



**INSTITUTE OF APPRAISERS & COST ENGINEERS**  
(Division of Nigerian Society of Engineers)  
Member, International Cost Engineering Council



**2012 ANNUAL CONFERENCE**

**ENGINEERING VALUATION AS AN INSTRUMENT FOR MANAGEMENT  
OF INDUSTRIAL & INFRASTRUCTURAL ASSETS**

BY

**Engr. Otis Anyaeji** FNSE F.ValASCostE ASE Econ  
Engineering Appraiser, Cost Engineer & Engineering Economist.

On the Theme

**ENGINEERING ECONOMY AS A KEY DRIVER FOR SUSTAINABLE DEVELOPMENT IN  
NIGERIA**

05 JUNE 2012

## **ENGINEERING VALUATION AS AN INSTRUMENT FOR MANAGEMENT OF INDUSTRIAL AND INFRASTRUCTURAL ASSETS**

### **Applications of Engineering Valuation**

When Engineers talk of machinery and equipment, they are referring to industrial and infrastructural properties and those types of properties not commonly exchanged in the market. Establishment of the value of such properties requires professional engineering judgment, and that is what engineering valuation is concerned about. The process of engineering valuation has received the greater part of its development in connection with the regulation of public utilities, and is applied in corporate administration where *inter alia* the trends of the replacement cost of the property, investment, and rates of depreciation afford useful information in determining financial policy, competitive position, and selling prices. Other applications of engineering valuation include taxation, sale or transfer of a business or part thereof, condemnations, estates, insurance. For Security Issues and financing, the government & stock exchange are interested in the value of industrial and infrastructural properties for which funds are raised through sale of securities to the public. The intent of the Company and Allied Matters Act No. 1 1990 is to make certain that the prospective purchaser has available the facts relative to the enterprise which affect the value of the securities and to guard against the issuance of securities not backed by property in sufficient value.

### **Prospectus, Mergers and Takeovers**

That is why in Sec. 554 the conditions of issuing expert's statement in a prospectus inviting persons to subscribe for securities in a company are clearly spelt out. Sec. 554 (3) stipulates that "expert" includes every Engineer, legal practitioner, accountant and any other person whose profession gives authority to a statement made by him.

And this is the section that captures the essence of the transactions of the Bureau for Public Enterprises as regards Privatisation.

On reconstructions, mergers & take overs of companies which as a purpose for valuation of machinery and equipment, Sec. 603 of CAMD No. I 1990 deals with the issue of expert opinion as follows.

"603 – (1) A bid under a takeover bid or directors' circular shall not include a report, opinion or statement of a legal practitioner, auditor, accountant, engineer appraiser or other expert unless that person has consented in writing to the inclusion of the report, opinion or statement in the bid or circular."

## **Financing**

Engineering Valuation is also applied in connection with the financing of properties for the determination of the value of the property against which a mortgage loan is desired. In cases of financial re-organization or settlement of enterprises in receivership an engineering valuation of the property or enterprise may be used as the basis of the re-organization.

C. J. Schwingle professional engineer, and one time president of the American Appraisal Company, the world's largest valuation organization did explain that industrial properties differ greatly from real income estate such as apartments which in themselves comprise the major element of the business and are almost self-contained income producing units or saleable entities. He added that for much of income real estate, management skills and

service or product differentiation have minimal significance in the establishment of value. Schwingle then revealed that industrial property assembled for highest and best use is normally but a part of a business enterprise and typically represents but one tool of that enterprise. The others he said might include working capital, inventory, goods in process, labour, managerial skills, accounts receivable, trademarks, know how, sales force and sales policy. He then lamented that the singular and peculiar place of machinery and equipment as tool of such an enterprise is too frequently overlooked, too often not appreciated, by many who are more accustomed to dealing with self-contained real estate entities that are more or less freely exchanged in the market place. We could not agree more with Schwingle's demarcation between industrial property and income real estate. The former is personal property while the latter is real property.

