PRESIDENT OF THE REPUBLIC

Presidential Decree 91/18,
of 10 April 2018

Among other principles relating to the economic and social policy for the Sector, Law 10/04, of 12 November 2004, lays down the principle of safeguarding and protecting the environment;

Whereas the activity of abandoning wells and oil and gas facilities, both onshore and offshore, requires adjustments in procedures in the Sector and also the adoption of the measures needed to ensure compatibility with activities relating to other natural resources extracted in the relevant areas;

Whereas it is imperative to establish rigorous, flexible and objective rules and procedures which ensure that wells and oil and gas facilities are abandoned without economic and social constraints and in keeping with the fundamental principles and rules laid down in the said Law, in order to protect the environment and other values;

The President of the Republic hereby decrees the following, under the combined provisions of Articles 120(l) and 125.3 of the Constitution of the Republic of Angola:

CHAPTER I
General Provisions

Article 1
(Subject Matter)

This Statute establishes the rules and procedures for the activities of abandoning wells and decommissioning oil and gas facilities in national territory.

Article 2
(Scope)

1. This Statute applies to the abandonment of wells and decommissioning of facilities used in onshore and offshore petroleum operations, under the terms of Law 10/04, of 12 November 2004, the Petroleum Activities Law.

2. This Statute does not apply to the decommissioning of facilities used for the refining of crude oil or the transportation, logistics, distribution and marketing of petroleum by-products.

Article 3
(Definitions)

1. For the purposes of this Statute, and save as otherwise expressly established in the Petroleum Activities Law, the words and expressions used herein shall have the same meanings, with the definitions in the singular also applying in the plural, and *vice versa*:

   (a) "Abandonment Campaign": programmed activity for abandonment of well or decommissioning of facilities;

   (b) "Abandonment of Well": plugging for the purpose of ceasing well activities;

   (c) "Abandonment Plan": the document containing the description of the methodology for abandoning wells and decommissioning petroleum facilities, including the costs associated with carrying out these activities;

   (d) "Casing": piping installed in the wells, whose purpose is to insulate fluid-impregnated permeable intervals;

   (e) "Decommissioning of Facilities": set of activities comprising the suspension of the operations, the definitive decommissioning and the removal of facilities, with their being allocated to an appropriate final purpose, and the environmental restoration of the areas where said facilities are located;

   (f) "Definitive Abandonment": permanent plugging for the purpose of ceasing well activities, due to mechanical or geological problems or in accordance with the work program (end of the well lifecycle, excessive production of gas, economic limit or termination of production);

   (g) "Drill Cuttings": pieces of subterranean rock formations resulting from drilling operations;

   (h) "Entities under Contract": national or foreign legal person which, in the capacity as investor, enters into an agreement with the National Concessionaire in any of the forms provided for in Article 14.3 of Law 10/04, of 12 November 2004;

   (i) "Environment": the various physical, chemical and biological systems and how they relate to each other and the economic, social and cultural factors, with a direct or indirect effect, immediate or delayed, on living beings and the quality of life of human beings;

   (j) "Environmental Impact": any change to the environment, especially with effects on the air, land, water, biodiversity and on the health of people and animals, resulting from the petroleum activities;

   (k) "Escrow Account": the account used to secure financial obligations, subject to specific rules which must be fully honored by the parties;

(l) “Facilities”: any structures or equipment installed for the carrying-out of petroleum operations;

(m) “Final Budget”: estimated amount upon updates, which shall be sufficient to cover all expenses relating to the schedule of activities of the definitive abandonment plan;

(n) “Lines”: pipelines for the transportation of liquid and gaseous fluids;

(o) “NORM”: naturally-occurring radioactive material;

(p) “Operator”: the entity which carries out petroleum operations in a given petroleum concession;

(q) “Organizations Involved”: all entities directly taking part in the process of approving the abandonment and decommissioning plan, and in processing and storing waste;

(r) “Petroleum”: crude oil, natural gas and any other hydrocarbon substances which may be found and extracted or otherwise obtained and saved from the area of a petroleum concession;

(s) “Plugging”: the operation of installing cement and mechanical barriers in wells, in order to isolate permeable intervals which contain fluids under pressure;

(t) “Pollution”: the dissemination in the environment of solid materials, fluids and gases, as well as the emission of noise, in such a way and in such quantities as negatively affect the environment, resulting from the petroleum activities;

(u) “Reserves”: quantities of petroleum deducted from known accumulations and estimated in advance as being recoverable as from a given date, applied in development projects under specific technical and economic conditions;

(v) “Risk Analysis”: evaluation of potential hazards and determination of a quantitative or qualitative estimate of risk related to a defined situation and a recognized threat;

(w) “ROV”: remotely operated vehicle;

(x) “Service Providers”: any entity engaged in the supply of goods and services for the petroleum activities which is not comprised in the Entities under Contract;

(y) “Surface Structures”: all production modules installed onshore or above the sea level, including FPSOs, FSOs and exportation buoys;

(z) "Temporary Abandonment": temporary plugging for the purpose of ceasing well activities, due to mechanical or geological problems or in accordance with the work program (fulfilment of the obligations in the exploration[1] period, reservoir studies and definition of the concept of development), taking into account the possibility of future development activities;

(aa) "Topside": the upper part of the offshore facility, which includes the staff accommodation, the production processing units, the anchoring and stability systems, and the power generation and gas compressing modules;

(bb) "Underwater Structures": all submerged equipment laid on the seabed, such as lines, manifolds, Christmas trees, production separators and other equipment.

2. The terms not defined in these Regulations shall be adapted to the national legislation in force and the internationally recognized standards on the matter.

Article 4
(General principles)

In addition to the other principles enshrined in the Angolan Constitution and in Law 10/04, of 12 November 2004, the Petroleum Activities Law, this Statute is based on the following fundamental principles:

(a) To ensure that petroleum operations are discontinued in accordance with the rules and procedures established in law, so as to ensure the integrity of abandoned wells and decommissioned facilities with a view to protecting the environment, taking future generations into account;

(b) Restoration of the environment and landscape, in order to re-establish the characteristics existing prior to the carrying-out of petroleum operations in a given area;

(c) To ensure the safety of the local community for navigation, fishing, circulation and other purposes, in the areas previously subject to petroleum operations;

(d) To secure and hold the Entities under Contract liable for funding of the amount necessary for the activities of abandoning wells and decommissioning oil and gas facilities in accordance with this Statute;

(e) To encourage the development and use of new technologies for well abandonment and decommissioning of petroleum facilities in Angola, taking account of environmental conservation, cost reduction and compliance with rules and practices accepted in the Petroleum Industry;

[1] Translators' Note: in the Portuguese gazetted version, a reference is made here to "*exploração*" (i.e. exploitation). However, it seems clear that intended reference was in fact to "exploration", which in Portuguese would translate by "*pesquisa*" – just as happens in Section 3.1.2 of Annex I to this Presidential Decree, where the definition of Temporary Abandonment is reproduced.

(f) To ensure the removal, reuse, recycling and appropriate deposit of materials and equipment resulting from the decommissioning of facilities;

(g) To ensure the correct handling, processing, transportation and final deposition of all waste produced, including NORM and drill cuttings.

CHAPTER II
Abandonment Plan

Article 5
(Provisional abandonment plan)

1. The Entities under Contract shall submit to the National Concessionaire a provisional abandonment plan, including the environmental impact study.

2. The provisional abandonment plan shall contain a forecast of the funds needed for its implementation, including a detailed cost breakdown for well abandonment and decommissioning of facilities, as per Annex 3 to this Statute which forms an integral part hereof, adjusted for the particular features of each abandonment project.

3. The provisional abandonment plan shall be prepared in accordance with the standard form described in Annex 2 to this Statute which forms an integral part hereof.

4. For the new development areas, the provisional abandonment plan shall be deemed approved with the approval of the general development and production plan.

Article 6
(Review and updating of provisional abandonment plan)

1. For producing fields and future concessions, the provisional abandonment plan shall be reviewed and updated every three (3) years and submitted to the National Concessionaire ninety (90) days prior to the start of the subsequent calendar year.

2. If there are matters falling within the scope of responsibilities of other government organizations, the National Concessionaire shall submit the provisional abandonment plan to the Supervising Body, for it to be reviewed together with the other State organizations.

3. The provisional abandonment plan updates submitted to the National Concessionaire shall be per Annex 2 and include the cost estimate according to Annex 3.

4. In the event of any change in the project which has a significant impact on technical, financial or strategic aspects, the plan shall be reviewed and updated on an extraordinary basis outside of the intervals defined, always on the basis of the economic limit or termination of production.

5. The National Concessionaire shall review the provisional abandonment plan within one hundred and fifty (150) days of the initial submission date by the Entities under Contract.

6. In case the National Concessionaire recommends revisions to the provisional abandonment plan, the Entities under Contract shall submit the revised plan to the National Concessionaire within a maximum period of forty five (45) days.

7. Upon the revised provisional abandonment plan being received, the National Concessionaire shall approve it within ninety (90) days.

8. Pursuant to paragraph 5 above, in case the National Concessionaire does not reply within the time period set, the provisional abandonment plan shall be deemed as approved.

9. For the purposes of the preceding paragraphs, the National Concessionaire and the Operator shall release the necessary funds to complete the approved decommissioning and abandonment of facilities from the Escrow Account as required per Annex 5 to this Statute which forms an integral part hereof.

Article 7
(Definitive abandonment plan)

1. The definitive abandonment plan shall be the result of the successive revisions and updates of the provisional abandonment plan throughout the lifecycle of the project.

2. Up to twenty four (24) months before the economic limit or termination of production, the Entities under Contract shall submit the definitive abandonment plan to the National Concessionaire.

3. Pursuant to the preceding paragraph, the National Concessionaire and its associates, the Supervising Body, as well as other Organizations involved shall carry out the following activities:

   (a) Agree upon and finalize the terms of the definitive abandonment plan between the National Concessionaire and its associates, in the first four (4) months;

   (b) Engage and establish contacts between the National Concessionaire and the Organizations Involved, in the subsequent eight (8) months;

   (c) The National Concessionaire and its associates shall submit the definitive abandonment plan to the Supervising Body, for final approval, in the subsequent twelve (12) months;

(d) As soon as the definitive abandonment plan is submitted to the Supervising Body for approval, the time period for its approval shall comply with Article 27 of Decree 1/09, of 27 January 2009, on Petroleum Operations.

4. The definitive abandonment plan shall be prepared in accordance with the standard form (Annex 2), and shall comprise, *inter alia*, the description of the following elements:

(a) Other aspects relevant for the selection of the abandonment option;

(b) Results of the specific studies on fauna, hydrocarbons and heavy metals resulting from the operational activities, as per the comparative studies and/or any other studies which may be determined by the Government Organizations Involved pursuant to the applicable law;

(c) Equipment for emergency interventions, in the event of incidents or accidents.

5. The definitive abandonment plan shall be submitted as provided in Figure 2.1 of Annex 1 to this Statute which forms an integral part hereof, and shall be the result of the successive revisions and updates of the provisional abandonment plan throughout the concession period.

CHAPTER III
Abandonment of Wells

Article 8
(Abandonment of wells)

1. The abandonment of wells shall be carried out as per Annex 1.

2. The abandonment of wells either during the exploration or production phase must be definitive.

3. Pursuant to the preceding paragraph, and provided this is duly reasoned by the Entities under Contract, temporary abandonments may be authorized for the conversion into production or injection wells, or for any other reasons.

4. The abandonment of a well must ensure that the geological formations are isolated by means of cement plugs or suitable alternatives, to avoid leakage and migration of fluids.

5. The removal of equipment from wells shall be preceded by surveys to assess the technical conditions.

6. The abandonment of wells shall vary depending on the architecture and trajectory of the well and the characteristics of the reservoirs.

7. A risk analysis shall be performed for all wells which have to be abandoned definitively as a consequence of radioactive sources which may have been left in the well.

8. The Entities under Contract shall be responsible for ensuring all aspects to prevent incidents or accidents, during or after the temporary or definitive abandonment.

9. In case an incident or accident occurs during or after the temporary or definitive abandonment, and it is determined that this was due to the negligence or willful misconduct of the Entities under Contract, the liabilities and related costs to restore the definitive abandonment of the wells shall be attributed to the Entities under Contract.

10. In the event of replacement of the Entities under Contract, the new Entity under Contract shall be responsible for the abandonment pursuant to the preceding paragraphs.

CHAPTER IV
Decommissioning of Facilities

Article 9
(Decommissioning of Facilities)

1. The decommissioning of oil and gas facilities and wells may be total or partial. The determining factors of the decommissioning option are described in Annex 1.

2. Pursuant to Annex 1 and provided this is duly reasoned by the Entities under Contract and approved by the Supervising Body, the facilities may be the subject of partial and/or early decommissioning.

3. When the Entities under Contract present the decommissioning option to the National Concessionaire, this option shall take into account the following determining factors:

   (a) Available technology;

   (b) Risk assessment;

   (c) Environmental impact study;

   (d) Inspections and audits;

   (e) Strategic issues.

4. In the abandonment plan, the Entities under Contract shall address the schedule of activities and costs of collection, cleaning, appropriate treatment of the equipment, transportation and placing of the structures at sites, within national territory, to be designated by the National Concessionaire, during the revision and update of the provisional abandonment plan.

5. The Entities under Contract shall be responsible for ensuring all aspects to prevent incidents or accidents, during or after the decommissioning of facilities.

6. The creation of artificial reefs on the seabed shall be subject to the approval of the Government Organizations Involved.

7. At the request of the Entities under Contract, the National Concessionaire shall submit the request for approval to the Supervising Body, which shall ensure that said approval is obtained.

8. In the event of replacement of the Entities under Contract, the new entity shall be responsible for the decommissioning of facilities pursuant to the preceding paragraphs.

CHAPTER V
Handover of Facilities and Wells

Article 10
(Handover of Facilities and Wells)

1. No later than eighteen (18) months prior to the termination date of the Development Area, the handover procedure shall be agreed upon between the Operator and the National Concessionaire, and said procedure shall include the inspection and audit activities.

2. The Entities under Contract shall handover the facilities and wells in a good state of repair, pursuant to the provisions of the agreements with the National Concessionaire.

3. Upon the handover being completed, the National Concessionaire shall within thirty (30) days issue the certificate of release of liability in the form of Annex 4 to this Statute which forms an integral part hereof.

Article 11
(Naturally-occurring Radioactive Material – NORM)

1. The injection of NORM in national territory is prohibited.

2. All and any handling of NORM shall be in accordance with the applicable legislation.

Article 12
(Environmental and social impact study)

The Entities under Contract shall take into account the technical requirements for assessment of the environment impact detailed in Annex 1 to this Statute which forms an integral part hereof, in accordance with Article 27.1(c) of Decree 1/09, of 27 January 2009, on Petroleum Operations, and all other applicable legislation.

CHAPTER VI
Inspection and Auditing

Article 13
(General inspection and audit)

1. Prior to carrying out the activities for the abandonment of wells and decommissioning of facilities provided for in the abandonment plan, the Supervising Body and the other government organizations involved may conduct inspection visits or request a specialized entity to carry out on their behalf an audit to the facilities.

2. During the activities for the abandonment of wells and decommissioning of facilities provided for in the abandonment plan, the Supervising Body and the other organizations involved shall conduct inspection visits or request specialized entities to monitor on their behalf the carrying-out of the activities.

3. After the end of the activities for the abandonment of wells and decommissioning of facilities, the Supervising Body and the other government organizations involved shall carry out an inspection to certify that said activities have been carried out in accordance with the approved plan.

4. Pursuant to the preceding paragraph, said entities may also request a specialized entity to carry out the inspection on their behalf.

5. After the end of the activities for the abandonment of wells and decommissioning of facilities, the Entities under Contract shall monitor the area to be restored, and this shall be made in accordance with Annex 1.

6. Upon completion of this monitoring, the National Concessionaire and the Entities under Contract shall submit to the Supervising Body a report on the monitoring of the Area.

7. After the monitoring period, the National Concessionaire and the Supervising Body shall confirm satisfactory completion of the abandonment plan and certify that all government organizations involved have reviewed and approved the completion of the abandonment plan.

8. The Supervising Body shall issue a certificate of completion of the works and the National Concessionaire shall issue a certificate of release of liability in the form of Annex 4. Both certificates shall be issued within a maximum period of sixty (60) days.

