



## **1. BACKGROUND**

The Auditor General’s report of December 2018 highlighted an increase in reported unaccountable oil losses over a five-year period ending in 2018 at Petrojam Limited. The Auditor General, in her report, found that Petrojam Limited did not provide evidence that it analyzed the sources of the unaccountable oil losses, with a view to better assess and address the problem.

## **2. OVERVIEW OF OIL MOVEMENT PROCESS**

The Term “oil losses” represents the volume of oil reported by petroleum refineries as being lost in their operations. These losses can include spills, contamination, fires, explosions, fraud, employee theft, as well as losses in refining, storage, transfer, distribution, processing losses and any other losses identified. The oil losses are often apparent when there are discrepancies identified when oil inputs are reconciled with the outputs of a refinery. The objective of oil loss management is to reduce oil losses in all operations to the minimum level consistent with international best practice for refineries of the type and scale as Petrojam Limited. The scope of the total oil loss control program must therefore cover all phases of operations, from the time refinery feedstock, blend stocks or finished products are purchased to the sale of finished products. The main stages of oil production at Petrojam Limited are described below:

- Shipping Operations – Shipping in general refers to transportation to or from the refinery by pipeline, tanker, barge and tank truck.
- Oil Movement and Storage (OM&S) Operations – The function of the typical refinery involves the movement and storage of raw materials, intermediate and finished products.
- Process Plant Operations – This is a complex arrangement of distinct processes starting with treatment and distillation of crude in the crude distillation unit (CDU); downstream of the CDU are three hydrotreaters, followed by the light-ends and reformer unit’s conditions that distillates to reach product qualities. Bottoms products are either further processed in vacuum distillation unit (VDU) to make bitumen/asphalt or blended to make intermediate of heavy fuel oils. LPG and light and heavy naphtha are also produced.
- Technical Operations – The technical functions in refinery operations include mechanical, electrical, instrumentation and civil functions, which are responsible for planning, monitoring, repairing and maintenance of equipment.



- Quality Control Laboratory Operations – The petroleum testing laboratory plays an important role in providing stream samples, the input value for calculations for or relating to basic sediment and water (BS&W), API gravity and fuel heating values.
- Accounting Operations – The accounting operations is responsible for processing and reporting statistics relating to oil inventories and loss quantities and computing the financial losses associated therewith.
- Terminal Operations – Petrojam Limited’s terminal operation is confined to the storage or holding of finished products to be sold and transported to end users or further external storage facilities including imported finished products.

### **3. OBJECTIVES OF THE ASSIGNMENT**

The objectives of this Oil Loss Forensic Audit are to:

- Quantify the oil losses at Petrojam Limited for the period April 1, 2012 to March 31, 2018;
- Establish the reasons for the identified oil losses; and
- Recommend mechanisms to address identified oil losses.

Generally, the consultant will:

- Without limitation to the stages identified in Section 2 above analyze all stages of operations, from the time refinery feedstock, blend stocks **or** finished products are purchased to the sale of finished product for each product category to identify the quantum, cost and the source(s) of the oil losses, in each area;
- Assess the systems of measurement, allocation and recording of oil losses; and
- Compare any oil losses identified with the international best practice for a refinery of the scale and type as Petrojam Limited.

The products to be investigated include:

- Liquefied Petroleum Gas (LPG);
- Gasoline;
- Automotive Diesel Oil;
- Ultra-Low Sulphur Diesel;
- Gas oil;
- Jet fuel;
- Kerosene;
- Lubricants;
- Intermediate Fuel Oil (IFO) 380 (Bunker Fuel);



- Heavy Fuel Oil; and
- Asphalt.