## **Market Value**

Because real estate entities are freely exchanged in the market place realtors can talk of "open market value". In contrast, industrial properties more so machinery and equipment are not commonly exchanged on the market, and so Engineering Valuers or valuation engineers speak of and work with "fair market value" with its refinements. It is said that real estate Buzzword is "Location, location, location" Using marine vessel as an example the buzz phrase is "condition, condition, condition". It is important to talk of accurate determination of the "value in use" of "plant, machinery and equipment". This value concept also applies to income real estate where it is fully defined as "the worth of property in particular use, such as the contribution to income provided by a particular building.

## **Liquidation, Fair Market & Replacement Values**

Primarily there are three values referred to for machinery and equipment viz liquidation, fair market and replacement. Thus fair market value-in-use for machinery and equipment valuers is defined as “the amount, expressed in Naira, that the property is worth to the user and may be based on the item’s capability of producing a product or part of a product, or part of a product as a measured percentage of profit; a contribution to other items, which is difficult to measure; items of a promotional nature; or value to the user on a required personal basis”. This definition means different things to for example machinery valuer (one type of specialist), a marine surveyor (another type of specialist), and jewelry valuer (yet a different kind of specialist)

For machinery and equipment that is to be continuously utilized in the same business, valuation engineers talk of fair market value-in-place-in-use, wherein installation and contribution of the item to the operating facility are considered. Where the market value for offsite use is required, engineering valuers speak of that value to a user for the item of machinery or equipment, after comparison of subject items with similar items sold in the market or used machinery dealers, with the buyer being responsible for cost of moving and transporting all items from site.

In determining these variants of fair market value, the operating parameters are capability of an M&E item of producing a product or part thereof, installation, comparison with similar M&E items sold in the market or used machinery dealers - all engineering issues.

If one for example wanted to buy a used car or used boat or used machine tool for example, would the person consult a real estate manager? Of course not.

As regards liquidation value implying the forced sale concept, it is required that the valuer should be knowledgeable in three specific areas appertaining to that value. One of the areas is value as altered by the set of circumstances associated with the particular concept.

The second is industry nomenclature applied to the specific types of equipment to give a proper and full description that identifies each item. The valuer in this case is expected to have the ability to know when items of equipment should be described as a unit or valued piecemeal. The third area is the economics of identical or related industries in order to make a judgment that may alter a final value assignment applied by the valuer. In the area of circumstances associated with concept, the valuer is dealing with either orderly liquidation value, where the latter depends on physical location, difficulty of removal, adaptability, specialization, physical condition etc all engineering issues; or, liquidation value-in-place where the majority of plants that fit into the concept include tank farm, chemical plants, steel mills, and other industries which have high costs for special installation, and therefore limited adaptability or marketability on a removal basis- again engineering based industries and issues. On industry nomenclature and industry economics there cannot be a substitute to the thorough understanding gained from

experience in the industry which engineers have and estate managers do not have. An engineer that has worked in the steel or electric power or other process industry understands the specifications of the machinery & equipment and products of these industries, as well as the factors that affect profit therein.

Estate managers are strangers to these engineering based industries during conceptualization, design (including costing) procurement, construction, commissioning, operation, maintenance and revaluation.

### **Valuation for Auctioneering**

For Auction Sales, equipment value as usually estimated by considering sales of equipment in the same industry or if that fails in a sufficiently similar industry. Equipment in machine tools industry cannot be compared with the elements of a condominium or office block but with metal working industries. Real estate managers do not work in these industries and thus do not stand a chance of gaining the kind of experience required for the auctioneering of plant and machinery or its intellectual property rights. When the GSM licenses were auctioned where were the realtors and what could they have contributed to the process?

In situations where there is no alternative, the valuer is expected to establish auction value through a judgment on a relationship to another industry where stronger comparables can be found. Thus value can be estimated by reference to sales in an industry with similar economics e.g. cement vs. lime, or pelletizing vs. sintering.