9. Pursuant to the preceding paragraph, on an exceptional basis and whenever this is duly justified, the parties concerned reserve the right to extend the completion works and the respective issuance of the certificate of completion of the works to the Entities under Contract, for a period not exceeding sixty (60) days, after the end of the monitoring period.

CHAPTER VII
Setting Aside of Funds, Methodology and Costs Estimate

Article 14
(Abandonment funds)

1. The Entities under Contract shall set aside the funds needed to carry out the activities for the abandonment of wells and decommissioning of facilities, based on the costs estimate relating to the schedule of activities comprised in the updated abandonment plan, approved by the National Concessionaire.

2. The funds set aside, in accordance with the relevant agreements, shall be deposited by the Entities under Contract in an escrow account as detailed in Annex 5 to this Statute which forms an integral part hereof.

3. The total of the abandonment fund for each Development Area or Concession Area shall be set aside by the Entities under Contract up to the economic limit or termination of production.

4. In the event of replacement of the Entities under Contract before expiry of the agreement with the National Concessionaire, the new Entities under Contract shall be responsible for funding the abandonment costs, in accordance with the terms applicable under the relevant agreements with the National Concessionaire.

5. Should the funds set aside be insufficient for the abandonment activities, the Entities under Contract shall provide the funds needed to carry out the abandonment works, in keeping with their participating interests, provided these are recoverable, and the National Concessionaire shall be released from any liability with respect to the funding needed.

6. Pursuant to the preceding paragraph, if the costs may not be recovered, the National Concessionaire and the Entities under Contract shall agree on the methodology for recovery or deduction of said costs, as provided for in the agreement entered into with the National Concessionaire.

7. Should the funds set aside be surplus, any balance remaining in the Escrow Account, plus any funds deposited pursuant to Article 17 of this Statute, shall be made available to the National Concessionaire, upon deduction of all statutory tax charges.

8. The setting aside of abandonment funds under the agreements with the National Concessionaire existing as at the effective date of this Statute shall be made pursuant to the terms of said agreements.

9. The setting aside of abandonment funds for new Development Areas or new Concession Areas in existing concessions shall begin in the time period between

commencement of commercial production up to 50% of the declared recoverable reserves, pursuant to such terms as shall be agreed upon between the National Concessionaire and the Entities under Contract.

10. Pursuant to the preceding paragraph, in case the National Concessionaire and the Entities under Contract do not reach an agreement as to the reserves for determining the beginning of the setting aside of abandonment funds, the methodology to be followed shall be the certification of the reserves by an independent entity chosen by the National Concessionaire within the time period for approval of the Provisional Abandonment Plan.

11. With respect to the agreements with the National Concessionaire entered into after the effective date of this Statute, the setting aside of abandonment funds shall begin at the commencement of commercial production.

12. Should the National Concessionaire and the Entities under Contract decide to invest the funds set aside, any interest, capital gains or return on said investment shall be accounted for as part of the abandonment fund and be deposited in the applicable Escrow Account.

13. The escrow agent must at all times meet the minimum credit rating requirement as defined in Annex 5.

14. In addition, any escrow funds investment must meet the minimum requirements of the investment principles as detailed in Annex 5.

15. In the event of replacement of any Entity under Contract before expiry of the agreement with the National Concessionaire, the new entity shall be responsible for its share of the funding of the abandonment costs, in accordance with the terms applicable under the relevant agreements with the National Concessionaire.

Article 15

(Abandonment funds in accounts other than escrow accounts)

1. Any abandonment funds already deposited by the Operators in an account other than an Escrow Account, before the date of publication of this Statute, shall be transferred by the National Concessionaire to an Escrow Account.

2. Said Escrow Account shall be set up by the Operator and the National Concessionaire pursuant to Annex 5 to this Statute. For this purpose, the funds shall be transferred within ninety (90) days of the Escrow Account being opened.

3. The abandonment funds already deposited in bank accounts in Angola other than Escrow Accounts shall be transferred to Escrow Accounts set up in Angola.

CHAPTER VI
Final Provisions

Article 16
(Applicability)

This Statute shall apply to all petroleum concessions, as from the fiscal year following its entry into force.

Article 17
(Repeal)

Any legislation inconsistent with the provisions of this Statute is hereby repealed.

Article 18
(Questions and omissions)

Any questions or omissions arising in the interpretation and application of this Statute shall be resolved by the President of the Republic.

Article 19
(Entry into force)

This Statute takes effect on the date of publication.

Reviewed by the Council of Ministers, in Luanda, on 28 February 2018.

Be it published.

Luanda, 26 March 2018.

The President of the Republic, JOÃO MANUEL GONÇALVES LOURENÇO.

ANNEX 1
Technical Specifications

Version Control	
Revision	Description
0.0	
0.1	
0.2	
0.3	
0.4	

Revision History

Responsibility			
Revision	Prepared by: Name	Checked by: Name	Approved by: Name
0.0			
	Date:	Date:	Date:
0.1			
	Date:	Date:	Date:
0.2			
	Date:	Date:	Date:
0.3			
	Date:	Date:	Date:
0.4			
	Date:	Date:	Date:

1. Introduction

The Oil and Gas industry has made efforts to abandon wells and dismantle facilities with special attention to the environmental issues and cost forecast involved.

An issue that has been dominant is the necessary funding for the deactivation and abandonment of facilities and wells for the production of oil and gas, so that at the end of their useful life the expenses of this nature are not attributed to entities other than the Entities under Contract.

The purpose of this document is to establish guidelines to enable the proper conduct of decommissioning facilities and abandonment of petroleum wells on onshore and offshore in the Republic of Angola.

Due to the lack of standards and procedures for the abandonment of wells and the deactivation of petroleum facilities, operators proceed according to the policies of their companies and/or countries.

To standardize these activities in Angola, operators need a planning guide with requirements for deactivation and abandonment operations focused on the specificities of the industry in the Country.

2. Plan and Objective

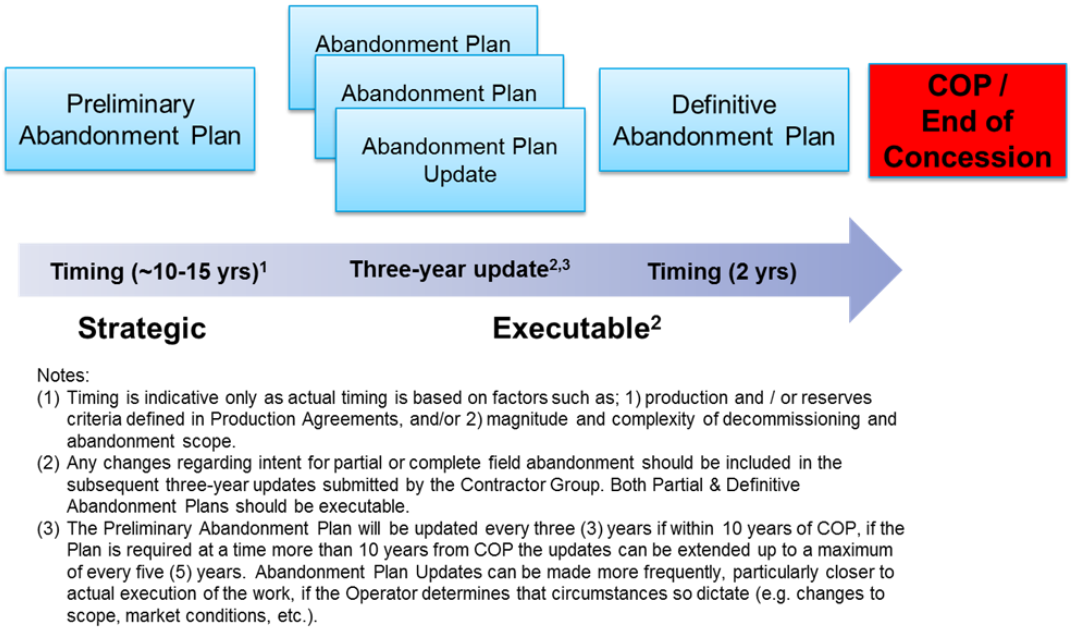
A well-considered plan of decommissioning of oil- and gas-producing facilities and abandonment of wells is the tool which is most essential and must be developed at the commencement of the abandonment project, ensuring that the targets and objectives to be achieved to ensure safe and economic disposal for these onshore/offshore production facilities are clearly defined. Planning permits the drawing up of abandonment projects with the following aims:

- Guiding the Operators on the standards and procedures to be observed during the activity of Abandonment of a petroleum project;
- Definition of the strategy, policy, philosophy, targets, and objectives for the abandonment program;
- Identify applicable legislation;
- Identification of the potential environmental, risk, safety and other matters which must be resolved;
- Identification of the cost factors;
- Communication to / discussion with the Ministerial Departments involved of the potential alternatives under review and the potential consequences;
- Communication to the company management of the magnitude of the potential problems which must be overcome;
- The purpose of this document is to guide Operators on the standards and procedures to be followed when abandoning a petroleum project.

The Entities under Contract are required to submit a provisional abandonment plan based on production and/or reserves criteria as defined in Production Agreements. The provisional abandonment plan is matured over time and becomes the Definitive Abandonment Plan, which is a comprehensive document that can be used to execute the work. Both partial and definitive abandonment plans are comprehensive documents that can be used to execute the work.

The typical content for these documents is summarized in Annex 2.

Figure 2-1: Development of the Abandonment Plan



Notes:
(1) Timing is indicative only as actual timing is based on factors such as; 1) production and / or reserves criteria defined in Production Agreements, and/or 2) magnitude and complexity of decommissioning and abandonment scope.
(2) Any changes regarding intent for partial or complete field abandonment should be included in the subsequent three-year updates submitted by the Contractor Group. Both Partial & Definitive Abandonment Plans should be executable.
(3) The Preliminary Abandonment Plan will be updated every three (3) years if within 10 years of COP, if the Plan is required at a time more than 10 years from COP the updates can be extended up to a maximum of every five (5) years. Abandonment Plan Updates can be made more frequently, particularly closer to actual execution of the work, if the Operator determines that circumstances so dictate (e.g. changes to scope, market conditions, etc.).

3. General Principles of Decommissioning of Producing Facilities and Abandonment of Wells

The decommissioning of petroleum facilities generally follows the completion of the operations of oil and gas production; a set of activities having the objective of permanent well abandonment, and removing and transporting inoperable producing facilities, used during production operations, to another location or maintaining them in-place. A situation may arise where a specific field or specific equipment within a field has safety and/or environmental issues or is no longer economic for the Entities under Contract to operate, which requires abandonment work while the petroleum operations continue in other wells or fields within the Development Area.

3.1 Well Abandonment

Abandonment activity consists of isolating the appropriate geological formations by means of barriers to ensure the integrity of the well, preventing leakage of liquid or gas.

Removal of the structure of the wells (casings, completion, well heads) should be treated in accordance with the environmental regulations in force. The objective of permanent well abandonment is to prevent escape of hydrocarbons to the environment and contamination of potable water. Well abandonment is concerned with the isolation of rock formations that have flow potential and is achieved by restoring suitable cap rock via placement of P&A (Plugging and Abandonment) barriers. P&A barriers must be set adjacent to suitable cap rock and establish full lateral coverage (rock to rock) across the well bore. The P&A barrier must be at a depth with fracture gradient that exceeds the highest anticipated future pressure from the intervals being abandoned. The material, number, position, length and placement of P&A barriers, and appropriate

technology (e.g., rig or tool selection) should be based on assessment of well condition, formation fluids, pressures, formation strength, potential flow rates, sustainability of potential flow and environmental impact. P&A barriers (wellbore and annulus) must be verified (for example pressure tested, tagged, logged or otherwise, as appropriate for the specific barrier element in question).

Well abandonment is not strictly linked to the end of working life or to the economic limit of the field, and this may be undertaken in the initial phase of exploration or development. Well abandonment may be temporary or definitive.

3.1.1 Definitive Abandonment

This consists in permanent plugging for the cessation of activities in the well arising as a function of the work program or from mechanical or geological problems (end of working life of the well, excessive gas production, economic limit, end of the concession license).

Figure 3-1: P&A Barrier Principles

Cased Hole Reservoir Barrier

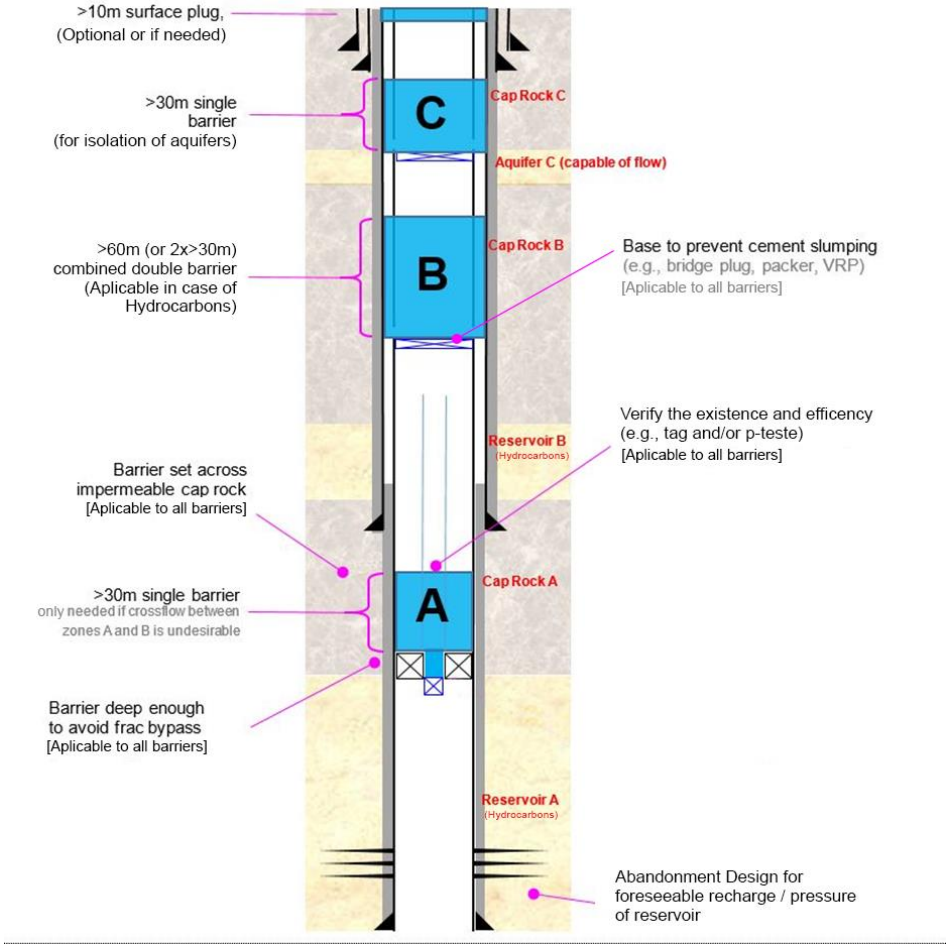
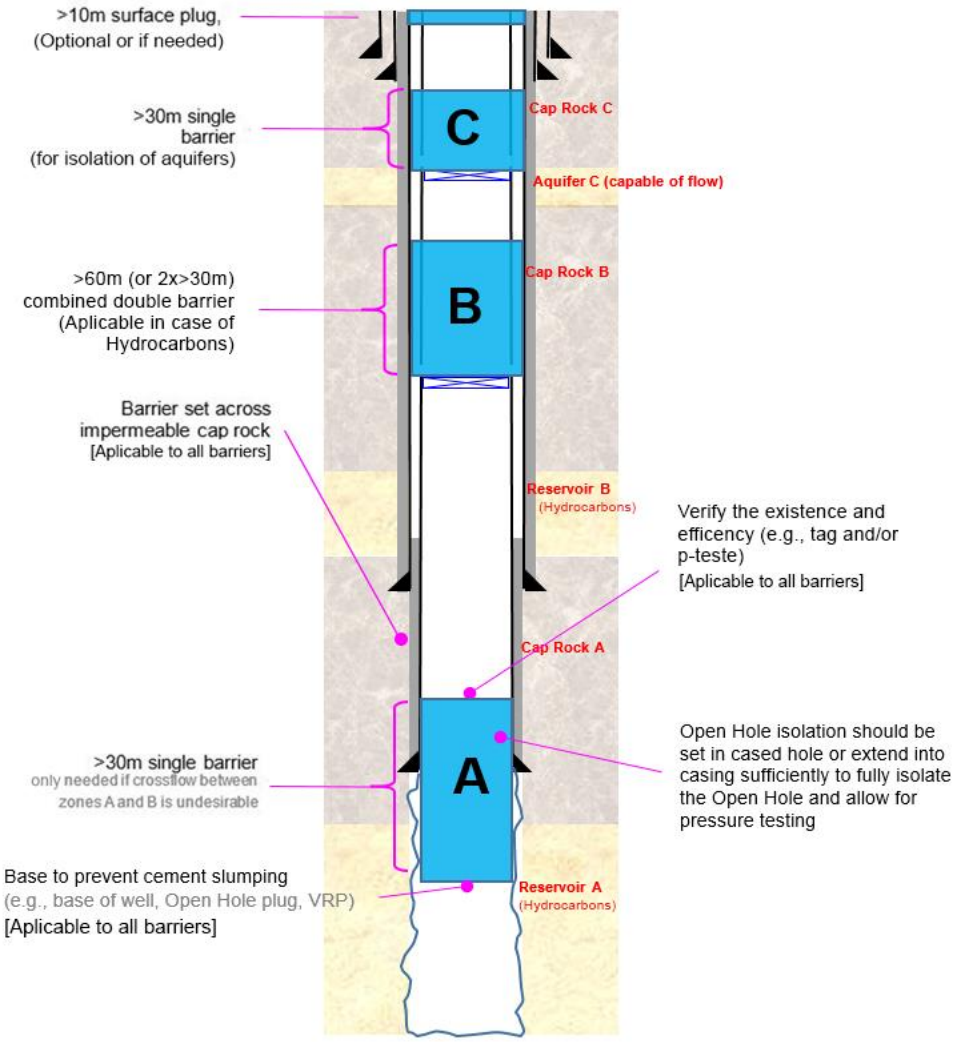


Figure 3-1: P&A Barrier Principles

Open Hole Reservoir Barrier



The Entities under Contract must also provide the isolation of aquifers and of formations of economic or public interest, by installing permanent barriers. Figure 3-1 illustrates the principles of the permanent barriers.

