Jigar Kothari

ASSOCIATE DIRECTOR
RBSA ADVISORS

RBSA Advisors

RBSA ADVISORS
BRONZE SPONSOR
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DEMYSTIFYING IVS ASSET STANDARD 300 (PLANT AND EQUIPMENT)

OVERVIEW

The valuation standard published by International Valuation Standard Council (IVSC), UK.

The Asset Standard IVS-300 is pertaining to valuation of Plant and Equipment which includes only modification, additional principles or specific examples of how the General Standards apply for valuation of Plant & Equipment.

WHAT IS PLANT AND EQUIPMENT?

Plant and Equipment are;

- Tangible Fixed Assets
- Use in the manufacturing/production or supply of goods or services
- To be used over a period of time
- Physically affixed to real property in whole or in part
- Capable of being moved or relocated
- Depreciate at a quicker or less linear rate
- Rapid technological change in particular market sectors

Plant and Equipment are being used for various purposes such as;

- **Manufacturing/ Production** like Steel, Cement, Power, Paper, Automobile, Textile etc.
- **Supply of Goods** like in Grocery stores, Jewellery showroom, shoe showroom etc.
- **Supply of Services** like Transportation, Port, Airport, Rail, Ships etc.
- **Rental** purpose like construction equipment, mining equipment, material handling equipment, Aircrafts, Helicopters, medical equipment etc.
- **Administrative** purpose like Vigilance System (CCTV), Fire hydrant system, HVAC system etc.

Plant and Equipment may be broadly divided into three categories.

1) **Plant:** Assets that are combined with others Eg. Cement plant, Steel Plant, Power Plant, Textile plant Etc.
2) **Machinery:** Individual, a fleet or system of, configured machines Eg. Pumps, Motors, vehicles, rail, shipping, and aircraft.
3) **Equipment:** Sundry machinery; tooling, fixtures, furniture and furnishings; trade fixtures and fittings and loose tools; that are used to assist the operation of the enterprise or entity.

The boundaries between these categories are not always easy to define, and the criteria used may vary according to the particular market sector the assets serve, the purpose of the valuation, and relevant national and international accounting standards.

RIGHT TO USE

This standard also covers the machinery and equipment subject to lease (right to use) like Aircraft, Helicopters, Medical equipment, Material handling equipment, Construction machinery, etc. The valuer is is expected to estimate the market value of an appropriate interest in the machinery which is taken on lease or given on lease considering the right to use of an asset. Further, the valuer is also expected to check and consider its service life and lease period because it may be possible that the service life of the assets is higher than the lease period therefore, the valuer needs to estimate the value of assets accordingly.

INTANGIBLE ASSETS

Intangible assets fall outside the classification of plant and equipment assets. However, the assets which are embedded with the operation of the plant are intangible in nature. In such cases, the valuation process will involve consideration of the inclusion of intangible assets and their impact on the valuation of the plant and equipment assets. For an example:

- Dies, molds used in automobile components manufacturing industry, electronic components manufacturing industry
- Technical know how for production of specialized chemicals, sponge iron production (Midrex, HYL-Mexico, Lurgi);
- Operating software like DCS, SCADA etc.

The report must also include comment on the impact on the reported value of any associated tangible or intangible assets excluded from the actual or assumed transaction scenario, eg,

- If an operating software is excluded for the valuation of CNC machine then the valuer is expected to disclose into the report and what will be the possible impact on the valuation of CNC machine in the absence of operating software.

FACTORS AFFECTING VALUATION OF PLANT AND EQUIPMENT

Valuation of plant and equipment will normally require consideration of a range of factors relating to the asset itself, its environment as well as physical, functional & economic potential. Therefore, to ascertain all the

related factors, the valuer should physically inspect the plant and equipment.

a) Asset-related factors to be considered:

i. Technical specification: Name of Machinery, Make, Model, Type, Year of Manufacturer, capacity, rating etc.

ii. Condition: Assess the physical condition, working condition based on discussion with operator & maintenance history.

iii. Life: Remaining useful, Economic or Effective life, consideration of both preventive and predictive maintenance.

iv. Obsolescence:
- Physical: Any loss of utility due to the physical deterioration of the asset or its components resulting from its age and usage i.e. wear & tear
- Functional/Technological: Any loss of utility resulting from inefficiencies in the subject asset compared to its replacement such as its design, specification or technology being outdated. Eg. Excess Capacity, excess capital cost, excess operating cost etc.

v. Leased Machinery: Whenever the machinery is subject to lease then the valuer has to consider the Lease tenure, Renewal of lease, Possibilities of end of lease.

