**ASSET AUDIT AND PLANT MACHINERY VALUATION**

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**INTRODUCTION**

According to (IVS 2011) items of plant and equipment are tangible assets that are held by an entity for use in the production or supply of goods or services, for rental by others or for administrative purpose and that are expected to be used over a period of time. Plant and machinery is therefore defined as installations and support facilities for manufacturing in an industry designed to perform a specific predetermined functions, whether used singly or in combination with other items to enhance the productivity of an operating facility. They include all devices in fixed or movable form, other than real estate, deployed in manufacturing, processing or assembly of products from the raw asset to the finished goods (Budhbhatti 1999). The following assets are not classified as plants and equipments

* Real Property
* Mineral or natural resources
* Raw materials and consumables
* Stocks and inventory
* Consumables
* Agricultural assets (e.g. plants, livestock e.t.c)
* Personal property such as art work. Jewelry and collectibles

Machinery and equipments valuation is a unique area of the appraisal profession and all knowledge gained and skills acquired in other aspects of life will be put to use by plant and machinery valuers.

However, before one can take up challenges in this area of specialization a basic knowledge of what machinery and equipment appraisal entails is important. Essentially machinery and equipment valuation entails identification and valuation of all types of machinery and equipment, trade fixtures, plant, furniture of office equipment and machine. It includes all items used in any industrial or commercial facility for the operation of the business. The nature of undertaking may be anything from oil refining to pure water factory. It could also include the largest departmental store or the corner coffee shop.

Part of the problem in plant and machinery valuation is lack of thorough understanding of the machinery and equipment being valued and improper inventory by the valuer. Otegbulu (2005, and 2011) is of the view that asset audit combined with detailed inventory will help in a proper understanding of the machinery and equipment being appraised. According to Derry (1991) ensuring that the exact content of an appraisal is right and proper inventory is not always given the deserved attention and errors in compiling or establishing a schedule of asset can lead to far greater inaccuracies than mistakes made later in the valuation process.

Asset audit enables us to determine exactly what you have, where it is being used or not, what state it is and whether it is being used sustainably or not. In addition to helping you in developing a reliable asset register, it will help in reducing valuation inaccuracy.

The international valuation standard and financial reporting standard now places more demand and expectations on the part of the valuer more than ever before. This demands new training, knowledge and expertise on the valuers. In the light of these expectations our subject of discussion is very timely.

**ASSET AUDIT**

Asset audit is a critical or detailed investigation of an asset in all dimensions to establish the status of the asset as an integral part of an entity or business concern. (Otegbulu 2005). With regard to plant and machinery, the critical issues may include.

* The assets technical specification
* The remaining physical life
* The asset condition including maintenance history and availability of spare parts
* If the asset is not valued in its current location (Premises of value) the cost of decommissioning and removal
* Any potential loss of complementary asset, e.g. If the operational life of the machine may be curtailed by the length of lease on the building in which it is located.
* Ownership of the asset whether practically owned or not, implication of any lease
* The location in relation to the source of raw material and market for the product. The effect of finite raw material.
* The impact of legislation that restricts utilization or imposes additional operating or decommissioning cost.
* The actual potential profitability of the asset based on comparison of running cost with earnings or potential earnings.
* Profit/capital outlay ratio
* The demand for the product from the plant and equipment with regard to both macro and micro economic factors that could impact on demand.
* The potential for the asset to be put to more valuable use than the current use.

**INTEGRATING ASSET AUDIT IN MACHINERY AND EQUIPMENT VALUATION.**

There is a need for a proper understanding of the machinery and equipment being appraised as in the case of land and buildings. It is not enough to indicate an opinion of value without a proper analysis of the subject machinery and equipment. Asset audit will help to bring out all the attributes, features circumstances and peculiarities of the machinery and equipment under consideration.

According to IVS103.C2 (2011) a valuation of plant and equipment will normally require consideration of varying factors relating to the subject asset. All these factors affect the utility of the machinery and equipment. It is also therefore important to note that we are not valuing knots and cast iron, but the plant and equipment of an enterprise based on its utility in relation to other similar enterprises at a particular date. The valuation process is as follows:

* Establish the scope and basis of valuation.
* Compile a schedule of the asset to be valued.
* Establish what is to be taken into account.
* Value the asset on an appropriate basis.

The first step to be taken in the valuation process is to carry out an inspection and survey of the machinery and equipment. Inventory taking is fundamentals in the valuation process as it forms the basic substance of the valuation exercise

**INVENTORY**

The valuer needs to visit the factory or the location of the plant, machinery and equipment to obtain details of the asset. An experienced valuer is much aware of the danger of relying on paper inventory or asset register provided by the client. From physical inspection you may find out that some retired items may still appear in the asset register. Some of the assets may be outside the premises of the enterprise for one reason or the other. Some may be with subcontractors away on repair, working at offsite project or in the company’s personnel home. This is known as extensions. Occasionally problems do arise as to whether an asset is part of plant and machinery or land and buildings. The principal purpose or use of the asset will determine where it belongs. These are called border line assets.