With definitive abandonment the Entities under Contract will isolate from surface, seabed or from any zone of potable water, the formations with a potential to flow, installing as a minimum 2 (two) permanent barriers. In addition, where crossflow is deemed unacceptable, each formation with a potential to flow should be isolated from one another by a minimum of 1 (one) permanent barrier.

In respect of formations with the potential of fracturing the shoe of the final casing or any formation above this, the Entities under Contract must establish as a minimum 2 (two) permanent barriers between the top of this formation and the shoe of the final casing or the base of the formation at risk of fracturing. These must be installed such

as to prevent flow to the external environment of the fluids from the deposits or intervals with a potential flow of hydrocarbons.

Two permanent abandonment barriers may be combined into a single combined barrier provided it is as effective and reliable as the two barriers. In this case a combined annular barrier must also be verified.

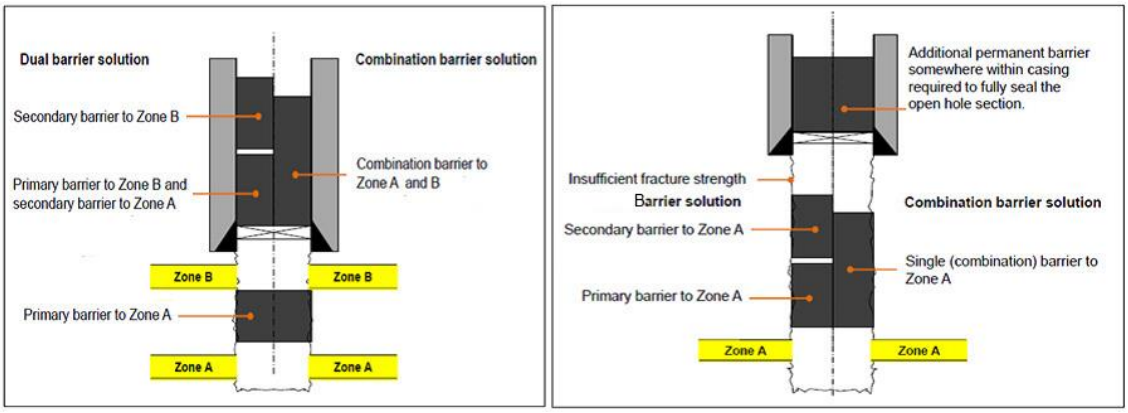
Cement plugs should be set on a suitable base (e.g. bridge plug, viscous reactive pill) to prevent slumping of cement.

A surface plug should also be installed in the shallowest casing stub if the wellhead is removed and annuli contain oil-based fluids.

The Entities under Contract must position the permanent barriers adjacent to verified annulus cement (or verified crept shale/salt), and across a natural seal for the zone being isolated. Barriers must also be placed deep enough to have a fracture gradient that exceeds the highest anticipated future pressure from the intervals being abandoned.

The positioning of barriers must be as a function of the geometry of the well, pressure of the formation, strength of the rocks, and hydrostatic gradient. A combination of barriers will be permitted as a function of the characteristics of the deposits, i.e. opting for a single barrier to isolate two distinct zones of production or injection.

Figure 3-2:



Crept shale, salt or settled barite may be accepted as part of a barrier instead of cement provided it has been qualified (e.g., logging and/or hydraulic testing).

The Entities under Contract must assess and mitigate the risks of compaction or subsidence on the integrity of the permanent barriers.

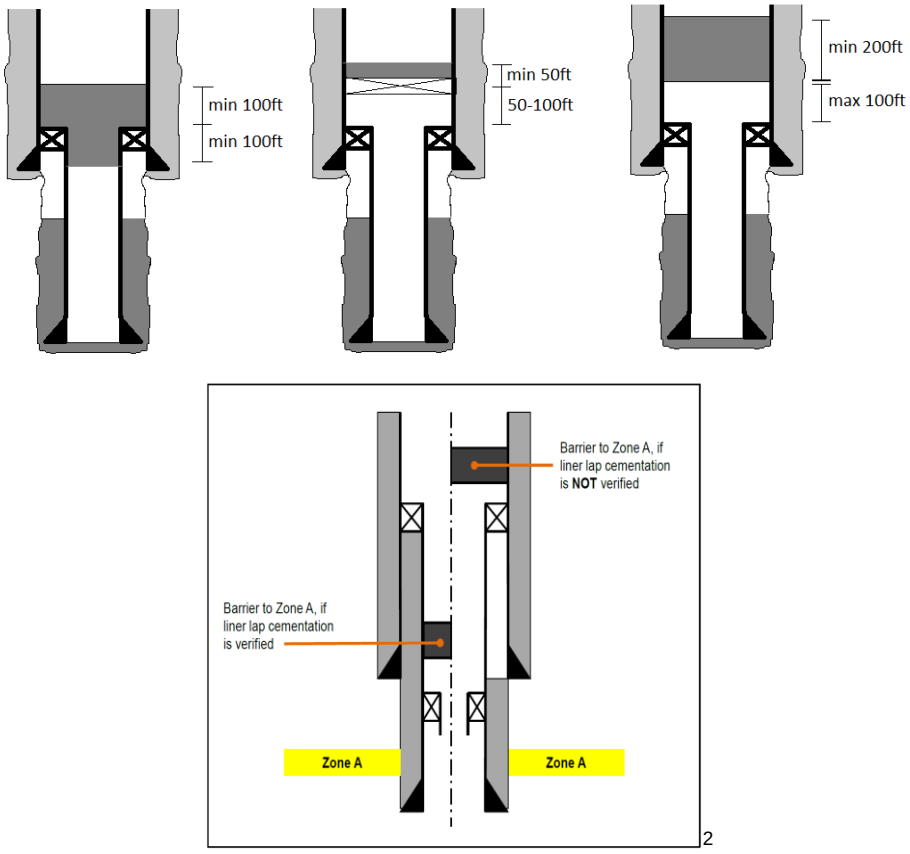
In highly deviated hole-sections (e.g. > 60 deg.) the planned P&A barrier length must be of a length to ensure satisfactory isolation and to not jeopardize the final vertical thickness of the installed barriers. Engineering work may be needed to verify that

highly deviated cement plugs are not defeated by channeling on the high-side of the wellbore or annulus (e.g. caused by the presence of free water in cement) and remediate if required.

The permanent barrier may only be positioned within the interior of the liner hanger if this is cemented to the exterior of the annular space throughout its entire length.

The installation of T-shaped cement plugs above the liner hanger or the utilization of a suitable base below the cement plug applied above the liner will be permitted.

Figure 3-3:



The Entities under Contract must prepare and update the well-handover documentation.

One possible generic well-plugging and -abandoning procedure is as follows:

1. Wells must be dead with recourse to the injection of seawater, brine or others to displace the hydrocarbons.

2. Removal of the tubing. Should removal of the tubing not be achieved, pump cement to seal the space between the tubing and the production casing. Cement

[2] Translator's note: the Portuguese gazetted version of this image is partially illegible

barriers in the outer annuli must be confirmed to be in place through testing and/or primary cement records, in this case in order to confirm fully lateral P&A barriers.

3. If required, carry out a cement squeeze across the formation utilizing drill pipe, coil or through tubing.

4. Confirm adequate annulus cement in place at the depths where permanent barriers must be installed (e.g. through primary cement records, running a circumferential bond log, performing a communications test). Note this may require inner casing strings to be removed via cut and pull, section milling, etc. If appropriate, set and test a retainer for the cement plug inside casing to prevent cement slumping.

5. Pump a cement plug into the casing.

6. Test the cement plugs by weight testing, typically to 10,000 lbs if using drill pipe.

7. Pressure test the cement plugs, typically to a minimum of 500 psi above the leak off pressure of the formation below the barrier, for 15 minutes. Sever and recover the intermediate casings 90 m below the mud line (if wellhead is to be removed).

8. Sever and recover the surface casing a minimum of 10 meters below the mud line (if wellhead is to be removed).

9. Pump 10 meters of the surface cement plug (if wellhead is to be removed).

10. Conduct a comparative assessment in case it is not necessary to remove the subsea wellhead in water depths of less than or equal to 400 meters.

11. If wellhead is not removed, install a corrosion cap.

12. Carry out a survey of the area with an ROV, Drones, or another available technology upon approval of the Concessionaire.

3.1.2 Temporary Abandonment

This consists in temporary plugging for the termination of well activities due to mechanical or geological problems, or as a function of the work program (fulfilment of exploration period obligations, reservoir studies, and development concept definition), in a landscape in line with the subsequent development activities.

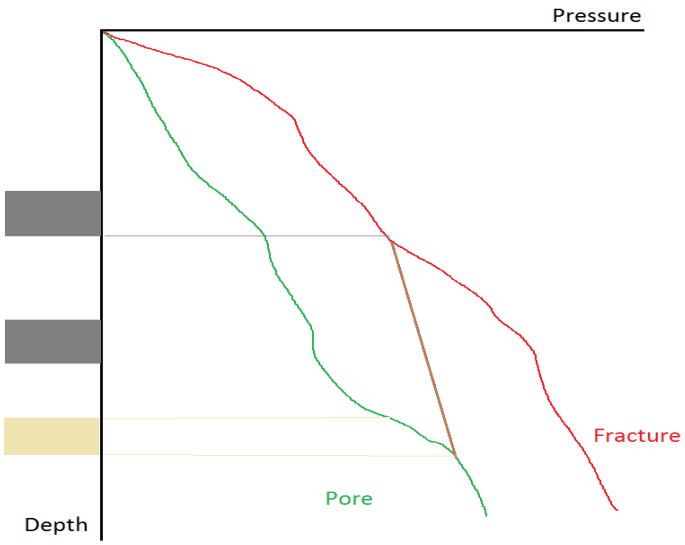
For any temporarily abandoned well, a monitoring program should be established based on a risk assessment.

The duration of temporary abandonment shall not exceed ~~5~~ [3] years, unless a documented report is submitted and approved by the Concessionaire to justify a longer period.
Adopt procedures to physically isolate access to the interior of wells at the seabed surface to prevent situations and conditions which may bring about incidents, without prejudice to the other abandonment procedures. Prepare and update the well-handover documentation for the next stage of the well lifecycle.

3.1.3 Characterization of Wells for Abandonment and Barrier Placement

Characterization of wells for abandonment must be undertaken as a function of the architecture (casing design), type of completion, and of the characteristics of the formation, this permitting their being grouped for the better implementation of abandonment procedures with a view to barrier installation at appropriate locations and optimization of time and costs.

Figure 3-4:



3.1.3.1 According to Casing

Wells may be designed with a casing in the reservoir (cased hole) and without casing in the reservoir (open hole).

As a function of completion, wells may be defined as SAS (stand alone screens), OHGP (open hole gravel pack), CHGP (cased hole gravel pack), ESS (expandable screens), or monobore and others.

3.1.3.2 According to Well Reservoir Features

[3] Translator's note: the Portuguese gazetted version as a typo as it refers to both 5 and 3 years but the numbers are both strikethrough.

Production wells to be abandoned must have a minimum of 2 (two) P&A barriers above the zone of potential flow of hydrocarbons.

3.1.3.2.1 Uncased Wells in the Zone of the Reservoir (Open Hole)

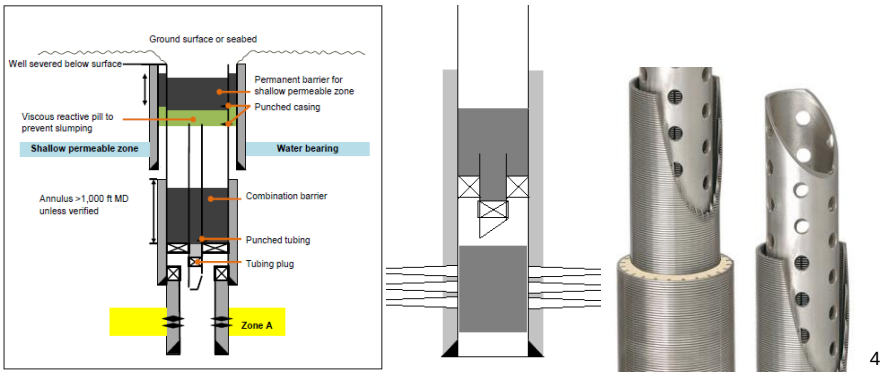
Wells with this architecture must be abandoned with a minimum of (2) P&A barriers above the zone of potential flow of hydrocarbons. The primary well barrier may be an openhole cement plug so long as the second plug is installed inside casing.

The Entities under Contract should isolate formations with the potential for cross-flow.

3.1.3.3 Abandonment According to Type of Completion

In general, control or injection cables should be removed from the intervals where permanent barriers are to be installed. Multi-point severing of cables which leaves many cable-free intervals in the barrier is also acceptable. Leaving undisrupted cables within the barrier would require analysis of long-term degradation of the barrier system and a documented risk assessment.

Figure 3-5:



[4]

3.1.3.4 Abandonment of Radioactive Sources

In case of back-off or BHA rupture with negative fishing result, atomic energy regulatory authority shall be notified immediately for the required authorizations to be obtained.

The part of the BHA with the tool containing the nuclear sources should be cemented in place if technically feasible (preferably with colored cement).

3.1.4 Barrier Construction and Integrity in Well Abandonment

For the construction of permanent barriers the Entities under Contract must employ materials with the following features:

[4] Translator's note: the Portuguese gazetted version of this image is partially illegible

(a) Impermeability to fluids;

(b) Isolating properties not deteriorating over time;

(c) Resistance to formation fluids (H_2S, CO_2 and hydrocarbons);

(d) Appropriate mechanical property to accommodate loads to which they will be subjected;

(e) Not experiencing contraction compromising their integrity;

(f) Adherent to the casings and formations around them.

P&A barriers must be tested to ensure the integrity of the well. The hydraulic pressure test must be carried out free from obstructions which might possibly prejudice its functionality. The pressure exerted in the test during (15) minutes should generally not be lower than the pressure test of the casing carried out prior to the commencement of work on the well. The position of the top of cement plug should be verified by tagging (or other means).

Single wellbore abandonment barriers must be a minimum of 30 m (100 ft) in length. Combined wellbore abandonment barriers must be a minimum of 60 m (200 ft) in length. If the cap rock for the zone being isolated is less than 30 m, the cement plug should be placed across the entire height of the cap rock.

To achieve the required barrier lengths, allowances should be made in the volumes of cement pumped to cater for uncertainties during placement. It may be necessary to place up to 150 m (500 ft) of cement to achieve 30 m of good cement. Similarly, it may be necessary to place 250 m (800 ft) to achieve 60 m of good cement.