### **Insurance Valuation**

A look at both the "insurance value" and "indemnity value for insurance purpose" will help situate the helplessness of the Nigerian real estate managers in this situation. The latter argue quite violently that replacement cost has no place in the business of valuation but let us see the definition of "insurance value of plant and machinery". This is the amount at which the article insured which is generally the current replacement cost to provide complete coverage. It will be a value based upon the requirement as stated in the policy.

"Indemnity value for insurance purpose" is the value decided on the basis of depreciated replacement cost to take account of prior usage unless the second hand equivalent plant is available in the market.

Replacement cost rings through both definitions. F.A. Somolu – Past President of Nigerian Society of Engineers had stated in the media that anybody who cannot put a replacement cost on an item of machinery and equipment has no business with the valuation of such item.

These definitions buttress Somolu's statement above, and it cannot be controverted that in most cases replacement cost new is the highest level of value for an item of machinery and equipment'

If we examine the concept of "insurable value depreciated" it will be observed as the value remaining after deducting depreciation based on analysis of age, condition, serviceable life and utility of an item, from the insurable replacement cost. Estimation of both the replacement cost and depreciation in this case is completely an engineering question. Insurance valuation requires classification of property (engineering), description and location of each item (engineering), verifiable costing and valuation (engineering). The procedure the valuer follows involves personal inspection of the item. Its manner of usage, maintenance records, etc. and then analysis of the condition of the item. Usually a detailed report is required showing proper classification of each item with an accompanying description, location and then the valuation. This can only be done by a valuation engineer/engineering valuer

### **Scrap vs. Salvage Value**

Colloquially scrap and salvage are used interchangeably but there is a wide difference between them as we can see from the definitions that follow. Scrap value means the tonnage or pound price of basic recoverable metals/materials that may include iron, steel, stainless steel, copper, aluminum, or titanium, wood etc. On the other hand salvage value is the value of recoverable machines or equipment or parts thereof including base castings, gears, shafts, or other mechanical components such as controls, gauges, valves, pipe fittings, or electrical parts.

It is apposite to ask here, if prices of metal or 2<sup>nd</sup> hand machines/equipment are desired who between the engineer and the estate manager is to be consulted?

### **Estimate**

It is correct that an accurate assessment of the foregoing value concepts for plant, machinery and equipment is a function of valuation. But it is meaningless for anybody to say that value analysis for plant, machinery and equipment is not a function of engineering. In this kind of valuation exercise the term estimate is used in the sense in which it is employed in general engineering practice, that is, "to indicate a carefully considered computation of some quantity, the exact magnitude of which cannot be determined. The estimate represents the true magnitude as closely as it can be determined by the exercise of sound engineering judgment based on appropriate computations". If the estimate of value of plant, machinery and equipment is based on real estate management judgment, then the resulting value if it is to be called that, is just worse than an outright guess. Perhaps for valuation of real estate the economic tools of demand and supply, cost-benefit analysis and theory of price are all that would be needed. In

engineering valuation however (including machinery and equipment valuation), factors or evidences of value normally considered include the original cost of property (usually established by engineers), adjusted for decreased usefulness and intangible elements, the replacement cost of the property, adjusted for consumed usefulness and intangible elements, the earning value of the property, the service worth value of the property; the market value of the property, purpose of the valuation, community and environmental factors, type of product or service, materials and labour supply, transportation facilities; governmental supervision, position of enterprise in the industry, general economic conditions and trends; geographical location, etc.

### **Valuation of Industrial Enterprise**

The art of engineering valuation of industrial enterprises is grounded in its process and procedure by following general economic and legal fundamentals like purpose of establishing value, basis of value, factors affecting value, weights of factors affecting values, property comprising an enterprise. Other fundamentals include overhead and direct costs, adjustment for depreciation, annual depreciation provision, past provisions for annual depreciation costs, organisation and financing. Then there are the factors of going value, good will value, value of other intangible properties, interest payments, discounts on securities, fair rate of return. Since the development of the art owes the greater part of its evolution to the regulation of public utilities, the process of establishing value of industrial properties must give proper weight to subservience of public utilities to public regulation, the authority of the courts in public utility rate litigation, the function and the practice of the courts in public utility rate cases. Finally of course, the engineering valuation process must factor in the legal principle for determining fair public utility rates.

