GUIDELINES FOR THE DESIGN, CONSTRUCTION AND OPERATION OF OIL AND GAS PRODUCTION FACILITIES IN NIGERIA

ISSUED BY

NIGERIAN UPSTREAM PETROLEUM REGULATORY COMMISSION

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Contents

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to describe the procedure for the design, construction, installation, pre-commissioning, commissioning, operation and maintenance of oil and gas production facilities in the Nigerian Upstream Petroleum Industry. It provides the baseline and minimum requirements for the safe design, construction, installation and operation of oil and gas production facilities to ensure the risk associated with the facility is minimised to as low as reasonably practicable.

These Guidelines are made pursuant to **Sections 7(e)** and **10(f)** of the Petroleum Industry Act 2021 and other applicable Laws and Regulations governing the Upstream Petroleum Industry in Nigeria. It provides the requirements for the necessary approval stages for licenses to establish, construct and operate upstream oil and gas facilities.

1.2 Scope

These Guidelines are applicable to the design, construction, modification, installation, operations and maintenance of manned and unmanned upstream oil and gas production facilities, including FPSOs, production platforms, drilling/wellhead platforms, Early Production Facilities (EPF), Integrated facilities, Produced Gas Flare Elimination facilities, etc, deployed in hydrocarbon handling, treatment, material handling and operational support facilities, living quarters etc.

1.3 Definition of Terms

i. Oil and Gas Production Facility

Refers to the facilities used for the production, stabilization, treatment, storage and export of oil and gas from within or in connection with a field. It includes facilities used for:

a. Oil and Gas Production, Handling and Treatment
b. Materials Handling and other Operational Support Services
c. Living Quarters (accommodation marine vessels, etc.)
d. A combination of any of the functions in (a-c) that includes flow stations, fixed and floating production platforms, FPSO, FSO, Well Head Platform (WHP), Well Injection Platform (WIP), EPFs, etc.

ii. Modification of Facility

This refers to a change/modification to an existing facility that causes a deviation from the As-Built drawings or replacement of any major/critical equipment. Modification includes upgrade, process changes requiring the introduction and/or removal of equipment, change in sizing of equipment/piping, de-bottlenecking and life extension works of facilities.

iii. Integrated Facility

This refers to the combination of facilities interlinked by operations and/or shared utilities, component(s) of which may include midstream facility(ies). The facilities may be covered by a single Field Development Plan.

iv. Early Production Facility

This refers to an integrated, modularised, temporary processing facility to fast-track production of oil and gas, mainly for test purposes.

v. Gas Flare Elimination Facility

This refers to facilities that are designed to take gas flare and process into commercial variable including third-party facilities that are incorporated into existing facilities to take and process flare gas.

2 APPLICATION PROCEDURE FOR REGULATORY APPROVALS AND CONSENTS FOR OIL AND GAS PRODUCTION FACILITIES

2.1 Application Overview

A licensee/Operator wishing to design, construct and commission any facility within or in connection with its field or lease shall:

i. Apply in writing to the Commission Chief Executive, with highlights of the proposed concept, together with documents contained in **Section 2.2**.
ii. Pay the applicable processing fees.
iii. Satisfy the requirements stipulated by the Commission and obtain the required approvals and consents contained in the following stages:
    a. Concept Design Approval (CDA)
    b. Front End Engineering Design (FEED) Approval
    c. Detailed Engineering Design (DED) Approval
    d. Commissioning / Introduction of Hydrocarbon Approval
    e. Permit to Operate

2.1.1 Other Conditions Governing the Design, Construction and Commissioning of Oil and Gas Facilities

i. The Commission shall attach officer(s) on the project in line with **Section 2.9** of these Guidelines.
ii. Subject Matter Experts from the Commission shall participate in all technical studies and milestone activities related to the project. For this purpose, a minimum of four (4) weeks' notice shall be given to the Commission to nominate personnel. Arrangements shall be made for the participation of the Commission's Officers at these reviews, and all relevant review documents shall be submitted to the Commission for in-house review prior to the commencement of the activity.
iii. The Operator shall comply with the minimum considerations stipulated for design, construction and installation (**see Section 3**) to qualify for approvals and permit for all stages. Any proposal to deviate from stated minimum considerations shall require technical justification made to the Commission.
iv. Companies shall comply with the minimum requirements stipulated for operations of facility.

2.1.2 Validity and Revalidation of Milestone Approvals

A validity period shall be attached to all milestone approvals issued pursuant to this Guidelines. The validity of milestone approvals shall depend on the size and complexity of the facility development/modification project as well as the proposed execution timelines for the project. In the event that the validity period of a milestone approval expires prior to the commencement of the subsequent phase of the project, the Operator shall be required to seek revalidation by submitting a formal application to the Chief Executive of the Commission, accompanied by all requisite documentation for the specified milestone approval (see **Section 6** for Revalidation Fees).

2.2 Process for Conceptual Design Approval Application

2.2.1 Concept Selection/Evaluation Studies

As part of the requirements for FDP approval, nominated officers of the Commission shall participate in the Concept Evaluation Studies, the outcome of which shall form part of the Concept Evaluation Report. The report shall be used to demonstrate the optimal facility development strategy for a field.

2.2.2 Concept Management Review Workshop

As an integral component of the Conceptual Design Approval application process, the Operator is required to arrange a Concept Management Review Workshop, in accordance with the following stipulations:

i. This shall involve the presentation and review of the concept selection process which was approved as part of the FDP approval.
ii. The officials of both the Operator and Commission at the workshop shall be of management cadre and empowered to take decision on behalf of their organization regarding the facility development project.
iii. The details of the technical and commercial aspect of the facility development project shall be presented.
iv. Where there are changes to the concept approved in the FDP, clear justification shall be made and presented to the Commission.
v. All the concept selection studies carried out during the FDP shall be reviewed and FDP addendum approval secured where there are changes.

2.2.2.1 Concept Management Workshop for Facility Modification Projects

Where the project involves the modification / upgrade / debottlenecking of existing facility, the Operator may be required to organize a Concept Management Review Workshop all the considered concepts and justification for the project shall be presented.

2.2.3 Submission of Application Package for Concept Design Approval

To apply for Conceptual Design Approval, the Operator/licensee is required to submit the following:

i. Evidence of payment of applicable fee (**see Section 6**)
ii. A copy of Field Development Plan (FDP) approval
iii. A copy of Environmental Screening Report approval (refer to applicable Regulation or Guidelines on Environment)
iv. Concept Evaluation Report containing the following details:
    a. Technical details of options and alternatives considered.
    b. Analysis of options and alternatives based on acceptable metrics such as Economics, Safety, Environment, Technology, Local Content, Constructability, etc.
    c. Technical Assumptions, Constraints, and Risk Analysis.
v. Preliminary, high-level layout of the selected concept showing the location of key components within the field (e.g., Well Head Platform, Manifold Location, Production Platform, Flowlines, Evacuation lines and Pipelines, Storage and/or Shuttle Vessel, etc.)
vi. Simplified Process Flow Diagrams and General Equipment Layout
vii. Project Charter (Justifications and scope of the project, Project timelines, Project organisations, Budget estimates / cost breakdown, Funding – with full details of Project Economics, Assumptions, Constraints, and Risks – refer to **Section 3.1.1**)
viii. Site Suitability Report
ix. Concept Management Review Workshop Report endorsed by the Commission.
x. All other information and drawings which provides relevant information regarding the overall intent of the facility and work-scope of the project.

2.2.4 Issuance of Conceptual Design Approval

The Operator shall be issued Conceptual Design Approval if it submits the required documents listed in **Section 2.2.3** and if, following its review, the submission:

i. adequately defines the project scope and its boundaries;
ii. demonstrates that optimal production and evacuation strategy have been adopted from among alternatives – Economics & Financials, HSE, Technology, etc.; and
iii. confirms that the selected concept aligns with all regulatory philosophies such as for flare elimination, production accounting, etc.

This approval will form the basis for the development of FEED. Please note that alterations to any concept technology adopted in the course of the Concept Design Application process must be communicated to the Commission in writing and a revalidated Conceptual Design Approval may be issued by the Commission provided that the new technology meets technical, cost and other requirements.

2.3 Process for Front End Engineering Design (FEED) Application

2.3.1 Notification of FEED Commencement

Following the receipt of Conceptual Design Approval, the Operator shall notify the Commission of the intention to commence FEED for a project at least four (4) weeks before commencement, and request for the Commission's Project officers who shall be attached to the project. The Commission shall nominate officers as applicable (**see Section 2.9**).

2.3.2 Permits, Consents & Approvals Workshop

Following the issuance of Conceptual Design Approval and nomination of the Commission's project officers, a Permits, Consents & Approvals workshop shall be carried out with all the relevant stakeholders (within the Commission and Operator's team). The objectives are as follows:

i. Development of a Permits, Consents & Approvals (PCA) Register which is specific for a project which shall be applicable for the full duration of the project up to Commissioning and PTO for upgrade and new projects respectively.

ii. Determine the specific approval gates, Permits/Licenses which will govern the project and responsible persons or parties.

iii. Delineate Project scope as may be applicable.

iv. Determine and outline the Engineering and Technical Studies that shall be carried out during the project.

The developed PCA Register shall be endorsed by officer(s) of the Commission and the Operator.

2.3.3 Engineering and Technical Studies at FEED Phase

During FEED, the Operator shall:

i. Undertake various studies, develop the project design basis, and carry out basic engineering with a view to identifying technical issues that may arise during detailed engineering, as well as estimate cost of the project.

ii. Ensure that all FEED Engineering and Technical Studies as well as milestone activities are carried out with the participation of the project officers nominated by the Commission.

iii. At the minimum, comply with the design considerations stipulated in **Section 3**.

iv. Inform the Commission for nomination of personnel to participate in Engineering and Technical studies at least four (4) weeks before such studies are due to take place, giving information on the location and scope of the studies. The studies may include but not limited to the following:

   a. Quantitative Risk Assessment Review
   b. Coarse HAZID and HAZOP
   c. Project Specification Review
   d. Other relevant Engineering and Technical studies or project milestone review

The above studies may be carried out separately or concurrently in integrated studies/workshops.

2.3.4 Environmental Studies at FEED Phase

The following shall apply:

i. In compliance with applicable Regulation and Guidelines for Environmental Management issued by the Commission, at FEED stage, the Operator is

expected to produce the ESR and PIAR of the project on the environment to obtain approval from the Commission.

ii. The ESR and PIAR shall be the basis for generation of Terms of Reference for the EMP which shall also be approved by the Commission.

iii. The PIAR approval from the Commission shall be submitted alongside the FEED application.

2.3.5 Procurement Activities at FEED Phase

All procurement activities during FEED shall comply with the considerations listed in **Sections 2.5.3 through 2.5.5**.

2.3.6 Submission of Application Package for FEED Approval

Upon satisfactory completion of the FEED phase, the Operator is eligible to apply for FEED Approval by submitting the following documentation:

i. Evidence of payment of applicable fee (**see Section 6**)

ii. Copy of Conceptual Design Approval (or Concept Evaluation Report if submitting a combined Concept Design Application and FEED Application)

iii. Copy of Preliminary Impact Assessment Report (PIAR) Approval issued by the Commission.

iv. Copy of Greenhouse Gas Management Plan (GHGMP) Approval issued by the Commission.

v. Permits, Consents & Approvals (PCA) Register endorsed by the officer(s) of the Commission.

vi. Project Quality Plans

vii. Technology Adaptation Plan (where new technology is to be deployed)

viii. Nameplate of facility/project containing the following:

   a. Hydrocarbon Feed volume rates as applicable in (bopd, mmscfd etc).
   b. Configuration of the plant/facility
   c. Product volume rates as applicable in (bopd, mmscfd, Million Tonnes Per Annum (Million TPA), Metric Tonnes Per Day (MTPD), etc)

ix. FEED documentations containing, at the minimum, the following:

   a. Basis for Design
   b. Material Balance
   c. Project Specifications including all codes and standards

d. Total facility with its configuration and dimensions sufficiently detailed for an accurate definition of the project scope
e. Simplified process flow diagrams
f. Preliminary Layout of facilities and the interconnecting pipelines with their capacities, and location of main valves
g. General equipment layout, simple process, mechanical flow diagrams and electrical single line diagrams
h. Metering manifold and its ancillary facilities with throughput capacities indicated.
i. Functional specifications
j. Sketches of the structural drawings.
k. Foundation parameters (for the mooring system, for example) and all design load considerations shall be incorporated in the form of a document annex.
l. Decommissioning Philosophy
m. All other drawings considered relevant for the review of the application shall also be submitted.

x. FEED Engineering and Technical Studies Reports – HAZOP, HAZID, Design Review, Constructability Review, etc.
xi. FEED cost breakdown and performance (planned versus actual)
xii. Contracting Strategy – Report and name of contractors being considered for contract award for DED phase if known.
xiii. Project Technical & Commercial Feasibility Report
xiv. List of all Procured Equipment or Systems/Packages including the technical specifications and cost elements (If applicable)

Note: If submitting a combined Concept Design Application and FEED Application i.e. Application for CDA/FEED, the Operator will be required to pay the applicable fees for both CDA and FEED. The submission must ensure that the requirements for both CDA and FEED are met.

2.3.7 Issuance of FEED Approval

The Operator shall be issued FEED Approval if it submits the required documents listed in **Section 2.3.6** and if, following its review, the submission:

i. defines the technical and project specific requirements and provides the baseline for Detailed Engineering Design;

ii. confirms that the Engineering design aligns with all regulatory requirements and philosophies such as for flare elimination, production accounting, etc.; and

iii. confirms that the preliminary budget along with its cost parameters for the project have been clearly stated.

The review process for FEED approval may necessitate additional submissions by the Operator or entail further workshops. The approval shall form the basis for the development of Detailed Engineering for the project.

2.4 Process for Detailed Engineering Design (DED) Application

2.4.1 Commencement of DED

i. Following the receipt of FEED Approval, the Operator is required to promptly notify the Commission's designated project officers of the intent to initiate DED in order to facilitate and ensure their project monitoring.

ii. After providing notification to commence DED, the Operator shall initiate activities and studies for the detailed engineering phase, with the participation of the Commission's designated project officer(s).

iii. This phase of the project shall involve the development of the detailed engineering data to an implementable level necessary for Procurement, Fabrication, Installation and Commissioning of the facility.

iv. The drawings, calculation notes, etc. shall form the basis of consideration for the detailed designs before fabrication.

v. All engineering (design work) activities are to be carried out in line with the minimum considerations and requirements stipulated in **Section 3** and **Sections 4 & 5** for Operations and HSE respectively as applicable and internationally recognised standards.

2.4.2 Engineering and Technical Studies at Detailed Engineering

Regarding Engineering and Technical Studies conducted during the DED phase, the following provisions shall be observed:

i. The Operator shall inform the Commission for nomination of personnel for participation. The Operator shall notify the Commission, at least four (4) weeks before such studies are due to take place, giving information on the location and scope of the studies.

ii. The milestone Engineering and technical studies to be carried out at Detailed engineering stage include, but is not limited to the following:

   a. Detailed HAZOP, SAFOPS, IPF and SIL classification and/or HAZAN reviews
   b. Criticality Ranking of Major Equipment
   c. Model reviews (30%, 60% and 90% as applicable) and the subsequent data interpretation
   d. Other relevant Engineering and technical reviews.

The above studies may be carried out separately or concurrently in integrated studies/workshops.

2.4.3 Environmental Study for Detailed Design Approval

The draft EMP approval shall be obtained from the Commission prior to issuance of DED approval. Any modification to the DED shall require a revalidation of the EMP approval.

