PETROLEUM MEASUREMENT REGULATIONS

DRAFT DATE: 01 AUGUST 2022

ARRANGEMENT OF REGULATIONS

PART 1

GENERAL

1. Objectives

The objectives of these Regulations are to-

(1) regulate and ensure accurate measurement and allocation of petroleum, petroleum liquids, natural gas and their derivatives.

(2) determine the basis for calculating revenue accruing to Government, licencees, contractors and other parties.

(3) provide sanctions and penalties for failure to comply with these Regulations.

2. Authority to Make Guidelines etc

(1) The Authority may issue guidelines, directives, and notices for the effective implementation of these Regulations.

(2) Where no specific provision is made in these Regulations for any part of petroleum, petroleum liquids, natural gas, and their derivatives measurement operations in Nigeria, subject to the approval of the Authority, practices conforming with international best standards shall be observed.

3. Duties of Licencees and Permit Holders

(1) A licencee or permit holder to whom these Regulations apply shall:

(i) ensure that the provisions of these Regulations, guidelines or any other directives from the Authority are fully complied with.

(ii) ensure that its contractors, employees, agents, and any person acting directly or indirectly for the licencee or permit holder complies with these Regulations, guidelines or any other directives issued by the Authority.

(iii) appoint, in writing a competent person to be responsible for metering and allocation systems and notify the Authority of the appointment and any subsequent change not later than 72 hours of such appointment or change.

(iv) ensure that any person engaged in metering activities possesses the requisite qualifications and competence to perform the activities.

(v) ensure that contractors and sub-contractors engaged in metering activities are duly registered with and have valid and appropriate permits from the Authority.

(vi) ensure that all metering and allocation systems are designed, fabricated, inspected, tested, and installed in accordance with these Regulations and guidelines issued by the Authority.

(vii) ensure that all measurement systems reports, records and data are maintained as prescribed by the Authority for audit.

(viii) ensure that its measurement operations are undertaken with valid and appropriate licences, permits or authorisations.

4. Duty to Provide Information

(1) The Authority may direct any person to provide information or data on any measurement operation and the person shall provide such information or data in the prescribed manner within the timeframe stipulated in such direction.

(2) A licencee or permit holder to whom these Regulations apply shall provide the Authority with information or data on:

(i) annual performance of measurement system.
(ii) annual maintenance plan and record for previous year.
(iii) malfunction of measurement system.
(iv) annual recertification notice.
(v) annual totalizer measurement.
(vi) annual actual measurement.
(vii) report of maintenance work on flow computer and other metering system components.
(viii) petroleum liquid and natural gas handling agreements, including cargo loss claim and
(ix) the performance of a newly installed metering system not later than three (3) months after installation.

5. Measurement Standards

The Authority shall approve standards and recommended practices to be used in the design, construction, modification, upgrade, operation, and maintenance of a measurement system.

PART 2

6. Classes of Dynamic Measurement

(1) There shall be five (5) classes of dynamic measurement based on their purpose of deployment as defined below:

(i) CLASS A MEASUREMENT

The metering stations used for the delivery of fiscal metering of petroleum to customers and where sales contracts are applicable.

(ii) CLASS B MEASUREMENT

The metering stations for the delivery of petroleum in commonly used pipeline systems and where allocation procedures or joint operating contracts apply.

(iii) CLASS C MEASUREMENT

The metering stations for the delivery of fuel gas within the operator's operating facility or to third party facility.

(iv) CLASS D MEASUREMENT

The metering station for flare and injection gas measurement.

(v) CLASS E MEASUREMENT

The weighing or metering station for petroleum based solid products measurement.

(2) The uncertainty limit analysis shall be developed for petroleum measurement systems within 95% confidence level in accordance with recognised standards and the uncertainty limits shall be prescribed by the Authority.

(3) The points of deployment for dynamic measurement shall be for:
(i) custody transfer;
(ii) allocation;
(iii) fuel gas; or
(iv) flare gas.

(4) Notwithstanding sub-regulation 6(3), all measurement methods in Crude Handling Agreements, Crude Transportation Agreements, Gas Sales/Supply Agreements, Gas Transportation Agreements, and other commercial agreements shall be as approved by the Authority.

