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## An Evaluation of Financial Accounting Issues in the Midstream and Downstream Segments

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**Abstract**

This paper is focused on the Midstream and Downstream segments of the Nigerian oil and gas industry. The study emerged as a result of the dearth in Nigeria specific research on Financial Accounting issues involved in the midstream and downstream segments of the oil and gas industry. Some of such issues include revenue recognition and emissions and trading schemes. Bearing in mind the current trend in Financial Reporting, the International Financial Reporting Standards (IFRS) is the reporting framework of this paper. The inadequacies in Financial Reporting, such as improper disclosures of reserves in the financial statements of oil and gas companies, were highlighted and also the issue of harmful carbon emission rates was also discussed, and solutions proffered include mandatory disclosure of reserves in the financial statements or supplementary financial information, and proper legislation by the government to curb the high carbon emission rates through fines and other strict penalties.

**Keywords:** Midstream, Downstream, Integrated Company, Certified Emissions Reduction

**1. Introduction**

The petroleum industry is divided into three segments; upstream, midstream and downstream. The midstream segment involves transportation, storage and wholesale marketing of crude oil and refined products. Its operations are often taken to include some elements of the upstream and downstream sectors. For example, the midstream sector may include natural gas processing plants that purify the raw natural gas as well as removing and producing elemental sulfur and natural gas liquids (NGL) as finished end-products (Wikipedia, 2014). However, the downstream stage in the production process involves processing the materials collected during the upstream stage into a finished product. The downstream stage further includes the actual sale of that product to other businesses, governments or private individuals. The type of end user will vary depending on the finished product. Regardless of the industry involved, the downstream process has direct contact with customers through the finished product. In the oil and gas industry, the downstream process consists of converting crude oil into other products and then selling those products to customers. Thus, oil refineries represent structures that operate within the downstream process. However, any kind of plant that processes raw materials may qualify as operating within the downstream stage of production (Bass, 2011). Midstream and downstream activities in the oil and gas industry include the transportation of crude oil and gas, the refining of crude oil and the sales of the refined products. This part of the value chain is also dependent on significant capital investment. This includes refineries, Liquefied Natural Gas (LNG) facilities, pipeline networks and retail stations.

**Background to the Study**

The analysis of a company's financial statements, whether it is for credit, investment, or any other potential purpose, relies heavily on the accounting data provided by the company in its financial reports (Jesswein, 2011). The Securities and Exchange Commission (SEC) and other users of financial information have recently been demonstrating increased concerns over a variety of reporting topics, including the potential problems associated with non-disclosure of reserves by oil and gas companies in their financial statements, and inadequate financial reporting as regards their operations. There has also been a case of high carbon emissions by companies involved in midstream or downstream activities, which negatively affects the immediate environment. This gave rise to this study, which seeks to address these issues for the benefit of the end users of such financial statements and the host communities involved.

### **Statement of the Research problem**

In a previous study by Alan (2011) which was based on the Financial Accounting issues in the midstream and downstream segments, such issues were addressed as regards the United States oil and gas industry. It became pertinent to ask oneself if there are any such research publications that focus on the Nigerian terrain, hence the need for a Nigeria specific research on such issues in the Nigerian oil and gas industry, in order to fill this gap. This gave rise to this research work.

### **Objectives of the study**

The objective of this paper is to elucidate the Financial Accounting issues in the midstream and downstream segments.

### **Relevance and Significance of the Study**

This study fills the gap in existing knowledge by revealing financial accounting issues in the Nigerian oil and gas industry. The findings will better inform accounting practitioners and users of financial statements on the salient financial accounting issues that are noteworthy of in the downstream and midstream segments of the Nigerian oil and gas industry

### **Literature Review**

In Jesswein (2011), it was opined that the analysis of a company's financial statements, whether it is for credit, investment, or any other potential purpose, relies heavily on the accounting data provided by the company in its financial reports. The paper examined the potential risks associated with relying on such misreported data. This is applicable in the case of oil and gas companies that refuse to disclose information about their reserves in their financial statements. In Alan (2011), a holistic view was made on the financial accounting issues in the United States oil and gas industry. In this paper, Nigeria is the scope and the financial accounting issues peculiar to the midstream and downstream segments of the oil and gas industry will be examined and also recommendations shall be made in order to ensure financial accounting and organizational best practices.

