

# MODULE 6

## **PRODUCTION ACCOUNTING**

# OUTLINES

- Types of Economic Interests in Oil and Gas Properties Revenues
- Accounting for Production Cost
- Special Problems in Production Accounting
- Gas Sales Controls

# Types of Economic Interest in Oil and Gas Properties Revenues

The extent and the degree of economic interest of the company is a function of how benefits and obligations of the property are shared, for example, how cost and revenue are shared

Production accounting is the process of identifying and measuring the revenues, expenses, and net income or loss attributable to the operation of petroleum producing properties. Production accounting provides a basis for sound property management and evaluation of profitability. It should be noted that production accounting could be sometimes difficult and complex in particular when the accounting involved has to do with both operating and non-operating interest.

## **Basic Types of Economic Interest**

1. **Royalty Interest (RI):** This is a non-working interest which must be retained by the mineral owner when he leases out his property to another party and he is entitled to receive a fraction of the produced or the revenue free and clear of development and production expenses being deducted from the entitlement before the payment is made.

# Types of Economic Interest in Oil and Gas Properties Revenues Cont....

2. Overriding Royalty Interest (ORI): This is created out of working interest to become a non-working interest. This is also made possible when a working interest owner disposes off his interest in order to retain his overriding royalty interest.
3. Production Working Interest (PWI): This is also created out of working interest to become a non-working interest in the sense that production is restricted to an agreed amount of money, quantity of oil and the time after which the production working interest will revert back to the original interest (working interest) from which it was created and the non-working interest leases to exist
4. Working Interest (WI): This is said to be the interest remaining, or the balance, or remnant, after the deduction of all other non-working interest i.e., Royalty Interest, Overriding Interest and Production Working Interest. The owner of the working interest pays all the cost of developing and producing the mineral.

# Types of Economic Interest in Oil and Gas Properties Revenues Cont....

The basic working interest is identified with one owner and one base. It may be subject to several types of non-operating interest.

5. Joint Working Interest (JWI): This is a situation where two or more parties own undivided fractions or percentage of the working interests.
6. Pooled Working Interest (PWI): This situation is the combining of two or more working interest with or without the same ownership interest. It may be mandatory by state regulation or as the option of the lessees.
7. Unitized Working Interest (UWI): Unitization is similar to pooling except that it is on a large scale and always involves the combination of working interest owned by two or more parties.

# Accounting for Production Costs

Production cost has been variously defined by different authors but in respect to oil and gas industry, it is said to be those costs incurred to operate and maintain an enterprise's well and related equipment and facilities, including depreciation and applicable operating cost of support facilities and equipment and other cost of operating and maintaining those wells and related equipment and facilities.

In another way, production costs are those costs consisting of the costs of gathering, field processing, treating and field storage of oil and gas. Production starts with the lifting of oil and gas in the surface and terminates at the outlet value on the field production storage tank.

## **Classification of Production Costs**

Production costs are classified variously. One way of classifying it is by the nature of the object of the expenditure. e.g. Salaries, taxes, materials, and supplies. Another way of classifying production costs is by the nature of Operational function served. E.g. pumping and gauging, sub-surface maintenance, secondary recovery operation. Production costs are classified as follows;

# Accounting for Production Costs Cont....

1. **Salaries:** It includes salaries and wages of pumpers, gaugers, roustabouts, maintenance crews, welders etc. It also extends to the salaries of the tank farm's superintendent and production foremen. In a situation where a supervisor is responsible for more than one lease, the rule in practice is to allocate their salaries to individual leases or wells based on time reports.
2. **Contract Services:** Services such as pump maintenance, recompletion and work over, catering, casing repairs, paraffin control and desanding may be contracted out by an oil company.
3. **Insurance:** These are costs related to the medical, workmen's Compensation, fire and windstorm, boiler explosions etc.
4. **Fringe Benefits:** These are part of total compensation of labour and should be allocated to individual leases.
5. **Repairs and Maintenance:** These are costs incurred in repairing lease equipment such as tank farms, separations, desanders, desalters, flow lines, lease cabins, engines, motors, pumps and other surface production equipment etc.

# Accounting for Production Costs Cont....

6. Royalties: These are based on quantities produced, valued at posted prices and levied at various rates.
7. Overhead and supervision: These include an allocated portion of the expense of operating the district office. In some companies, general and administrative expenses are allocated to district offices and thus become part of the district expenses allocated to individual leases. Two of the allocation bases most commonly used are (i) Number of wells served, and (ii) Barrels of Crude oil produced.

## Functional Classification of Expenses

Company practices vary with respect of functional groupings or classification of production costs. The groupings or classification of production costs commonly used are as follows:

- Pumping and gauging
- Sub-surface maintenance:
  - i. Pumps
  - ii. Tubing
  - iii. Casing



# Accounting for Production Costs Cont....

- Work over and recompletions:
  - i. Treatment of oil
  - ii. Gas dehydration
  - iii. Salt water disposed
  - iv. Gathering
- Surface maintenance:
  - i. Lease and well equipment
  - ii. Roads
  - iii. Cutting of grasses and weeds
  - iv. Secondary recovery operations

## **Direct and Indirect Expenses**

Production costs could either be direct or indirect in oil and gas business.