From the above, it is evident that valuation of machinery and equipment or any engineering valuation for that matter is not a dance real estate managers can attempt with as it were palms full of snuff. Both TCPC and BPE have had cause in the past to impeach and castigate valuations made by realtors, and there are loads of ridiculous valuations of machinery and equipment carried out by estate managers and waiting to be impeached at the slightest scrutiny.

### **Valuation Standards**

The standard of practice of valuation of industrial and infrastructural assets is regulated by each country's laws and not by the International Valuation Standards Committee. The latter may issue what it regards as minimum requirement, but the actual regulation of the practice of the valuation is done by each country's laws and regulation. It would be international bad manners if IVSC or any multilateral agency were to insist otherwise. That is why it is not International Standards Committee that regulates legal, medical, architectural, engineering and if you don't mind estate management services in Nigeria but the laws of the land. It is so in any country. While IVSC is popular in the British sphere to

which Nigerian estate managers are beholden, it is yet to have the same profile in the US. By far the US is the world leader in valuation in all its specializations. In 1987 nine appraisal organizations constituting the North American Council of Appraisal Organisations (NACAO) and six non appraiser members including the American Bankers Association established the Appraisal Foundation. Of these nine appraisal organizations eight were composed entirely of real estate appraisers. The ninth, i.e the American Society of Appraisers is multidisciplinary awarding certification in real estate appraisal, machinery & equipment appraisal, personal property appraisal, business valuation, and technical valuation. The Appraisal Foundation is organized such that its board of trustees appoints two independent boards viz (i) the Appraisal Standards Board which promulgates the Uniform Standards of Professional Appraisal Practice USPAP, and (ii) the Appraisal Qualifications Board which promulgates appraiser qualifications. The Financial Institution Reform, Recovery, and Enforcement Act (FIRREA) stipulates mandatory compliance with USPAP for all federally related real estate transactions. Although as at 2010 USPAP had not been legislated mandatory for federally related transactions involving personal property (under which machinery & equipment belong) and business appraisals, it has been widely adopted by major appraisal organizations in North America. Every November, a complete updated USPAP is published to be effective the following year. Thus for 2001, ten Standards and Standards Rules had been published. Standards 1 to 3 relate to Real Property Appraisal/Development, Stds 4 to 5 are on Real Property/Real Estate Consulting, Std 6 concerns Mass Appraisal, Development & Reporting, Stds 7 & 8 deal with Personal Property Appraisal, Development & Reporting (valuation of machinery and equipment belongs here). Stds. 9 to 10 pertain to Business Appraisal, Development & Reporting. The American Society of Appraisers states that USPAP contains the minimum standards for the development and reporting of an appraisal. The Society is of the view that for personal property such as machinery and equipment, professional appraisers are generally subject to all of USPAP standards, but are more specifically governed by Std. 7 (personal property appraisal) and Std. 8 (personal property appraisal reporting). The Institute of Appraisers & Cost Engineers (Division of the Nigerian Society of Engineers) identifies with what the American Society of Appraisers stands for, and adopts standards accepted by ASA while developing her own.

No international body has regulatory powers, which rather belong to country governments and local professional regulatory agencies and associations for general practice. For specialist areas e.g. valuation, the relevant professional associations are self regulating, and where there are many associations they can come together to promote standards and best practices seeking ultimately the recognition of their professional standards by courts.