7. Calibration and Traceability

(1) A licencee or permit holder shall ensure that measurements and calibrations made under these Regulations are traceable to national and/or international measurement standards.

(2) A licencee or permit holder shall ensure that an instrument used for calibration has traceability to national and/or international measurement standards.

(3) A third-party laboratory used to calibrate equipment covered by these Regulations shall:

(i) be accredited in accordance with internationally recognised standards and

(ii) have a documented uncertainty equal or better than those set out in this regulation.

(4) A licencee or permit holder shall ensure that a laboratory analysis of the composition or quality of petroleum, petroleum liquids, natural gas, and their derivatives for custody transfer and allocation purposes is carried out by a competent or an accredited laboratory in the presence of the Authority.

8. Reference Conditions

(1) The reference conditions for temperature and pressure to determine standard volume is 60 °F and 14.696 psia (101.325 kPa or 0 psig) for crude oil and condensate.

(2) A reference pressure other than 101.325 kPa may be used for natural gas liquid and liquefied petroleum gas subject to the approval of the Authority.

(3) A reference temperature and pressure of 15°C and 101.325 kPa may be used for petroleum products and liquified natural gas.

9. Bypass of Measurement System

No by-pass of the meter bank, dispensing pump, loading gantry or provision for reverse flow through the meter bank shall be permitted for any measurement system.

10. Methods of Measurement

(1) These Regulations shall apply to both static and dynamic measurements for petroleum, petroleum liquids, petroleum products, natural gas and its derivatives.

(2) The primary measurement method for determining the quantities of petroleum, petroleum liquids, petroleum products, natural gas and its derivatives shall be by dynamic measurement method.

(3) Notwithstanding sub-regulation 10(2), where dynamic measurement is not applicable, static measurement shall apply subject to conditions prescribed by the Authority.

PART 3

11. Metering System Design

(1) No metering system shall be designed for measuring petroleum, petroleum liquids, petroleum products, natural gas and its derivatives without the approval of the Authority.

(2) Every meter bank shall be designed to N+1 philosophy and make provisions for proving system.

(3) All application in sub-regulation 11(1) shall be accompanied with the type of meter selected and selection criteria, design philosophy, fluid properties, type of proving method, and project cost estimate.

(4) Design and locations of metering system shall be such that it is easily accessible to condition monitoring, maintenance, replacement, recertification, and repair works.

12. Testing, Calibration, and Inspection of Measurement System

(1) No licencee or permit holder shall procure, fabricate, assemble, integrate, ship, install, modify and commission a measurement system, sampling system, proving system or flow computer without conducting appropriate tests, calibration, inspection, and verification exercises.

(2) The Authority shall witness the activities stated in sub-regulation 12(1).

(3) The result of tests in sub-regulation 12(1) above, whether at fabrication shop or site, shall be validated to ensure the systems meets the requirements prescribed by the Authority.

(4) Prior to approval for equipment shipment or vessel sailing into the country, the measurement system that will be used for petroleum, petroleum liquids, petroleum products, natural gas or other derivatives in Nigeria shall meet the following minimum conditions: -

(i) all meters are tested and calibrated;
(ii) all critical equipment are inspected and tested;
(iii) all sampling devices are tested and calibrated;
(iv) all cargo tanks are inspected and calibrated;
(v) all proving systems are inspected, tested, and calibrated.

(5) Where a licencee or permit holder fails to test or recertify a measurement system the Authority may, in addition to any penalty under these regulations, direct a third party to test and recertify a measurement system and the licencee or permit holder who failed to test or recertify the measurement system shall be responsible for paying for the third party so directed by the Authority.

13. Operation and Maintenance of Measurement System

(1) No licencee or permit holder shall operate a part or whole of a measurement system without the authorization of the Authority.

(2) No licencee or permit holder shall commence the maintenance of a part or whole of a measurement system without the authorization of the Authority.

(3) Every licencee or permit holder shall, in the course of operating a measurement system, keep performance records of metering system, sampling system, proving system, dispensing system, flow computing system, and static measurement system in accordance with requirement and conditions prescribed by the Authority.