Attention also need to be paid of items which may be out of sight such as piping or wiring (Cabling) system and plants outside and sited in the roof.

Plant and equipment connected with the supply or provision of services to a building are often integrated within the building and once installed are not separated from it as the items will usually form part of the real property interest. Examples of these include plant with the primary function of supplying heating, cooling or ventilation to a building and equipment such as elevators. In some situations, the purpose of valuation may require these items to be valued separately and care must be taken to avoid either omission or double counting.

The valuer must make effort to identify and confirm the status of each item of machinery and equipment in a logical manner. The above process is known as macro-identification. This is followed by micro identification which is concerned with listing of a single machine. To accomplish this, it is necessary to adopt a standard procedure (similar to technical specification) having the following descriptive characteristics.

* Clients’ asset number/identification number if available.
* Description-General category-what is it, specific type, further classification of category.
* Model
* Size or capacity if measured or given
* Serial no if found
* Name of manufacturer
* Name of supplier if known
* Year of Manufacture
* Details of attachment, accessories and components e.g. tooling etc
* Type of drive and details of drive e.g. chain drive, belt drive, motor with hp
* Reference to any special foundation, servicing connection like wiring controls, piping, installations as the case may be
* Heating boilers
* Crane gantries
* Air-conditioning and installations
* Lift system
* Alarm system
* Water and gas services
* Effluent plant

Other important dimensions include,

**THE REMAINING PHYSICAL LIFE, ASSET CONDITION AND MAINTENANCE HISTORY.**

Every asset has physical life which varies from asset to asset. The physical life of a machine can be affected by its level or frequency of maintenance. There are situation in which the physical life of an asset may be longer than its economic life. The remaining physical life of a machine or any asset is taken care of through depreciation (physical deterioration) process. A valuer should also look at an assets condition and maintenance history of the machine as this has effect on the assets effective age and value. (Otegbulu 2008 and Budhbhati 1999). An asset condition can range from excellent, very good, good, fair, poor, Scrap.

**LOCATION OF WHERE THE MACHINE IS VALUED (PREMISES OF VALUE)**

Sze (2006) argued that for plant and machinery valuers, the most commonly used concept or standard of value is the market value. It is not enough as a descriptor of value because an asset can be exchanged for money in so many conceivable ways, some of which have been indentified and collectively known as premises of value. A machine being valued may need to be dismantled to be used elsewhere. In the table below some boxes are silent. It is considered that market value without an explicit premise has an unspoken premise which could be derived from the context in which the standard is used. Hence one can say market value installed or removal.

(Sze 2006, IVSC 2003, ASA, 2000, Ifediora 2009, Otegbulu and Babawale 2011). As an illustration, if we say that the market value of equipment is $350,000.00 (without a premise), it is implied that the item is ready to be picked in the market at no extra cost to the buyer. But if the equipment is still installed and the purchaser will need to dismantle the equipment by himself, crate it and transport it, at a cost of $35,000.00, he will likely renegotiate down to $315,000.00. This is to buttress the importance of premises of value as an aspect of asset audit and in the minimization of inaccuracy in machinery and equipment valuation.

Standard of value Premises of value

Market Value Silent

Market Value In continued use

Market Value Installed

Market Value Removal

Silent Orderly liquidation value

Silent Forced liquidation value

Adapted from Sze (2006).

**FINITE LEASE AND AGE OF BUILDING**

When a plant or machinery is installed in building whose lease physical life is coming to an end, it means that the machine will need to be dismantled and relocated elsewhere at a cost. This will affect value as in the case of premises of value.

**TECHNOLOGY**

Technology changes with the dynamics of time and the valuer must investigate the extent of compliance of the appraised machinery to modern technology as this could have a direct effect on functional and economic obsolescence (Otegbulu 2005 and 2008). Change in technology can lead to change in taste which will render the product or service derived from the plant being obsolete. It is also important to investigate the maintainability of the appraised machinery in line with the existing technology in the country.

**MACHINE INCOMPATIBILITY**

This is somehow related to functional obsolescence and arises when a machine already in function loses its optimum capacity due to a decline in co-operation from its operating counterpart. This could affect the output of counterpart machine(s) and consequently its utility and value.

**1000 units→ 800 units→ 1000 units → 800 units (output)**

**LEASED MACHINERY AND EQUIPMENT**

Machinery and equipment are usually held under two types of lease arrangements;

**Finance Lease and Operating lease**

Finance Lease is an arrangement whereby the entity is buying machinery over a period of time and the lease (the entity) assumes all the risks and the rewards of ownership. Assets held under finance lease should be included in a financial and insurance valuation. For financial and valuation, consideration should be given to any outstanding debt under lease.