2.4.4 Procurement Activities at DED

All procurement activities during DED shall comply with the considerations listed in **Sections 2.5.3 through 2.5.5**.

2.4.5 Submission of Application Package for DED Approval

Upon satisfactory completion of the DED phase, the Operator is eligible to apply for DED Approval by submitting the following documentation:

i. Evidence of payment of applicable fee (**see Section 6**)

ii. Draft Environmental Management Plan (EMP) Approval issued by the Commission.

iii. Design Dossier/Package containing, at the minimum, following:
   a. Details of design criteria in line with these Guidelines as applicable
   b. General facility layout diagram
   c. Safety Equipment Layout diagram
   d. Process Flow Diagrams (PFD) showing the detailed Material Balance and reservoir fluid chemical composition
   e. Electrical one-line diagram
   f. Approved for Construction (AFC) Piping & Instrumentation Diagram (P&ID) drawings
   g. Calculation Notes
   h. Process Hydraulic and Surge Analysis
   i. SAFE Charts / Cause and effect diagram

iv. DED Engineering and Technical Studies Reports – HAZOP, HAZID, SAFOP Design Review, Constructability Review, etc.

v. DED cost breakdown and performance (planned versus actual)

vi. List of all Procured Equipment or Systems/Packages including the technical specifications and cost elements (If applicable)

vii. Contracting & Monitoring Strategy containing the following if known:
   a. List of companies being considered for the fabrication and installation activities in Nigeria with copies of companies' valid Oil and Gas Industry Service Permits (OGISP).
   b. Safety track record of the proposed fabrication company(ies) on similar jobs carried out in Nigeria.
   c. Curriculum Vitae (CV) of the principal personnel of the proposed Inspection Company.
   d. Quality Control and Quality Assurance plans of the Fabrication / Construction Company.
   e. Third party Technical Integrity Verification plan/schedule covering critical equipment.
   f. The yards in which the facility or its components would be fabricated / constructed or manufactured.
   g. The arrangements made for the statutory monitoring of the various stages of the fabrication by the Commission's project Officer(s).

viii. For FPSO/FSO and other offshore/swamp facilities as applicable, the additional requirements are as follows:

a. Document showing the coordinates of the proposed geographic location of the facility, FPSO / FSO as applicable to enable the Commission to obtain appropriate clearance from the relevant Government Agencies.

b. Evidence of application for Terminal Establishment Order.

2.4.6 Issuance of Detailed Design Approval

The Operator shall be issued DED Approval if it submits the required documents listed in **Section 2.4.5** and if, following its review, the submission:

i. confirms that all identified risks for the facility/project have been eliminated or mitigated to as low as reasonably practicable;

ii. confirms that the Engineering design and specifications for equipment procurement, fabrication, construction, and installation is adequate and completed; and

iii. confirms that the Engineering design aligns with all regulatory requirements and philosophies such as for flare elimination, production accounting, etc.

The review process for DED approval may necessitate additional submissions by the Operator or entail further workshops. The approval shall form the basis for the Construction, Fabrication, and Installation activities for the project.

2.5 Process for Pre-Commissioning and Commissioning / Introduction of Hydrocarbon Approval

2.5.1 Commencement of Construction/Fabrication/Installation Activities

Following the receipt of DED Approval, the Operator is required to promptly notify the Commission's designated project officers of the intent to initiate Construction/Fabrication or installation activities in order to facilitate and ensure their project monitoring.

2.5.2 Construction/Fabrication/Procurement/Installation Activities

This phase of the project involves predominantly the physical coupling and welding of structural, process piping systems, supports and equipment. It includes the stages of preparation of fabrication drawings, yard fabrication, transportation to location

and erection. The Company to be selected to carry out fabrication and installation of any facility shall duly possess relevant OGISP as stipulated in the (Petroleum Drilling and Production) Amendment Regulation, 1988. All fabrication and construction shall generally conform with the requirements listed in **Section 3.15**.

2.5.3 Completion of Fabrication

The approved inspection method shall be as defined in the Quality Management Plan (QA/QC) or other internationally accepted methods approved by the Commission Chief Executive. At the completion of fabrication, the quality control inspection company shall compile a report confirming that:

i. All materials used were strictly in accordance with approved specifications as verified through steel mill certificate.
ii. All the processes of fabrication were in accordance with the approved standards and codes of practice.
iii. The report shall also include all equipment functional tests carried out in the yard and the associated test results.

2.5.4 Factory Acceptance Test (FAT)

i. In line with applicable Regulation and Guidelines for Petroleum Operations (Safety) issued by the Commission, FAT and Site Acceptance Test and Site Integration Test shall be performed for all fabricated and/or procured Critical Equipment and Long Lead Items (LLIs) in the presence of nominated officers of the Commission. Consequently, the Operator (or EPC vendor/contractor as applicable) shall make available to the Commission, the Inspection and Test Plan for such tests.
ii. The Operator shall ensure that FAT/Pre-shipment Inspection for Critical Equipment and LLIs procured and owned by EPC vendors/contractors had been performed as stated in (i) above prior to the equipment being leased or integrated into a facility.
iii. The Commission shall direct, where it considers necessary, the appointment of Independent Verifications Agents appointed by the applicant for the conduct of inspections pursuant to these Guidelines. The qualifications and role of such Independent agents, which cost shall be borne by the applicant, shall be as provided in Guidelines or directives issued by the Commission from time to time.

iv. Under extraordinary circumstances, the Commission Chief Executive may grant approval for a Virtual FAT in accordance with the Guidelines established by the Commission for this specific purpose.

2.5.5 Installation and Erection

This comprises the processes of load out to location, transportation, and site erection. The following shall apply:

i. The methods and procedures to be used in carrying out these operations shall be in accordance with internationally recognised standards such as API RP 2A, etc. The officers of the Commission shall witness the exercise as applicable.

ii. The installation and mooring of facilities shall be in accordance with marine classification standards and codes. All floating facilities shall be class certified by the appropriate class registers.

2.5.6 Pre-Commissioning Activities

The following shall apply towards the end of construction and installation activities during pre-commissioning:

i. The Commission shall be formally notified of the approximate date of completion of erection/installation for the commencement of pre-commissioning activities.

ii. The Operator shall ensure the participation of nominated officers from the Commission in the exercise.

iii. Pre-commissioning consist of those activities undertaken after mechanical completion, that could involve the introduction of fluids into systems, but not hydrocarbons. Pre-commissioning activities shall be documented on check sheets and managed to ensure that asset integrity can be verified and demonstrated.

iv. Depending on the scope of project, Notification for Pre-commissioning and application for Commissioning / Introduction of Hydrocarbons Approval may be lodged in concurrently or separately.

2.5.7 Calibration of Storage Tanks

Any constructed or refurbished storage tank (for Crude Oil, LPG, LNG, etc.) either carried out as stand-alone project or part of a production facility development

project, shall be calibrated in line with the *Procedure Guide for the Determination of the Quantity and Quality of Petroleum and Petroleum Products in Nigeria* before it is commissioned for use.

2.5.8 Pre-Start Up Safety Audit (PSUA) / Pre-Start Up Safety Review (PSSR)

Prior to the commencement of Commissioning and activities involving the introduction of hydrocarbon, PSUA shall be carried out by the Operator in the presence of the Commission's nominated project officers, the outcome of which shall be a PSUA report endorsed by the Operator and forwarded to the Commission. Thereafter, nominated SMEs from the Commission shall carry out PSSR taking into consideration the PSUA report. The objectives of the PSUA/PSSR are as follows:

i. Review documentation and equipment/system of a facility to ascertain its completion and readiness for safe operation.
ii. Review Mechanical Completion reports and certificates for all systems and sub-systems (mechanical, rotating, electrical, piping, instrumentations, communication, and HVAC).
iii. Identify Punch list items criticality to start-up of operations, timelines, and commitment for close out.
iv. Conduct facility inspections and function test of equipment as applicable.
v. To demonstrate that newly constructed, installed or modified facilities are able to perform in accordance with specified requirements.
vi. Confirm that the construction of equipment and processes are in accordance with design specifications.
vii. Ensure that adequate safety, operating, maintenance, and emergency procedures are in place for operations, including the Operations Safety Case.
viii. Ensure that training has been completed for all workers who may affect or be part of the process.
ix. To confirm that people, procedures, and systems are in place to ensure timely delivery, commissioning, and handover of infrastructure or projects.

2.5.9 Submission of Application Package for Commissioning / Introduction of Hydrocarbon Approval

After satisfactorily completing either or all of construction, fabrication, procurement, installation activities as applicable and prior to Commissioning and Introduction of Hydrocarbon into the system, the Operator shall be eligible to apply for Commissioning / Introduction of Hydrocarbon Approval by submitting the following:

i. Evidence of payment of applicable fee (**see Section 6**)
ii. Copy of Operations Safety Case Approval issued by the Commission
iii. Copy of Final EMP Approval issued by the Commission
iv. Copy of Temporary Permit to Flare issued by the Commission
v. Copy of Tank Calibration Chart Approval issued by the Commission (if applicable)
vi. Pre-commissioning and (Cold) Commissioning reports and certificates for all systems and sub-systems (including FAT reports for critical equipment endorsed by the Operator and Officers of the Commission)
vii. Mechanical completion, pre commissioning and commissioning Punch Lists (Punch List A, B and C) and their close out action/status.
viii. Operations Readiness Report (ORR) which includes Start-Up sequence and Ramp-up schedule (covering planned plant stability, performance test, reliability test, etc.)
ix. Status update on Project Action Tracking Register
x. Procurement/Construction/Installation cost breakdown and performance (planned versus actual)
xi. For FPSO/FSO and other offshore/swamp facilities as applicable, the additional requirements are as follows:
    a. Proof of Vessel flag and specification which shall comply with Ports Acts and Nigerian Maritime Safety Authority / Nigerian Ports Authority Regulation.
    b. Proof of vessel classification by one of the internationally recognised classification societies to provide third-party technical verification of plants, installation, and commissioning of various components to ascertain its integrity and sea worthiness.
xii. Pre-Start Up Safety Audit (PSUA) Report endorsed by the Operator. Note that Pre-Startup Safety Review (PSSR) to be conducted by nominated SMEs of the

Commission shall apply following the submission of the PSUA as stated in **Section 2.5.8**.

2.5.10 Issuance of Commissioning / Introduction of Hydrocarbon Approval

The Operator shall be issued Commissioning / Introduction of Hydrocarbon Approval if it submits the required documents listed in **Section 2.5.9** and if, following its review, the submission:

i. confirms that the construction and or installation activities carried out meets the design requirements and its intended objectives;
ii. confirms that construction and or installation activities have been completed or have reached an advanced stage and is ready for start-up or hydrocarbon to be introduced into the system; and
iii. confirms that adequate pre-start up safety checks have been conducted for the facility/project.

The review process for Commissioning / Introduction of Hydrocarbon Approval may necessitate additional submissions by the Operator or entail further inspection and verification exercise.

2.6 Process for Permit to Operate (PTO) Application

2.6.1 Cold Commissioning

The Operator may continue with Commissioning activities without introducing well stream / service fluids into systems/sub-systems as part of process for final inspection and functional test of the platform equipment and instruments, and other pre-commissioning tests and verifications carried out on the platform structures and its ancillary facilities and close out of punch list items.

2.6.2 Hot Commissioning

This involves introducing hydrocarbon into a facility (or system/sub-system) to commission (initial start-up) or pre-commission (after facility modification). This stage of commissioning using hydrocarbon (Hot Commissioning) will continue until the facility is fully commissioned, process stability is achieved, and safe, normal operation is guaranteed.

2.6.3 Performance Acceptance Test

This is a 72-hour Performance Test that is carried out on a facility wherein the production is ramped up to a level (based on performance acceptance criteria set by the Commission) and maintained at this level for 72 hours. The test shall be witnessed by nominated Officers of the Commission.

2.6.4 Reliability Test (Maximum Continuous Rating Test)

This is the test carried out on a facility wherein the facility is made to run non-stop at a stable production level to ascertain that it can be reliably and safely operated. The test shall be carried out for a reasonable amount of time. Stability, Operability, Reliability, Availability and Safety are the hallmarks of this test. The test shall be witnessed by nominated Officers of the Commission.

2.6.5 Submission of Application Package for Permit to Operate

Following the Commissioning / Introduction of Hydrocarbon into a facility and at the end of successful Performance and Reliability tests, the Operator shall be eligible to apply for a Permit to Operate the facility by submitting the following documentation:

i. Evidence of payment of applicable fee (**see Section 6**)
ii. Report of **72 hours Performance Test** for the facility
iii. Report of **Reliability Test** for the facility
iv. Management of Change Logs and Report showing details of all the changes to the AFC drawings as compared with field modifications arising from Mechanical Completion, Pre-Commissioning and Commissioning
v. As-Built Drawings (P&IDs, isometrics, etc)
vi. Plant Operating Manual
vii. Process Safety Management System Plan
viii. Inspection and Maintenance Strategy
ix. Obsolescence Management Strategy (OMS) for the facility
x. Emergency Response Plan
xi. Status of PSUA / PSSR action items
xii. List of all Codes, Standards and Specifications used to deliver the facility.
xiii. End of Project Report including project cost breakdown and performance (planned versus actual), Technical Activities Conducted (planned versus actual), Lessons Learnt, etc.

xiv. Copies of all applicable approvals, permits or consents obtained in the delivery of the project including:

a. Field Development Plan (FDP) Approval
b. Final Environmental Management Plan (EMP) Approval
c. Conceptual Design Approval (CDA)
d. Front End Engineering Design (FEED) Approval
e. Detailed Engineering Design (DED) Approval
f. Point Source Registration Permit (Refer to the applicable Regulations and Guidelines on Environmental Management issued by the Commission)
g. Operational Permit for Waste (sewage, produced/oily water, solid waste) Treatment Plant
h. Fiscal Metering / LACT Unit Approval (Refer to the *Procedure Guide for the Determination of the Quantity and Quality of Petroleum and Petroleum Products in Nigeria*)
i. Storage (Crude Oil, LPG, LNG, etc.) Tank Calibration Chart Approval (Refer to the *Procedure Guide for the Determination of the Quantity and Quality of Petroleum and Petroleum Products in Nigeria*)
j. Terminal Establishment Order

Note: The reports of (ii) and (iii) shall include details of production, trends of process parameters, process upset, ramp down and ramp up, shutdown and re-start, etc. and their time logs.

2.6.6 *Issuance of Permit to Operate*

The Operator shall be issued Permit to Operate if it submits the required documents listed in **section 2.6.5** and if, following its review, the submission:

i. confirms that all necessary performance and reliability tests after start-up / commissioning have been carried and that the outcome is satisfactory; and
ii. confirms that all outstanding action items raised during the pre-start up activities have been closed out.

2.7 Removal, Relocation and Decommissioning of Facility

The following shall apply:

i. In the event of a planned removal, relocation and decommissioning of a facility (or part of a facility) temporarily or permanently, the Operator shall submit a detailed technical justification (including plans for handling of crude production, storage, and export, where applicable) for review and approval of the Commission.

ii. If the removal of the facility is because of end-of-life or field abandonment, it shall be carried out in line with good oil field practice and applicable Regulation and Guidelines on Decommissioning and Abandonment issued by the Commission.

2.8 Quarterly Management Review (QMR) Meetings

The Operator shall initiate Quarterly Management Review meetings from the commencement of FEED until the end of the project, for milestone/regular update of the Commission's Management on the progress of the project. It shall provide a platform for the following:

i. Making high-level presentation to the Commission's Management on the progress of the project including contributions and level of involvement from the attached Officers of the Commission.

ii. Present challenges requiring high level resolution and management interventions, that may affect project timelines to facilitate approvals.

iii. Resolve other matters that may arise.