(4) No licencee or permit holder shall delete the records of any measurement system without the prior authorization of the Authority.

(5) A licencee or permit holder shall keep and submit periodic measurement system data when requested by the Authority.

(6) All system diagnosis, modification, upgrade, and maintenance shall not be carried out without the authorization of the Authority.

(7) No licencee or permit holder shall tamper with prover loop detector switch and other critical components of metering system without authorization from the Authority.

(8) A licencee or permit holder shall conduct meter linearity annually and the report of such exercise shall be approved by the Authority.

(9) Permit holder shall conduct master meter linearity as prescribed by the Authority.

(10) A licencee or permit holder shall conduct uncertainty analysis for metering system.

14. Operations Management and Supervision

(1) The Authority shall supervise the development and operations of all metering and allocation systems to confirm accuracy, reliability, and repeatability through-

(a) meter selection
(b) conceptual design
(c) design validation
(d) meter calibration
(e) verification of accuracy of sampling systems, flow computers, gas chromatograph, proving systems and other critical components.
(f) workshop/factory/fabrication and site acceptance tests

(2) Where a third-party contractor operates a measurement system, the Authority shall supervise and ensure the reliability of such systems and operations.

15. Measurement Loss and Shrinkage

(1) All petroleum allocation methodology shall be approved by the Authority prior to implementation.

(2) All cargo loss or shrinkage complain shall be reported to and investigated by the Authority

(3) No Petroleum or Petroleum products shrinkage or measurement loss or decanting method shall be applied without prior approval of the Authority.

16. General Offences

(1) Any person who:

i. Fails to obtain a licence, permit or authorisation required under these Regulations;
ii. Fails to provide information required under these Regulations;
iii. Makes a false declaration to the Authority or wilfully furnishes information so required which is in any respect false or insufficient; or

iv. Fails to comply with any provisions of these regulations or any directives given or condition of any permit or licence issued under these Regulations;

shall, in addition to the sanctions, fines and penalties contained in the Act, be liable to the relevant administrative penalties contained in the Second Schedule to these Regulations, and any licence, permit or authorisation granted to that person may be suspended or revoked.

(3) Where no specific penalty for an offence under these Regulations is provided in the Second Schedule, the Authority may impose an administrative penalty not exceeding USD 250,000 (Two Hundred and Fifty Thousand United States Dollars).

17. Interpretation

In these Regulations, unless the context otherwise requires-

"**accuracy**" means the ability of the measurement instrument to indicate value closely approximately the true value.

"Act" means the Petroleum Industry Act, 2021

"**accredited laboratory**" means a laboratory recognized and authorised by the Authority to perform calibration of measurement equipment or devices;

"**allocation system**" means methods, measurements and estimates used for the allocation of petroleum and appurtenant documentation and procedures;

"**allocation**" means an allotment of petroleum, petroleum liquid and natural gas between fields, production facilities, pipelines, processing facilities, storage facilities;

"**Authority**" means the Nigerian Midstream and Downstream Petroleum Regulatory Authority

"**barrel (bbl)"** has the meaning ascribed to it in the Act;

"**calibration**" means the process or procedure of determining the exact volume, capacity, or partial capacity of a standard capacity measure.

"competent person" means a person appointed, with the approval of the Authority, by the manager in writing as a reliable person capable of exercising overall general supervisory responsibility in ensuring compliance with the provisions of these Regulations or parts thereof.

"**critical component**" means component of the measurement or metering system that have direct impact on the functionality or output of the measurement system

"Crude oil" has the meaning ascribed to it in the Act

"**custody transfer measurement**" means provide quantity and quality information used for the physical and fiscal documentation of a change in ownership or a change in responsibility for Petroleum, petroleum liquid, natural gas and derivatives;

"**Custody transfer**" means change in ownership or responsibility

"**detector switch**" means a device that indicates the passage of a displacer in a prover.