3.1.5 Risk Analysis

During the activities for the abandonment of wells and decommissioning of facilities, the Entities under Contract must work to ensure the safety of operations and implement the measures required to prevent and minimize the occurrence of possible hazard and/or damages; in this case, all efforts must be made beforehand to identify the same and reduce them in an opportune and controlled manner, maintaining them within acceptable safety limits.

The Entities under Contract must prepare, document, and implement procedures for managing the risks associated with the management of the integrity of the well.

Identify the hazards together and analyze the associated risks, at the different stages of the lifecycle of the well, by means of recognized methods, duly documenting the results.

Identify the actions required and make recommendations for mitigation and reduction of the risks to an acceptable level.

The Entities under Contract must prepare and submit to the National Concessionaire a risk-analysis report including as a minimum the following elements:

(a) Identification of the company which executed the analysis;

(b) Objective and scope of the study;

(c) Description of the well or assemblies of wells subjected to analysis;

(d) Risk-analysis methodology utilized;

(e) Premises of the study;

(f) Identification of hazards;

(g) Modes of hazard detection;

(h) Identification of accident scenarios;

(i) Classification of risks;

(j) Existing safeguards, control measures and mitigation measures;

(k) Recommendations and conclusions.

The risk-analysis report shall be submitted to the Supervising Ministry for information.

3.1.6 Well Integrity

In all abandonment situations, the Entities under Contract are obliged to ensure the integrity of the well during its entire lifecycle.

For the purposes of the foregoing paragraph, the Entities under Contract must prepare, document, and implement acceptance criteria, plans and procedures for inspection, verification, maintenance, and monitoring of the integrity of wells, in conformity with internationally accepted best industry practices.

Ensure that the barriers and other systems, together with critical equipment, are functional, suitable and available for use.

Carry out barrier verification by testing.

Ensure that the cutting equipment have the capacity to cut tubular parts or cables lowered into the well.

Make the severing capacity information available.

Make available contingency procedures together with mitigation of the risks in the case of passing elements not shearable by the severing elements.

Ensure the replacement of the severing elements for subsea wells lacking the safety margin of a riser.

Ensure that the plans and procedures of inspection, verification, monitoring, and maintenance, in relation to the management of well integrity, contain as a minimum:

(a) Clear instructions for carrying-out the activities safely;

(b) Be risk-based procedures;

(c) Conformity with the manufacturer's manual; and

(d) Comply with the best practices of the industry, regulations and procedures defined by the Entities under Contract.

Prepare, implement, and document corrective and preventive actions to deal with discrepancies (deviations) identified during the execution of the plans and procedures.

Ensure that the handling of the discrepancies (deviations) is risk-based, establishing the minimum periods and determining those responsible for the implementation of actions.

3.1.7 Procedures

It is the responsibility of the Entities under Contract to ensure that all activities involved in the management of well integrity during the entire lifecycle are covered by procedures conforming to legal requirements and observing best industry practices.

Prepare, document, and implement clear and concise procedures with specific instructions for the safe execution of the activities involved in the management of well integrity, taking into account operational specificity and complexity.

Have available manuals, regulations, or specific well-control procedures for the stages of construction, intervention and abandonment.

Have available manuals, regulations, or specific procedures for the management of the pressure of annuli for the production stage.

Develop methodology defining well-criticality criteria together with the additional control measures to be established in these cases.

Have available manuals, regulations, or communication procedures permitting the interruption of activities when loss of integrity of the elements of barriers and/or of control of the well is detected.

Ensure that the workforce involved in well-integrity management is appropriately trained in the procedures and their revisions.

Prepare a methodology such that workforce supervisors and managers can assess compliance with the critical procedures.

Prepare, document, and implement corrective and preventive measures should inadequate performance be identified.

3.1.8 Well Data

In order to ensure data reliability and updating, the Entities under Contract must update the well-identification documents, which must include, but not be limited to, the following information:

(a) General well data: (field, facility, nomenclature);

(b) Criticality of the well;

(c) Planned working life;

(d) Updated schematic drawing of the well;

(e) Schematic drawing or diagram of barriers;

(f) Description and function of barriers;

(g) Dimensions, depths, top and bottom (TVD and MD) of all tubular elements and of all barriers;

(h) Mechanical properties of the rock where barriers are installed;

(i) Manufacturer and model of the equipment acting as barrier;

(j) Mode of activation (manual/automatic) and of operation (open/closed) of valves;

(k) State of integrity of each barrier;

(l) Procedure of verification of the integrity of barriers throughout their lifecycle;

(m) Barrier acceptance criteria;

(n) Date of the last verification, results, and assessment of barriers;

(o) Top and base of the deposits and formations with potential flow with their respective pressures, temperatures, and fluid data;

(p) Maximum and/or minimum pressures admissible on each barrier;

(q) The greatest pressure which the casing annulus can support, measured at the wellhead;

(r) Identification of primary barrier and secondary barrier;

(s) Record of important events or incidents which may compromise integrity during the lifecycle of the well;

(t) Field for observations and comments (abnormalities, exceptions, etc.).

3.2 Facility Decommissioning

The Contractor Group or the entity responsible for the abandonment and decommissioning of onshore and/or offshore producing fields must be legally- and contractually-formalized with technical experience to propose procedures, identify the available technology that can be used to perform the work, incorporate findings from the Environmental Impact Assessment for the block, field, or portion thereof, address operational factors that affect production and safe operation, such as operating issues, mechanical conditions, asset and structural integrity considerations, estimate the duration of activities and costs, as a function of the plan and final budget for abandonment.

3.2.1.1 Onshore Facilities

During the onshore facilities decommissioning process, the Entities under Contract shall comply with laws, regulations, procedures and other measures necessary to prevent and minimize to the maximum extent contamination of the earth's environment.

Prior to the decommissioning and dismantling of onshore facilities, the following aspects, without limitation, should be considered:

- Conduct a population survey of the area;

- Evaluate the condition of the lines and the impact of their removal, if they are located in housing and natural reserve areas.

The Entities under Contract or the entity responsible for the abandonment shall detail the method of cleaning the lines, the type of fluid used for cleaning, the by-products resulting from the production activity, the mode of storage or disposal of these by-products (chemical, toxic or radioactive) that may have been generated during the production activity.

3.2.1.2 Offshore Facilities

The existing facilities in shallow water are platforms with topsides that are supported by steel piled jackets fixed to the sea bed. These platforms serve as wellhead, production, or injection facilities, and are all manufactured in steel.

The existing facilities in deep waters are of the compliant piled tower (CPT), tension leg platforms (TLP), FPSO, FSO, FPU, CALM buoys, accommodation ships, subsea pumps, subsea separators, and other subsea systems type, manufactured in steel and cement.

3.2.2 Onshore Facility Decommissioning and Abandonment

The decommissioning and abandonment of onshore facilities may affect local populations and the surrounding environment. Table 3-1 summarizes the disposition of onshore facility components to clearly indicate which components:

- Will be removed, regardless of location;
- May be removed, partially removed, or abandoned in place, depending on the results of a comparative assessment to determine the most viable option;
- Can safely remain in place after cleaning.

For facilities that require a comparative assessment to determine the most viable option, indicated as “Best Option” in Table 3-1, a population survey must be carried out in the area to determine if the facilities to be abandoned are within a nature reserve or close to residences or community buildings where people gather, such as churches or schools. Additional surveys may be performed such as the technical feasibility of decommissioning or if other users in the area have a need for all or part of a facility (e.g., roads, buildings, electrical lines, or foundations). The completed surveys will be incorporated into a comparative assessment to evaluate the overall environmental and safety risk, technical challenges, economic factors and impact to other users of the area. The Entities under Contract should determine the most viable option by performing a comparative assessment, which shall be submitted for approval in the abandonment plan.

Prior to decommissioning and abandonment activities, the Entities under Contract must submit, in detail, the method for cleaning the facilities, the type of fluid used for the cleaning, the products resulting from the cleaning activity, and the manner of storage or disposal of these products which may have been generated.

3.2.2.1 Onshore Piping

Onshore facilities use piping within the area of operation to transfer oil, gas or other liquids from wells to the facility or from one facility to another. Table 3.1 summarizes

the disposition of onshore piping. Aboveground piping will be removed after cleaning. Pipelines buried at a depth of at least 0.9 meters or greater can be safely abandoned in place after disconnection from all sources of hydrocarbons and rendering the pipeline hydrocarbon free by purging / cleaning.

Table 3-1: Disposition of Onshore Facilities

Facility Component	Onshore Use		
	Within Nature Reserves	**< 800 m[1] from Residence or Community Building**	**Other locations**
Storage tanks	Remove	Remove	Remove
Aboveground equipment (e.g., separators, generators, pumps, motors)	Remove	Remove	Remove
Above ground piping	Remove	Remove	Remove
Below ground piping (≤ 0.9 m below surface)[2]	Best Option [3]	Best Option [3]	Best Option [3]
Below ground piping (> 0.9 m below surface)[2]	Best Option [3]	Remain	Remain
Buildings	Best Option [3,4]	Best Option [3,4]	Best Option [3,4]
Infrastructure within facility (e.g., roads, culverts, earth works, electric transmission lines, utilities)	Best Option [3,4]	Best Option [3,4]	Best Option [3,4]
Infrastructure outside facility (e.g., roads, culverts, earth works, electric transmission lines, utilities)	Best Option [3,4]	Best Option [3,4]	Best Option [3,4]
Foundation Removal and Underground Equipment (e.g., piles, concrete, cable tray, power cable, instrument cable)	Best Option [3,4]	Best Option [3,4]	Best Option [3,4]
Water wells	Best Option [3,4]	Best Option [3,4]	Best Option [3,4]

Notes:

1) ASTM E1527 Phase I minimum distance to brownfield or voluntary cleanup sites
2) Pipelines buried at a depth of at least 0.9 meters can be safely abandoned in place after cleaning / purging.
3) Operator to determine the most viable option based on a site-specific comparative assessment.
4) Subject to these requirements, installations may be left wholly or partially in place where it will serve a new use (such as enhancement of a living resource) or can be left without causing unjustifiable interference with other users per Note 3.

3.2.3 Offshore Facilities Decommissioning and Abandonment

The objective of offshore facilities decommissioning is to complete the required activities in compliance with the Law, in protection of the environment and users of the sea, and in the most safe and efficient manner.

In observance of the principles of the United Nations Convention on the Law of the Sea, and the International Maritime Organization, all offshore installations (fixed platforms such as SPJ, CTP; floating units such as TLP, FSO, FPU, FPSO, buoys, etc.) utilized during the process of production of petroleum fields must be wholly removed at the end of the working life of the fields, except where non-removal or partial removal is allowed in accordance with these guidelines. In the event that the facilities dismantled contain NORM, the handling and disposition of the same must be in conformity with the environmental laws of the Ministry of the Environment and the regulations of the Governmental Organizations Involved.

The process of decommissioning offshore production systems consists of three practical phases:

- The first phase consists in rendering the facilities depressurized and hydrocarbon-free, undertaking well abandonment, removal of conduits and/or risers, washing and cleaning processing systems, and preparing the components for the operations of raising, if submerged, and removal;

- The second phase involves the dismantling and removal of facility and of associated components;

- A third phase involves the restoration and monitoring of the location.

When decommissioning offshore facilities, the Entities under Contract must comply with the laws, regulations, procedures and other measures necessary to prevent and reduce impact of the marine environment to a maximum.

Establish the method and procedure for decommissioning facilities, taking into account:

(a) Age and current structural integrity of the platform;

(b) Location and depth of water;

(c) Platform type;

(d) Weight of structures;

(e) Climatic and oceanic variations;

(f) International and national laws and regulations;

(g) Cost assessment;

(h) Analysis of the risk and complexity of operations.

Determine that the method selected ensures the execution of the activities efficiently and safely, taking into account environmental conservation, whether in respect of complete removal, partial removal, topple-in-place, and leaving the structure at the location for alternative utilization.

Have available manuals, regulations, and specific procedures for implementation of the option selected.

Define the specifications and execute the activities in conformity with that established.

Prepare, document, and implement clear and concise procedures with instructions for safe execution from the personnel and environmental point of view during the phase of facility-decommissioning activities.

Ensure that the workforce involved is in possession of appropriate knowledge and procedures for the activities to be carried out.

Hold the available environmental authorizations for carrying out the dismantling.

Table 3-2 summarizes the disposition of offshore facility components as more fully described in the following sections. There are three (3) basic options for facility components: remove, partially remove, or remain. Determining which of these is the most viable option involves the evaluation of several criteria. Wherever “Best Option” is indicated in Table 3-2, the Entities under Contract should perform a comparative assessment utilizing an industry acceptable process to determine the most viable option. The comparative assessment should evaluate the following five (5) criteria to determine the most viable option.

- Safety;
- Environmental;
- Technical;
- Other Users of the Sea;
- Economic.

Table 3-2: Disposition of Offshore Facilities

Facility Component	Water Depth	
	< 400 m	> 400m
Topsides	Remove	Remove
Floating Units (FPSO, TLP, FSO, FPU, CALM, etc.)	Remove	Remove
Oil Offloading Lines (OOLs), fluid transfer lines (FTLs), other jumpers between Floating Units	Remove	Remove
Substructures(SPJ, CPT, all others fixed to seabed)	Complete or Partial Removal (1,2,4)	Complete or Partial Removal (1,2)
Subsea wellhead & production equipment	Best Option (2)	Best Option (2,6)
Umbilicals including associated risers & structures such as SCM, SDU, UTA, etc.	Best Option (2)	Best Option (2,6)
Mooring systems for floating facilities (wire & chain, tendons, suction piles, etc.)	Best Option (3)	Remain
Export pipelines, infield flowlines	Best Option (3,5,8)	Remain
Risers / riser components, & structures associated with pipelines / flowlines such as F/PLET, F/PLEM, valve manifolds, etc.	Best Option (7)	Remain

Notes:

(1) Partial removal is allowed as stated in Annex 1, if determined to be the best option based on a site specific comparative assessment (ref Section 3.2.3). Reefing options are applicable for both complete and partial removal. IMO Guideline Resolution A.672(16) states an unobstructed water column not less than 55 m is required above any partially removed installation or structure.

(2) Operator to determine the most viable option based on a site specific comparative assessment.

(3) State that an unobstructed water column not less than 55 m deep is required above any partially removed installation or structure.

(4) For fixed installations installed after Jan 1, 1998 in less than 400 m of water and weighing more than 4000 mt in air, excluding deck and superstructure, may be partially removed. Notwithstanding these requirements, installations may be left wholly or partially in place where it will serve a new use (such as enhancement of a living resource) or can be left without causing unjustifiable interference with other users of the sea per Note 2.

(5) Entities under Contract to determine most viable option for remediation of each shore crossing. A shore crossing is defined as the region in which a pipeline transitions from offshore to onshore.

(6) At water depths >400 m, the Entities under Contract may select an in situ abandonment or "Remain" as the Best Option, and must submit a site specific comparative assessment.

(7) For riser / riser components and structures only in <400m (such as F/PLET, F/PLEM, valve manifolds, etc.), the Entities under Contract should perform a site specific comparative assessment to determine the Best Option.

(8) The export pipelines and flowlines located in areas where trawling is not usual, and in areas where these lines are buried or corroded, the Entities under Contract may select an in situ abandonment or "Remain" as the Best Option.

3.2.3.1 Decommissioning Upper Components (Topsides)

The topsides are defined as parts of all offshore facilities above the water level on which equipment is installed, and include personnel accommodation, production

processing units, anchoring and stability systems, in addition to the energy-generation and gas-compression modules and other equipment.

The topsides of all facilities must be removed to onshore, to be recycled or disposed of onshore.

The topsides decommissioning plan must be accompanied by an environmental impact study for the activities in which the methods for cleaning lines, the type of fluid used for cleaning, the by-products resulting from the production activity, and the environmental impact of the equipment to be abandoned in-place are detailed. The processing and storage systems must be inspected to ensure that no gas or oil remains in the systems prior to commencement of decommissioning operations.

3.2.3.2 Decommissioning Substructures

3.2.3.3.

The substructure is defined as parts of all offshore facilities below the water level that structurally support the topsides and are typically fixed to the seabed. These include steel piled jackets (SPJ), compliant tower platforms (CTP), monopods / caissons, etc.

Substructures must be either completely or partially removed as indicated in Table 3-2.