Note: QMR may be organized by an Operator for one (1) or multiple projects concurrently.

2.9 Responsibilities of the Commission's Project Nominee(s)

The following conditions shall apply, at the minimum, regarding officers nominated as Project Officers by the Commission:

i. The officers of the Commission nominated for a project shall be considered as part and parcel of the Project Management Team. Therefore, the Operator shall ensure that the nominee(s) are actively involved and abreast of all activities in the delivery of the project.

ii. Documents to be transmitted to the Commission for approval shall be issued to the Commission's nominated project officers for review and comments.

iii. The responsibilities and deliverables on the Commission's Project nominees include but not limited to the following:

a. Participation in the development of project deliverable as applicable. Review and monitor the various elements of project phases and related work activities.

b. Submission of independent periodic report to the Commission on the status of activities, areas of deviations from either statutory requirements or industry best practices and follow up on instructions as may be issued by the Commission.

c. Liaise with resident project manager/project team to provide guidance towards the development/implementation of an effective statutory compliance.

d. Monitor the development of the facility design philosophy, project work-scope for consistency with all statutory requirements, approved codes, and standards. Assess and validate the implementation of the codes, and standards in line with the technical specifications for the execution of the facility development project.

e. The Nominees shall participate in all project activities including the monitoring of fabrication, manufacturing, and procurement and installation of all equipment.

f. Attend all technical meetings/reviews and participate in all Technical, Safety, and Engineering Studies for the project while monitoring the implementation of decision taken at such meetings/reviews/studies.

g. Carry out regular and/or joint inspection activities at the fabrication yards/manufacturer's workshop to ensure appropriate quality control/quality assurances are followed in the integration of components and equipment.

h. Review procedures for installation, hook-up, and commissioning to monitor compliance as applicable.

i. Ensure the optimal participation / input of the Commission in the execution of the project. This includes facilitation of QMRs, participation in surveys, inspections, and other Milestone activities as applicable.

j. Verify / validate the accreditation and OGISP status of all companies required for the execution of the project.

k. Evaluate facility operation, safety, emergency, maintenance manuals and other relevant document in readiness to operate.

iv. The nomination of Commission's Project Officers pursuant to these Guidelines is without prejudice to the powers of the Commission to nominate other specialist staff for participation in project milestone activities (i.e Engineering and Technical studies, FAT, SAT, etc.).

2.10 Participation of Commission's Project Officers and Nominee(s) in Project Monitoring & Milestone Activities

Unless where expressly stated in a letter by the Commission to an applicant, all expenses and costs related to the participation of the Commission's officers/Officers in any project monitoring, inspection program, and milestone activity / review pursuant to these Guidelines shall be borne by the applicant.

2.11 Produced Gas Flare Elimination Facility

The following process applies to the development of third party Produced Gas Flare Elimination Facility Projects. This applies to facilities that are designed to take gas flare and process into commercial variables. A Company wishing to develop a Gas Flare Elimination Facility (GFEF) shall:

i. Apply in writing to the Commission Chief Executive, with highlights of the proposed concept and Engineering design considerations, together with documents contained in **Section 2.11.1**.

ii. Pay the applicable processing fees.

iii. Satisfy the requirement stipulated by the Commission and obtain the required approvals and consents contained in the following stages:

a. Approval to Construct (GFEF)

b. Permit to Operate (GFEF)

2.11.1 Application Package for Approval to Construct (GFEF)

To apply for GFEF Approval to Construct, a Company is required to submit the following:

i. Evidence of payment applicable to DED Application (**see Section 6**)

ii. Copy of Permit to Access Flare Gas or Producer's Approved Flare Project Consent issued by the Commission.

iii. Design Dossier/Package containing, at the minimum, the following:
   a. Details of design criteria in line with these Guidelines as applicable
   b. General facility layout diagram
   c. Safety Equipment Layout diagram
   d. Process Flow Diagrams (PFD) showing the detailed Material Balance and reservoir fluid chemical composition.
   e. Piping & Instrumentation Diagram (P&ID) drawings

iv. List of companies being considered for the fabrication and installation activities in Nigeria with copies of companies' valid Oil and Gas Industry Service Permits (OGISP)

v. Safety track record of the proposed fabrication company(ies) on similar jobs carried out in Nigeria.

vi. Curriculum Vitae (CV) of the principal personnel of the proposed Inspection Company.

vii. Quality Control and Quality Assurance plans of the Fabrication Company.

The Approval to Construct for a GFEF shall be issued upon the satisfactory review of an application. The review process may necessitate additional submissions by the Company or entail further workshops. The approval shall form the basis for the Construction, Fabrication, and Installation activities for the project.

2.11.2 Application Package for Permit to Operate (GFEF)

Following the receipt of Approval to Construct, the Company shall notify the Commission of the intention to commence Construction for a project at least four (4) weeks before commencement and ensure that the Commission's Project Nominees are attached to the project (**see Section 2.9**).

After completing either or all of construction, fabrication, procurement, installation activities as applicable and prior to Commissioning and Introduction of Hydrocarbon into the system, the Company shall apply for Permit to Operate by submitting the following:

i. Evidence of payment applicable to Permit to Operate Gas Production Facility (**see Section 6**)
ii. Copy of Approval to Construct (GFEF)
iii. PSUA / PSSR Report (refer to **Section 2.5.8**)
iv. Operations Safety Case Approval
v. Final Environmental Management Plan Approval
vi. Status update of Ready for Start Up (RFSU) Certificates of all systems.
vii. Pre-commissioning and (Cold) Commissioning reports and certificates for all systems and sub-systems (including FAT reports for critical equipment endorsed by the Operator and nominated officers of the Commission)

Note: The considerations listed in **Section 2.5.2 through 2.5.8** shall apply in the development for some of the requirements for this Permit to Operate (GFEF).

2.12 Deployment of Early Production Facility (EPF)

The following process applies to the deployment of EPF (Please note that this applies only to facilities covered by the definition of **Section 1.3 (iv)**). An Operator wishing to deploy an EPF within or in connection with its field or lease shall:

i. Apply in writing to the Commission Chief Executive, with highlights of the proposed concept, together with documents contained in **Section 2.12.1**.
ii. Pay the applicable processing fees.
iii. Satisfy the requirement stipulated by the Commission and obtain the required approvals and consents contained in the following stages:
    a. EPF Concept Approval
    b. EPF Installation Approval
    c. EPF Commissioning Approval

2.12.1 Application Package for EPF Concept Approval

To apply for EPF Concept Approval, the Operator/licensee is required to submit the following:

i. Evidence of payment applicable to Conceptual Design Application (**see Section 6**)
ii. A copy of Field Development Plan (FDP) or Extended Well Test Approval
iii. A copy of Environmental Screening Report Approval issued by the Commission.

iv. Preliminary Layout of facilities and interconnection pipings (plot plan) vis-à-vis future or planned production facility.
v. Simplified Process Flow Diagrams and General Equipment Layout
vi. Concept Evaluation Report containing the following details:
    a. Justifications and scope of the EPF project (also include an expanded scope of planned production platform, if applicable)
    b. Project timelines
    c. Budget estimates
    d. Concept Safety Evaluation
    e. Site Suitability Report
    f. All other information and drawings which provides relevant information regarding the overall intent of the facility and work-scope of the project.

2.12.2 Application Package for EPF Installation Approval

1. Upon the receipt of EPF Concept Approval, the Operator may commence further activities only after requesting for and receiving project nominees from the Commission. The conditions listed in **Section 2.9** shall apply.
2. The Commission's project officers and nominated Subject Matter Experts from the Commission shall conduct a Site Suitability Inspection of the location where the EPF is proposed to be sited.
3. The Commission's project Officers and nominated Subject Matter Experts from the Commission shall participate in all engineering design, technical studies, construction/integration activities, pre-mobilization, pre-shipment as well as witnessing the testing of all critical equipment.

Upon satisfactory completion of the design, technical studies and construction/integration of the EPF (before deployment/transportation to production site), the Operator shall be eligible to apply for EPF Installation Approval by submitting the following:

i. Evidence of payment applicable to DED Application (**see Section 6**)
ii. A copy of EPF Concept Approval
iii. Site Suitability Report Endorsed by the Operator and officers of the Commission
iv. General facility layout diagram
v. Piping & Instrumentation Diagram (P&ID) drawings.

vi. Pre-Shipment, FAT, Pre-Mobilization reports for facility or equipment as applicable endorsed by the Operator and officers of the Commission.

vii. Hazard and Operability Studies (HAZOP) and Hazard Identification (HAZID) / Bow-Tie reports endorsed by the Operator and officers of the Commission.

2.12.3 Application Package for EPF Commissioning Approval

1. Upon the receipt of EPF Installation Approval, the Operator may deploy/transport the EPF to production location.
2. In preparation to start-up operations, PSUA / PSSR shall be conducted with the participation of the Commission's project Officers and nominated Subject Matter Experts (see **Section 2.5.8**).

Upon the satisfactory completion of PSUA/PSSR, the Operator shall be eligible to apply for EPF Commission Approval by submitting the following:

i. Evidence of payment applicable to Permit to Operate Oil Production Facility (**see Section 6**)

ii. A copy of EPF Installation Approval

iii. Operations Safety Case Approval

iv. PSUA / PSSR Report.

2.12.4 Modification/Upgrade of EPF

Subject to the FDP approval for a field, the Operator may modify or upgrade an EPF (for which EPF Commissioning Approval has been issued) to full production facility. All the conditions and steps for Facility Modification (**Section 2.14**) shall apply. Upon the receipt of Commissioning / Introduction of Hydrocarbon (Modification) Approval, the Operator shall be eligible to apply for and obtain PTO under **Section 2.6**.

2.13 Development of Integrated Facility

A licensee/Operator wishing to develop a facility or group of facilities within or in connection with its field or lease, and which operation meets the criteria for Integrated Facility as defined in **Section 1.3(iii)** and stated in the ***Guidelines on Classification of Integrated Upstream and Midstream Petroleum Operations***, shall take note of the following:

i. The Engineering milestone approval process shall comply with the requirement of **Section 2.1**.

ii. In addition to the requirement for CDA/FEED, the Operator shall include justification that establishes the proposed concept as Integrated Facility. This may include PFDs, P&IDs, etc. showing interconnection between the components (facilities) and proposed production measurement point.

iii. The development of an Integrated facility shall be administered as one (1) development project irrespective of the number of components (facilities) provided that the development is interdependent and carried out concurrently.

iv. The fees payable for milestone Engineering approvals for the integrated facility development shall be equivalent to what is applicable for a single facility development project except for Permit to Operate (PTO). The fees for PTO shall be made per components (facilities) making up the integrated facility.

v. Upon the receipt of an application for the development of an Integrated Facility, the Commission shall review and determine that the criteria for Integrated Facility have been met, and if satisfactory, progress with its administration. Otherwise, the application shall be treated as a stand-alone facility development.

2.14 Process for Facility Modification Application

2.14.1 Notification of Engineering Design (Modification) Commencement

1. The Operator shall notify the Commission of the intention to commence Engineering Design for a facility modification project at least four (4) weeks before commencement, and request for the Commission's Project Nominees who shall be attached to the project.
2. An application which fails to meet the conditions for modifying a facility in accordance with **Section 1.3(ii)** shall not be treated as a facility modification application and the Commission shall inform the Operator of the appropriate regulatory consents required for that application.
3. An Operator wishing to modify a facility within or in connection with its field or lease shall:

i. Apply in writing to the Commission Chief Executive attaching supporting documents listed in **Sections 2.14.2 and 2.14.3**.
ii. Pay the applicable processing fees.
iii. Satisfy the requirement stipulated by the Commission and obtain the required approvals and consents contained in the following stages:
   a. Engineering Design (Modification) Approval
   b. Commissioning / Introduction of Hydrocarbon (Modification) Approval

2.14.2 Submission of Application Package for Engineering Design (Modification) Approval

1. The Operator shall commence activities and studies for the engineering with the participation of the project officer(s) nominated by the Commission.
2. This phase of the project shall involve the development of the engineering data to an implementable level necessary for Procurement, Fabrication, Installation and Commissioning of the facility.
3. The drawings, calculation notes, etc. shall form the basis of consideration for the designs before fabrication.
4. All engineering (Design work) activities are to be carried out in line with the minimum considerations and requirements stipulated in **Sections 2.4.2 – 2.4.4, Sections 2.5.2 – 2.5.8, Section 3** and **Sections 5 & 6** for Operations and HSE respectively as applicable and internationally recognised standards.

To apply for Engineering Design (Modification) Approval, the Operator/licensee is required to submit the following:

i. Evidence of payment of applicable fee (**see Section 6**)
ii. Valid Environmental Management Plan (EMP) Approval issued by the Commission.
iii. Modified Engineering Design Dossier/Package in accordance with **Section 2.4.5 (iii)**.
iv. Applicable Engineering and Technical Studies Reports – HAZOP, HAZID, SAFOP, Design Review, Constructability Review, etc.
v. Engineering cost breakdown and performance (planned versus actual)
vi. List Equipment or Systems/Packages to be procured including the technical specifications and cost elements (If applicable).

vii. Life Extension Study Report (if conducting Life Extension for Facility).

viii. Contracting and Monitoring Strategy in line with **Section 2.4.5 (vii)**.

2.14.2.1 Issuance of Engineering Design (Modification) Approval

The Operator shall be issued an Engineering Design (Modification) Approval if the required documents listed in **Section 2.14.2** are submitted and if, following its review, the submission meets the criteria stated in **Section 2.4.6**.

2.14.2.2 Commencement of Construction/Fabrication (Modification) Activities

Following the receipt of Engineering Design (Modification) Approval, the Operator shall notify the project officers in accordance with **Section 2.5.1**.

2.14.3 Submission of Application Package for Commissioning / Introduction of Hydrocarbon (Modification) Approval

After completing either or all of construction, fabrication, procurement, installation activities for the modification as applicable and prior to Commissioning and/or Introduction of Hydrocarbon into the system, the Operator shall be eligible to apply for Commissioning / Introduction of Hydrocarbon (Modification) Approval in strict adherence to the requirements listed in **Section 2.5.2 – 2.5.9** as applicable, provided that requirement of **Section 2.5.9 (xii)** shall be mandatory. For requirement **Section 2.5.9 (ii)**, the Operator shall submit a revalidated Operational Safety Case approval arising from the facility modification.

The Operator shall be issued a Commissioning/Introduction of Hydrocarbon (Modification) Approval in accordance with **Section 2.5.10**.

3 MINIMUM DESIGN, CONSTRUCTION, AND INSTALLATION CONSIDERATIONS AND SPECIFICATIONS

Operators shall comply with this section for the minimum considerations for design, construction and installation to secure the approvals/licenses. Deviations from stated minimum consideration may require further engagement with the Commission.

3.1 Overview of Design, Construction, and Installation Considerations

The design process shall ensure that facilities are constructed and operated safely and without harm to people and the environment. The design, construction and installation shall put into consideration all Economic, Technical and Non-technical consideration which may affect the project delivery. Additionally, the design, construction, installation, commissioning, and operation shall:

i. Comply with provisions of Petroleum Industry Act, 2021 and applicable Regulations, Guidelines and Directives issued by the Commission.

ii. Conform to acceptable design codes, specifications such as that prescribed by Standards Organization of Nigeria, American Society of Mechanical Engineers, National Fire Protection Association, American Welding Society – Structural Welding Code, British Standards (BS), API Recommended Practice and other codes and standards recognised by the Commission.

iii. Ensure the participation of the Commission's project Officers in line with **Section 2.9** which is mandatory during the project phase.