"**dynamic measurement**" means measurement under a flowing condition using meters

"**Factory acceptance test**" means a test that is carried out at the fabrication shop or test yard on an equipment before shipment into the country or site;

"**fiscal metering**" means a metering carried out in connection with purchase, sale and the calculation of taxes and royalties;

"**flare gas**" means a natural gas burnt off or vented to the atmosphere;

"flow meter" means a device for a continuous measurement/registration, and display of the amount of petroleum which flows through a pipeline; r

"**gas chromatograph**" means a device for measuring the gas composition;

"**inspection**" means examination of a product, process or installation to assess or determine its conformity with specific or general requirements;

"**instrument**" means a device used for measurement and calibration;

"**international measurement standard"** means a measurement standard acknowledged and recognised internationally as a point of reference for measurement and testing

"Licencee" has the meaning ascribed to it in the Act

"**linearity**" means the total range of deviation of the accuracy curve from such a straight line between the minimum and maximum recommended flow rate;

"**metering system**" means the meters, prover, instrument part, sampling system, flow computer, and other auxiliary equipment;

"Natural gas" has the meaning ascribed to it in the Act

"NGN" means Nigerian Naira

"**Petroleum**" has the meaning ascribed to it in the Act

"Petroleum liquids" has the meaning ascribed to it in the Act

"Petroleum Products Offtake" means purchase of bulk petroleum products for the purpose of export, reselling, retailing or distribution.

"Petroleum Products" has the meaning ascribed to it in the Act

"**permit holder**" means holder of an official certificate of permission to undertake an activity issued by the Authority"

proving system" means system for validating the performance of a meter;

"**repeatability**" means the ability of a meter and prover system to repeat its registered volume during a series of consecutive proving runs under constant operating condition;

"**sampling device**" means equipment used for the collecting a fluid sample from a system

"**sampling system**" means a system for the collection of a sample from the fluid flowing in a pipe;

"**site acceptance test**" means a test that is done on an equipment at the place of operation during commissioning;

"**traceability**" means the quality of a measurement result to be linked to a reference standard through an unbroken chain of calibrations.

"**Uncertainty**" means an interval of value within which the true value is believed to lie with a stated probability;

"USD" means United States Dollar

"**verification**" means provision of evidence that a given equipment conforms to a specified requirement.

18. Citation

These Regulations may be cited as the Petroleum Measurement Regulations 2022

FIRST SCHEDULE

FEES

S/N	LICENCE/PERMIT/AUTHORISATION	SERVICE CHARGES	APPLICATION FEES
1	Metering System Concept approval	USD 10,000	USD 2,000
2	Detailed Design / Approval to Construct	USD 10,000	USD 2,000
3	Licence To Operate	USD 10,000	USD 2,000
4	Operational LACT/Accounting Meter(s)	USD 10,000 Per LACT system/accounting meters renewable every 5 years	
6	Terminal Storage Tank Calibration / Recertification (crude oil and natural gas) Calibration / Recertification of Storage Tank Land / Offshore Terminal.	USD 1,500 per tank ($1,000 per tank (Land Tanks) / $500 per tank (Offshore FPSO, FSO and Barges))	
7	Export Permit Application.	$1,000. (One Thousand USD)	
8	LACT System Calibration / Recertification at Export Terminal / Injection Points.	$1,000 Per LACT Unit	
10	Recertification/recalibration of third party / service companies primary measures / master provers (pipe prover, tank prover, compact prover, master meter etc)	$1,000 per unit	