Vi. Leased premises: Whenever the machinery is installed in leased premises then the valuer has to consider the potential loss of machinery due to the difference in the lease tenure of the building and operating life of the machinery.

vii. Additional Cost: Cost of Additional equipment/Accessories; Cost of Transportation; Cost of installation and commissioning; Trial run, Etc.

viii. Ex-Situ: If the asset is not valued in its current location, the costs of decommissioning and removal, potential loss of asset due to decommissioning, and any costs associated with the asset's existing in-place location, such as installation and re-commissioning of assets to its operational status.

ix. No Historical Cost: In cases where the historical costs are not available for the machinery and equipment then the valuer can refer original EPC contract, purchase order, and Invoices to get the historical cost.

b) Environment-related factors to be considered:

i. Location: The location in relation to the source of raw material and market for the product. Eg, where raw materials are finite or where demand is transitory. Eg. Cement Plant near to limestone mines, Steel plant in proximity of availability of iron ore, automobile industry near to its end user location.

ii. Environment Impact: Any environmental or other legislation that either restricts utilization or imposes additional operating or decommissioning costs. Eg. flue gas desulfurization for Power Plant etc.

iii. Disposal of Assets: Radioactive substances that may be in certain machinery and equipment have a severe impact if not used or disposed of appropriately. This will have a major impact on expense consideration and the environment that is called Asset Retirement Obligation (ARO). Eg. Nuclear Power Plant

iv. Disposal of Waste: Toxic waste which may be chemical in the form of a solid, liquid or gaseous state must be professionally stored or disposed of. Eg. Provision of hazardous waste disposal like fly ash, STP/ETP, incinerator, pyrolysis plant, etc.

v. Approvals & Licenses: Licenses to operate certain machines. Eg. Boiler license, Fire & Safety

License, License for passenger lift etc.

c) Economic-related factors to be considered:

i. Potential Profitability: The actual or potential profitability of the asset based on comparison of operating costs with earnings or potential earnings to be considered to estimate economic obsolescence.

ii. Macro Economics Factors: The demand for the product manufactured by the plant with regard to both macro- and micro-economic factors could impact on demand.

iii. Highest & Best Use: The potential for the asset to be put to a more valuable use than the current use.

IDENTIFICATION OF ASSETS TO BE VALUED

To comply with the requirement to identify the assets to be valued, consideration must be given to the degree to which the asset is attached to, or integrated with, other assets. For example,

- Assets may be permanently attached to the land and could not be removed without substantial demolition of either the asset or any surrounding structure or building, Eg. Boiler, Blast Furnace, Kiln etc. Boiler can not be removed without demolition of its structure or buildings so the buildings & structures of boiler can be considered as a part of plant and equipment.

- An individual machine may be part of an integrated production line where its functionality is dependent upon other assets. Eg. Textile spinning Mill, Integrated Steel Plant, Bottling Plant etc. An individual machine out of the continuous processing line may not have the separate value so such machine can be considered along with the entire line only.

- An asset may be considered to be classified as a component of the real property (eg, a Heating, Ventilation and Air Conditioning System (HVAC)). Eg. Hotel premises, Cold storage, Textile Industries, Pharma Industry etc. The plant and equipment like HVAC, Electrical Installation, Lift, Elevators can be considered along with the valuation of buildings.

In such cases, it will be necessary to clearly define what is to be included or excluded as a plant and equipment valuer.

Plant and equipment usually included in valuations of the real property interest:

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 separable from it. These items will normally form part of the real property interest. This will include:

- Items associated with the provision of services (gas, electricity, water, drainage, fire protection and security) to the property.
- Equipment for space heating, hot water and air conditioning, elevators not integral to any process and
- Structures and fixtures that are not an integral part of process equipment, for instance, chimneys, plant housings and railway tracks.