**Direct Production Costs:** These are costs that are directly essential, necessary and unavoidable in the production of oil and gas such as cost of gauging and pumping, sub-surface maintenance heating and treating of oil and /or gas etc.

# Accounting for Production Costs Cont....

**Indirect Production Costs:** These are costs that are incidental to the production of petroleum products which do not directly contribute to it. E.g. taxes, royalties, insurance and overhead and superintendence costs.

# Special Problems in Production Accounting

There are two special complexities worth mentioning in production accounting. These are;

- i. Problem of treating well work over, and
- ii. Problem of treating production cost in inventory

## **i. Problem of Treating Well Work Over Costs**

There have been controversies as to the proper disposition of well work over costs e.g whether such costs should be capitalized or expensed as part of production costs in the statement of comprehensive income. According to Uche (2002), “this matter appears very pertinent because well work over costs represent a major expenditure that does not occur frequently and may in fact never occur in the productivity of a well is restored or enhanced, by a workover, it would seem logical that since such will benefit future periods, they should be capitalized and amortized to those periods”.

Industry practice, however, is to expense workover cost. They justify the treatment on the basis of immateriality (for large companies).

# Special Problems in Production Accounting

## Cont....

Although prevailing practice may result in a more “conservative” financial statement, proper not have been achieved. Well workover costs that involve drilling to a deeper horizon or plugging back to a shallower production formation are referred to as recompletions. Since recompletions increase the production potential of reserves, such costs are amortized to future periods.

### **ii. Problems of treating production cost in inventory**

It is the opinion and the generally accepted accounting principles that production cost, which is part of the cost of oil and gas produced, should be allocated to cost of goods sold and inventory, but it is very rare for the oil companies to value oil in pipelines and tanks at cost. Inventories in pipelines and tanks are generally ignored or are valued at selling prices. The oil in the tank is viewed as tangible goods, with an assured market and therefore presumed sold as produced. Thus, a portion of the revenue is realized before actual sale, a practice contrary to realization concept. Proponents of this method argue that it does not materially distort income. Clearly, two principles – the matching principle and realization principle – had not been fully complied with as costs would not have been matched with revenues.

# Gas Sales Contracts

1. **Take - or - Pay Provision:** Where the purchaser of a gas sales contract fails to take delivery of a specified gas, he must pay for the difference (deficiency/ short fall) as required by gas sales contract provision. However, the buyer is usually allowed to make-up for the difference in payment when future supplies are made.
1. **Minimum Royalty:** This is a variant of the basic royalty provision. Under this arrangement, the lessee agrees to pay to the lessor for a slated period either a certain minimum amount of money or the value of the basic royalty fraction of production whichever is higher. The excess of the minimum payment over the period month may not be deductible from the shortage arising in any future period. The essence of both the take-or-pay provision and the minimum royalty provision is to compel the purchaser to live up to the terms of agreement both in quantity and value.

## **Illustration on treatment of production costs in inventory**

WKC Petroleum Company Plc on 1<sup>st</sup> January 2014 had crude oil inventory in the pipelines and tank at 5500 barrels valued at ₦350 per barrels. Note also that on 31<sup>st</sup> December 2014, the oil in tank and pipelines was 2200 barrels valued at ₦280 per barrel.

## Gas Sales Contracts Cont....

You are required to compute for;

- i. Reduction in operating inventory
- ii. Appropriate Journals

### Solution

i. Opening inventory (5500 barrels @ ₦350)	1,925,000
Less: closing inventory (2200 barrels @ ₦280)	<u>616,000</u>
Net decrease in inventory	<u>1,309,000</u>

### Journal

Particulars	Dr	Cr
Crude oil revenues A/C (Dr)	1,309,000	
To inventory		1,309,000
Being adjustment for the value of crude oil in tanks and pipeline at the end of the year		

# Review Questions

1. Briefly discuss
  - i. Working interest
  - ii. Royalty Interest
  - iii. Overriding Royalty Interest
  - iv. Unitized Working Interest
  - v. Production Working Interest
2. In relation to gas sales contracts, explain what you understand by Take-or-Pay Provision and minimum royalty provision
3. Vividly elucidate on how costs are classified in respect to production costs of petroleum
4. Adeolutayo Petroleum (Nig) Limited. On 1<sup>st</sup> January 2013, had crude oil inventory in the pipelines and tank at 6780 barrels valued at ₦1,500 per barrel. On 31<sup>st</sup> December 2013, the oil in tank and pipelines was 4,002 barrels valued at ₦1,450.50 per barrel.

## Review Questions Cont....

You are required to calculate;

- i. The net decrease in the inventory, and
- ii. Record . the net decrease accordingly



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