The option to be selected will primarily depend on the pertinent legislation and factors to be considered in the selection of a method for each platform removal include:

- Platform age and current structural integrity;
- Location and water depth;
- Platform configuration and type;
- Weight of facilities to be raised;
- Climatic conditions;
- Laws and regulations;
- Costs;
- Distance from the coast;
- Complexity of the operations.

Several options may be considered for removal of substructures in the marine environment:

- Complete removal with disposition onshore;

- Complete removal with reefing at a designated reefing site;
- Partial removal;
- Topple-in-place;
- Leaving the structure in-place for alternative use;
- Complete removal.

Complete removal of the platform is, typically, a process of reverse installation. The main operations regarding complete removal are severing, raising, loading and disposition of the sections. The facility may be sectioned into one or more parts depending on the size and capacity of the vessel involved in the operation.

This option, depending on its location, requires removal of piles down to a depth sufficiently below the seabed (approximately 5 meters) in order to eliminate any interference with the other users of the location, such as fishermen and vessels.

Cutting methods typically considered for platform removal include but are not limited to: mechanical separation and separation with explosives.

The mechanical separation options include abrasive water jets, sand cutters, diamond wire saws, carbide cutters, rotary shears, saws, and guillotines. This type of severing constitutes a large portion of all removal operations, but some of the methods might be considered to be more expensive and slower. Severing by explosion will depend on the volume of the materials used in the construction of the platform.

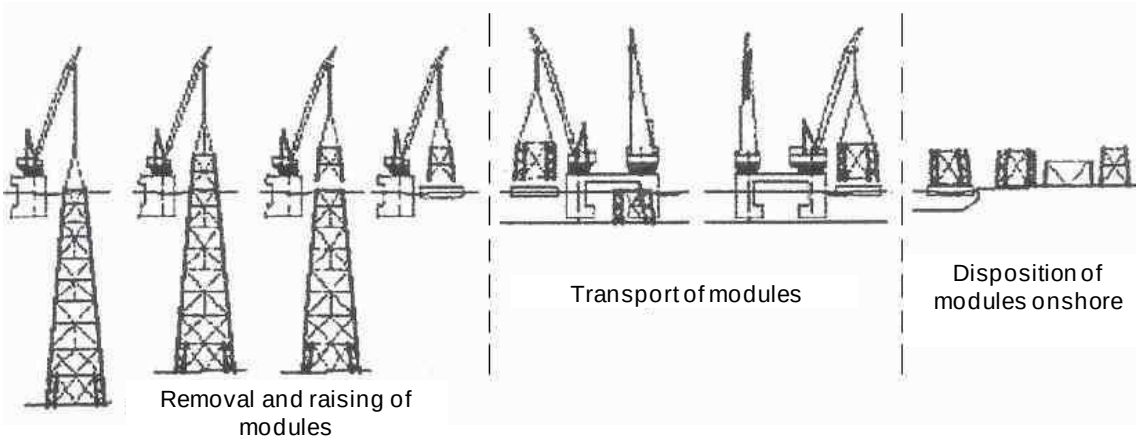
All options should be evaluated to determine the most efficient cutting method. If explosives are used, the Entities under Contract must submit a plan for their use including measures for protection of both personnel and marine life in the vicinity of explosions.

Following complete removal, the area around the platform removed must be wholly cleared of debris resulting from the installation and operation of the field.

There may also be an accumulation of drill cuttings on the seabed flowing from the drilling activity. These are the broken rock from drilling which lies deposited on the bed until after the end of production, and may contain oil-based or synthetic drilling fluids from the innumerable drilling activities. The Entities under Contract must sample these drill cuttings and develop a plan for their disposition based on a site specific comparative assessment.

Another option for the substructures removed is their transport and disposition in areas designated as reefing sites, a process known as reefing.

Figure 3-6: Decommissioning of Substructures

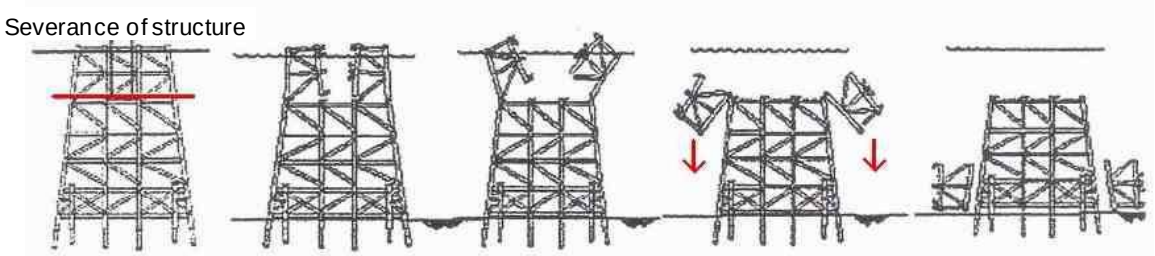


3.2.3.4 Partial Removal

Partial removal is an option for facilities with a weight exceeding 4000 tons. The substructure may be partially removed provided that it leads to an unobstructed water depth of 55 meters. The exact depth is shown in Table 3-2 and will depend on the legal requirements.

Another option would be to perform reefing of the substructure at an approved location. Nevertheless, there must be a benefit for the marine environment, principally if it is utilized in conjunction with artificial reef programs, by virtue of the fact that the portion of the structure left in-place will provide habitat for sea life.

Figure 3-7: Reefing in Place of Substructure



3.2.3.5 Topple-In-Place

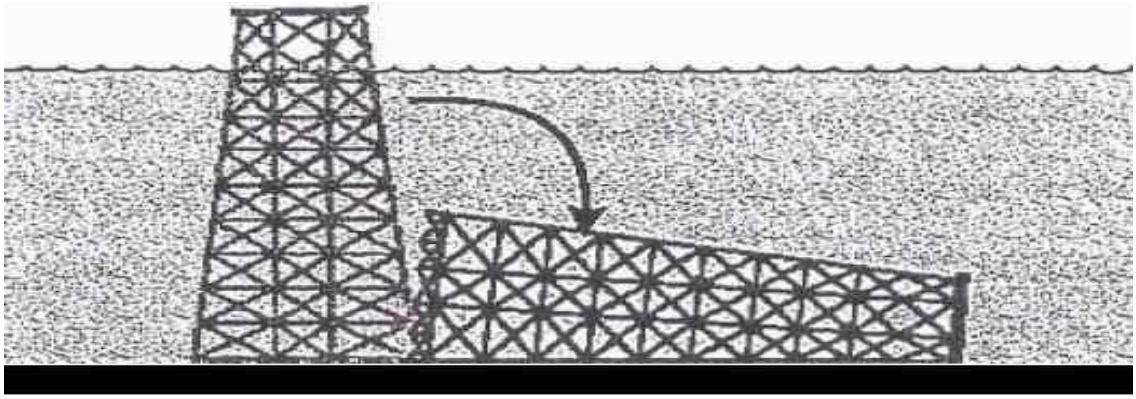
Abandonment of the substructure by toppling is very similar to partial removal. It primarily consists of the removal of the topsides, which may be reutilized, or abandoned on the seabed, or buried with the substructure.

Subsequently it requires the toppling-in-place of the entire substructure, complying with the existence of a free water column such as to not negatively interfere with fishing and navigational activities.

The high degree of precision and control required in order for the toppling of the substructure procedure to be safe increases the degree of complexity of this option.

Explosive charges or mechanical cutting may be utilized to section the critical members in a controlled severance sequence, enabling the jacket to be toppled at its existing site. At times it is necessary to utilize a tug to provide extra force in order for the toppling of the substructure to take place.

Figure 3-8: Reefing of Substructure by Topple-in-Place



3.2.3.6 Decommissioning Floating Facilities

The Entities under Contract shall dismantle floating facilities in accordance with Table 3-2. These Facilities include FPSO, FSO, FPU, TLP, export buoys, and any interconnecting lines (such as oil offloading lines (OOLs), fluid transfer lines (FTLs), etc.). Final disposition for the moorings associated with these facilities is also identified in Table 3-2. The Entities under Contract must carry out the study on the implications of abandonment in respect of these structures by virtue of the fact that many of them serve as central processing facilities. These facilities exhibit easy demobilization being floating units with mobile capability. Consequently their principal operational difficulties in respect of decommissioning are in relation to the subsea systems.

3.2.3.7 Decommissioning Subsea Production Equipment

The Entities under Contract must assess the complexity of the subsea system to determine the appropriate method for decommissioning the subsea production equipment.

Subsea production equipment in this category is typically installed on the seabed, and includes but is not limited to the following:

(a) Wellheads;

(b) Xmas trees;

(c) Subsea separators;

(d) Multiphase subsea pumps;

(e) Production manifolds.

At the end of the working life of oil-producing fields, subsea production equipment and associated structures must be decommissioned and duly cleaned. Decommissioning must take place prior to that of processing the primary production facilities in order to render it possible that the wastes deriving from cleaning the subsea equipment can be treated in the former.

The severance technologies to be utilized and the removal procedures must be approved beforehand by the National Concessionaire. An assessment must be made of the degree of corrosion, encrustation and burial of the subsea equipment to evaluate the degree of environmental impact. Marine encrustations must be removed from the facility whilst still offshore, if technically possible, by virtue of the fact that disposal of this material onshore very often presents other environmental implications.

In some cases subsea equipment located in water depths of less than 400 meters may be abandoned in-place by virtue of conditions, such as a high degree of burial, which renders the operation of removal very difficult or even impossible. In these cases, the Operator should submit the comparative assessment with supporting technical and environmental impact studies, should it consider that partial removal or the non-removal of the subsea structures is the sole viable technical, economic, environmental and safety option, which shall be approved by the Supervising Ministry upon recommendation of the National Concessionaire and other Governmental Organizations Involved.

For water depths exceeding 400 meters, the subsea equipment may be abandoned in place, upon having been previously washed, filling the lines with seawater, and closing all the valves, following procedures defined by the company executing the work, and approved by the Supervising Ministry upon recommendation of the National Concessionaire and other Governmental Organizations Involved.

The option of removal or disconnection of the anodes may be assessed in accordance with the proportion of cathodic protective material remaining in order to facilitate the process of degradation. Should the removal of these be necessary, the company executing the work must submit the duly-justified removal plan for approval to the National Concessionaire. The Entities under Contract shall:

- Establish the technical and environmental procedures for decommissioning of structures to be abandoned on the seabed.

- Submit environmental studies confirming that the recommended alternative will not damage the environment nor be an impediment to the use of the reconstituted area by other users of the sea.

The disposition of this subsea production equipment onshore is a possibility; however very often it has other environmental implications.

An assessment of the degree of corrosion, incrustation and subsidence of the submarine equipment should be made to assess the degree of environmental impact if it is chosen to remove them, marine incrustation should be removed from the facility while it is still offshore, if this is technically possible.

3.2.3.8 Pipeline/Flowline and Riser Decommissioning

It is the Entities under Contract's responsibility to ensure the utilization of the required means and equipment capable of realizing the cleaning, decommissioning, and final disposition of export pipelines, infield flowlines with their associated risers and structures such as PLEMs, PLETs, FLEMs, FLETs, valve manifolds, etc. Table 3-2 indicates the final disposition for these lines.

The plan for final decommissioning shall include the methods for flushing and cleaning, disposition of the fluids resulting from flushing and cleaning, and any final remedial measures required to stabilize the lines.

Risers must be decommissioned, cleaned and abandoned on the seabed, in accordance with the technical and environmental procedures approved beforehand by the National Concessionaire.

3.2.3.9 Umbilicals

By virtue of generally being buried, umbilicals must be abandoned on the seabed following decommissioning and be duly cleaned, preventing environmental impact to the maximum. Table 3-2 indicates the final disposition for umbilicals.

The plan for final decommissioning shall include the methods for flushing and cleaning, disposal of the fluids resulting from flushing and cleaning, and any final remedial measures required to stabilize the umbilicals.

4. Removal and Use of Substructures

All offshore material up to a water depth of 400 meters could be wholly removed. Partial removal of substructures will require the party so proposing to demonstrate by comparative assessment that this is the sole viable technical, economic, environmental and safety option, and to prove that the recommended option will not result in damage to the environment or impediment to the use of the zone by other users of the sea (navigation, fishing, tourism or otherwise).

4.1 Artificial Reefs

Advantage may be taken of the decommissioned subsea equipment utilizing it as installations for the formation of artificial reefs, and it may be deposited in areas authorized beforehand by the Governmental Organizations Involved.

An application which has been considered for small jackets and large offshore platforms is the concept of rigs-to-reef, installing the partially- or wholly-submerged structure on the seabed such that it acts as an artificial reef.

The Contractor Group must ensure and prove to the National Concessionaire that the decommissioned subsea equipment to be placed at a reefing site or left in place is incapable of leading to impairment of an environmental nature, and that it may be taken advantage of and utilized as structures for the formation of artificial reefs.

Be certain that the areas selected for the creation of artificial reefs are not the marine protection zones.

5. Environmental Aspects

The decommissioning and abandonment of oil-producing fields always entails an environmental risk by virtue of the nature of the equipment and products resulting from these activities. Prior to commencing decommissioning and abandonment activities, the types of chemical product, heavy metals, radioactive, toxic and other materials which may compromise the health of the personnel involved and the environment in the decommissioning, storage or disposition zone must be identified and quantified, by completing an Inventory of Hazardous Materials (IHM) or comparable assessment.

The entity responsible for abandonment must submit a waste management plan that details the manner of treatment and storage or disposition of all resulting products, and the same must be in accordance with the provisions of the Angolan legislation on petroleum-producing activities and international principles in respect of abandonment.

As a function of their exposure to production, the petroleum- and gas-processing and -storage facilities may contain naturally-occurring radioactive material (NORM), low specific activity (LSA) material, heavy metals, and organic substances. Technical conditions should be created to identify and treat these by products to prevent or limit them impacting the entire downstream system of the disposition process as far as the final destination.

For environmental impacts associated with onshore oil and gas producing operations, potential soil, surface water, groundwater and other impacts are addressed using scientific risk-based remediation targets that provide for the protection of human health and the environment.

5.1 Hazardous Waste

By virtue of the fact that some facilities have been in operation for a long period there may be a risk that they contain hazardous waste, such as asbestos, mercury, low specific activity (LSA) materials, and paint, etc.

5.2 Other Considerations

The treatment, handling and storage of chemicals, radioactive materials and toxic products is not limited to the aforementioned substances, nor solely to the methods stated. All other substances capable of causing the same effects must be treated in accordance with the environmental regulations and laws in force.

5.3 Waste Management Options

Applications for disposition of waste or other materials must demonstrate that due consideration has been given to the following waste management options ranking, involving an increasing degree of environmental impact:

(a) Reuse;

(b) Recycling away from the location;

(c) Destruction of hazardous components;

(d) Treatment to reduce or remove hazardous constituents;

(e) Disposal on land, in air and in water.

An authorization to dispose of waste or other materials must be denied if the competent authority determines that suitable opportunities exist for the reutilization, recycling or treatment of the waste without undue risk to human health or the environment or disproportionate costs. The practical availability of other means of disposal must be considered in the light of a comparative assessment of the risks involved in disposal and the alternatives.

6. Post-Abandonment Monitoring

Inspections must be carried out following abandonment. The scope and frequency of offshore post-abandonment inspections should be determined by the Entities under Contract, but as a minimum should be performed twice (utilizing an ROV, Drones or other available technologies) within 15 months of the completion of all abandonment work. The first inspection shall be done within 90 days of completing the abandonment work. The second inspection shall be done no sooner than 12 months from the completion of the abandonment work, but no later than 15 months.

Any requirement for further inspection within the abovementioned period will be based on the stability, degradation and environmental impact of the materials remaining on-site.

ANNEX 2
Abandonment Plans

Preamble

The Contractor Group / Operator is responsible for developing Preliminary, Partial, and Definitive Abandonment Plans for the facilities and wells in the Block or Concession Area, and for Abandonment Plan Updates.