If the plant and equipment valuer asked to carry out valuation of such asset separately then, the scope of work must include a statement that the value of these items would normally be included in the real property interest and may not be separately realizable.

When different valuation assignments are undertaken to carry out valuations of the real property interest and plant and equipment assets at the same location, care is necessary to avoid either omissions or double counting.

ADDITIONAL ASSUMPTIONS

The scope of work should also include the additional assumption to describe the situation and circumstances in which the plant and equipment to be valued.
Examples of assumptions that may be appropriate in different circumstances for the plant and equipment include ;

Assumption	Situation	Circumstances
1	Whole, In Place*	Operating Business
2	Whole, In Place*	Business is not yet in production
3	Whole, In Place*	Business is closed
4	Whole, In Place*	Forced Sale
5	An individual items for removal from their current location	

** Valuation based in whole and not part or fraction of plant and equipment. The assets are not subject to removal from it place.*

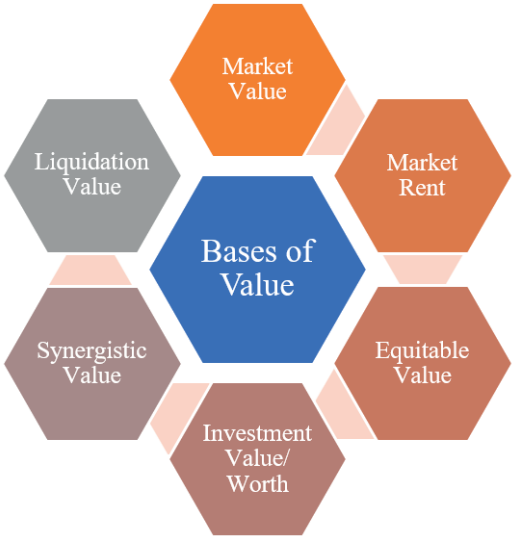
Based on the situation, the valuer may require to report value considering more than one assumption. Eg. The valuer may asked to value in two scenario like business as an operational and business as a closed. The valuer has to appropriately incorporate the same at the time of finalizing the scope of work.

PURPOSES OF VALUATION

Valuations of plant and equipment are often required for different purposes;

BASES OF VALUE

As per the IVS 104 Bases of Value,



A valuer must select the appropriate basis(es) of value when valuing plant and equipment.

PREMISE OF VALUE

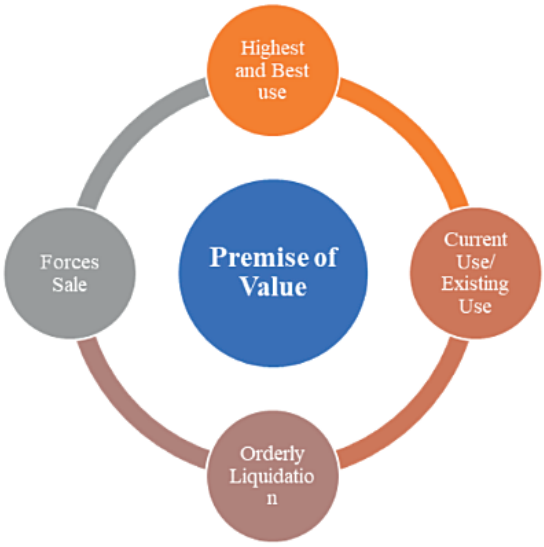
The use of appropriate Bases of Value and associated premise of value is crucial in the valuation of plant and equipment reason being the value is different for the same plant and equipment for different bases of value and premise of value.

For example of forced liquidation condition where the plant and equipment have to be removed from a property in a timeframe because the lease of the property is being terminated.

To advise on the likely realizable value of plant and equipment, it is necessary to consider the different alternative to sale from the current location such as the practicality and cost of removing the items for shifting to another location within a timeframe and any reduction in value due to moving the item from its working condition.

For example in any chemical plant where the most of plant and equipment are fabricated and assembled at the site only and when it will be dismantled then a majority of the plant and equipment cannot be assembled at different locations so it will impact on realization of the value of such plant and equipment in compared to its current working condition.