3.1.1 Economic Considerations

The Operator, alongside the Commission, shall ensure that economic studies are carried out to confirm the feasibility of the project and its continuous operations throughout its operational life. The Operator shall consider and ensure the following:

i. Available/guaranteed sources of fund for the project

ii. Integrity and capacity of financial partners

iii. Viability of the project via indicators such as return on investment (ROI), internal rate of return (IRR), cash flow trends, payback time, break-even point, profit margin etc.

iv. Capital expenditure (CAPEX) and operating expenditure (OPEX) for facility to support sensitivity analysis.

3.1.2 Technical Considerations

All technical considerations to ensure the facility is safe and designed to internationally recognised standards shall be considered. The following key design objectives shall be considered:

i. Safety in design
ii. Technical Integrity & Design Life
iii. High Availability & Reliability
iv. Operability & Maintainability
v. Cost effectiveness and machine life cycle.

3.1.3 Non-Technical Consideration

The operator shall consider all Non-Technical Risk (NTRs) such as regulatory, public, socio-economic, governmental, environmental matters, local content, community engagements which affect projects.

3.2 Facility Layout & Site Selection

3.2.1 Facility Selection Criteria

The choice of facility to be designed shall ensure safety, cost effectiveness in line with the field development studies.

3.2.2 Facility Layout

The following shall, at the minimum, apply:

i. Proper hazard Area Classification and Risk Assessment shall be considered for safe design, layout, and operation of the facility to minimize, to ALARP, the release of containment to prevent the ignition and spread of any unavoidable or accidental releases.
ii. The location of critical equipment shall be designed to ensure:
    a. Satisfactory means of escape for persons in the event of a fire or other incident.
    b. Hazardous areas are protected from sources of ignition.
iii. Considerations for all environmental related concerns, such as waste handling & treatment, spillage control and containment etc. as provided for in the applicable Regulation and Guidelines for Environmental Management issued by the Commission, shall be incorporated in the general layout, location and construction programme of the facility.

3.3 Operational Consideration

The following shall, at the minimum, be considered and ensured:

i. The functions to be performed by the facility shall be clearly identified and stated. The facility's design criteria dictated by operational requirements shall be reviewed during every iteration of the design phases. The operational consequences of these requirements shall be fully established before the final design decision is made.

ii. Some of the requirements to be furnished at the time of consideration of the facility design including parameters to be considered leading to the option selection, FEED, and detailed design of the FPSO/FSO system, onshore, offshore and swamp facility configuration include the following:

a. Projected field life.
b. Operation philosophy.
c. Simultaneous operations (SIMOPS) etc.
d. Service Life.
e. Name plate for the facility including as applicable:
   (i) The Hydrocarbon Feed volume rates in (bopd, mmscfd etc)
   (ii) Configuration of the plant/facility,
   (iii) Product volume rates as applicable in (bopd, mmscfd, mtpa, mtpd, etc)
f. Environmental conditions.
g. Scope & arrangement of other field facilities.
h. Space available & the manoeuvring rooms at the site.
i. Hydrocarbon Storage requirements.
j. Product Export Method.
k. The features to be incorporated in the facility and the necessary ancillary facilities.
l. Possible sources of external static and dynamic loads on the facility during operations shall be identified and their magnitudes estimated.
m. For offshore and swamp facilities -
   (i) New-build versus Conversion.
   (ii) Preferred hull type(s) (double hull type) and construction material(s).

(iii) Transportation & installation of topside facilities

(iv) Subsea process systems.

(v) Water depth.

3.4 Engineering Drawings and Specifications

3.4.1 General Requirements

The following shall, at the minimum, apply:

i. Facility drawings and specifications shall describe total facility configuration, technical specifications, and dimensions, sufficiently detailed for an accurate definition of the project scope.

ii. All facility drawings, PFD and P&ID drawings shall be in SI unit or equivalent.

iii. Installation and as-built drawings shall be prepared at the relevant stages of the facility construction.

iv. Facility drawings and specifications shall be:

   a. Incorporated in the form of a documentary annex at applications

   b. Presented at all reviews and on demand.

3.4.2 The Conceptual Drawings

The concept drawings shall show the following:

i. General concept of the project in the form of block and line diagram.

ii. Layout of facilities and the interconnecting pipelines with their capacities, and location of main valves.

iii. General equipment layout, simple process and mechanical flow diagram.

iv. Metering manifold and its ancillary facilities where necessary, with throughput indicated.

3.4.3 Design Specifications, Drawings, Reports and Deliverables

Facility drawings and specifications shall be presented at FEED and DED stages as applicable. This shall be in the form of piping, process, and instrumentation diagrams (P&IDs) and PFDs. The design deliverable includes but not limited to:

i. General Basic Engineering Design Data

ii. Safety Drawings, specifications or reports containing the following and as applicable:

   a. Hazardous area classification drawings; IFD and IFC at FEED and DED respectively.

b. Preliminary Fire water demand calculation at FEED and Final Fire water demand calculation at DED.
c. Fire & Gas detection layout at DED.
d. Fire water network layout drawing, IFD at FEED and IFC at DED.
e. Safety philosophy.

iii. Process drawings, specifications or reports containing the following and as applicable:

a. Process Flow Diagrams (PFDs).
b. Heat & Material Balances (HMB).
c. Equipment list.
d. P&IDs, IFD and IFC at FEED and DED respectively.
e. P&IDs - packaged units. Preliminary (main principles) at FEED and detailed at DED.
f. Process descriptions.
g. Equipment Process Data Sheets.
h. Instrument Process Data Sheets. Control & On/Off Valves analysers, flowmeters, PSVs etc at FEED and all the details shall be shown at DED.
i. Packaged units' duty specifications.
j. Emergency shutdown philosophy.
k. Causes & Effects diagrams.
l. Heat exchangers thermal design & data sheets.
m. Preliminary (main principles) of Utility balance at FEED and final Utility balance at DED.

iv. Mechanical Specifications containing the following and as applicable:

a. Equipment specifications
b. Equipment mechanical design
c. Equipment Mechanical Data Sheet
d. Requisition for inquiry. For main equipment at FEED and for all at DED.
e. Requisition for purchase. For LLI at FEED and for all at DED.
f. Technical Bid Tabulation. For main equipment at FEED and for all at DED.
g. Vendor follow-up at DED

v. Plant layout, piping Installation, piping /material and piping/stress drawing and specifications containing the following and as applicable:
   a. General Plot Plan
   b. Unit Plot Plan, IFD and IFC at FEED and DED respectively
   c. 3D model review. Equipment and main process lines only at FEED and all at DED
   d. Piping routing drawings at FEED
   e. Piping studies and Layout drawings, Piping General Arrangement drawings, Isometric drawings, at DED
   f. General specification for piping materials
   g. Piping classes summary
   h. Material selection and corrosion control report
   i. Special piping items specification at DED
   j. Piping Material Classes Specifications
   k. Standard drawings. Design drawings at FEED and installation drawing at DED
   l. Piping Material Take Off
   m. Design specification (piping stress design basis)
   n. Piping stress calculations. Simplified calculation of critical lines with impact on Plant Layout at FEED and all at DED
   o. Piping support drawings and list at DED

vi. Instrumentation & Control Documentation containing the following and as applicable:
   a. Control system specifications
   b. Instrument data sheets. Control & On/Off Valves analysers, flowmeters, PSVs etc at FEED and all shall be shown at DED.
   c. Instrumentation & Automation design specification
   d. System architectural drawing
   e. Systems I/O sizing
   f. Instrument list
   g. Material Requisitions, Material Take-Off, Cable schedule and Loop diagrams at DED
   h. Hook-up drawings.

i. Control and technical rooms/buildings Equipment Arrangement drawings. Preliminary and size of building at FEED and all the details at DED.

j. Cable routing drawings. Main routing at FEED and all routing at DED

vii. Electrical Documentation/Deliverables drawings containing the following and as applicable:

a. One Line Diagram
b. Block diagrams
c. Connection diagrams
d. Electrical consumers list; Preliminary at FEED and final at DED
e. Equipment general specification
f. Electrical design specification
g. Equipment data sheet
h. Material Requisitions at DED
i. Standard drawings
j. Specification for bulk and Material take off
k. Cable schedule. Preliminary (main principles) at FEED and final at DED
l. Substation Equipment arrangement drawings
m. Cable routing drawings. Main routings at FEED and all routings at DED
n. Sizing calculation
o. Earthing drawings
p. Lighting layout
q. Equipment schedules
r. Power system studies reports

viii. Civil and Structural drawings, painting and coating containing the following and as applicable:

a. Soil investigation specification
b. Design specifications
c. Main Civil works specifications at FEED and all civil specification at DED
d. Guide / outline drawings
e. Design drawings, calculations & calculation notes at DED
f. Drainage network calculation

g. Reinforced Concrete/ Structural steel drawings & designs.
h. Buildings architectural drawings
i. Painting Specifications
j. Painting Standard drawings at DED.

3.5 Engineering and Technical Studies

Facility designs shall be subjected to necessary Engineering and Technical studies at each stage of the project, from concept selection to the operational phase, for the achievement of design or operational integrity, assurance and ensuring that risk is reduced to as low as reasonably practicable. The following shall, at the minimum, apply:

i. The process of the studies shall conform to internationally recognised standards and recommended practices and comply with applicable Guidelines for Engineering and Technical Studies issued by the Commission.
ii. In line with **Section 2.9**, the Commissions Officers on the Project shall participate in all Project Engineering and technical studies.
iii. The Commission's SME shall participate in the Milestone Engineering and Technical studies. For this purpose, a minimum notice of four (4) weeks shall be given to the Commission and arrangements shall be made for the participation of its Officers at those review meetings with all relevant documents and pre-read materials made available for appropriate in-house review.
iv. The Engineering and Technical studies shall be applied in the development of the Safety Case for the facility, in compliance with the applicable Guidelines on Safety Case issued by the Commission.

3.6 Materials Selection

i. Detailed material selection study and analysis shall be carried out prior to selection of materials for pressure vessels, pipings, valves, steel structures, etc. in line with applicable international standards.
ii. For structural members, it shall, at the minimum, ensure that:
    a. The allowable stresses in all the structural members shall be proportioned as specified in internationally recognised standards such as the recommended practice API RP2A and those in the codes and specifications of the "American - Institute of Steel Construction (AISC)".

b. These considerations shall apply to the determination of allowable tensile and compressive forces, shear and hoop stresses, and those due to any combinations of these stresses.
c. All connections and joints shall be subjected to appropriate stress analysis as specified in the recommended practice such that their load bearing, and transfer capacity shall be compatible with the stresses developed in the members being connected.
d. The structural steel plates, shapes and pipes shall conform with the appropriate ASTM specifications or other internationally recognised equivalents for the desired purposes.

3.7 Civil and Structures Consideration

3.7.1 General Requirements

The following shall, at the minimum, be put into consideration in the civil and structures in the facility: The structure shall be designed to ensure:

i. Stability and Strength
ii. Serviceability and Access for operation and maintenance
iii. Accommodate Loadings – dead, live, and construction load.
iv. Adherence to soil classification and bearing capacity, hazard level, design life, importance level, Earthquake, dynamic analysis
v. Constructability

3.7.2 Civil

The civil scope shall include the following:

i. Survey (including datums), set out, general arrangements
ii. Loadings, equipment, traffic
iii. Erosion protection
iv. Geotechnical, subgrade, and slope stability
v. Strength and durability
vi. Surface and subsurface drainage.

3.7.3 Design and Operations Load

The following shall, at the minimum, apply:

i. The design of the facility shall include all the functional, environmental, dead, live, and transient loads to which the structure will be subjected throughout its operational life.
ii. The loads that may affect the facility or its parts shall be determined. All load calculations shall be documented and sources of derivation of environmental loads shall be specified.
iii. Where load values were derived from analytical models, the efficacy of the analysis shall be demonstrated to the satisfaction of the COMMISSION at the time of consideration of application for approval of the design. To this end, the definition of loads specified in internationally recognised standard such as API RP2A or approved equivalent standards shall be acceptable.
iv. Load calculations shall be documented and the sources of derivation of environmental loads shall be specified and presented at the detailed design stage.

3.7.4 Imposed Forces During Construction

The following shall, at the minimum, apply:

i. These shall include all anticipated forces to be imposed on the structure during fabrication in the yard, load - out and transportation to the location, launching, installation and erection at location.
ii. The consideration given to these forces shall be in accordance with the fabrication and installation procedure to be used and this shall be outlined at the time of detailed design of the platforms and facility.
iii. Any review of this procedure and the corresponding design criteria during project implementation shall be notified appropriately.

3.7.5 Fatigue Failure Considerations

The following shall, at the minimum, apply:

i. This is failure occasioned by imposition of cyclic stresses on members of the structure which shall be considered.
ii. For offshore facilities, stresses imposed on the structure by waves, a detailed wave analysis of the platform location and water depth shall be carried out for accurate establishment of the appropriate fatigue design life of the platform.
iii. This information shall be provided along with the submission of the detailed design parameters.

3.7.6 Foundation Consideration

The selection of foundation criteria shall, at the minimum, meet the following considerations:

i. Follow a process of soil investigations in the immediate neighbourhood of the platform location.

ii. Possibility of sea floor movement or differential settlement of structures shall also be investigated, for those sites where these conditions are expected.

3.7.6.1 Pile and Gravity Based Foundations

The following shall, at the minimum, apply:

i. These, being the commonest way of fixed offshore platform construction, shall be regarded as the conventional method while all other designs shall be subject of special presentation to the Commission Chief Executive before approval is granted after appropriate consideration of such peculiar foundation design.

ii. In the application of this conventional foundation design method, pile design load bearing capacity, pile materials selection and pile performance shall, at the very minimum, comply with the specifications in the current version of API RP 2A, API RP 2GEO or other internationally recognised equivalents.

iii. Since all platforms shall be actively in use for either drilling or production operations, load conditions for pile design, shall be with the application of a factor of safety of 2 in all cases.

3.7.6.2 Other Foundation Design

i. These are designs classified as shallow foundations for which the depth of their embedment is less than the minimum lateral dimension of the foundation element.

ii. Such designs shall be subject of a special presentation for the consideration of the Commission with adequate information on the static and hydraulic forces of the environment and any other relevant technical information to justify that type of foundation.

3.8 Tamper-proof Considerations

Considerations should be given to the implementation of tamper-proof, theft prevention, and surveillance for facilities that are normally at remote locations and/or unmanned such as Well Heads, flowlines, gathering lines and manifolds.

3.9 Safety Considerations

3.9.1 General

The following shall, at the minimum, apply:

i. Facility emergency shutdown and alarm systems shall have a dual circuit actuation device, preferably of independent pneumatic and electronic type trigger systems or of other acceptable fail-safe designs.
ii. Fire sensors and gas detection, and alarm systems shall be provided at strategic points.
iii. Isolation valve shall be provided at a safe point, and it shall be always maintained in operational condition.
iv. Flare stack design shall generally conform with the provisions of API RP 14C, API Std 537, API RP 521 and other relevant ASME codes. Specifically, it shall be so located that the maximum heat radiation exposure of personnel at the nearest point of the deck/platform to the flare shall be as stipulated in the applicable Regulation and Guidelines on Safety and Environmental Management issued by the Commission.
v. The facility shall be provided with adequate lightning protection.
vi. Guard rails, handrail barriers shall be provided as appropriate.
vii. Safety showers and eye washer facilities shall be provided and adequately marked. Particularly close to chemical storage and usage areas.