The Preliminary Abandonment Plan (Technical Study) is a strategic document with primary focus on the Cessation of Production (COP) outlook (as described by depletion of the reservoir, economics, and facilities issues associated with low / minimal production as compared to original design throughput), operating and mechanical issues, integrity of the assets and structures, and the range of timing / dates for carrying out the work. The Contractor Group / Operator may prepare an outline for this plan, as is best suited to the scope of work. A summary of the content is as follows:

Preliminary Abandonment Plan

- COP Outlook & range of timing / dates
- Review the COP in light of existing development / Estimated Ultimate Recovery (EUR) & new opportunities
- Identify a range of dates for the COP
- Facilities Overview
- Identify Development Area facilities & development phases (history of the field)
- Identify common facilities
- Scope of Work (Facilities + P&A)
- Number / types of wells for P&A
- Facilities to remove / remain
- Regulatory basis (i.e. per ACEPA's guidelines, etc)
- Expected comparative assessments to support basis & timing for the assessments
- Engagement Plan (SNL / stakeholders)
- Planned communications, participation, engagements with SNL
- Stakeholder mapping to identify other engagements

- Execution Schedule / Strategy / Key Milestones
- P&A schedule / strategy – platform versus subsea wells
- Facilities removal schedule / strategy
- Key milestones to include – submission of Definitive Abandonment Plan, etc.
- Cost Estimate (ref Annex 3)
- Initially submitted template
- Range of certainty
- Cost Opportunities / Vulnerabilities (objective = efficiency / achievement of lowest cost)
- Identify issues that have a potential considerable impact on costs, such as P&A design / execution methods, topsides removal limitations / availability of suitable vessels, handling / disposal of NORM, etc.
- Key Technical Issues / Challenges
- Address – topsides removals (SPJ, FPSO, TLP, CALM, CPT, etc), jacket removals, subsea / other deepwater facilities removals (e.g. risers, moorings, umbilicals, etc.)
- Waste management (particularly NORM)
- Environmental impact

When the Preliminary Abandonment Plan has been approved by the National Concessionaire, the Contractor Group shall continue to mature the Plan by submitting Abandonment Plan Updates until it becomes the Partial or Definitive Abandonment Plan, which has primary focus on execution of the work and is considered a fully executable plan. The Abandonment Plan Updates, and the Partial and Definitive Abandonment Plans will be submitted in accordance with the template that follows, adjusted to suit the scope of work.

The Tables and Figures in this template are intended to summarize information for each of the sections. The Contractor Group / Operator may adjust the style of the Tables and Figures as necessary, to adequately summarize the information on the facilities and wells, as long as the intent regarding content is achieved.

Depending on the time of submission, some information requested in the template may not be fully available, and consequently the Contractor Group / Operator may mark those sections as “not applicable”. The final version of the Partial or Definitive Abandonment Plan must contain all information for all sections.

The Definitive Abandonment Plan shall as a minimum have the following contents:

(a) A description of the history of the petroleum field;

(b) Geographical location of the Facilities and wells;

(c) A full inventory and description of the Facility, pipelines and wells, including the location, depth and type of material of the Facilities to be abandoned;

(d) Variation in climatic conditions in the region;

(e) Environmental and Socio-economic Impact Study, including findings of specific surveys of benthic fauna, hydrocarbons and heavy metals resulting from operational activities;

(f) An inventory of the chemical and hazardous materials found at the Facilities, and plans for their removal;

(g) A description of production and deposit records;

(h) A discussion of the possibility of continuing the production operations, covering technical, financial, safety, environmental and socio-economic aspects;

(i) A description of decommissioning options, regarding technical, economic, environmental and safety aspects, and assessment of impact on other users of the sea and land (including the possibility of using the facility for other activities in the area, such as fishing, agriculture and industrial activities);

(j) Presentation of a preliminary public consultation process of the respective users.

1. A detailed description of the recommended decommissioning solution, including:

    (a) Description of the comparative assessment methodology, and the results of all comparative assessments;

    (b) Measures and procedures for the proper decommissioning, removal and disposal / re-use of the facilities, in accordance with petroleum industry standard practice;

    (c) Measures and procedures to mitigate environmental impact and appropriately rehabilitate the landscape, in accordance with the applicable law and petroleum industry standard practice;

    (d) Procedures for chemical and hazardous materials removal, neutralization and elimination;

    (e) A list of safety measures based on a documented risk analysis;

    (f) Issues relating to management and monitoring of the abandonment plans;

(g) Time horizon and schedule for implementation of decommissioning activities.

2. Methodology for estimating abandonment costs, cost estimate, and cost opportunities / vulnerabilities.

3. Post abandonment monitoring plans.

ANNEX 2

Partial or Definitive Abandonment Plan and Abandonment Plan Updates

1. Terms and Abbreviations

Include an index of terms and abbreviations used in the document

Abbreviation	Meaning

Figures and Tables

Include an index of figures and tables used in this document.

2. Appendices

Include an index of Appendices that shall form an integral part of this document, and the original copies of electronic files supporting this document.

Appendices	Description	Format
1	State approvals	Document
2	Environmental Impact Study	Document
3	Risk analysis	Document
4	Facilities Design Management System	Database (Software)
5	Structural model	Database (Software)
6	Equipment reliability, availability and maintenance model	Database (Software)
7	Petroleum field management model	Database (Software)
8	Reservoir model	Database (Software)
9	Inspection reports on wells and equipment	Database (Software)

3. Executive Summary

3.1 Abandonment Plans / Combined Abandonment Plans

This document contains the _____ Abandonment Plan for the _____ facility (or facilities) and _____ transport lines.

Combined Abandonment Plan: Provide a clear statement confirming that there is a separate plan for each set of associated instructions.

3.2 Cessation of Production (COP) Outlook

A summary of the timing / dates for the Cessation of Production (COP).

3.3 Requirements for the Plan for Decommissioning the Facilities and Well Abandonment.

Describe:

3.4 Introduction

Insert introductory paragraphs describing the context of the proposal for decommissioning, with information on Platforms (topsides & substructures), Floating Units, subsea facilities, other production facilities, Pipelines/Pipework, and Well Abandonment (as applicable).

3.5 Overview of the Field and Facilities / Pipelines to be Decommissioned and Wells to be Abandoned

Preferably, through a three-dimensional drawing of the facilities, including the wells and subsea equipment.

3.5.1 Facilities and Wells

Table 3-1: Facilities to be Decommissioned

Offshore

Fields:		Type of Product (Oil/Gas/Condensates)	
Area (sq. m)	Depth (m)		
Surface Facilities			
Number	Type*	Platform Weight (t)	Leg Weight (t)
Subsea Facilities		Number of Wells	
Number	Type**	Platform	Seabed
Notes:			
*	Fixed leg/floating platforms / FPSO etc.		
**	Template/manifold / WHPS/manifold etc.		

Onshore

Fields:		Type of Product (Oil/Gas/Condensates)	
Area			
Facilities			
Number	Type*	Weight (te)	
Number of Wells			
Number	Type**	Location	
Notes:			
*	Separator, tank, compressor, etc.		
**	Injector, Gas-producing		

Table 3-2: Details of Partners

Consortium Partner Name	Operator	Participating Interest (%) If zero, mark 0%

3.5.2 Pipelines

Table 3-3: Pipelines to be Abandoned

Number of Pipelines			(See)

Table 3-4: Details of Pipelines Partners

Partner Joint Title	Operator	Participating Interest (%) If zero, mark 0%

3.6 Summary of the Proposed Abandonment Plan

Complete Table 3-5.

Table 3-5: Summary of the Abandonment Plan

Selected Option	Reasons for the Selection	Proposed Solution for Abandonment
1. Deck		
2. Jackets / Floating Structures (FPSO etc.)		
3. Subsea Facilities		
4. Pipelines, Pipework and Umbilicals		
5. Wells		
6. Others		
7. Interdependencies		
Provide (where relevant) commentary on any interactions between the different elements of the decommissioning plan, e.g.: Drilling Model.		

3.7 Location of the Field, Including Field Layout and Surrounding Facilities

Figure 3-1: Field Location in Angola

Include a figure showing the geographical location of the field in Angola.

Figure 3-2: Field Layout

Insert a diagram showing the layout of the field, including subsea facilities (see example).

Note: “surrounding facilities” refers to those that are potentially impacted by this plan.

Complete by listing any surrounding facility in Table 3-6[5].

[5] Translator’s note: Portuguese version erroneously refers to Table 4-6.

Table 3-6: Surrounding Facility

Owner	Name	Type	Distance / Direction	Information	Current Condition
Impact on Proposals for Decommissioning					
If relevant, describe the impact that surrounding facilities may have on proposals for decommissioning.					

Table 3-3: Surrounding Facilities

Insert a diagram showing the specified surrounding facilities, if any.

3.8 Industrial Implications

Provide a summary describing the strategy for acquiring / contracting the means to undertake the abandonment.

4. Cessation of Production (COP)

A discussion of factors that affect the Cessation of Production (COP), including reservoir depletion, economic aspects, and facilities-related issues associated with low / minimal production as compared to original design throughput. Full description of the timing / dates for COP and carrying-out of the abandonment work.

5. Operational Issues

A discussion of factors that affect production and safe operation, and a description of the reasons why specific assets must be decommissioned or abandoned due to:

- Operating issues;
- Mechanical conditions (e.g., well failures);
- Asset integrity; and
- Structural integrity considerations.

6. Description of Items to be Decommissioned

6.1 Facility(ies): Offshore Surface Facilities (Surface Equipment / Jackets / FPSO etc.)

Complete Table 6-1: Surface Facility Details

Surface Facility Details

Repeat for each facility included in the plan. Enter N/A (not applicable) or N/D (no data), as appropriate.

Table 6-1: Surface Facility Details

Name	Facility Type*	Location**		Surface Equipment / Facilities		Jackets (if applicable)			
				Weight (Te)	No. of Modules	Weight (Te)	No. Legs	Weight of Foundations	Current condition ***

Notes:	
*	Fixed Steel Jacket / Fixtures / FPSO / etc.
**	Geographical coordinates to 3 decimal places and in degrees
***	Current condition, with the latest structural and inspection report

6.2 Facility(ies): Onshore Facilities

Complete Table 6-2. Repeat for each facility included in the plan. Enter N/A (not applicable) or N/D (no data), as appropriate.

Table 6-2: Onshore Facility Details

Name	Module*	Location**		Weight (Te)		No. of items of equipment			

Notes:	
*	Compression, separation, storage, etc.
**	Geographical coordinates to 3 decimal places and in degrees

6.3 Facilities: Subsea, Including Anchoring Equipment

Complete Table 6-3. Enter N/A if not applicable.

Table 6-3: Subsea Facilities and Anchoring Equipment

Subsea Facilities* including Anchoring Equipment	Number	Dimensions / Weight (Te)	Location**		Comments / Current Condition ***
Other (Brief Description)					
Notes:					
*	Collector/manifold, Xmas trees (assembly of valves, spools, and fittings), etc.				
**	Geographical coordinates				
***	Mention the last inspection report in Comments/Current Condition.				

6.4 Pipelines

Complete Table 6-4 with details of pipelines, flow lines, and umbilicals.

Table 6-4: Data for Oil Pipelines, Gas Pipelines, Pipelines / Flow Lines / Umbilicals

Description	Pipeline Number (per PWA)	Diameter (Inches)	Length (km)	Description of Component Parts [1]	Products Transported [2]	Point of Departure and Arrival	Current Burial Status [3]	Current Pipeline Condition [4]	Current Product [5]
Notes:									
1	E.g. Concrete; Steel; Umbilical; Flexible; Package								
2	E.g. Oil; Gas; Water; Chemicals								
3	E.g. Installed on the seabed; entrenched; entrenched and buried; wide-ranging								
4	E.g. Operational; out of use; Interim Pipeline System ("IPS")								
5	E.g. Clean; flushed; hydrocarbons and/or chemicals								

Table 6-5: Anchoring Structure for Pipelines

Anchoring Structure	Total Number	Weight (T)	Location	Exposed/Buried/Condition

6.5 Wells

Complete Table 6-6.

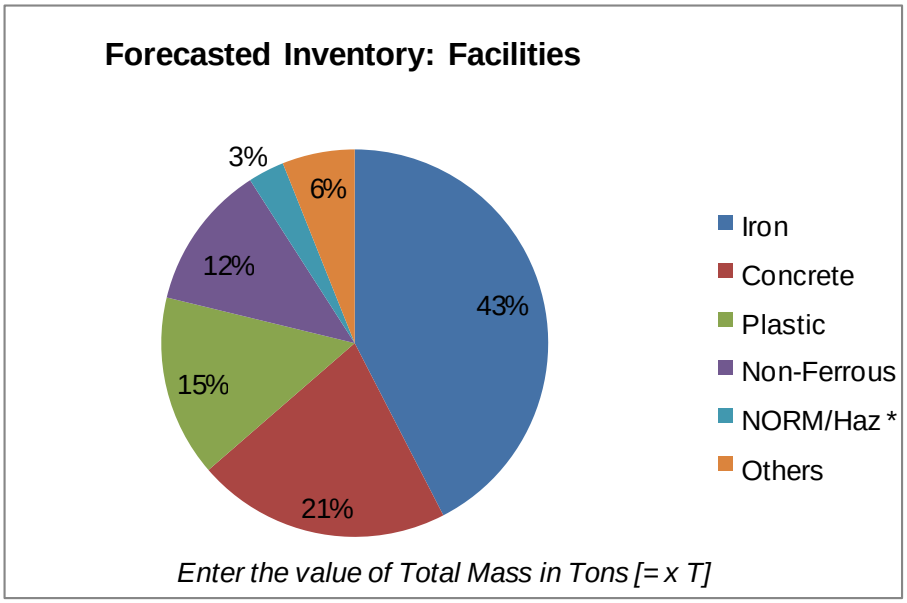
Table 6-6: Well Data

Well Platform	Designation [1]	Current Status	Well Category / Status [2]
(Identifier)	Producer Wells	In production	
(Identifier)	Injection Wells	In production	
Subsea Wells			
(Identifier)	Producer Wells	Abandoned	
(Identifier)	Producer Wells	Suspended	
Note:			
1	E.g. Production; Injection; Oil; Gas		
2	As defined by the Contractor Group		

6.6 Forecasted Inventory

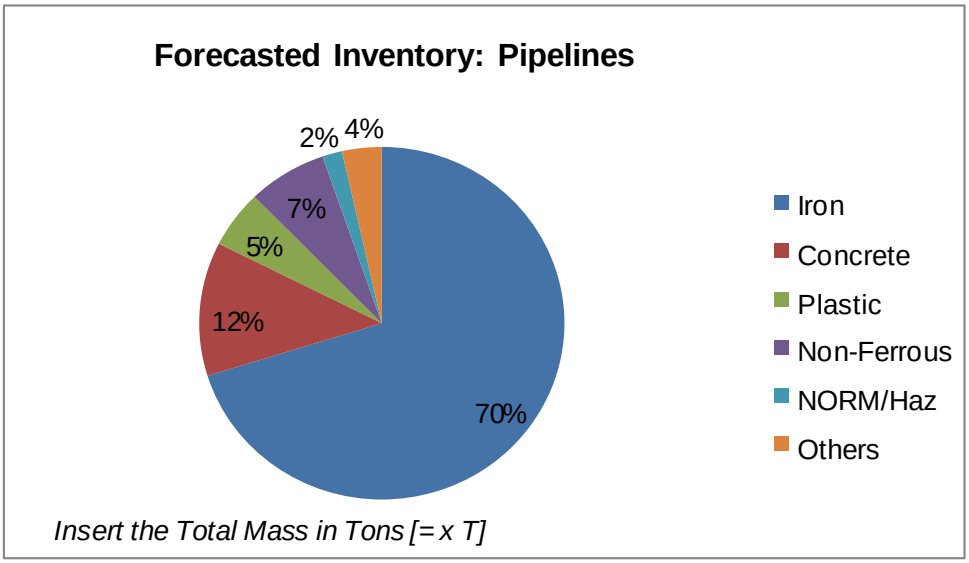
Provide a table or chart (pie chart) providing a forecast of remaining inventory for the decommissioning plan contained in this document. [These Figures are for purposes of illustration only. The Contractor Group / Operator may select a method of display that is appropriate for their facilities].

Figure 6-1: Pie Chart of Forecasted Inventory (Facilities)



* NORM/Hazardous Waste

Figure 6-2: Pie Chart of Forecasted Inventory (Pipelines)



7. Methods for Removal and Disposal

In line with the waste hierarchy, the reuse of a facility (or parts thereof) is first in the order of preferred decommissioning options. Re-use of facilities is encouraged where practical, and it is expected that the decommissioning plan shall demonstrate that the potential for re-use has been thoroughly examined.

The plan should therefore include a statement of how the principles of the waste hierarchy shall be observed, including the extent to which facilities (or parts thereof) are to be re-used, recycled or decommissioned.

7.1 Surface Equipment

7.1.1 Overview of Surface Equipment Decommissioning.

Enter N/A if there is no surface equipment. Briefly describe the surface equipment and the decommissioning method. Include a diagram to illustrate the method. Repeat for each item of surface equipment included in the plan.