### **Theoretical framework**

As opined in Jesswein (2011), it is the duty of managers and financial accountants to present financial statements which show a true and fair view of the financial position of an entity for the benefit of the owners of the entity or end users of such financial information. This is in line with the agency theory which recognizes a principal-agent relationship between the owners and managers of an entity. However, this is not adequately practiced in the financial reporting of oil and gas entities in Nigeria, as reserves are not included in the financial statements. Companies involved in gas flaring in Nigeria sometimes disregard their immediate environment when they emit pollutants in excess of their allowances or permits. Such practice is against the corporate social responsibility theory which refers to a code of conduct and action beyond what is required by laws, regulations and trade rules. In other words companies involved in gas flaring must ensure that they consider the welfare of the inhabitants of their immediate environment.

### **Financial Statement Disclosures**

Oil and gas producing companies differ from companies in other industries because their reserves are not recorded in the balance sheet. Efforts have been made over the years to

improve the disclosure of enterprises reserves by way of footnotes and supplementary information in the financial statements. Investors want to know what portions of a company's resources are dedicated to oil and gas activities and what results are achieved from it. This gave rise to statement no. 69 of the US FASB in November, 1982 which sets out guidelines for disclosures about oil and gas producing activities. In order to provide guidance on disclosures, the UK oil industry accounting committee issued SORP-1 in April 1986. Disclosures that required conforming to the above pronouncements, and the petroleum industry practice includes; method of accounting, capitalized costs relating to oil and gas producing activities, costs incurred, disclosure of the results of operation for oil and gas producing activities, proved oil and gas reserve quantity information, and disclosure of a standardized measure of discounted future net cash flows relating to proved oil and gas reserves. These disclosure rules apply to quote companies with significant oil and gas producing activities.

### **Financial Reporting in the Midstream and Downstream Segments Using International Financial Reporting Standards (IFRS)**

Financial accounting has been referred to as the language of business, because it involves communication of financial information to the end users. Therefore, no communication is complete until it is understood by the receiver. This is why financial reporting is highly important. The International Financial Reporting Standards is applicable here, and some issues in the midstream and downstream sectors according to Alan (2011) include;

#### **2. Inventory Valuation**

IAS 2 states that inventory should be measured at cost. Some methods of valuing inventory include; specific identification, weighted average and first-in first-out (FIFO). Most entities use cost to value inventories, but inventories could also be valued at net realizable value (NRV) or fair value less costs to sell (FVLCTS). FVLCTS for commodities is usually equivalent to their NRV. FVLCTS and NRV could be used in the following circumstances;

##### **a) Producers inventories:**

IAS 2 states that inventory of minerals and mineral products should be measured at NRV according to industry practice, but it is not usual industry practice for inventories of oil and gas to be measured on this basis, especially by downstream producers. In some countries, commodity trading businesses use this method. Changes in the carrying amount of inventories that are carried at NRV are recognized in the income statement in each period. Determination of NRV reflects the conditions and prices that exist at the balance sheet date. Adjustments are not made to valuations to reflect the time that it will take to dispose of the inventory or the effect that the sale of a significant inventory quantity might have on the market price. The prices of firm sales contracts are used to calculate NRV only to the extent of the contract quantities but only if the contracts are not themselves recognized on the balance sheet under another standard, such as IAS 39.

##### **b) Broker-dealer inventories**

IAS 2 states that inventories held by broker-dealers should be measured at FVLCTS and the spot price at the balance sheet date should be used as fair value. Broker-dealer items should

be items acquired for the purpose of resale. There could be repackaging of such items, but this should not change their nature. In cases where the nature of such items is changed e.g. their chemical composition, entities could be disqualified from broker-dealer exemption. Inventories valued at FVLCTS must be disclosed in the notes with their carrying amounts.

**c) Line fill and cushion gas**

Pipelines, refineries and gas storage which are items of Property, Plant and Equipment (PP&E) require a certain minimum level of product to be maintained in them in order for them to operate efficiently. Such product is usually classified as part of the property, plant and equipment (IAS 16). Such product is recognized as a component of the PP&E at cost and subject to depreciation to estimated residual value. Products owned by an entity but stored in PP&E owned by a third party are also classified as inventory, e.g. gas in a rented storage facility. Such products should be measured using FIFO or Weighted Average Method.