3.9.2 Human Factors

Ergonomics studies shall be carried out in line with internationally recognised standards and incorporated into the design and installation of a facility. Additionally, the following shall be ensured:

i. Workstations, workplace, or equipment shall be designed and constructed to reduce and eliminate the need for stooping, bending, stretching, over-reaching and working over-head during operation.

ii. Display screens, dials and Start/Stop/Emergency buttons shall be positioned so that they are readily visible and accessible to plant operators.

iii. The operation of equipment in the facility shall not increase the risk of Upper Limb Disorder; for example, repetitive tasks, handling operations, machine paced work and prolonged operation.

iv. Health risks arising from gases, liquids, dusts, mists, biological hazards, or vapours used by, contained in or remitted by the facility shall be eliminated or adequately reduced via engineering controls.

3.9.3 Dropped Object

Dropped objects studies shall be carried out to assess the hazards arising from lifting operations during the normal operating mode and maintenance, leading to possible loss of containment and asset damage for the establishment of drop object protections.

3.9.4 Evacuation and Escape Route

Escape and evacuation analysis shall be carried out to identify and eliminate, as far as practicable, congestion which may develop during emergency abandonment, due to normal movement of personnel and crew along escape routes, including the possibility that a rescue team may need to move along these routes in a direction opposite the movement of personnel. Additionally, the following shall be ensured:

i. Means of safe abandonment of the installation/unit for the maximum personnel on board, following a hazardous incident and a decision to abandon the installation/unit.

ii. There shall be a minimum of two (2) escape routes from each area/deck of the facility that is manned.

iii. These routes shall be clearly marked with arrows and illuminated exit signs at strategic locations on the facility.

iv. All escape doors shall open outwards, except for cabin doors where there is need to avoid injury to persons in the corridor when the door is opened.

3.9.5 Shutdown Philosophy

All emergency shutdown and alarm systems shall have a dual actuation device, preferably of independent pneumatic or electric type trigger systems or of other acceptable fail-safe designs.

3.9.6 Noise

Noise survey studies shall be carried out and incorporated into the design and installation to ensure that the total noise level at any point on the facility emanating from engines, fluid velocities in the piping, etc. comply with the following:

i. Does not exceed 85dBA for an 8-hour time weighted average (TWA)
ii. Provision for hearing protection shall be made if noise levels are equal to or greater than 85dBA for an 8-hour time weighted average
iii. The sound pressure level at the edge of the nearest residential area shall not exceed 50dBA at night.

3.9.7 Signages

Safety signages shall be designed and installed in line with API RP 1109 and other internationally recognised standards. It shall, at the minimum, be designed and installed to achieve the following:

i. Warn people exposed to a risk or danger.
ii. Prohibit behaviour which could cause hazard.
iii. Specify particular behaviours necessary to safeguard health.
iv. Supply information about safety exits or means of aid or rescue.
v. Supply other information useful to avoid the occurrence of incidents/accidents.

3.9.8 Fire Protection

The following shall, at the minimum, apply:

i. Fire water network demand studies and calculations shall be carried out for the facility in line with internationally recognised standards such as NFPA.
ii. The fire water system shall be designed to handle the maximum fire water demand for the facility.
iii. The fire protection shall cover the following:
    a. Fire and Gas detection system
    b. Active Fire protection
    c. Passive fire protection
    d. Natural ventilation and HVAC system
    e. Helideck as applicable
    f. Layout and explosion barriers

3.9.9 Fire And Gas Detection

The following shall, at the minimum, apply:

i. Fire and gas detection system shall be provided at strategic points of any facility.

ii. The system shall be capable of indicating the presence of a fire audibly through an alarm and visibly at a control point or any point which is continually manned.

iii. All facilities shall be provided with necessary firefighting equipment for possible containment of fire accidents.

iv. The minimum firefighting requirement to be provided shall be made up of the following:

a. Fire And Gas Detection System

(i) Flammable Gas Detectors

(ii) Manual Alarm Call Points

(iii) Hydrogen Sulphide gas detectors — H2S gas detection (if required)

(iv) Detectors — flame, smoke and heat detectors

b. Active Fire Protection

(i) Fire monitors strategically positioned

(ii) Automatic fire deluge for process areas and separators

(iii) Auto CO2 flood

(iv) Dual agent hose reel skid

(v) Aqueous film forming fluid (AFFF) hose reel

(vi) pressurised fire main

(vii) Firewater pumps

(viii) Water deluge system

(ix) Fire monitors — foam system — sprinkler system

(x) Fixed gaseous fire extinguishing system

(xi) Fixed foam fire extinguishing system

(xii) Water mist system

(xiii) Helideck firefighting system

(xiv) Fire hydrants and hose reels

(xv) Dry chemical extinguishers, where relevant, in accordance with the Underwriters Laboratories (UL) specifications.

3.9.10 Public Address, Alarm and Emergency Communication Systems

The following shall, at the minimum, apply:

i. Public Address System and signal alarms shall be installed in the facility for use during emergencies and to warn and guide personnel as quickly as possible in the event of a hazardous event or emergency.

ii. The Public Address, alarm and emergency communication systems shall depend on emergency power systems, consisting of emergency generators and Uninterrupted Power Supply.

3.10 Environmental Considerations

3.10.1 General

The following shall, at the minimum, apply:

i. Environmental related studies such as EBS, ESR, PIAR, ERR etc. as provided for in the applicable Regulation and Guidelines for Environmental Management issued by the Commission, shall be carried out. Approval for such studies must be obtained before commencement of construction.

ii. The general layout, location and construction programme of the facility and platforms shall comply with all the applicable conditions and specifications in the applicable Regulation and Guidelines for Environmental Management issued by the Commission.

iii. The facility shall be equipped with adequate provisions for containing, and handling spillages and other potential contaminants.

iv. The design considerations for metocean shall be ensured for offshore installations.

v. All the systems and components of the facility shall be designed to withstand any anticipated extremes of environmental phenomena on location.

3.10.2 Drainage

The facility, platforms and decks shall be configured in such a way that there will be an efficient drainage system with adequate provision for handling and disposing drained liquids in accordance with applicable Regulation and Guidelines for Environmental Management issued by the Commission.

3.10.3 Effluent Handling

The facility shall be equipped with adequate effluent treatment systems to achieve the specifications contained in the applicable Regulation and Guidelines for Environmental Management issued by the Commission.

3.10.4 Point Sources

During the design phases, there shall be considerations for point sources which shall be duly registered with the Commission in line with applicable Regulation and Guidelines for Environmental Management issued by the Commission.

3.10.5 Atmospheric Venting/ Green House Gases Emission (GHG)

The following shall, at the minimum, apply:

i. Facility design and operations must take into consideration, GHG emissions as required by the applicable Guidelines for the Management of Fugitive Methane and Greenhouse Gases Emissions issued by the Commission.

ii. All facilities must be designed to minimize GHG emissions to ALARP, and a Measurement Reporting and Verification (MRV) & Leak Detection and Repair (LDAR) strategy must be in place during construction through installation and operations.

3.10.6 Use of Chemicals

All chemicals for use in any facility shall be duly approved by the Commission and shall comply fully with the requirements of applicable Regulation and Guidelines for Environmental Management issued by the Commission.

3.11 Living Quarters and Central Control Room

The following shall, at the minimum, apply:

i. Living Quarter must be appropriately separated from process areas with adequate means of escape.

ii. All Living Quarters shall be laterally separated from that carrying the oil and gas process facilities, gas compressor facilities or gas turbine generators based on results obtained from fire and explosion studies, noise mapping survey, heat radiation safe distance and other risk assessments.

iii. The Living Quarters deck of manned platforms containing process facilities shall be isolated from that on which process facilities are installed by suitably rated firewalls in line with NFPA requirements or other internationally recognized equivalents.

iv. The Operator shall ensure that the accommodation facilities are situated in a safe and secured environment.

v. The doors to the accommodation exit doors are to be designed to allow for quick and easy exit within the shortest and acceptable time limits.

vi. The living quarters shall be designed for comfort and relaxation. Amenities such as toilet, washrooms, gyms etc. shall be properly situated and designed for comfort.

vii. All sections of the facility shall have emergency exits which are clearly marked and visible.

3.11.1 Central Control Room

The central control room shall be designed in line with internationally recognised standards. The following considerations shall, at the minimum, apply:

i. It shall be aesthetically pleasing and designed to be conducive for operators.

ii. It must be ensured that it possess appropriate security monitoring and surveillance systems such as CCTV, for operations monitoring, etc.

iii. It shall be equipped with communication equipment and interfaces for central operations management, central displays & signals, handling of emergencies etc.

iv. Visual Display Screens shall be positioned to reduce the interference from glare to the minimum.

v. Control rooms design within process areas shall have positive pressure isolation and appropriately rated explosion proof walls, where the minimum safe distance to site the control room cannot be achieved.

3.12 Gas Utilization and Flare

3.12.1 Gas Utilisation

The following shall, at the minimum, apply:

i. The facility shall be designed with a no continuous flare philosophy.

ii. Produced gas shall be utilised either in the field to enhance production or sold for value creation.

3.12.2 Design of Flare System

The flare stack design shall comply with the stipulations of applicable Regulation and Guidelines for Safety and Environmental Management issued by the Commission, and generally conform with internationally recognized codes and standards such as API Std 521, API Std 537 etc. Specifically, it shall ensure the following:

i. No cold venting of hydrocarbon in the facility
ii. Located where the maximum heat radiation exposure of personnel at the nearest point of the deck to the flare shall be as stipulated in the applicable Regulation and Guidelines for Safety and Environmental Management issued by the Commission.
iii. Maintenance of flame stability to avoid excessive and unnecessary flame extinguishment or blow out.
iv. Avoidance of flashback in the flare system.
v. Complete combustion for smoke suppression
vi. Flare structures shall be fitted with stairs, ladders, handrails or guards to provide safe personnel access for maintenance and inspection. Where appropriate, securing points for personnel harness shall be provided.
vii. The use of closed loop purge gas system or Nitrogen as purge gas is highly encouraged.

3.13 Corrosion

Operators shall carry out detailed corrosion studies. The corrosion control system of all facility shall generally follow the codes and specifications outlined in the Association for Materials Protection and Performance (AMPP) Standards SP0176 and its subsequent revisions or other internationally acceptable equivalents. The Operator shall, at the minimum, ensure that:

i. The environmental factors for the design of cathodic protection for the facility shall be as derived from the study of the area, under local conditions.
ii. All the portions of the facility, which being subjected to atmospheric weather conditions of sun, rain, and wind, its corrosion control is by application of protective coating system. Usage of other special materials that are resistant

to atmospheric corrosion, as specified in the AMPP reference standards or its equivalent shall be an acceptable method.

iii. Acceptable corrosion control measures shall be by provision of additional steel thickness for all structural members. Other measures outlined in the AMPP reference Standards, or its equivalent are acceptable.

iv. For adequate protection of all the structural members that are exposed to water, applicable cathodic protection systems shall be as specified in AMPP or its equivalent, and their subsequent renewals shall be provided.

v. Protective coatings shall also be applied to these members during the fabrication stage as an additional protection measure.

3.14 Mechanical Considerations

3.14.1 Pressure Vessels

All pressure vessels shall be designed and constructed in line with internationally recognised standards such as ASME, DNV etc. Additionally, the following shall be ensured as appropriate:

i. Pressure vessels Name plate shall be in line with internationally recognised standards.

ii. Appropriate installation of vessel protection sensors and valves including, High level and Low-Level sensor, High temperature and low temperature sensor, Check valve, Pressure safety valve, Pressure safety high and low, High-pressure sensor, and Low-pressure sensor.

iii. Insulations and other covering, where applicable, shall be properly designed and installed.

iv. Welding shall be continuous and properly tested by appropriate NDT methods.

v. Material test certificates such as Welding procedure, Weld Log Report and welding certificates, Mechanical Calculation sheet (Design Calculation), Equipment and Materials Certification Documents at Vendors Shops, Visual and Dimensional Examination Report, Inspection Test Plan, Material Identification Markings Report and Non – Conformance Report shall be documented and made available on demand.

vi. Structural attachment/pressure vessel mounting support shall be properly installed.

3.14.2 Relief and Depressurising Systems Pressure Safety Valves

Pressure relief, vent, depressurising, and disposal shall be designed and installed in line with internationally recognised standards such as API std 521, API RP 520, etc. The systems shall, at the minimum, ensure the following:

i. Protection of equipment and facility against excessive pressure, minimisation of the escape of hydrocarbons in case of rupture and safe collection and discharge of released hydrocarbon fluids.
ii. Handling of the maximum relief rates expected due to any single equipment failure or possible cascade effects where upsets in one process segment can cause upsets elsewhere.
iii. Block valves installed in connection with pressure relieving devices (PSV, rupture disc or depressurisation valve) are interlocked or locked open as appropriate.
iv. PRDs on downstream equipment can satisfy relief requirement of the vessel and cannot be isolated from the vessel.
v. Each input source is protected by a PRD set no higher than the maximum allowable working pressure of the vessel and a PSV is installed on the vessel for fire exposure and thermal expansion.
vi. Each input source is protected by a PRD set no higher than the vessel's maximum allowable working pressure and at least one of these PRD's cannot be isolated from the vessel and the PRD is adequately sized for thermal expansion and fire exposure for the vessels being protected.

3.14.3 Rotating Equipment

All rotating equipment shall be designed in line with internationally recognised standards. The following shall, at the minimum, be ensured:

i. Every rotating, reciprocating or hazardous part of any equipment/machinery shall be securely fenced or guarded, where it is practical to do so.
ii. Every guard protecting rotary table chain or similar machinery shall be capable of resisting the shock of a breaking chain.
iii. Adequate foundations and vibration resistant installations.

3.14.4 Piping

The design and construction of piping shall be in compliance with internationally recognised standards such as API, ASME and DNV etc. It shall be ensured that:

i. Piping systems are properly segregated so that utility media, e.g., steam, compressed air-cooling water etc., are not contaminated by flammable fluids.
ii. All equipment piping shall be arranged to provide sufficient clearances for operation, inspection, maintenance, dismantling and removal of equipment.
iii. All pipe runs shall be clearly identified by colour codes or by other acceptable means.

3.14.5 Mechanical Handling Philosophy

The philosophy to be followed for handling various equipment/components during normal operation and maintenance shall be considered. The following shall be ensured:

i. Access/transport routes and laydown area requirements shall be provided
ii. The need to lift, carry, push, or pull heavy loads, or parts, shall be eliminated to the extent possible.
iii. Proposed handling procedures
iv. Material handling recommendations

3.14.6 Mechanical Workshops

The mechanical workshops in the facility shall be designed with considerations for guaranteeing comfort and safe environment for personnel. The following shall be ensured:

i. Floors must be fixed, stable and non-slip as well as free from protrusions, cavities, or dangerous inclined surfaces.
ii. The floor must have a joint, waterproof surface and a sufficient slope to rapidly collect liquids towards a discharge point in environments where liquid substances are likely to fall to the ground.
iii. Environment floors and walls that are used for processing, handling, and storing of flammable, explosive, or corrosive materials must consent in certain conditions an easily and complete removal of dangerous or harmful materials.
iv. Windows, and ventilation devices must easily be opened, closed, adjusted, and fixed by workers in complete safety.

v. Traffic routes must be highlighted to ensure workers safety; barriers must be arranged at equipment transit ways and where applicable to avoid collisions.

vi. Must be designed with emergency routes and exits, compliant with current fire regulations so that, in case of danger, personnel can be quickly evacuated.

vii. Gas, vapours, smells, or fumes extraction must be the closest possible to the area where they are produced.