Note: For floating facilities, provide a brief description of the decommissioning methodology.

Description of the Surface Equipment:

Figure 7-1: Diagram of the Surface Equipment

Preparation/Cleaning: Outline in Table 7-1 the methods that are to be used to clean, purge or clean [sic] the surface equipment at sea, prior to removal to shore.

Table 7-1: Cleaning of Surface Equipment for Removal

Type of Waste	Composition of the Waste	Route to Waste Deposit

Removal Methods: Surface equipment must be completely removed before being sent to shore. The possible methods should be outlined in Table 7-2. State which methods are to be considered for surface equipment decommissioning. Following this, briefly describe those applicable to your project.

Table 7-2: Removal Method for Surface Equipment

1) HLV (Semi-Submersible Crane Vessel) - 2) Monohull Crane Vessel - 3) SLV - 4) Small Components - 5) Other (brief description) ☐	
Method	Description
Proposed removal method and waste route (ensure that this section appears in bold font)	*Describe the method you propose for removal and disposal of surface equipment, stating any potential problems relating to the trans-boundary transportation of waste. Highlight if more than one option is being used within the tender. If appropriate, add the phrase - "A final decision on the method of decommissioning will be made following a commercial tender procedure."*

7.2 Jackets

7.2.1 Review of Jacket Decommissioning

State N/A if the item is not a jacket. Provide an overview of the jacket decommissioning method. Include any special considerations that affect the options. Include a diagram to illustrate the methodology. Repeat the plan for each jacket.

Figure 7-2: Jacket Elevation View

7.2.2 Jacket Decommissioning Method

State the different methods considered for removal and deposition of the jacket. Complete Table 7-3 [6]describing the decommissioning of the jacket. Any piles shall be cut below the natural seabed level, at a depth which ensures that any remnants are very unlikely to become uncovered. The depth will mainly depend on the prevailing conditions of the seabed and subsea currents.

[6] Translator's note: Portuguese version erroneously refers to Table 8-3.

Table 7-3: Methods for Decommissioning the Jackets

1) HLV (Semi-Submersible Vessels) - 2) Monohull Ship Crane - 3) SLV - 4) Small Components - 5) Others - (Brief Description)	
Method	Description
Proposed removal method and disposal route (this section should appear in bold font)	*Describe the method for removing and disposing of the jacket, stating any potential issues relating to the trans-boundary transfer of the waste. Highlight if more than one option is being used within the tender.*

7.3 Subsea Facilities and Stability Equipment

Complete Table 7-4 with the items to be decommissioned.

Table 7-4: Subsea facilities and Stability Equipment

Subsea Facilities and Anchoring Equipment	Number	Option	Deposition and Route (if applicable)
Other (short description)			

7.4 Pipelines

Decommissioning options: Table 7-5 summarizes the pipelines or groups of pipelines included in the decommissioning plan. Include a reference to Table 2-3.

Table 7-5: Decommissioning Options for Pipelines or Groups of Pipelines

Pipeline or Group of Pipelines (per PWA)	Pipeline Conditions / Group Installation Conditions / Entrenched / Buried	Pipelines or Part of Pipeline	Options Considered for Dismantling*
*Fundamental options			

7.5 Pipeline Anchoring Equipment

State in Table 7-6 [7]how items are to be decommissioned.

[7] Translator's note: Portuguese version erroneously refers to Table 6-7.

Table 7-6: Pipeline Anchoring Equipment

Equipment	Number	Options	Abandonment Method (if applicable)

7.6 Wells

Provide a brief description to show your approach to abandoning the Well.

Table 7-7: Well Abandonment

Wells that are to be permanently abandoned, as listed in Section 7.5 (Table 7-6), shall be plugged and abandoned in accordance with Annex 1.
Other relevant technical aspects:

Risk Analysis Method: Briefly outline the method used to undertake a Risk Analysis. The method must describe the process and basis for determining the potential likelihood and impact of events and/or scenarios.

Result of the Risk Analysis: Provide a table similar to the example in Table 7-8 below for each well or group of wells, summarizing the results of the Risk Analysis. Identify the options for mitigation and the level of risk. Repeat for each group of wells.

Table 7-8: Results of the Risk Analysis

Well or Well Group	Recommended Options*	Justification	Risk Mitigation Actions

7.7 Waste

Provide a summary in Table 7-9 [8]describing how the main waste chains from the proposed plan would be managed. If appropriate, state any potential challenges related to the trans-boundary waste transfer. Also complete Table 7-10 [9]detailing the planned final deposition of product from the facility(ies) and pipework.

[8] Translator's note: Portuguese version erroneously refers to Table 8-9.
[9] Translator's note: Portuguese version erroneously refers to Table 8-10.

Table 7-9: Waste Management Method

Waste	Removal Methods

Table 7-10: Inventory Layout

	Total Inventory Tonnage	Planned Onshore Tonnage	Planned Waste Tonnage
Facilities			
Others			

Include a summary / graphic / table stating your estimates of the percentages of materials to be returned onshore that are to be reused, recycled, or disposed of in a landfill.

8. Environmental Impact

8.1 Environmental Sensitivity (Overview)

Complete Table 8-1 [10]describing the more important / sensitive characteristics of the environment at the receiving location where decommissioning activities will take place. Make reference to details in the Environmental Impact Assessment, which should be mentioned as a supporting document.

Table 8-1: Environmental Sensitivities

Environment at the Receiving Location	Main Sensitivities
Interests to be preserved	
Seabed	
Fish	
Shoals	
Marine Mammals	
Birds	
Onshore communities	
Other users of the seas	
Atmosphere	

8.2 Potential Environmental Impacts and their Management

[10] Translator's note: Portuguese version erroneously refers to Table 9-1.

Summary of the Environmental Impact Assessment: Provide a summary of the main impacts identified in the Study, taking into account the inputs of the impacts consulted, in accordance with the Responsibility Matrix.

Overview: Complete Table 8-2 identifying the key environmental impacts associated with the decommissioning of each facility, summarizing how these are to be managed.

Table 8-2: Environmental Impact Management

Activity	Main Impacts	Form of Resolution
Removal of Surface Equipment		
Removal of Jackets / Floating Facilities		
Removal of Underwater Facilities		
Decommissioning of Pipelines		
Decommissioning of Surface Equipment		

9. Comparative Assessments

When performing a comparative assessment, the Operator should select the clearest and most straightforward methodology for decommissioning and abandonment recognized by the industry (e.g., Evaluation Method A: Narrative/Red-Amber-Green (RAG), Oil & Gas UK "Guidelines for Comparative Assessment in Decommissioning Programs") to support the "Best Option" decisions. The Operator should describe the selected methodology and the reasons for the selection.

Summary of all comparative assessment results.

10. Consultation with Stakeholders

Summary of the Consultations: (This section should be updated when the consultation phase is complete).

(1) Summarize the comments received to date from statutory consultants. Provide copies of the public notice and correspondence from statutory respondents as an Appendix.

(2) Include brief summaries of other consultations undertaken to date, and make reference to any supporting documents. Under "Response", state how the stakeholders' concerns have been addressed and/or influenced your decision-making process.

(3) You may also use the webpage https://abandono.sonangol.co.ao/default.aspx, and the discussion area of the webpage to clarify concerns and provide answers to queries.

Table 10-1: Summary of Comments from Stakeholders

Who	Comment	Reply
Informal Consultation		
Statutory Consultation		

11. Project Management

11.1 Project Management

Provide a summary of the project management plan.

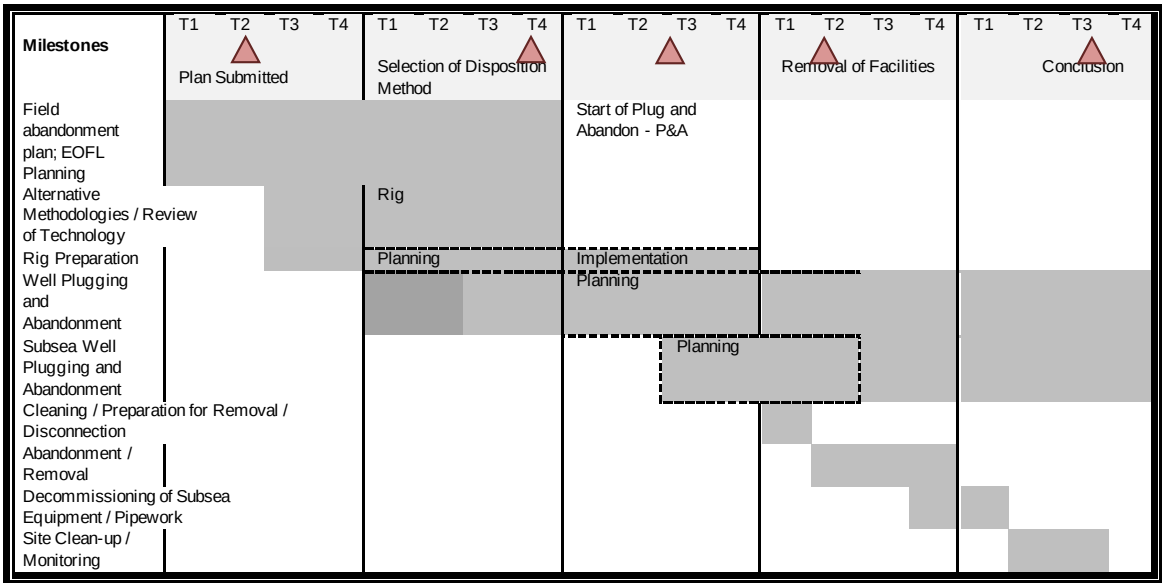
11.2 Schedule

Project Planning: Insert a Gantt Chart showing a simplified project schedule, with a definition of key dates and milestones. Include the procurement, with the appropriate public tender procedures.

11.3 Costs

An overall cost estimate shall be provided, in accordance with Annex 3 to these Regulations. Cost opportunities and vulnerabilities shall be clearly identified.

Table 11-1: Project Schedule Gantt Chart



12. Post-Abandonment Inspection and Monitoring

Include a statement on these checks.

Provide a statement on how post-abandonment monitoring is to be undertaken, and the sequence of activities.

13. Supporting Documents

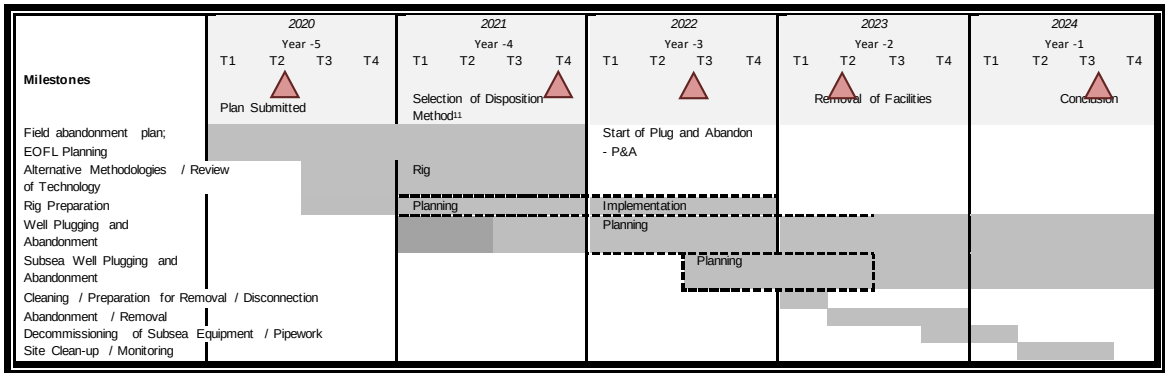
Provide a list of supporting documents and software (e.g., supporting diagrams, graphics or other material) mentioned in the plan and which are not presented in the Appendices.

Table 13-1: Supporting Documents

Appendices	Description	Format
1	State Approvals	Document
2	Environmental Impact Study	Document
3	Risk analysis	Document
4	Facilities Description	Drawings and documents, as required
5	Comparative Assessments	Document
5	Inspection reports on wells and equipment	Document

These supporting documents shall be posted on the internet at https://abandono.sonangol.co.ao/default.aspx.

- Comfort letters from the members of the Contractor Group;
- Copies of the comfort letters from the current holders of participating interests in the field should be provided here. The originals must be submitted with the final version of the plan.



[11] Translator's note: the word "Method" is missing in the Portuguese gazetted version of this Table

Estimate Basis: Assumption of important Data

Description of the facilities

Name of Field	
Development Area(s)	
Water Depth (m)	
Number of Wells	
No. Of Drilling Points	
Common facilities	FPSO, TLP, CALM
Others	

Description:

Including all common facilities

Photos:

Schedule important dates / Milestones

Cessation of Production		Beginning	End
Wells Plugging and abandonment (P&A)			
Offshore campaign #1			
Offshore campaign #2			
Opex after COP			

Comments:

Details on the removal of offshore equipment / abandonment campaign, critical path, and other main factors having an impact on the schedule

Excluded units / Estimate limits

Specify limits for the facilities included in the estimate, and list included and excluded units

Estimate Basis: Assumption of important Data

Main Assumptions

PM&E (Production machinery and equipment):	Typically a % of the overall cost, e.g. 5 +%
Opex after CoP (Cessation of Production): Fuel, staff, logistics (vessels & helicopters), maintenance of facilities	
Well Plugging and Abandonment: Types of wells (producing, water injection, gas injection), rig class, days need to plug and abandon each well, by main activities, non-productive time (*NPT*)	
Preparation and protection of Facilities: Permanent teams on the platforms or vessels, class of vessels	
Removal of facilities: Weight of surface equipment, weight of jack-ups, weight of piles, abandonment / removal option, class of mobilized vessel (typical name of vessel) for each offshore removal / abandonment campaign, days of work needed for each main activity, estimate of non-working days due to bad weather	
Disposal of Facilities: Forecasted inventory / quantities of recyclable and hazardous material, recycling / disposal Plans (in the Country or abroad)	
In-site repair and monitoring: Class of vessel, days need for main activities	
Monitoring after abandonment (exploration vessels, divers, ROV or others)	
Specific studies (Benthic Fauna, Quantity of hydrocarbons which may be ingested by marine Fauna, reaction of heavy metals in the water, environmental impact)	
Cost of removal and transport to final destination: cost of temporary destination and final destination	
Exposure: 30% of all initial estimates is required In the final cost estimate, the value shall be justified by risk analysis and the respective risk mitigation plan	

Brief description of the vessel and rates

Plug and abandon wells	Days		Costs $M		
	Mob/Demob	worked hours	total	Daily rates	Total
Identification of Vessel					
Removal and abandonment of facilities					
Heavy Lift Vessel (HLV)					
Piping reel-lay Vessel					
Diving support vessel (DSV)					
Anchor Handling Tug (AHT)					
Multi Service Vessel (MSV)					
Other types of vessels (describe)					
Total					

Summary of costs

Production Equipment & Machinery		
Opex after Cessation of Production		5% of total cost
Plug and abandon well		Class of vessel
Preparation and Safety of facilities		Based on experiences
Removal / Abandonment of Facilities		Primary class of vessel
Disposal of facilities		Location assumption
In-site repair and monitoring		In-site survey needs
Monitoring after abandonment		
Specific studies		
Radioactive material treatment cost		
Exposure		30% of all estimates is required
Total	$	

ANNEX 4-A

Form of Certificate of Abandonment of Wells and Decommissioning of Facilities and Release of Liability of the Entities under Contract

From:

Sociedade Nacional de Combustíveis de Angola, Empresa Pública, hereinafter referred to as "National Concessionaire", a company incorporated in Luanda, Republic of Angola, in accordance with Decree 52/76, of 9 June 1976, acting in its capacity as National Concessionaire and on behalf of the Republic of Angola;

To:

XYZ, a company incorporated under the laws of _____ (hereinafter referred to as _____);
XYZ, a company incorporated under the laws of _____ (hereinafter referred to as _____);
XYZ, a company incorporated under the laws of _____ (hereinafter referred to as _____);

(jointly referred to as "Entities under Contract").