### **Qualifications for Valuation of Industrial Property**

In writing the foreword to KiritBudhbhatti's magnum opus "Valuation of Plant & Machinery (Theory & Practice)" (1999) Chris Derry FRICS and former Chairman, Plant & Machinery Committee of RICS had this to say inter alia:

'So far, I have made no mention of India which, whilst perhaps being a late starter is now powering ahead at a rate which is impressive to say the very least with its own representative bodies and professional standards. Most impressive of all, however, the Center for Valuation Studies at BVM Engineering College, VallabhVidyanagar 388 120, Gurajat offers what I believe is the only degree course in the entire world where the student can study and graduate in machinery and equipment appraisal – an example to be envied by other countries where the discipline has been established for much longer.' Budhbhatti an electrical Engineer and plant & machinery valuer, represents India in the International Valuation Standards Committee. IVSC as a responsible professional NGO would not dare promulgate valuer qualifications for the subscribing countries. It can only accept qualifications as promulgated by the subscribing associations. We have earlier mentioned that in the US there are nine valuation associations, with only one involved in engineering valuation i.e. ASA. In the UK, Chris Derry tells us in the said foreword that unlike forty eight years ago when he became a plant and machinery valuer based in North of England, the plant and machinery valuation discipline is now well represented by the leading professional institutions which he named as the Royal Institution of Chartered Surveyors, and the Incorporated Society of Valuers and Auctioneers. Derry confirms our position on standards and qualifications further stating that there are professional bodies which either recognize or are wholly dedicated to machinery and equipment appraisal in several European countries, Australia, New Zealand etc, all of which offer a forum for debating and developing professional standards and most organize examinations that enable practitioners to achieve qualifications which are recognized both in their own countries and abroad. This helps to show that while IVSC has a role to play in standards and qualification, that role is not of original jurisdiction.

In India there are at least two valuation societies viz Institution of Surveyors, and the Institution of Valuers both based at New Delhi; in Ireland there are two associations, the Society of Chartered Surveyors in the Republic of Ireland, and the Irish Auctioneers and Valuers Institute, both based in Dublin. Two associations also operate in New Zealand, the New Zealand Institute of Valuers, and the Institute of Plant and Machinery Valuers, New Zealand both in the same building in Wellington. In the UK, a third valuation association operates as the Institute of Revenues, Rating and Valuation.

It is a wrong assertion that in Nigeria, in accordance with Decree 24 of 1975, the only acceptable qualified Valuers of Plant and Machinery are those registered by the Estate Surveyors Registration Board of Nigeria. The rules and regulations for the practice of estate surveying and Valuation made under Decree 24 of 1975 states clearly in Sec. 2, "Nobody shall determine or estimate the value of any or all interests in real property unless

he is an Estate Surveyor or Valuer". This effectively situates both Nigerian Institution of estate Surveyors and Valuers and the Estate Surveyors and Valuers Registration Board, as real estate valuation associations.

To further expose that qualification of valuer is determined by laws of the particular country and not by any international NGO, let us review the statutory qualifications for a valuer in India which also has a vibrant Institution of Surveyors modeled after RICS. The Ministry of Finance of the Government of India laid down the qualifications for registration as a valuer of plant and Machinery under Rules 8A (8) 8A (13) and 8A (14) of the Wealth Tax Rules 1957 for the purposes of Wealth Tax Act, Gift Tax act and Income Tax Act. Rule 8A (8) states that a valuer of machinery and plant shall have the following qualifications, namely:

- (i) he must
  - (A) be a graduate in mechanical or electrical engineering of a recognized university;  
or
  - (B) possess a post-graduate degree in valuation of machinery and plant from a recognized University or
  - (C) possess a qualification recognized by the Central Government for recruitment to superior services or posts under the Central Government in the fields of mechanical or electrical engineering.
  