#### 4. **Scope of Work**

1. Review prior audits of Petrojam Limited and in particular audits of the company's operations which have information in relation to or prior assessments of oil losses at the company. A list of such audits is provided in **Appendix 1**.
2. Assess all stages of the company's operation from purchase of products to final sale including the refinery operations, product receipt, delivery systems and procedures, measurement and recording/IT systems, storage facilities, pipelines and management practices. The auditor should therefore *inter alia*:
  - a. Undertake a review of refinery procedures to include:
    - i. An interrogation of the procedures that govern oil movement and storage procedures, including the processes and documentation surrounding the receipt and transfer of crude to ensure that the amounts ordered are received;
    - ii. A review of the process to transfer crude for refining and the measurement systems to determine whether amounts transferred are being accurately recorded.
  - b. Assess the accuracy and adequacy of existing measurement systems including a review of the methodology/system responsible for processing and reporting statistics relating to oil inventories and loss quantities and computation of the associated financial losses. This will include interrogation of the various information system (Terminal Loading Systems, Enterprise Resource Planning) for audit trail authenticity, active generic system users and ability to change data base without trail;
  - c. Review the inventory management system including the inventory receipt, inventory delivery and inventory taking processes for adequacy as well as for conformance with best practices for the industry;
  - d. Review, analyze and report on the system used for temperature adjustment providing details on the methodologies for accounting and allocating related costs;
  - e. Analyze the different ways in which Petrojam Limited supplies products to its customers and the various systems and measurement arrangements used to account for the different types of product supplied to its customers; including a review of the systems at the



- loading racks to ensure that the quantities of products sold are being accurately accounted for.
- f. For customers supplied by pipeline(s), determine whether the means of measurement and accounting for the product are adequate for this business and what improvements can be made;
  - g. Assess the movement and storage of products produced from the refinery and products imported and determine to what extent any differences could contribute to losses;
  - h. Undertake a review of storage facilities. This should include:
    - i. A review of the integrity of the tanks in the tank farm to ascertain if there are leaks (current and previous) and assess volumes of losses associated therewith.
    - ii. Assessment of the integrity of all pipelines in the transfer system (Kingston and Montego Bay) to ascertain if there are any leaks.
  - i. Ensure that the reconciliations prepared on the receipt of crude products are done on a consistent basis and losses identified are recorded accurately.
  - j. Review the management, procedures and processes for the movement of intra island transfers on ships to ensure that products are accounted for accurately and the reconciliations are done on a consistent basis.
  - k. Inspect the automated systems to ensure that the meters are working and calibrated in accordance with internal standards.
  - l. Assess the procedures, processes and documentation surrounding the receipt and transfer of crude to ensure accurate measurement and recoding of amounts received.
3. For any irregular transactions, errors of omission and commission identified, establish, as far as possible, the persons involved and the extent of their involvement;

## 5. EXPECTED OUTPUT

The consultant is responsible to:

- a. Prepare an inception report containing sampling approaches and work-plan; and
- b. Provide a factual finding report highlighting;
  - i. Estimated volume of losses by product category, noting the volume of accountable and unaccountable losses;
  - ii. The reasons and causes for oil loss for each product category both accountable and unaccountable losses;
  - iii. The individuals involved and the extent of involvement for irregular transactions;



- iv. Gaps or weakness in the inventory management process; equipment including IT systems, storage facilities and **operating systems and processes**; and
- v. Recommendations on:
  1. Improvements to address any gaps identified.
  2. Any actions or further investigations needed vis a vis any irregular activities that may be identified.

## 6. REQUIRED EXPERTISE

- Capacity to carry out detailed forensic investigations;
- Knowledge of complex inventory management system in the oil and gas industry;
- Knowledge in Enterprise Resource Planning, specifically Systems Applications and Products;
- Knowledge of terminal loading systems; and
- A minimum of ten years' experience in carrying out forensic audits of oil refinery operations.

The proposal should demonstrate the firm's experience with similar projects and the capacity to effectively undertake the project.

## 7 DURATION

- The duration of the contract will be from.....to.....2019.

## 8 SUPERVISION

- The consultant will work under the supervision of the .....



## Appendix 1

### List of PETROJAM Audits

No.	Date	Prepared By	Title
1	November 24, 2009	Centennial Group	Special Audit of PETROJAM Limited
2	December 2017	PDVSA	Corporate Internal Audit Trade, Supply and International Business Audit Report – PETROJAM Joint Venture Management
3	December 2017	Auditors Generals Department of Jamaica	Performance Audit Report – Diversification of Energy Supply
4	December 2018	Auditors Generals Department of Jamaica	Compendium Audit Report - A review of Aspects of PCJ and a Comprehensive Audit of PETROJAM Limited

### Contact Us:

#### **Questions and Comments about the TOR?**

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