3.14.7 Lifting Equipment

The lifting equipment shall be designed and installed in conformance to internationally recognised standards such as NORSOK standards etc. and in compliance with the applicable Guidelines for Lifting Operations issued by the Commission. The following shall be ensured for lifting equipment.

i. It must be sufficiently strong, stable, and suitable for the proposed use. Similarly, the load and anything attached (e.g., timber pallets, lifting points) must be suitable.

ii. i. It must be positioned or installed to prevent the risk of injury from the equipment or the load falling or striking people.

iii. The operating controls must be designed and placed to avoid accidental operation and injury. They shall have emergency stop controls where necessary.

iv. It must be visibly marked with any appropriate information for its safe use, e.g., Safe Working Loads. Accessories, e.g., slings, clamps etc., shall be similarly marked.

3.15 Fabrication and Construction Considerations

All fabrication and welding procedures shall generally conform with the following:

i. As applicable, the relevant specifications in the under-listed documents or their internationally recognized equivalents shall be used:

   a. American Welding Society-Structural Welding Code DI. 1-88 and its subsequent revisions.

   b. American Institute of Steel Construction (AISC) specification for the Design, Fabrication and Erection.

   c. API RP 2A or IACS requirements.

d. Section 13 (Fabrication, installation, and inspection) of API RP 2A
e. API Spec 2F, API RP 2SM, DNV and ISO requirements.
f. America Welding Society – Structural welding code – AWS D3.5., AW.S. DI. 1.88 and subsequent revisions.
g. AISC – specifications for the Design, fabrication, and Erection of Structural Steel for Buildings AISC.

ii. For each structural system or subsystem, fabrication specifications shall be developed and must be compatible with the structural design, welding and inspection standards used to design a system or a subsystem.
iii. Design specifications and drawings should be well developed and detailed for careful execution of all fabrication work in accordance with quality, manufacturing, and testing procedures.
iv. Faults and deficiencies (if any) shall be corrected before painting and coating. All faults detected, and repairs effected during fabrications shall be adequately documented in the Non-Conformance Register and corresponding Corrective Action Register respectively.
v. Penetrations through load bearing structural member should be carefully detailed and appropriately compensated.
vi. Facility, FPSO/FSO assembly, erection sequence, dimensional and weight control, heavy lifts, and hull and deck mating operations shall follow internationally recognised standards such as API RP 2T, ISO19901.
vii. The expected cumulative fatigue damage to structural members during transportation shall be assessed and if found significant, shall be included in the calculation of life cycle fatigue damage.
viii. Where applicable, transportation of structures / vessels to and fro offshore site shall be in accordance with internationally recognised standards such as the provisions of DNVGL-ST-N001 for wet towing and when towed on a cargo barge.

Note: Conversion of existing vessel into FPSO / FSO shall be in accordance with relevant internationally recognised standards such as API RP 2 FPS or IACS requirements.

3.16 Pipelines

The design, construction and operations of pipelines shall be in compliance with the Regulations and Guidelines on Pipelines issued by the Commission.

3.17 HVAC systems

HVAC systems shall be installed for all enclosed areas of the Installation such as living quarters, electrical switch rooms, equipment rooms and other areas with potential of build-up/ingress of harmful gases.

3.18 Electrical Considerations

The following shall, at the minimum, be ensured:

i. The design of the electrical systems shall be in conformance with internationally recognised standards such as the specifications and recommended practices of IEC, BS, AIEE, API, IEEE, etc.
ii. All base load power utilisation on the facility shall be in accordance with the Nigerian National Electrical Grid Standards.

3.18.1 Power Specification

All base load power generation on the facility shall be in accordance with the Nigerian National Electrical Grid Standards and NERC requirements as applicable.

3.18.2 Motor Control Room

The motor control room shall be designed and installed in line with internationally recognised standards. All electrical boxes, conductors, wires, etc. shall be designed and manufactured in compliance with UL listing. The following shall, at the minimum, be ensured:

i. Access to electrical connections, fuse boxes, switches, transformers, and other electrical equipment shall be marked with proper voltage signs.
ii. Main power switches shall be labelled, indicating the units they control.
iii. Whenever there is any possibility of an electrical shock at an electrical control panel or switch panels, mats or platforms made of insulating material or any other non-electrically conducting material shall be adequately placed.
iv. There shall be adequate lighting in all electrical control rooms / MCCs.
v. All MCCs and sub-stations shall have at least a fire detection system and firefighting equipment.

3.18.3 Emergency Power Supply System

Independent backup power systems shall be installed for all emergency systems. The design and installations shall be in line with internationally recognised standards such as SOLAS, etc. The following shall, at the minimum, be ensured:

i. The emergency source of power shall be automatically connected to the emergency switchboard in case of failure of the main source of electric power.
ii. The electrical power available shall be sufficient to supply all services essential for safety in an emergency.
iii. It shall not be designed to be used for supplying power during normal operation of the facility.
iv. For emergency generators, it shall be of independent fuel supply and equipped with starting device with a stored energy capability and back up.
v. For UPS and backup system:
    a. It shall be capable of carrying the emergency electrical load without recharging while maintaining the voltage of the battery
    b. Power Back up system shall be sized and installed to power circuits for a minimum of 24 hours operations upon loss of AC power.
    c. Failure of the battery charging system shall provide an alarm at manned control station.

3.19 Instruments and Controls

The instruments and control shall be designed to internationally recognised standards such as IEC, NFPA, ANSI etc. They shall meet both functional requirements and the requirements for safety, reliability, and real time response. The following shall, at the minimum, be ensured:

i. To the extent possible, process control, monitoring and management for the facility shall be via DCS in CCR.
ii. Critical process equipment and large machineries shall be equipped with a highly reliable safety instrumented system (SIS) to execute emergency shutdown and safety interlock protection of all units and critical equipment.
iii. All automatic control systems for emergency shutdown of all strategic or critical equipment on the facility such as separators, surge vessel, pipeline

end manifolds (PLEM), compressors and pumps shall be of acceptable fail-safe logic design.

iv. Electricals of instruments shall meet the requirements for explosion proof and protection.

v. Field instruments for use in explosion hazard areas shall be of intrinsic safety models and explosion proof types according to the requirements.

3.20 Inspection and Maintenance Philosophy

3.20.1 Inspections Philosophy

The following shall, at the minimum, apply:

i. The Operator shall design its inspection philosophy in line with applicable Regulation and Guidelines for Petroleum Operations (Safety) issued by the Commission, manufacturer's recommendations and other internationally recognised standards.

ii. If the Operator intends to use Risk Based Inspections, it shall be approved by the Commission in line with the applicable Guidelines on the Implementation of Risk Based Inspection issued by the Commission.

iii. Baseline inspections for critical equipment shall be carried out with the participation of the Commission's nominated Officers.

3.20.2 Maintenance Philosophy

The Maintenance Philosophy shall be developed for equipment on board a facility and this shall form the basis of the equipment maintenance throughout the operating life of the facility. Additionally, the following shall, at the minimum, apply:

i. The philosophy shall be developed based on approved detailed design specifications and original equipment manufacturer's recommendations.

ii. A criticality assessment and equipment maintenance study and RAM study shall be conducted to minimise overall operational downtime.

3.20.3 Obsolescence Management

The Operator shall implement Obsolescence management strategy in the design of a facility.

3.21 Establishment of Laboratory

As applicable, laboratory shall be established in any facility for carrying out various testing and analysis. It shall meet the following minimum requirements:

i. It must be aesthetically pleasing and designed to be conducive for personnel.
ii. It must have impervious and chemically resistant work surfaces.
iii. It must have proper installation of chemical fume hood, biosafety cabinet(s), sink(s), safety shower eye-wash station and other necessary lab equipment, as appropriate.
iv. It must have electrical outlets sufficient in number and location to minimize the use of extension cords.

Note: Laboratories shall be accredited by the Commission before operations is commenced and annually during operations.

3.22 New Technology

All new technologies to be adopted for use in the design, construction and operation of facilities shall be duly approved by the Commission in line with the relevant process and/or procedure guide.

3.23 Additional Minimum Considerations for Offshore/Swamp Facilities

For an Offshore/swamp facility, the following additional technical consideration to guarantee the safety of the facility shall be considered.

3.23.1 Subsea System

The design, construction and installation of subsea systems shall conform with internationally recognised standards such as NORSOK, API etc. The following shall be ensured:

i. Subsea systems shall be designed for diver-less installation and intervention, and Diving operations shall not be planned in water depths exceeding approved limits.
ii. Subsea production systems shall be designed to optimise life cycle cost within the defined safety level.
iii. All pressure containing equipment shall be rated to the highest system operating or test pressure.
iv. Subsea systems interfaces are very critical to the function, operation and maintainability of the system and must be clearly defined during the initial design.

v. Subsea control system shall be designed to be failsafe. The system shall be designed such that any operation can be terminated leaving the well(s) in a safe state when predefined operational limits are exceeded.
vi. The system shall be designed for easy fault diagnosis without system retrieval.
vii. Intervention interfaces shall be implemented according to international standards (e.g., API 17H).
viii. Connectors with critical functions shall have an arrangement preventing unintentional release.
ix. Components to be utilized subsea shall be qualified by being field-proven or by undergoing qualification testing in simulated environments similar to the specific application.

3.23.2 Additional Safety Considerations for Offshore/Swamp Facilities

The following shall, at the minimum, apply:

i. There shall be provided, a minimum of two access ways .to each manned platform deck level and the route of these accesses shall be clearly marked with arrows and illuminated signs at strategic locations on the deck.
ii. Unmanned platforms shall be provided with intruder detection device backed up by an effective protection response arrangement where practicable.
iii. Adequate navigational warning signs shall be provided around the facility for both day and night warnings to other marine traffic around the location.
iv. A facility isolation valve shall be provided below the deck of the platform, and it shall always be maintained in operational condition.
v. Power supply to the warning signs shall be arranged such that automatic change over to a standby UPS is available in the event of failure of the normal supply.

3.23.3 Additional Environmental Considerations for Offshore/Swamp Facilities

For Offshore/swamp facilities, the additional environmental considerations are as follows:

i. There shall be adequate provision in place to ensure health and hygiene on board.
ii. Provision should be made for the lowest possible risk of pollution on board as addressed by applicable Regulation and Guidelines for Environmental

Management issued by the Commission, and "MARPOL" compliance, and enforced by Class.

iii. Effluent handling and produced water treatment facilities shall be designed to ensure set environmental limits / standards as stated in applicable Regulation and Guidelines for Environmental Management issued by the Commission, are met.

3.23.4 Security Considerations

Adequate security considerations such as standard anti boarding type design, radars capable of detecting unauthorised personnel entering the restricted area shall be built into the design.

3.23.5 Structural Steel Materials for Offshore/Swamp Facilities

The following shall, at the minimum, apply:

i. The structural steel plates, shapes and pipes shall conform to the appropriate American Society for Testing and Materials (ASTM) or EN Standards or other internationally recognised equivalent standards for the desired services.

ii. The allowable stresses in all structural members shall be proportional as specified in the API RP 2FPS codes and specifications of the American Institute of Steel Construction (AISC).

iii. Consistent with these specifications, the appropriate allowable stresses are calculated for the hull based on the following references or other internationally recognised equivalent:

   a. Tubular members API RP 2A or BS or ISO
   b. Non-tubular beam-columns members AISC or EN or ISO
   c. Stiffened flat plate structures API BUL 2V or IACS or BS
   d. Stiffened shell structures API BUL 2U or IACS or EN
   e. Nodes and transition joints API RP 2A / or IACS
   f. Fastening and nuts AISC or IACS. API RP 2T should be used for Pontoon Column
   g. In all cases, the safety levels and design philosophy as provided in AISC or IMO
   h. National Fire Protection Association (NFPA) or ISO

3.23.6 Corrosion for Offshore/Swamp Facilities

The following shall, at the minimum, apply:

i. Specific structural areas to be considered for corrosion protection (using the primary systems of coating/painting, cathodic and corrosion thickness allowance) are:
   a. Accommodations
   b. Void spaces (open and closed)
   c. Machinery and equipment spaces
   d. Storage spaces etc.
   e. Internal surface – wet
   f. Fuel tanks
   g. Cargo and slop tanks
   h. Ballast tanks
   i. Fresh water tanks etc
   j. External surfaces
   k. Topside facilities and superstructure
   l. Deck areas
   m. Above waterline hull
   n. Waterline area (splash zone)
   o. Underwater hull etc.

ii. In general, the corrosion control system/steel materials of facility shall follow the codes and specifications outlined in the current version of AMPP Standards SP0176 or other internationally accepted standards.

iii. Being subjected to high corrosion rate, the structural steel in ballast shall be adequately protected from corrosion during the design life by appropriate combination of coatings and sacrificial anodes.

iv. Coatings or sacrificial anodes or impressed current or their combinations shall be used to protect the exterior hull surface below the waterline.

v. Material corrosion allowance shall be appropriately applicable as well as special coating.

3.23.7 Civil and Structures for Offshore Installations

The following shall, at the minimum, apply:

i. The design of the facility shall take into considerations all available meteorological and oceanographic parameters such as the prevailing winds, waves, tides, currents, sea floor conditions and load bearing capacity, anticipated marine - growth rate and other sea bottom foundation information.

ii. All environmental parameters shall be obtained from site survey or data gathering and shall be properly documented.

iii. Sea bottom foundation investigation for pile supported structures shall provide enough engineering data to determine the axial capacity of piles in tension and compression, the load - deflection characteristics of axially /laterally loaded piles, pile drive-ability characteristics and mud mat load bearing capacity.

iv. Platform structures shall be designed on the basis of 100-year oceanographic criteria but where a shorter recurrence interval is desired, the basis of this choice should be presented.

v. All the systems and components of the facility shall be designed to withstand any anticipated extreme of environmental phenomena on location.

3.23.8 Hydrostatic Stability

The following shall, at the minimum, apply:

i. Hydrostatic Stability requirements shall be met for all pre-service and operating conditions for both intact and damaged conditions of the floating structure.

ii. In this respect, loading computer and hull stress monitoring are to be of a class approved type and shall consider various stability conditions as per class.

iii. Design considerations must include the possibility of vortex induced vibrations on risers, umbilicals/cables etc.

3.23.9 Weight & Centre of Gravity Requirement

The following shall, at the minimum, apply:

i. A lightship survey and inclining experiment shall be conducted when construction is as near to completion as practical to accurately determine the lightship weight and position of the centre of gravity.

ii. Any subsequent changes to the lightship survey and/or inclining experiment shall be accounted for and included in the final documentation and updated during service.

3.23.10 Mooring Systems

The following shall, at the minimum, apply:

i. Mooring systems shall be designed and installed in line with internationally recognised standards such as API, and to meet requirements of class societies such as DNV, ABS etc.

ii. The use of Dynamic Mooring analysis as outlined in API RP 2SK or IACS class society requirements or other internationally recognised equivalent standards shall be adopted in the design of facilities. However, the designer is at liberty to choose either the time-domain or frequency-domain analysis for a specific design case.

3.23.11 Lifesaving Equipment

Life-saving appliances and equipment shall comply with the relevant applicable internationally recognised standards such as SOLAS. Additionally, the following shall be ensured:

i. Life-saving appliances shall be evaluated, tested, and approved as provided in internationally recognised standards such as contained in SOLAS requirements.

ii. The number of life-saving equipment in the form of Lifeboat, life rafts, ring buoys, survival capsules, exposures units etc shall be commensurate with the maximum work force anticipated to be present at any time on the facility in conformance with "SOLAS" and "ISO" standards.

iii. Life-saving equipment shall be strategically positioned, and the release mechanism shall be of dual actuation devices.