For the purposes of this Certificate, all capitalized terms used herein shall have the meaning ascribed to them by Presidential Decree No. [__/__], of [__] [__] [__].[12]

RECITALS:

WHEREAS, the National Concessionaire and [_____], in its capacity as Operator, on behalf of the Entities under Contract, are parties to a Contract known as [_____], executed on [__] [__] [__], relating to the exploration and production activities in Block [__] offshore Angola (the "Contract"), approved by [Decree / Decree-Law] [__/__], of [__] [__] [__];

ACKNOWLEDGING THAT, nothing in this Certificate shall be construed as detrimental to the rights, obligations, prerogatives and privileges of the Entities under Contract under the Contract with the National Concessionaire;

WHEREAS,

By reason of the termination of the Contract with the National Concessionaire, the National Concessionaire instructed the Entities under Contract to carry out and complete the works for the Decommissioning of Facilities and the Abandonment of Wells, in the [Development Area / Concession Area] of Block [__], pursuant to the Abandonment Plan approved by the Supervising Ministry;

The National Concessionaire declares, acknowledges and certifies that:

[12] Translator's note: specific reference to PD 91/18 is missing in the Portuguese gazette version.

- The works for the Decommissioning of Facilities and the Abandonment of Wells, described in the approved Abandonment Plan, were successfully carried out by the Entities under Contract and, as the monitoring period by the Entities under Contract lapsed and as the relevant [Inspections / Audits] were carried out, it confirms and accepts the completion of the works for the Decommissioning of Facilities and the Abandonment of Wells, in accordance with the approved Abandonment Plan and the provisions of Presidential Decree No. [__/__], of [__] [__] [__];

- It is aware of their current state, which it fully accepts for all legal purposes.

Pursuant to the above and to the Contract with the National Concessionaire, the National Concessionaire confirms and certifies that:

Pursuant to this instrument, it releases of liability and defends the Entities under Contract for the carrying-out of the works for the Abandonment of Well(s) and Decommissioning of Facilities in the [Development Area / Concession Area] of Block [__], and consequently also releases the [Operator / Entities under Contract], its subsidiaries, branches, affiliates and parent companies, from any and all liability, claim or legal action, and obligation arising out of or in any way related to said activities, and shall defend, hold harmless and reimburse the [Operator / Entities under Contract] in case the following situations occur:

(i) Force majeure;

(ii) Unforeseeable circumstances;

(iii) Damages caused by the sole responsibility of third-party agents.

IN WITNESS WHEREOF, the National Concessionaire issued and delivered this CERTIFICATE OF ABANDONMENT OF FACILITIES AND RELEASE OF LIABILITY OF THE [OPERATOR / ENTITIES UNDER CONTRACT] to [_____], in its own name and in the name of the other members of the Entities under Contract, in Luanda, on [__] [__] [__].

Signed by and on behalf of:

Sociedade Nacional de Combustíveis de Angola, on behalf of the Republic of Angola.

Represented by:

Title:

Signature:

ANNEX 4-B

Form of Certificate of Handover of Well(s), Facilities
And Release of Liability of the [Operator / Entities under Contract]

From:

SOCIEDADE NACIONAL DE COMBUSTÍVEIS DE ANGOLA, EMPRESA PÚBLICA, hereinafter referred to as "National Concessionaire", a company incorporated in Luanda, Republic of Angola, in accordance with Decree 52/76, of 9 June 1976, acting in its capacity as National Concessionaire and on behalf of the Republic of Angola;

To:

XYZ, a company incorporated under the laws of _____ (hereinafter referred to as _____);
XYZ, a company incorporated under the laws of _____ (hereinafter referred to as _____);
XYZ, a company incorporated under the laws of _____ (hereinafter referred to as _____);

(jointly referred to as "Entities under Contract").

For the purposes of this Certificate, all capitalized terms used herein shall have the meaning ascribed to them by Presidential Decree No. [__/__], of [__] [__] [__].[13]

RECITALS:

WHEREAS, the National Concessionaire and [_____], in its capacity as Operator, on behalf of the Entities under Contract, are parties to a Contract known as [_____], executed on [__] [__] [__], relating to the exploration and production activities in Block [__] offshore Angola (the "Contract"), approved by [Decree / Decree-Law] [__/__], of [__] [__] [__];

ACKNOWLEDGING THAT, nothing in this Certificate shall be construed as detrimental to the rights, prerogatives, obligations and privileges of the Entities under Contract under the Contract with the National Concessionaire;

WHEREAS,

[OPTION 1]:

Alternative A: By reason of the termination of the Contract with respect to the [Development Area / Concession Area] of Block [__], the National Concessionaire instructed the Entities under Contract to proceed with the Handover of the Well(s) and Facilities in the [Development Area / Concession Area] of Block [__], which are in production or are capable of producing, in good state of repair and operation, subject to normal wear and tear;

[13] Translator's note: specific reference to PD 91/18 is missing in the Portuguese gazette version.

Alternative B: The National Concessionaire decided to proceed with the Decommissioning of Facilities and the Abandonment of the Wells located in the [Development Area / Concession Area] of Block [__],[directly / through a third party appointed by it];

[OPTION 2]:

The National Concessionaire instructed the Entities under Contract, through the Operator, to carry out the works for the Abandonment of Well(s) and Decommissioning of Facilities in the [Development Area / Concession Area] of Block [__], but the escrow funds deposited into the Abandonment Escrow Account were not made available to the Entities under Contract, thus making it impossible to carry out the works for the Decommissioning of Facilities and the Abandonment of Wells, as provided for in the approved Abandonment Plan;

The National Concessionaire declares and acknowledges that:

[OPTION 1 – Alternative A]:

The Entities under Contract discharged their obligations and responsibilities in accordance with the activities provided for in the schedule agreed upon with the National Concessionaire relating to the Handover of Well(s) and Facilities, pursuant to and for the purposes of this Statute. The National Concessionaire [inspected / requested the audit of] the Well(s) as well as of the Facilities in the [Development Area / Concession Area] of Block [__], and is aware of their current state and fully accepts them for legal purposes.

[OPTION 1 – Alternative B]:

The Entities under Contract discharged their obligations and responsibilities prior to the National Concessionaire's decision to proceed with the Abandonment of Well(s) and Decommissioning of Facilities, [directly / through a third party appointed by it], including the funding of the Escrow Account under the terms of the definitive Abandonment Plan and approved by Presidential Decree [__/__], of [__] [__] [__], it being the National Concessionaire's sole responsibility to execute or cause to be executed the Abandonment Plan, notably by taking charge of all costs and expenses relating to the execution thereof and to the subsequent inspection and audit.

[OPTION 2]:

The escrow funds deposited into the Escrow Account were not made available, thus making it impossible to carry out the works for the Decommissioning of Facilities and the Abandonment of Wells provided for in the Abandonment Plan, and consequently the National Concessionaire assumes full responsibility for conducting the future works for the Abandonment of Well(s) as well as the Decommissioning of the Facilities, thus assuming exclusively the full responsibility for carrying out the works for the Abandonment of Well(s) and the Decommissioning of Facilities, as provided for in the definitive Abandonment Plan approved by Presidential Decree [__/__], of [__] [__] [__].

Pursuant to the above and to the Contract with the National Concessionaire, the National Concessionaire confirms and certifies that:

The assumption by the National Concessionaire of the responsibilities listed in the subparagraphs below shall not extend to claims, demands or requests for compensation for court action or otherwise, if this results from confirmed acts of willful misconduct and/or gross negligence by the Entities under Contract, which occurred prior to the Handover of the Well(s) and Facilities.

It assumes full responsibility, as at this date, for the carrying-out of the works for the Abandonment of Well(s) and Decommissioning of Facilities in the [Development Area / Concession Area] of Block [__], and consequently releases and shall defend the [Operator / Entities under Contract], its subsidiaries, branches, affiliates and parent companies, from any and all liability, claim or legal action, and obligation arising out of or in any way related to the Decommissioning of Facilities and the Abandonment of Well(s) in the [Development Area / Concession Area] of Block [__], to be carried out by the National Concessionaire [directly / through a third party appointed by it], and shall defend, hold harmless and reimburse the [Operator / Entities under Contract].

This instrument shall take effect as from the date on which it is issued, corresponding to the date on which:

[OPTION 1 – Alternative A and Alternative B]: The Entities under Contract hand over to the National Concessionaire the Well(s) and/or Facilities in the [Development Area / Concession Area] of Block [__], in good state of repair and operation, and the National Concessionaire issues the relevant handover certificate;

[OPTION 2]: The Entities under Contract notify the National Concessionaire that it is impossible to proceed with the works for the Decommissioning of Facilities and the Abandonment of Wells, thus transferring to the National Concessionaire the full responsibility to prepare, develop and carry out said works.

In witness whereof, the National Concessionaire issued and delivered this Certificate of Handover of Well(s), Facilities and Release of Liability of the [Operator / Entities under Contract] to [_____], in its own name and in the name of the other members of the Entities under Contract, in Luanda, on [__] [__] [__].

Signed by and on behalf of:

Sociedade Nacional de Combustíveis de Angola, on behalf of the Republic of Angola,

Represented by:

Title:

Signature:

ANNEX 5

Escrow Account Specifications

Clause 1

Escrow Principles

1. The purpose of the Escrow Account is to guarantee that the abandonment funds set aside remain available at all times and dedicated solely to the funding of the abandonment operations. The escrow funds shall not be used for any purpose other than the funding of abandonment costs.

2. The National Concessionaire and the Operators agree that escrow arrangements will complement the Agreements with the National Concessionaire and will be implemented to meet the abandonment funding requirements of these agreements.

3. Upon the selection of the Bank and before the opening of the account, the National Concessionaire shall request the opinion of Banco Nacional de Angola, in its capacity as Foreign Exchange Authority of the Republic of Angola.

4. The funds deposited in the Escrow Account(s) shall be segregated from any other accounts opened by or operated by the National Concessionaire or the Entities under Contract. In addition the funds will be segregated from other entities or third parties which are not a party to an escrow agreement to mitigate the exposure to any third party creditor.

5. The Escrow Account shall be exclusively in US Dollars and will receive funds deposited or transferred by the Operator on behalf of the Entities under Contract.

6. The entity providing escrow services ("Escrow Agent") will be selected by the National Concessionaire and the Entities under Contract on the basis of a competitive evaluation process. The National Concessionaire and the Entities under Contract will jointly determine the criteria for selection of the Escrow Agent to provide escrow services.

7. The Escrow Agent shall have a minimum long term credit rating of at least A (S&P), A2 (Moody's) or A (Fitch) (the "Minimum Requirements").

8. The National Concessionaire and the Entities under Contract may agree to appoint one or more Escrow Agents and allocate the abandonment funds among them, at the sole discretion of the National Concessionaire and the Entities under Contract.

9. The Escrow Account shall be opened in the name of the National Concessionaire. The account will be managed by the Escrow Agent in accordance with the executed Escrow Agreement, which must include dual signatory approval by both the National Concessionaire and the Operator for any release of funds from the Escrow Account, as detailed in Clause 2 of this Annex 5.

10. In the event of change of the Operator, the Escrow Account will be adjusted with the Operator being replaced as a party and a dual signatory by the new operator.

11. In the event of change of the Operator with other entities as co-venture partners in the Agreement with the National Concessionaire, then the Operator's signatory powers shall be transferred to the member of the Entities under Contract with the highest participating interest in the Concession.

12. In the event the National Concessionaire takes responsibility for carrying out the abandonment, the Ministry of Finance shall become the second signatory of the Escrow Account.

13. In the event that the Escrow Agent fails to continue to meet the minimum requirements, the National Concessionaire and the Entities under Contract shall appoint a replacement Escrow Agent, provided that such replacement Escrow Agent meets all the minimum requirements. Funds held in escrow will be transferred to the replacement Escrow Agent that meets the minimum requirements.

14. Each individual Development Area or Concession Area will maintain a separate Escrow Account. However, the National Concessionaire and the Entities under Contract may agree to combine Development Areas into one Escrow Account if the Escrow Agent is able to separate the funds allocated to each Development Area for reporting purposes.

15. The interest, capital gains or return on investment shall be accounted for as part of the abandonment fund, and all amounts will be deposited in the applicable Escrow Account.

16. When calculating abandonment funding obligations, the reserves basis will be 2P [Proved and Probable] up to the end of the concession period.

17. For the avoidance of doubt, neither the balance of the Escrow Account nor any investment made with the abandonment funds shall be used to serve a guarantee or any other type of security by any party, and shall at all times remain free from any liens and/or encumbrances. Any party that violates this requirement shall indemnify the remaining parties against any third-party claims brought against the balance of the Escrow Account.

Clause 2

Release of Funds

1. The National Concessionaire and the Entities under Contract will jointly release funds from the Escrow Account. The release of funds will occur in the following circumstances:

   (a) Partial Abandonment by Operator

Where the National Concessionaire and the Entities under Contract agree it is necessary to abandon wells and/or decommission Facilities, in a Development Area or Concession Area during the exploration or production period ("Partial Abandonment"), the Entities under Contract will be able to seek release of funds from the Escrow Account to fund those abandonment activities.

(b) Definitive Abandonment by Operator

Where the National Concessionaire requests the Operator to conduct the abandonment of the facilities and wells, the escrow fund will be progressively released in a timely manner from the Escrow Account to the Operator when implementing the actual abandonment of the facilities.

(c) Continued Operations or Abandonment by National Concessionaire

Where the National Concessionaire requests the Entities under Contract to hand-over ownership of the facilities and/or wells, or where the National Concessionaire decides to conduct the abandonment of the wells and the decommissioning of the facilities itself, the abandonment fund will be released to the National Concessionaire subject to the Entities under Contract receiving a Certificate of Release of Liability from the National Concessionaire against any future liability.

2. The National Concessionaire and the Entities under Contract agree that, in all other cases, the Escrow Account scheme shall only be terminated upon the satisfactory completion of the actual Abandonment operations, regardless of the party in charge of the implementation of such abandonment operations.

Clause 3
Investment Principles

1. The National Concessionaire and the Entities under Contract may jointly elect to have the abandonment funds invested in securities that meet specific financial and other criteria. If the National Concessionaire and the Entities under Contract elect to pursue this option, the following Investment Principles will apply during the execution and implementation of this investment strategy:

(a) Investment decisions will be made jointly by representatives of the National Concessionaire, the Entities under Contract and the Ministry of Finance;

(b) The selected Investment Manager shall invest the funds in one or more collective fixed income fund(s) (the "Collective Funds");

(c) Each of the Collective Funds shall include government, government-sponsored, or corporate fixed income securities, with a rating of at least "AA-" by Standard & Poor's or at least "Aa3" by Moody's Investor Services or at least "AA-" by Fitch;

(d) The securities held by each of the Collective Funds shall be denominated in United States Dollars;

(e) Collective Funds shall not allow for speculation on currency values;

(f) The credit rating of each of the Collective Funds, based on the average of the underlying security ratings, must be at least AA-/Aa3 by two of the three major rating agencies (Moody's, S&P and Fitch). All individual securities within the Collective Funds must be investment grade securities with a minimum long-term rating of Baa3/BBB- or a minimum short-term rating of A-1/PA/F-1, by two of the three major rating agencies (Moody's, S&P and Fitch) at time of purchase;

(g) All gains from the investment strategy will be re-invested in the Escrow Account;

(h) The target duration of the Collective Funds shall be determined with an objective of ensuring funds are available to National Concessionaire or the Entities under Contract from the Escrow Account as and when needed;

(i) Derivatives use is strictly prohibited.

2. With a view to contributing to the development of the Angolan economy, investments in Angolan sovereign debt below the credit rating required by Clause 3.1(f) of this Annex 5 shall be contemplated, appropriate to invest between 5% and 15% in Angolan sovereign debt denominated in American Dollars or Euros, provided that improvements shall be implemented to mitigate the risk inherent thereto, such as appropriate financial principles, guidelines and mechanisms. The financial principles, guidelines and mechanisms, and the improvements shall as minimum comply with the following criteria:

(a) Define principles ensuring the availability of funds to comply with the abandonment obligations when necessary;

(b) Define mechanisms for the repayment of the funds invested in Angolan sovereign debt, as well as their respective guarantees;

(c) Determine principles defining the limits of the aggregate investment in Angolan sovereign debt.

3. For the purposes of the preceding paragraphs of this Clause 3, a multi-sector Work Group shall be created, comprising representatives of the Ministry of Finance, the Ministry of Mineral Resources and Petroleum, the National Bank of Angola, the National Concessionaire and the Entities under Contract, to evaluate and define appropriate financial principles, guidelines and mechanisms.

4. Pursuant to the preceding paragraph, the Work Group shall be created within sixty (60) days of the publication of this Statute.

The President of the Republic, JOÃO MANUEL GONÇALVES LOURENÇO.