- (ii) (A) he must be a person formerly employed-
  - (a) In a post under Government as 'gazetted officer'; or
  - (b) In a post under any other employer carrying a remuneration of not less than Rs. 2000 – per month; and  
In either case, must have retired or resigned from such employment after having rendered services as a mechanical or electrical Engineer or valuer of machinery and plant for a period of not less than ten years;  
Or
  - (c) As a professor, reader, or lecturer in a university, college or institution preparing students for a degree in mechanical or electrical engineering or for (any qualification) referred to in clause (i), and must have retired or resigned from such employment after having taught for a period not less than ten years;  
Or
  - (d) he must have been in practice as a consulting engineer or valuer of machinery and plant for a period of not less than ten years and must have, in the opinion of the Board, acquired sufficient experience in the valuation of machinery and plant.

Provided that in the case of a person, possessing a post-graduate degree in valuation of machinery and plant from a recognized University, the provisions of this sub-rule shall have effect as if,-

(a) for the words “ten years”, the words “two years” had been substituted.

In Nigeria the Companies & Allied Matters Decree No. 1990 Sec. 137 as amended by Decree No. 46 of 1991 defined a valuer as an auditor, a valuer, a surveyor or engineer, or accountant not being a person in the employment of the company nor an agent or associate of the company or any of its directors or officers.

Budhbhatti (1999) reminds us that a plant and machinery valuer requires a comprehensive knowledge of machine tools, utility and special purpose custom built equipments, requiring long training time to be an ideal valuer. Apart from preparation of inventory and inspection of plant and machinery the valuer must have at his disposal the state-of-art of the plant and machinery and acquire familiarity with the particular discipline. He must develop over the years the basic clarity for analyzing the established methodology to handle essentials of the industry.

As Merritt AgabianASA rightly states in “Appraising Machinery & Equipment” (1989), the starting point of an appraisal (valuation) using the cost approach is the replacement cost new. He further explained that the theory is that an item is worth no more than replacement cost new, installed and indeed may be worth less because of its condition. In other words, the replacement cost new installed is the upper limit of value in a machinery and equipment valuation. The questions to answer then are (i) who can determine cost of machinery and equipment, is it a real estate manager? And (ii) who can determine and interpret the condition of machinery and equipment, is it a real estate manager? The answers in both cases are No. Only the Engineer can determine such cost and conditions.

### **Macro & Micro Identification**

Let us check out macro-identification and micro-identification from the book “Appraising Machinery & Equipment” (1989) ed. John AlicoP.EFASA an engineer and President, Alico Engineers & Appraisers. Macro-identification is explained as a method of studying the entire manufacturing process by identifying major components contributing to the design capacity of the plant. The caveat is given that some components are entire plants made from a composite of items designed to work together e.g an oil rig; some plants are a combination of plants within a plant whereby an entire plant may be feeding the process stream in conjunction with another part of the plant e.g feedstock plant for an adjacent chemical fertilizer plant.

On the other hand, micro identification is the process of finding the individual characteristics of the equipment.

During this process it is likely that the equipment line will be broken up into individual components including piping/tubing, pumps, exchanger, homogenizer, wiring, and controls. The valuer has to note special installation or extraordinary costs during this listing of a single machine where brand name, model, serial number, type of power, dimensions, materials of construction, auxiliary equipment, special accessories or controls etc are of prime importance.

Engineering Valuers/Valuation Engineers cannot attempt macro identification or micro identification without the assistance of plant engineers working on the plant property and equipment being valued. How then can an estate manager valuer carry out these engineering processes that task the skills of the valuation engineer to the hilt. Even if the estate manager is handed a full list of equipment in an oil refinery, will he be able to identify these on the ground?

### **Role & Function of Engineering Valuer**

Budhbhatti (1999) on the role and function of a valuer in valuation of plant and machinery states "over and above, he must be able to hold discussions with various personnel in the plant at various levels which may include – plant manager, shop floor specialist, draughtsman, pattern maker, maintenance supervisor, electrical supervisor, production supervisor". Marston, A. et al (1953) in their "Engineering Valuation & Depreciation" have this to say on general examinations of properties preliminary to valuation:

"Before the detailed work of the valuation is undertaken, the engineer responsible for the valuation should make a preliminary general examination and study of the whole property; this examination is to gain a correct idea of the general character and sufficient familiarity with the features of the property to enable him to plan his work and organize his staff properly. Clients should be consulted; the owners and managers of the property and others concerned should be interviewed.

