number; and
- (b) surveyed location in accordance with Section 106 and location relative to the nearest shot line and shot point; and
- (c) surveyed elevation of ground level and kelly bushing; and

- (d) the operating company, the interest holders and comprehensive details of the drilling rig used; and
- (e) the spud date, date of completion of drilling and date of rig release, with driller's and logger's total depths; and
- (f) a description of the stratigraphic units penetrated; and
- (g) a composite well log containing bit record, penetration rate, casing record, formation tops giving name and age, sonic and gamma ray logs, core intervals, sidewall cores with age, hydrocarbon shows, test intervals and results, log analyses intervals and results and a film or other transparent copy of each plan or composite log that is larger than A3 paper size submitted under this section shall also be supplied; and
- (h) core and sidewall sample descriptions; and
- (i) petrologic reports; and
- (j) palaeontological and palynological reports; and
- (k) fluid analyses (hydrocarbons and water); and
- (l) core analyses; and
- (m) formation test reports, charts and interpretation; and
- (n) log interpretation; and
- (o) full details of hole size, deviation surveys, casing string and cementing summaries; and
- (p) details of the well completion where applicable, including well head, valves and choke assemblies, flow recorders, tubing string(s) and all down hole items and any down hole and surface artificial lift equipment; and
- (q) details of the abandonment procedure where applicable; and
- (r) maps of the structure horizons used to locate the well with post-drill intersections; and
- (s) well velocity survey details where carried out; and
- (t) a summary sheet giving brief details of the drilling, any problems encountered, coring, testing, casing, cementing and geological interpretations of the well; and
- (u) details of any drillstem tests or production tests performed complete with preliminary interpretation of the test; and
- (v) complete directional drilling data in tabular format including a final trajectory plot; and
- (w) bit record in IADC format; and
- (x) drilling fluid summary report for each hole section; and

- (y) final wellbore schematic; and
- (z) final wellhead schematic; and
- (aa) perforating summaries; and
- (ab) well stimulation summaries; and
- (ac) cased hole logging summaries.

241. Addresses to which Reports to be Sent.

- (1) Reports required under this Regulation shall be addressed to the following address—

The Director of Petroleum
Department of Petroleum & Energy
PO Box 1993
PORT MORESBY
PAPUA NEW GUINEA.
Telephone: 322-4200
Fax: 322-4222

- (2) If reports are sent by courier, the report shall be addressed to the following address—

The Director of Petroleum,
Department of Petroleum & Energy
Elanese Street,
Newtown,
PORT MORESBY
PAPUA NEW GUINEA.

- (3) Cores and cuttings shall be sent to the address as listed in Subsection (2).

PART XII.—PENALTIES.

242. Offences.

- (1) A person who fails to comply with a Direction given under this Regulation or who contravenes a provision of this Regulation is guilty of an offence.

- (2) Where a person—

- (a) is performing the functions of a Licensee, whether as an employee or agent of or contractor to the Licensee, or as an employee or agent or subcontractor of a contractor to the Licensee, or otherwise; and
- (b) in carrying out those functions commits an offence under this Regulation,

the licensee is guilty of an offence.

243. Penalties.

A person who commits an offence against this Regulation, for which a penalty is not otherwise provided for that offence, is liable—

(a) where he is the licensee, Person-in-Charge, deputy Person-in-Charge or other person giving directions relating to the carrying on of any petroleum prospecting development or production operations in a licence area—to a penalty of a fine not exceeding K5,000.00 and where the offence is a continuing one, to a default penalty of a fine not exceeding K500.00 per day for each and every day during which the offence continues; and

(b) where he is a person other than a person described in Paragraph (a)—to a penalty of a fine not exceeding K500.00 and where the offence is a continuing one, to a default penalty of a fine not exceeding K100.00 per day for each and every day during which the offence continues.

244. Defence of Impracticability.

It is a defence to a charge of a contravention of, or non-compliance with, any provision of this Regulation or a special instruction for the time being applicable under this Regulation that observance of or compliance with such Regulation or special instruction as the case may be was not reasonably practicable in the circumstances.

245. Defence of having taken responsible steps to comply.

It is a defence to a charge of a contravention of, or non-compliance with, any provision of this Regulation or a special instruction for the time being applicable under this Regulation if the person charged proves that he took all reasonable steps to comply with the requirements of the Regulation or special instruction.

MADE thisday of 2016.

SIR MICHAEL OGIO

GOVERNOR-GENERAL.