An operating lease is simply a hiring arrangement, and the machinery remains the property of the leasing company and have to be returned at the expiration of the lease period or further lease is negotiated. The leasee carries neither the risk nor the rewards of ownership. Machinery and equipment held under the terms of an operating lease are excluded from financial valuation, but usually included in insurance valuation unless otherwise stated in the lease agreement.

An appraiser must look out for these details when taking inventory.

**LOCATION OF RAW MATERIAL/ENVIRONMENTS**

Industrial raw material is very critical to the utility and operation of machinery and equipment. If the raw material is unavailable, and unlikely to be available in the near future, the valuer should be able to establish the continued relevance of the machinery as a production unit. Also the impact of any environmental or other legislation that either restricts utilization or imposes additional operating or decommissioning costs. (Otegbulu 2005 IVS 2011). The valuer must ensure that the plant is in conformity with existing environmental laws in the area.

**EARNING CAPACITY**

Under this situation, the machinery and equipment will be reviewed in form of actual or potential profitability of the asset based on comparison of operating costs with earning or potential earning. It could also be viewed in terms of return on investment in relation to the capital outlay. If the return is low compared to the capital outlay, the reason should be investigated (IVS 2011 Otegbulu 2005). Demand for the goods or service being produced can affect the earning capacity and be a source of economic obsolescence.

As we all know economic obsolescence deals with influences external to the machinery itself. It is the most misunderstood and the most difficult to quantify. It is defined as impairment of desirability or useful life arising from economic forces such as change in optimum use, legislative enactments which restrict or impair property rights and change in supply demand relationship.

**ASSET POTENTIAL**

The valuer should investigate if the machinery asset is underutilized and assess the potential of its being put into optimum use. The full potential of the machinery need to be reflected in its value depending on whether the valuation is based on existing use or highest and best use.

**SCRAP AND SALVAGE VALUE**

According to Otegbulu (2008) scrap and or salvage component of machinery and equipment is often equated with junk and is not accorded any realistic basis for inclusion in most appraisal. Occasionally there may be valid reason to determine scrap or salvage value. Primarily, the reason is to estimate the value of recoverable from the disposal of machinery and equipments, which is surplus, obsolete, incomplete or damaged (Graham, 1989). An item of machinery and equipment which is obsolete or damaged and is useless to an operating plant could be valued on this basis because the fact that it is not of use to the operating facility or enterprise does not necessarily mean that it has no economic value.

**MACHINERY AND EQUIPMENT VALUATION**

The three traditional approaches to valuation is applicable to plant and machinery valuation. These are cost (Depreciated Replacement Coat (DRC) , Market and Income Capitalization and method.

The cost and market approach deals with the valuation of individual items of machinery and equipment. The income approach conceptually discusses the valuation of a business but may occasionally be applicable the valuation of specific machinery and equipment.

Cost method is most commonly used in plant and machinery valuation and details of it will be discussed here. It is based on current cost less depreciation. Depreciation is loss in value due to any cause which may include physical deterioration, functional obsolescence and economic obsolescence. In effect cost new less depreciation equates to market value. For insurance valuation the approach may be slightly modified.

The logical approach to cost method of valuation is as follows;

1. The cost of machinery to suppliers port( free on board (FOB)
2. Add insurance and freight charges (Nos. 1 and 2 are called CIF i.e Cost, Insurance and Freight)
3. This is the cost landed at the purchasers’ port. From port to factory and incidental charges. Nos. 1, 2 and 3 is the cost landed to the factory.
4. Add cost of installation and commissioning
5. Nos. 1, 2, 3 and 4 is the replacement cost.

Replacement cost new (A)

Depreciation (B)

DRC = A - B

**RECOMMENDATIONS**

* Provision of the international valuation standards and international financial reporting standard should be included in the valuation curriculum of higher institutions and professional examination.
* An intensive education and retraining of valuers should be encouraged to enable them meet with the challenges arising from dynamics of time. A well educated professional valuer with the correct training and professional experience who is independent and acts according to recognized standards will be in a better position to provide a value added advisory service (Gilbertson and Preston 2005).
* Valuers should appreciate the fact that valuation should be advisory and a useful tool for decision making by clients. Valuation reports should therefore be explicit. We should move away from the present black box approach to valuation.
* Estate surveyors and valuers practicing as consultants should charge adequate professional fees that will provide an incentive for them to carry out their job with precision and professionalism
* Valuers that lack the competence to carryout particular valuation job requiring high level of competence should work with others colleagues with better exposure and understanding of the subject in line with international best practices.

**CONCLUSION**

Globalization has brought about new challenges in valuation practice. These includes the challenges of transborder transaction, privatization, product pricing, share flotation which require new knowledge and competencies.

Valuation is the skill of putting value on an asset, accuracy; consistency transparency and core competence, the four cornerstone of real estate asset pricing are required for proper assessment of asset value in line with international best practices and expectations of international valuation standard and financial reporting.

Thank you.

Otegbulu A.C 2012.

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