3.23.12 Helideck

The design of helicopter facility and deck shall follow NCAA requirements. The following shall be ensured:

i. The helideck surface shall be appropriately coloured, non-slip and with sufficient drainage.

ii. Equipped with lighting system, visual aids, rescue equipment, communication equipment, signages and safety equipment as appropriate.

iii. Refuelling system shall be designed in line with the applicable standards.

iv. Fire-fighting appliances and equipment shall be provided to adequately protect the units from fire hazards associated with helicopter operations.

3.24 Nigerian Content/Local Content

The following shall, at the minimum, apply:

i. Local content of project execution shall be in line with the **Nigerian Oil and Gas industry Content Development Act, 2010**.

ii. Project Management structure shall be composed in a manner that shall reflect the indigenisation and technology transfer policy of the government.

3.25 Decommissioning, Abandonment and Restoration

Facilities shall be designed for ease of decommissioning. Operators shall comply with the applicable Regulations and Guidelines on Decommissioning and Abandonment issued by the Commission.

4 MINIMUM FACILITY OPERATIONS REQUIREMENT

4.1 Renewal of Permit to Operate

Operators shall renew the PTO for each of their facilities, annually. For this purpose, Conformity assessment audits and/or pre-license inspections shall be carried out. The following shall be submitted:

i. Evidence of payment of PTO fees (**see Section 6**).
ii. Conformity Assessment Certificate
iii. EMP/EES Approval
iv. Operations Safety Case Approval
v. As-built drawings
vi. Facility maintenance records and Integrity tests for critical equipment
vii. List of all equipment and date of commissioning
viii. Inspection and Maintenance records and reports of the preceding year

4.1.1 Conformity Assessment

The Commission shall carry out conformity assessment audit/verification for the purpose of establishing compliance status of a facility prior to renewal of PTO. The applicable fees (**see Section 6**) for the Conformity Assessment shall be paid and the exercise shall be carried out by nominated officials of the Commission. Following a successful audit, a Conformity Assessment certificate which is a prerequisite for the renewal of PTO shall be issued. The objectives of the audit are, at the minimum, as follows:

i. Review documentations and equipment/systems of the facility to ascertain its integrity and readiness for continued safe operation. The following documentation shall be made available for review during the audit:
    a. Permit to Operate
    b. Emergency procedures & Facility Response Plans
    c. Security Plan
    d. Spill Prevention Control and Countermeasure Plans
    e. Operation Manual and SOPs
    f. Training records
    g. Operator Training Reports
    h. Copies of Inspections reports carried out
    i. Maintenance Records

j. Approved checklist for the facility

k. Classification society certificate, as applicable.

ii. Carry out physical inspection and verification of the facility equipment and components.

iii. Ensure that adequate safety, operating, maintenance, and emergency procedures are in place for continued operations.

iv. Ensure that training has been completed for all workers who operate the facility.

Note: In addition to the conformity assessment, Pre-License Inspection may apply for some facilities.

4.2 Operations Inspection and Maintenance

4.2.1 General

The Operator shall, at the minimum, ensure the following:

i. Submit the Annual Inspection and Maintenance Plan/Schedule for the year to the Commission by the third week of every January.

ii. Any deviation from submitted inspection and maintenance plan/schedule for critical equipment must be communicated to the Commission in a timely manner.

iii. The appropriate inspectors and company conducting inspection shall be required to possess relevant OGISP, certification and qualifications to carry out the inspection.

iv. Spare Contingency plan shall be in place. Maintenance and replacement of parts shall be carried out as and when due. Only appropriate and approved spares shall be used.

v. Maintenance shall be carried out by qualified personnel with approved procedure, risk assessment, permit to work and job safety analysis.

4.2.2 Facility Inspection and Statutory Inspection of Equipment

The inspection and maintenance of facility shall be in line with manufacturer's recommendations and in compliance with the applicable Regulation and Guidelines for Inspections issued by the Commission. Inspections and tests, in line with regulatory requirements, shall be incorporated in a maintenance schedule and system for the following equipment:

i. Pressure relief systems, vent systems and devices

ii. Critical controls, interlocks (both safety & non-safety), alarms and instruments
iii. Emergency devices (including shutdown systems and isolation systems)
iv. Fire protection equipment
v. Piping systems (including components, for example, valves, excess flow valves, expansion bellows) in critical service
vi. Key process-to-service tie-ins
vii. Electrical earthing, grounding, bonding
viii. Emergency alarm and communication system
ix. Monitoring devices and sensors
x. Pumps
xi. Lifting equipment
xii. Subsea systems (Mooring systems, Umbilical, Jackets, Risers, manifold, etc).

4.2.3 Shutdown Maintenance and Turn Around Maintenance

All Planned Shutdown Maintenance as scheduled by Operators shall be duly submitted to the Commission at least three (3) months prior to its commencement for regulatory oversight. Additionally, the following shall, at the minimum, be ensured:

i. If the planned scope involves any facility modification or upgrade, proper engagements shall be made, and the scope appropriately approved prior to commencement of the planned shutdown activities.
ii. Weekly progress report of the maintenance shall be rendered until completion, for monitoring purposes only.
iii. On completion of the maintenance exercise, close out report shall be submitted.
iv. Maintenance programmes and records are to be kept on board the facility.
v. Estimates of production deferment as a result of the shutdown for inspection and Maintenance must communicated to the Commission.

4.3 Work Program

The following shall, at the minimum, apply:

i. Operators shall be required to submit Work Program annually to the Commission.

ii. The submission shall be in line with the applicable Guidelines on Work Program issued by the Commission and approved FDP.

iii. The Commission may require the physical presentation of annual work program by Operators.

4.4 Drilling and Well Development

The following shall, at the minimum, apply:

i. All drilling and well development programs shall be in line with an approved FDP. Any changes to the drilling and/or well development programs will require a review of the FDP and shall be approved by the Commission before implementation.

ii. Operators shall ensure that applicable approvals are obtained from the Commission for all Drilling programs.

4.5 Journey Management Plan

Operators shall develop and implement journey management plan that ensures:

i. Proper planning, organization, and controls of all journeys to ensure maximum security and limited night travel by road.

ii. Completion of documentation such as manifestos, Bill of Quantity, Certificate of Quantity and forms containing details on journey timing, routes, passengers, and vessels.

iii. The conduct of pre-journey inspections on vehicle/vessels as required.

iv. Use of only trained and certified crew/personnel to operate shuttle vehicle/vessels.

v. Mandatory use of safety device and Personnel flotation device by all personnel during the duration of all journeys as applicable.

vi. For offshore and swamp facilities, compliance with the requirements contained in the applicable Guidelines for travelling to Offshore and Offshore Safety Permit issued by the Commission.

4.6 Terminal Operations

Operators shall ensure that only approved methods are employed for the evacuation of products from its facility. The operations shall be carried out in compliance with the applicable Regulations and Guidelines for the Determination of Quantity and Quality of Petroleum and Petroleum Products issued by the Commission. Operators shall apply for export clearance and obtain approval from the Commission for all loading and

offloading operations. Relevant shipping documents for export/import documentation shall be issued by the Commission. The Commission shall attach its Officers to regulate/monitor activities in all established oil and gas terminals.

4.6.1 Functions of the Commission's Officers at Terminals & Custody Transfer Points

The Commission's Officer(s) shall be resident on all terminals (Land, FPSO/FSO and such other facilities designated for oil and gas export/custody transfer point). They shall ensure that all operations/facility management are done in accordance with the applicable Regulations and Guidelines issued by the Commission. They shall be the Custodian of the export valve key (opening and closing of export valve before and after export) and be responsible for the following:

i. Monitor export operations to ensure:
   a. Preparation/Endorsement of Certificate of Quantity for every export.
   b. Vessel clearance issued by the Commission and Nigerian Custom inward and outward clearance for export.
   c. Meter proving during export and ensure compliance with the Commission's set limit.
   d. Ship/shore difference is not more than the stipulated limits.
ii. Fiscalisation/Defiscalisaction of the tanks at the operational intervals such as stated in the procedure guide.
iii. Participate in sampling and quality laboratory analysis to ascertain crude oil, gas, produced water quality specifications.
iv. Participate alongside nominated SME from the Commission in the annual LACT unit recertification at the production/custody transfer points and terminals.
v. Carry out routine inspection of facilities, noting overall facility condition, appraisal on safety facilities and ensuring compliance with operating Procedures and Standards, and ensuring that emergency drills are conducted.
vi. Ensure that the National Production Monitoring System (NPMS) is regularly updated and up to date as required.
vii. Ensure that all personnel on board the facility at applicable location have valid OSP (Offshore safety permit) and BOISET.
viii. Other functions as may be determined by the Commission.

4.6.2 Operations Report

The following shall, at the minimum, apply:

i. Operators shall ensure the timely submission of daily Operations Report to the Terminal Officer in the specified format and update same on any Portal that may be designated for such.

ii. Operators shall ensure the submission of all other reports as may be required from time to time.

4.7 Deployment of New Technologies

The following shall, at the minimum, apply:

i. All new technologies to be deployed for upstream operations in the Nigerian oil and gas industry must be approved by the Commission. New technology means technology new to deployment in Nigeria.

ii. Operators must comply with applicable Guidelines on the deployment of new technologies issued by the Commission.

4.8 Flare Management

Operators shall comply with the applicable Regulations and Guidelines on Flare Gas Management issued by the Commission. In addition, Operators must ensure that:

i. There is no routine flare during operations.

ii. Where applicable, payment for gas flaring is made promptly.

iii. Daily and Monthly gas production, utilization and flare reports are submitted to the Commission in line with the applicable template and made available on demand.

4.9 Produced Water Handling

Operators shall ensure proper handling of produced water and adherence to Zero Discharge policy in line with the applicable Regulations and Guidelines on Environmental Management issued by the Commission.

4.10 Pipeline Operations

All pipeline operations shall comply with the applicable Regulations and Guidelines on Pipelines issued by the Commission.

4.11 Contractor Management

The following shall, at the minimum, apply:

i. Operator shall ensure the safety of all its workers including contractors In line with the applicable Regulations and Guidelines on Petroleum Operations (Safety) issued by the Commission.

ii. All contractors and service providers engaged in any service or operations must possess the relevant OGISP prior to engagement. The requirement for obtainment of OGISP is contained in the applicable Guidelines issued by the Commission.

4.12 Work-at-Height, Confined Space and Lifting Operations

All Work-at-Height activities and lifting operations shall comply with the applicable Guidelines on Work-at-Height, Confined Spaces and Lifting Operations issued by the Commission.

4.13 Document Control

The following shall, at the minimum, apply:

i. Operators shall ensure that document control measures are in place for the easy retrieval and protection of records.

ii. The Commission shall, from time to time, specify the means or platforms by which an Operator shall forward or provide specified information regarding operations.

4.14 Operations of Central Control Room

i. CCRs shall be restricted for unauthorised entry.

ii. A copy of applicable Petroleum Safety Regulations issued by the Commission shall be conspicuously displayed at the CCR.

iii. Proper housekeeping shall be maintained in the CCR.

4.14.1 Operations of Motor Control Centre

In the operations of Motor Control Centres, the following shall, at the minimum, be ensured:

i. Personnel shall be provided with electrical protective equipment suitable for work hazards. Lock-out/Tag-out requirements shall be complied with if electrical work is to be done.

ii. Access control shall be implemented at the MCC. Signs shall also be displayed indicating the access restrictions Gates of sub-stations shall always be closed and locked.

iii. All areas shall be kept clean and neat. All electrical boxes, covers, protectors and comparable items shall always be closed, except during maintenance, testing or repairs.

iv. Electrical installation areas, MCC rooms and substations shall not be used as storage areas, lunchrooms, workshops, break rooms or similar areas.

v. No flammable materials shall be stored in electrical control rooms for any reason, either temporarily or permanently. No combustible materials, dry vegetation etc. shall be stored nor shall they be allowed to accumulate close to electric substations.

vi. Whenever there is any possibility of an electrical shock at an electrical control panel or switch panels, mats or platforms, made of insulating material or any other non-electrically conducting material, shall be adequately placed.

vii. Lighting, emergency lighting, fire detection system and firefighting equipment in all electrical control rooms / MCCs shall be properly maintained.

4.15 Operations of Facility Living Quarters

It is important to ensure the welfare and protection of personnel in living quarters of a facility. The following shall be ensured:

i. Operators shall ensure that accommodation facilities are situated in a safe and secured environment.

ii. The rooms, toilets, bathrooms, etc. in accommodation facilities shall be comfortable, clean, well ventilated, and always maintained. Special attention is necessary where product vapor, mist or dust may occur.

iii. Accommodation facilities shall have a robust medical and emergency evacuation procedure.

iv. Signages and critical safety information shall be duly pasted at strategic locations.

v. Provision of internet services, catering facilities, recreational facilities and laundry services for personnel as may be necessary.

vi. Provisions shall be made to ensure adequate facilities for washing, drinking and sanitation.

4.15.1 Catering Services

Where catering facility is provided, the following shall, at the minimum, be ensured:

i. Galley, kitchen and/or dining area shall always be kept clean and all equipment in the area shall be in good working condition.
ii. Fly traps, smoke detectors, fire extinguishers and other required accessories shall be installed at strategic locations, clearly marked and accessible.
iii. Exits to and from the kitchen shall be clear and free from stored items and obstructions.
iv. Combustible liquids or gases shall be properly stored and clearly labelled.
v. The store attached to the kitchen shall be kept clean, well-organized, adequately ventilated, and free of pests.
vi. Potable water shall be readily available at the kitchen.
vii. The food served shall take into consideration the different food allergies that may exist amongst personnel and the quality shall be satisfactory enough to provide comfort.
viii. Personnel working in the kitchen area shall always possess valid and up-to-date Food Handling Certificate and shall be required to participate in the necessary emergency trainings and drills.
ix. Personnel are required to wear the necessary cooking gears and PPEs as applicable for their job.
x. Personnel shall be required to keep, comply with, and make available on demand, the general procedure for handling food and wastes.

5 MINIMUM HSE REQUIREMENTS FOR FACILITY OPERATIONS

5.1 General Practices

To ensure adequate safety measures are established, Operators shall, at the minimum, implement the following:

i. Applicable Regulation on Petroleum Operations (Safety) issued by the Commission, shall be conspicuously displayed at facilities.
ii. All staff members of a facility shall be required to always wear company photo identification cards or necessary means of identification.
iii. Personnel on Board tracking systems shall be installed to efficiently monitor and control the movement of personnel.
iv. Access to critical areas shall be restricted and secured against unauthorized entry.
v. Emergency communications systems hardware (public address and general alarms systems) and procedures shall be regularly tested.
vi. Personnel shall be trained and empowered to intervene and exercise a stop-work authority in any operation or procedure that is not considered safe.

5.2 Competent Persons & Training

Operators shall report the appointment of competent persons to the Commission in line with applicable Regulation and Guidelines for Petroleum Operations (Safety) issued by the Commission. Operators shall, at the minimum, ensure the following:

i. Operations shall be conducted by competent persons that are qualified and possess satisfactory training to carry out assigned functions. All activities and operations in a facility shall be supervised by an appropriate person/Manager.
ii. Operators shall be required to provide training to competent/responsible persons in the facility covering safe work procedures and emergency actions.
iii. Operators shall have duly approved SOPs and Safe Work Procedures which shall guide all operations in the facility and shall be made available on demand.
iv. Training records shall be maintained for five years and must be made available to the Commission upon request.

v. All personnel shall be made aware of SOPs, facility site-specific guide and policy, safe practices, documentation and procedures in day-to-day operations.