SECOND SCHEDULE

PENALTIES

S/N	OFFENCE DESCRIPTION	UNIT	AMOUNT
1.	Employment / engagement of non-accredited Authority Contractors for fabrication, construction, calibration, testing etc. of any critical equipment or facility.	Per facility	$5,000. (Five Thousand USD) In addition to suspension of not less than 3 months
2.	Using unapproved tank for storage hydrocarbon without approval.	Per tank	$5,000. (Five Thousand USD)
3.	Using unapproved tank for storage or changing tank petroleum product without approval.	Per tank	NGN1,000,000.
4.	Modification, Alteration, upgrade, etc. of LACT or Measurement System (Export) without Authority authorisation.	Per LACT System	$250,000. (Two Hundred and Fifty Thousand USD)
5.	Modification, Repair, Alteration of surface or underground hydrocarbon storage tanks without approval. Introduction of dead woods, capillary tube or false bottom, etc. attract the same fine.	Per storage greater than or equal to 500 barrels.	$25,000. (Twenty-Five Thousand USD) for crude oil tanks
6	Installation, Modification, Repair, Alteration of surface or underground petroleum products storage tanks without approval.	Per storage tank	NGN1,000,000.
7.	Non-compliance in ensuring AUTHORITY Representatives witness outturn verification at the port of discharge.	Per loaded Vessel or shipment	$250,000. (Two Hundred and Fifty Thousand USD)
8.	Failure to apply the AUTHORITY Methodology for Determination and Allocation of crude Oil Losses.	Per facility	Monetary equivalent of 30% of the total loss volume allocated at the prevailing oil price in USD
9.	Non-compliance with applying approved new base volume and meter factor from proving.	Per loading	$250,000. (Two Hundred and Fifty Thousand USD)
10.	Non-compliance with installation/tampering with AUTHORITY Locking Device (sea line Valves) on export pipeline.	Per Terminal	$100,000. (One Hundred Thousand USD)

11.	Tampering with Metering Systems or its ancillary equipment without approval.	Per Meter	$2,000,000 (Two Million USD)
12.	Commissioning any critical equipment or facility e.g. valve, compressor, pump, sampler, etc. without approval.	Per equipment	$50,000. (Fifty Thousand USD)
13.	None display on operational tank in service "Tank Service", "Date of Calibration" and "Next Due Date of Calibration for Crude oil and Natural Gas	Per tank in service or operation	$100,000. (One Hundred Thousand USD) Per Tank
14	None display on operational tank in service "Tank Service", "Date of Calibration" and "Next Due Date of Calibration for Petroleum Products	Per tank in service or operation	NGN1,000,000. (One Million NGN) Per Tank
15.	Installation of LACT System at Export terminals or Custody transfer point without approval.	Per month	$75,000. (Seven Hundred and Fifty Thousand USD)
16.	Non- Compliance with frequency of calibration of measurement dipping tape, UTI, Temperature / Pressure Gauges, Transmitters, probes etc.	Per Equipment	$5,000 (Five Thousand USD)
17.	Falsification of Proving System Calibration/Meter Proving reports.	Per Prover/Meter	$250,000 (Two Fifty Thousand USD)
18.	Failure to Calibrate/Recertify metering system Ancillary Equipment (Temperature & Pressure Gauges, Transmitters etc.)	Per Equipment	$5,000
19.	Failure to Recertify Prover Loop when due		$175,000 Per Annum
20.	Failure to Recertify Auto sampler when due		$25,000 Per Annum
21.	Failure to carry out statutory meter proving when due	Per Meter	$20,000 per proving frequency in addition to Any other sanctions by The Authority.
22	Procurement of critical equipment without Test		NGN 5,000,000
23	Engagement of non- Authority accredited contractors for fabrication, construction, calibration, testing, or any other midstream and downstream activities.		Not more than USD 250,000 and suspension of not more than 1 year
24	Measuring petroleum at custody transfer or sales points with faulty or uncalibrated measuring equipment, Ullage		USD 10,000 and seizure of faulty

	Transmitting Instrument (UTI) or metering system		measuring instrument
25	Measuring petroleum products with faulty or uncalibrated measuring equipment or Ullage Transmitting Instrument (UTI)		NGN 100,000 and seizure of faulty measuring instrument
26	Conducting a factory acceptance test or site acceptance test of any critical equipment without authorisation and witnessing by officers of the Authority		USD 250,000
27	Installation or tampering with dispensing pump or loading gantry without authorisation	Per pump	NGN 500,000
28	Failure to grant access to Authority staff during investigation	Per Staff	USD100,000 per facility

All payments in USD can be made in its NGN equivalent using the prevailing Central Bank of Nigeria rate.

Made at Abuja this ..... day of 2022

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Engr. Farouk A. Ahmad
Authority Chief Executive
Nigerian Midstream and Downstream Petroleum Regulatory Authority

Explanatory Note

These Regulations are to regulate the petroleum measurement operations of companies in the midstream and downstream sector, provide guidance on operations, application fees, sanctions and penalties for failure to comply with these Regulations.