If one wants to know what is meant by valuation engineer or engineering valuer he can go to R.V. Hughes (1967) professor of Petroleum Engineering in his "Oil Property Valuation" Prof. John M. Campbell formerly Chairman School of Petroleum Engineering had warned in his Oil Property Evaluation" that any evaluation report that ignores the precepts of the engineering method cannot be a fair report, and that the only things separating a good evaluation from a poor one are the integrity. The professional status and the good Judgment of the evaluation engineer.

### **Specialization in valuation**

Only quacks can say that there are no specialized areas or disciplines of valuation. Every lady knows that the value of her jewelry can only be obtained from the jeweler or goldsmith and not from an estate manager or engineer.

The American Society of Appraisal is the oldest and only major appraisal organization representing all of the disciplines of appraisal specialists. Its members include specialists in real estate, business valuation, machinery and technical specialties, personal property, gems and jewelry, appraisal review and appraisal management. In short, ASA is involved in all types of tangible and intangible property, both realty and personalty.

Under real estate, members still specialize in one or more of the areas of residential, commercial, industrial, urban, rural, ad valorem, timber and timberland.

For the Machinery and Technical Specialties (M&TS) members specialize in one or more of these areas - agricultural chattels, aircraft, arboriculture, computers and high-tech personal property, cost surveys, industrials, machinery and equipment, marine survey (commercial), marine survey (yachts), mines and quarries, oil and gas, public utilities. Specializations under personal property include African Sculpture, antique and collectible glass, antique firearms/Armor & Militaria, Antique Furniture, Antiques and Decorative Arts, Asian Art, Audiovisual Media Recordings, Automotive Specialties, Books, Clocks, Fine Arts, Fine Arts photography, Firearms, Native American Art, Numismatics, Oriental rugs, pre-Columbian Art, Residential Contents (general), Silver and Metalware, sports collectibles & Memorabilia, textiles (general), textiles (quilts), Violins.

Under M & TS is it conceivable that the skills needed for developing current and projected market values for used reciprocating engine aircraft and turbine powered aircraft would be the same as that required to perform damage surveys and valuation to determine condition and value upon sale of yachts, boats and ships? On the specializations for Mine & Quarries on the one hand, and Oil & Gas on the other hand let ASA state the methodologies for their valuation:

Mines & Quarries - these specialists are concerned with the value of mineral reserves other than oil, gas and other fluids whether available through surface or underground mining or quarrying operations. Coal; industrial minerals such as talc, bentonite clay, limestone, etc.; and construction materials such as sand, rock, gravel and marble are valued by engineering/mathematical methodologies for purposes of taxation, property sale, litigation, etc.

Oil & Gas - these appraisers are concerned with the value of hydrocarbon reserves under the surface of the earth, whether proven, unproven, developed or undeveloped. They must also determine value of various types of interests in minerals, subsurface leases, and unexplored properties. With backgrounds in engineering, geology and mathematics, they are concerned with future values as well as present values in an environment of economic and technological uncertainty”.

To say that the principles of valuation to determine the open Market Value and other value concepts is the same for all items under the sun whether it is realty or personalty is like

saying that the principles of all athletic events are the same and that once a person is a sportsman or sportswoman he or she does not have to specialize. He or she can represent the country in football, track events (short, medium and long distances), field events, lawn tennis, swimming etc.

In the ASA sponsored "Appraising Machinery and Equipment", the cover review of the book opens thus: "Real estate appraisal methods just don't work for machinery and equipment (M and E).

**Engr. Otis Anyaeji**  
Founding Chairman  
Institute of Appraiser & Cost Engineers  
(Division of the Nigerian Society of Engineers)  
05 June 2012