**d) Net Realizable Value (“NRV”) of oil inventories**

Oil produced or purchased for use by an entity is valued at the lower of cost and net realizable value unless it is raw product which the entity intends to process to create a new product e.g., refining of crude oil. Net realizable value is determined by considering the estimated selling price in the ordinary course of business less the estimated costs to complete processing and to sell the inventories. An entity determines the estimated selling price of the oil product using the market price for oil at the balance sheet date, or where appropriate, the forward price curve for oil at the balance sheet date. Use of the forward price curve would be appropriate where the entity has an executory contract for the sale of the oil. Movements in the oil price after the balance sheet date typically reflect changes in the market conditions after that date and therefore should not be reflected in the calculation of net realizable value.

**e) Spare part inventories**

Entities usually keep pieces of equipment also known as spare parts for servicing their plant and machinery used in their refining activities. Such spare parts are carried as inventory and recognized in profit or loss as consumed. If there is no evidence of damage or obsolescence in inventory or PP&E, then they should be carried at cost.

**3. Revenue recognition in Midstream and Downstream**

Revenue recognition could be challenging in the midstream and downstream. This is because crude oil and gas has to meet specific refinery requirements and must be hauled long distances. Entities could exchange product to meet logistical, scheduling or other requirements. Some issues encountered here include;

**a) Product exchanges**

When energy companies exchange crude or refined oil products between themselves, it is termed a buy-sell arrangement. These are done in order to save transportation costs by exchanging a quantity of product A in location X for a quantity of product A in location Y. this could create variations in the quality or type of the product. Balancing payments reflect differences in the values of the products exchanged where appropriate. Exchanges could be based on alike or dissimilar goods. Exchange of goods that are alike

doesn't create revenue recognition or gains, but exchange of dissimilar goods does.

The exchange of crude oil, even where the qualities of the crude differ, is usually treated as an exchange of similar products and accounted for at book value. Any balancing payment made or received to reflect minor differences in quality or location is adjusted against the carrying value of the inventory. When the crude oil exchanged has significant differences (e.g. light sweet crude exchanged for heavy sour crude), such a transaction should be accounted for as a sale of one product and the purchase of the other at fair values. A significant cash element in the transaction indicates that the transaction may be a sale and purchase of dissimilar products.

**b) Cost and Freight vs Free On Board**

Oil and gas are often extracted from remote locations and require transportation over great distances. Transportation by tanker is more costly than by pipeline. Companies often sell prior to shipping but their oil or gas will be held at the port of departure. In respect to future shipping costs, there are two variants. These are; cost, insurance and freight (“CIF”) or free on board (“FOB”). In a CIF contract the selling company is responsible for paying the costs, freight and insurance until the goods reach their final destination. It is important to note that the risks of the goods are transferred to the buyer once the goods have departed from the seller. IAS 18 is concerned with when revenue should be recognized as regards the transfer of risks and rewards of the goods between the buyer and seller. It is common industry practice to transfer the risks of the goods once they have left the shipping rails and then recognize revenue. FOB contracts mean that the selling company delivers the goods when the goods pass the ship's rail but is not liable for any other costs after that. In FOB contracts the purchaser assumes the risk of loss upon delivery of the product to an independent carrier. He is also responsible for paying the insurance costs.

**c) Oilfield services**

Oilfield service companies perform geological and seismic analysis, provide drilling rigs and also manage operations. Revenue from oil field services is based on the stipulated contract involved. For an entity that provides drilling rigs, the contract terms must be understood in order to provide for costs of mobilization and demobilization. The percentage completion method is used for recognition of revenue for services rendered.

**4. Emissions Trading Schemes**

The European Union (EU) requires member states to reduce the rates of their total emission of greenhouse gases. This was supported by the introduction of the EU Emissions Trading Scheme (EUETS) on 1 January 2005. Under the scheme, EU member states have set limits on carbon dioxide emissions from energy intensive companies. The scheme works on a 'cap' and 'trade' basis and each member state of the EU is required to set an emissions cap covering all installations covered by the scheme. The EU cap and trade scheme may serve as a model for other governments seeking to reduce emissions. The Nigerian government can take a cue from this. Although the IASB has a project for emissions trading but little has been done on it since its inception.

**a) Accounting for ETS**

Emission rights permit an entity to emit pollutants up to a specified level. The emission rights are either given or sold by

the government to the emitter for a defined compliance period. Schemes in which the emission rights are tradable allow an entity to:

- Emit fewer pollutants than it has allowances for and sell the excess allowances
- Emit pollutants to the extent that it has allowances for, or
- Emit pollutants above the level that it holds allowances for and either purchase additional allowances or pay a fine.