5.3 Personal Protective Equipment (PPE)

Operators shall ensure that every personnel including contractors and service providers, are provided with PPE of international standards. Operators shall, at the minimum, ensure the following:

i. Appropriate clothing shall be worn by personnel for operations. Personnel in operational area of a facility shall be required to wear PPE as appropriate, which include:
   a. Hard hat
   b. Hand glove
   c. Fire retardant reflective clothing
   d. Steel toe boot
   e. Safety goggle

ii. Ear protections shall be required in areas mapped as noisy area - areas up to 85 decibels.

iii. Special PPEs e.g., breather, safety harness etc., for personnel performing specialised operations shall be provided.

5.4 Security

The following shall, at the minimum, apply:

i. Operators shall employ appropriate security measures to prevent vandals, unauthorised individuals, and animals from entering a facility.

ii. The installation and use of Closed-circuit television (CCTV) is highly encouraged.

iii. Hazardous areas in a facility such as chemical areas, high pressure areas, etc., shall be restricted from unauthorized persons.

iv. Radars, where applicable, shall be regularly monitored.

5.5 Housekeeping

The following shall, at the minimum, apply:

i. Operators shall ensure that the landscaping, surrounding, and environment are well-maintained.

ii. Poor housekeeping shall be deemed a sign of negligence by the Operator.

iii. The facility shall be kept in good condition and free of unnecessary items and objects that can contribute to spread of fire, hindrance to easy evacuation or escape of personnel or clean-up in the event of a leak or spill.

5.6 Occupational Health

Operators shall ensure that all personnel including contractors undergo occupational fitness test in line with the applicable Guidelines on Occupational Health issued by the Commission. Operators shall establish a medical emergency procedure which details the Med-Evac Plan/Procedure for their facilities. In addition, the following shall, at the minimum, be ensured:

i. Operators shall develop and implement health and wellbeing programs for personnel.
ii. First Aid boxes and emergency equipment shall be well stocked and situated at strategic locations with an established procedure to regularly inspect and restock them.
iii. Automated External Defibrillator (AEDs) shall be strategically placed in facilities.
iv. Operators shall have an equipped on-site clinic which is always manned by qualified medical professionals. The medical personnel shall, at a minimum, meet the following requirements:
    a. possess qualification in nursing and must be trained and experienced in occupational health and emergencies.
    b. The medical personnel must be attached to a conventional hospital on a periodic rotational basis to maintain up-to-date information and awareness with his/her medical practice.
    c. The cumulative number of weeks to be spent by the medic at the conventional hospital must not be less than two (2) weeks in a calendar year and evidence of same must be presented on demand.
v. The onsite clinic shall have an active retainership with a conventional hospital for escalating emergencies.
vi. Personnel shall be trained on First Aid administration, artificial respiration, and resuscitation.

5.7 Renewal of Operations Safety Case

The approved Operations Safety Case of a facility shall be renewed in line with the applicable Guidelines on Safety Case issued by the Commission.

5.8 Fire Protection

Operators shall ensure all special, technical, and organizational measures are in place in a facility to prevent or reduce the likelihood of a fire or explosion, prevent the rapid spread and to minimize its intensity should such an event occur in the premises. The following shall be ensured:

i. All firefighting equipment must be regularly inspected.
ii. There shall be an adequate number of fire extinguishers which shall be strategically placed in facilities. Prominent signs showing location of fire extinguishers should also be posted.
iii. Fire extinguishers must be kept pressurized and inspected.

5.9 Chemical Handling & Laboratory Services

Operators shall comply with applicable Regulation and Guidelines on Environmental Management issued by the Commission for the handling of chemicals and management of Laboratory services. Any Laboratory for a facility shall be duly accredited annually by the Commission. The following shall be ensured:

i. Necessary laboratory tests required for quality of products shall be carried out periodically.
ii. Laboratories must be manned by competent personnel with requisite qualifications.
iii. Requisite personal protection equipment for personnel working in the laboratory.
iv. Standard operating procedures for equipment and analysis must be documented and presented on demand.
v. Provision of a comprehensive list of all chemicals. Only chemicals that are duly approved by the Commission are permitted for use.
vi. Provision of Safe Handling of Chemicals (SHOC) card and Safety Data Sheet (SDS) for all chemicals. The SDS shall always be placed close to chemical shed.
vii. Chemical fume hood, biosafety cabinet(s), sink(s), Safety shower, Eye-wash station, and other necessary lab equipment, shall be in good working condition.

viii. All laboratory equipment shall be appropriately calibrated. Current calibration certificate for each equipment shall be made available on demand.

ix. Documented procedures for receipt, retention, handling or safe disposal of laboratory related wastes, expired chemicals, and management of chemical spillages.

5.10 Environmental Management Systems

Operators shall comply with applicable Regulation and Guidelines on Environmental Management issued by the Commission for the environmental management of its facility.

5.10.1 Environmental Monitoring

Operators shall carry out continuous environmental Monitoring studies for its facilities in line with applicable Regulation and Guidelines on Environmental Management issued by the Commission.

5.10.2 Waste Management

Operators shall have a comprehensive waste management system in line with the applicable Regulation and Guideline which shall, at the minimum, ensure that:

i. Proper waste segregation into its individual waste streams is adopted.

ii. Wastes are properly contained in sealed drums or skips and labelled properly.

iii. Cradle-to-grave philosophy is adopted by the operator as it is the responsibility of an operator to ensure proper handling and management of all waste generated.

iv. Proper record of all waste consignment notes shall be kept and provided on demand.

v. Operators shall ensure that only Waste Managers accredited by the Commission are engaged.

5.10.3 Renewal of Point Sources

All registered point sources shall be continually renewed as prescribed in the applicable Regulation and Guidelines on Environmental Management issued by the Commission.

5.11 Emergency Preparedness

Operators shall have duly approved emergency response and preparedness plan and be made available on demand. The Operator shall ensure as follows:

i. That facility operators and workers are familiar with the emergency response preparedness plan, emergency actions, appropriate resources and equipment.
ii. That emergency procedures have built-in scenarios and management and shall be regularly tested in a drill periodically.
iii. That emergency notification placards which boldly list 24-hour emergency phone numbers are posted at the strategic places in the facility.

5.11.1 Oil Spill Contingency

The Operator shall develop, for his facility, oil spill response document for managing oil spill incidents, as prescribed in the applicable Regulation and Guidelines on Environmental Management issued by the Commission. The operator shall ensure as follows:

i. Availability of adequate and appropriate spill preparedness and response equipment capable of managing at least Tiers 1 and 2 spill.
ii. That the response equipment are stored in specified areas within the facility, in good working condition and readily available in an emergency.
iii. Training of personnel on spill responses.
iv. That periodically, spill incident drill is carried out to ascertain the readiness of personnel in the event of an emergency.
v. The provision of environmental sensitivity index map that covers the facility and immediate environment for reference purposes in the event of a spill incident.

5.12 Additional Operations & HSE Requirements for Offshore and Swamp facilities

5.12.1 Travel to Location

The following shall, at the minimum, apply:

i. All personnel travelling to offshore/swamp location must possess OSP card.
ii. Operators must comply with the applicable Guidelines for travelling to Offshore and Offshore Safety Permit issued by the Commission for all travel to offshore/swamp location.

5.12.2 Lifesaving Equipment

All lifesaving equipment shall be inspected and maintained in line with the manufacturer's recommendations and internationally recognized standards such as the requirements of SOLAS.

5.12.2.1 ***Lifejackets & Lifebuoy***

SOLAS compliant lifejackets shall be provided for every person on board a platform. In addition, the following shall be ensured:

i. Sufficient number of lifejackets shall be stowed in suitable locations for those persons who may be on duty in locations where their lifejackets are not readily accessible.
ii. Sufficient lifejackets must be made available for use at remotely located survival craft.
iii. The number and placement of lifebuoys shall be such that a lifebuoy is accessible from exposed locations.

5.12.3 Marine Survey

It shall be mandatory for offshore and swamp facilities to be surveyed to monitor the adequacy of installed corrosion protection systems and determine the condition of the structure throughout its operational life. To this end, the levels of survey as described below shall be observed:

5.12.3.1 ***First Level Survey***

This shall comprise tests on the effectiveness of the corrosion protection systems of the sections of a facility above water. Consequently, the following shall, at the minimum, apply:

i. The survey level shall be by visual inspection to detect paint coating deterioration; formation of corrosion scales, distorted or missing members and other visual structural deformities.
ii. The structural members in the splash zone shall also be inspected to ascertain the conditions as applicable, deck legs, girders, trusses, hulls and other critical areas.
iii. This survey shall be carried out annually and adequate records of observations shall be maintained on the facility for verification during the statutory inspection of the facility by the Commission.

5.12.3.2 ***Second Level Survey***

This survey shall cover all the underwater areas of the facility otherwise referred to as the submerged zone. The following shall, at the minimum, apply:

i. It shall either be through visual inspection by divers or with the use of remote operated vehicles with camera attachment. The purpose shall be to, among other defects, detect the following:
    a. Excessive corrosion
    b. Accidental or environmental overloading leading to structural defects.
    c. Scour, sea floor instability, differential settlement, or other foundation failures.
    d. Fatigue damage
    e. Accumulation of debris
    f. Excessive marine growth

ii. Survey of this type shall be conducted at least once every five years of the facility operational life and reports arising therefrom shall be forwarded to the Commission along with proposals on any remedial maintenance or further detailed survey that is considered due after the interpretation of the survey results.

5.12.3.3 ***Third Level Survey***

This shall focus on suspect areas identified from the second level survey. The following shall, at the minimum, apply:

i. The selected areas from that survey shall be thoroughly cleaned of marine growth and corrosion scales.

ii. They shall thereafter be carefully examined visually, and any areas of confirmed or suspected to have been damaged shall be subjected to underwater non-destructive testing.

iii. Adequate records of such tests and any repair works carried out shall be maintained and made available on demand.

5.12.3.4 ***Risk Based Survey***

The following shall, at the minimum, apply:

i. Any other risk-based inspection strategy by operator shall be submitted for the approval of the Commission.

ii. A report of these tests and any repair works considered necessary shall also be forwarded to the Commission.

5.12.4 Subsea System

The following shall, at the minimum, apply:

i. Operators shall ensure the integrity of hose assemblies and associated fittings installed on critical services, mooring chains and associated fittings installed on the facility.

ii. Operators shall comply with applicable Guidelines and Requirements for Maintenance and Inspection of Flexible Pipes, Steel Catenary Risers and Mooring Chain Systems issued by the Commission.

5.13 Incident Reporting

The following shall, at the minimum, apply:

i. Operators shall establish procedure for reporting, documenting, follow-up and closing of near misses, incidents and accidents in their facilities in line with the applicable Regulation and Guidelines for Incident Reporting and Investigation issued by the Commission.

ii. Whenever a fire occurs or in case of serious injury or fatality or dangerous occurrence in a facility, a report of the incident shall be forwarded to the Commission within 24 hours.

6 PAYMENT OF FEES

All fees relating to the applications listed in this Guidelines are as contained in the ***Upstream Petroleum Fees and Rents Regulations***.

7 SANCTIONS

These Guidelines provide the procedure and minimum requirements for the design, construction, installation and operations of Oil and Gas Production Facilities in Nigeria.

Non-compliance with the requirements of these Guidelines shall be deemed as violations to relevant sections of the Petroleum Act, 2021, Petroleum Act 1969 as amended, Petroleum (Drilling and Production) Regulations 1969 & subsequent amendments and Mineral Oils (Safety) Regulation, 1997. These violations may result in the rejection of applications for statutory approvals and the imposition of applicable consequence management, including, but not limited to, fines, penalties, suspension of operations and/or revocation of licence.

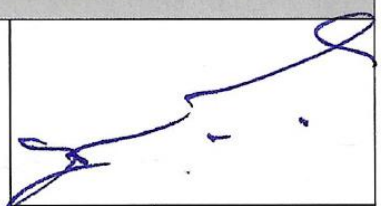
8 GLOSSARY

Abbreviations, terms, and references used in this document are explained hereunder:

AFC	Approved for Construction
AFD	Approved for Design
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ALARP	As Low as Reasonably Practicable
AMPP	Association for Materials Protection and Performance
API	American Petroleum institute
ASME	American Society of Mechanical Engineers
AWS	America Welding Society
BOPD	Barrel of Oil per day
BS	British Standard
CCR	Central Control Room
CCTV	Closed Circuit Television
CDA	Concept Design Approval
CVA	Certified Verification Agents
DCS	Digital Control System
EBS	Environmental Baseline Studies
EES	Environmental Evaluation Studies
EMP	Environmental Management Plan
EPC	Engineering, Procurement and Construction
ERR	Environmental Risk Register
ESD	Emergency Shutdown
ESR	Environmental Screening Report
FAT	Factory Acceptance Test
FDP	Field Development Plan
FEED	Front End Engineering Design
FPSO	Floating Production Storage and Offloading
FSO	Floating Storage and Offloading
GHG	Green House Gases Emission
HAZAN	Hazard Analysis

HAZID	Hazard Identification
HAZOP	Hazard and Operability
HSE	Health Safety and Environment
HVAC	Heating, ventilation, and air conditioning
IACS	International Association of Classification Societies
IEEE	Institute of Electrical and Electronics Engineers
IEC	International Electrotechnical Commission
IFC	Issued for Construction
IFD	Issued for Design
IPF	Instrumented Protective Function
IVA	Independent Verification Agents
LACT	Lease Automatic Custody Transfer
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
PTO	Permit to Operate
MCC	Motor Control Center
MMSCFD	Million Standard Cubic Feet Per Day
MSDS	Material Safety Data Sheet
MTPA	Million Tonnes Per Annum
MTPD	Metric Tonnes Per Day
MT	Metric Tonnes
NCAA	Nigerian Civil Aviation Authority
NCR	Non-conformance Register
NDT	Non-Destructive Test
NERC	Nigerian Electricity Regulatory Commission
NFPA	National Fire Protection Association
NPMS	National Production Monitoring System
NUPRC	Nigerian Upstream Petroleum Regulatory Commission
OGISP	Oil and Gas Industry Service Permit
OMS	Obsolescence Management Strategy
OSP	Offshore Safety Permit
ORR	Operations Readiness Report
P&ID	Piping and Instrumentation Diagram

PCA	Permits, Consents & Approvals
PFD	Process Flow Diagrams
PIAR	Preliminary Impact Assessment Report
PPE	Personal Protective Equipment
PRMS	Pressure Reducing and Metering Station
PSSR	Pre-Start Up Safety Review
PSUA	Pre-Start Up Audit
PSV	Process safety Valve
PRD	Pressure Relief Device
QAQC	Quality Assurance and Quality Control
QMR	Quarterly Management Review
RAM	Reliability Availability and Maintainability
RBI	Risk based inspection
RFSUC	Ready for Start Up Certificates
SAT	Site Acceptance Test
SAFOP	Safety and Operability Review
SIL	Safety Integrity Level
SIS	Safety Instrumented System
SME	Subject Matter Experts
SOLAS	International Convention for the Safety of Life at Sea
SOP	Standard Operating Procedure
TSC	Technical Safety Control
UL	Underwriters Laboratories
UPS	Uninterruptible Power Supply

Approved by	
Engr. Gbenga Komolafe *FNSE,* **(Commission Chief Executive, Nigerian Upstream Petroleum Regulatory Commission)**	 **Date** 14/12/23