In Nigeria, ExxonMobil, Shell and Chevron flared between 23.5bn cubic feet of gas in January 2012 alone (The Guardian Newspapers, 2012).

Such emissions would have been reduced if there was proper legislation against gas flaring in the country, because they would attract a very high payment in fines if flared above the companies' allowances. IFRIC 3 "Emission Rights" was published in December 2004 to provide guidance on how to account for cap and trade emission schemes. The interpretation proved controversial and was withdrawn in June 2005 due to concerns over the consequences of the required accounting because it introduced significant income statement volatility. Although IFRIC 3 provides guidance for practitioners, but there are also other approaches used today. A cap and trade scheme can result in the recognition of assets (allowances), expense of emissions, a liability (obligation to submit allowances) and potentially income from government grants. Allowances are recognized at cost if separately acquired. Allowances received from government are recognized either at fair value or at cost in line with IAS 20 "Accounting for Government Grants and Disclosure of Government Assistance". Straight line basis or units of production approach can be used to account for the consumption of government grants and the revaluation model (IAS 38) could be subsequently used for measuring emission allowances. IAS 38 provides that the carrying amount of such allowances should be restated to fair value on each balance sheet date while any changes in the fair value is recognized in equity and impairment recognized in the income statement. Entities are required to deliver allowances or pay a fine to the extent of their pollution.

#### **Certified Emissions Reductions (CERs)**

The United Nations Framework Convention on Climate Change introduced a Clean Development Mechanism (CDM) in order to encourage green projects by developed nations. One wonders if such encouragement is also given to developing nations like Nigeria. Emission credits could be bought by firms and governments. These are called Certified Emissions Reductions (CERs) and they are based on pollution activities from developing countries. It is important to note that the CER scheme is not a cap and trade scheme. The UN has a CDM board which is in charge of selecting entities which have green projects. If such green projects are approved by the CDM board, then the UN grants them CERs. The number of CERs that CDM grants to the Green Entities depends on the amount of CO<sub>2</sub> that will be reduced through the consumption of the green products. For example, the Green Entity may produce a level of 50,000 units of green product. The use of this green product by consumers will contribute to the reduction of 50,000 tons of CO<sub>2</sub> in a year, compared with conventional fossil fuels. The entity will be eligible for 50,000 CERs. UN can sell them to other companies irrespective of their locations. These companies can exchange these purchased CERs for EU emissions allowances which can be sold subsequently or used to satisfy

obligations under an EU carbon emissions scheme. CERs are valued by valuation specialists. CERs are assets that should be recognized by the entity that holds them. They are assets of an intangible nature and should either be accounted for as intangible assets in accordance with IAS 38, or as inventories in accordance with IAS 2. They could either be classified as intangible assets if the entity plans to make use of the CERs to reduce their emission rates or as inventory if the entity plans to sell the CERs. Since the UN is like a government entity, IAS 20 is used. Hence, CERs may be recognized at cost or at fair value, with a corresponding deferred income balance recognized as the difference between fair value and cost.

#### **5. Depreciation of downstream assets**

Downstream assets such as refineries, gas treatment installations, chemical plants, distribution networks and other infrastructure are subject to depreciation. The depreciation is allocated on a systematic basis over an asset's useful life. The residual value and the useful lives of the assets are reviewed at least at each financial year-end and, if expectations differ from previous estimates the changes are accounted for as a change in an accounting estimate in accordance with IAS 8 Accounting Policies, Changes in Accounting Estimates and Errors. The straight line basis or throughput basis is used to depreciate assets like refineries over their useful life. IAS 16 also provides for component depreciation in which each part of a PP&E item is depreciated separately.

#### **Conclusion and Recommendation**

Due to the unique nature of the midstream and downstream segments of the Nigerian oil and gas industry, it is commonplace to encounter some financial accounting issues or challenges which affect managers, financial accountants and end users of financial statements. Some issues peculiar to these segments are elucidated as regards their accounting treatment. It is suggested that proper disclosure of reserves should be made by oil and gas companies by way of footnotes and supplementary information in their financial statements, in order to properly inform the users of such financial information about the correct financial position of such companies. Also, proper legislation should be enhanced in respect to gas flaring and carbon dioxide emissions by oil and gas companies as this has proved to be a serious problem to host communities involved. It is hoped that this paper would be beneficial to accountants, legislators and other parties in order to make informed judgments and proper accounting treatments.

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