As per the IVS 104 Bases of Value, A premise of value or assumed use describes the circumstances of how an asset or liability is used. Some common premises of value are:



VALUATION APPROACHES AND METHODS

The three principal valuation approaches described in the IVS may all be applied to the valuation of plant and equipment assets depending on the nature of the assets, the information available, and the facts and circumstances surrounding the valuation.

Market Approach: It is commonly used when sufficient data of recent sales of similar assets are available.

The sales comparison method under the Market approach is used when a well-established secondhand market exists and Sale instances or quotes of similar or comparable assets are available. Aircraft, Helicopters, Ships, Vessels, Motor vehicles, certain types of construction equipment, etc. are examples of Market Approach.

The quoted price of an identical Asset from an active market is considered for the measurement purpose. If a quoted price of an identical asset is not available then, quoted prices of a similar asset in the active market are used and relevant adjustments are carried on such derived prices.

EXAMPLE FOR A REPRESENTATION PURPOSE	
Subject Asset	Crude oil tanker was purchased from Hyundai Heavy Industries Co. Ltd. From Korea in Year 2003. Technical Specification: Gross Tonnage: 61978 Dead Weight Tonnage (DWT): 113913 Engine: 1 x 6S60MC
Comparable Asset	Price adopted from global market transactions with similar specifications and Manufacturer: The crude oil tanker is available for sale in the global market with similar specifications and the same year of build. Technical Specification: Gross Tonnage: 63661 DWT: 114761 Engine: 1 x 6S60MC, Asking Price is US $ 15,500,000.
Market Value	Market Value is estimated as US $ 13,085,000 post adjustment made on account of negotiation, DWT and year of build.

However, many types of plant and equipment are specialized and where direct sales evidence for such items will not be available; in such circumstances it may be appropriate to adopt either the income approach or the cost approach to the valuation.

Income Approach: It can be used for valuation of Plant and equipment;

- where specific cash flows can be identified for the asset or a group of assets, Eg, where a group of assets forming a process plant is operating to

produce a marketable product. Like Oxygen Plant, Coke Oven Plant, Hot Strip Mill, Plate Mill etc. are the examples of group of assets wherein the group of assets are easily identified and having a separate marketable products.

The valuation must consider the cash flows expected to be generated over the life of the asset(s) as well as the value of the asset at the end of its life. However, some of the cash flows may be attributable to intangible assets and difficult to separate from the cash flow contribution of the plant and equipment. To ensure that elements of value relating to intangible assets, goodwill and other contributory assets is excluded.

Due to the limitation of availability of separate cashflow of an individual asset, the use of income approach is not normally practical for many individual items of plant or equipment; however, it can be utilised in assessing the existence and quantum of economic obsolescence for an asset or asset group.

Cost Approach: Depreciated replacement cost method under cost approach is commonly adopted for plant and equipment, particularly in the case of individual assets that are specialized or special-use facilities when available market data is poor or non-existent for valuation by market approach.

The Depreciated Replacement Cost is derived from the Current Reproduction / Replacement Cost after deduction of depreciation.

Estimation of the replacement cost: The replacement cost is the cost of obtaining an alternative asset of equivalent utility; this can either be a modern equivalent providing the same functionality or the cost of reproducing an exact replica of the subject asset.

The replacement cost of the assets either by obtaining the budgetary quote from the supplier/manufacturer or by applying price escalation indices to the original cost of plant & machinery or Capacity Benchmarking.

a) **Price from Supplier/Manufacturer:** Current basic price of the asset can be obtained from manufacturer/vendor by taking budgetary quotations. All other applicable costs such as non-recoverable taxes & duties, transportation, loading/unloading, insurance, erection and commissioning, foundation, etc. which are essential to put the asset into a commercial operation state, as applicable added to the basic price of the asset.

Example for a representation purpose:

Subject Asset

6-High Single Stand Reversing type Cold Rolling Mill was purchased from Hitachi in the year of 1987.
Technical Specification:
Width of Strip: 1000 mm
Input Thickness: 1.8 mm to 3.5mm
Output Thickness: 0.12 to 1.0 mm
Maximum Speed: 1000 mpm
Coil Weight: 20 tons

Subject Asset	Quotation invited from similar manufacturer of 6-High Cold Rolling Mill Manufacturer : CMI-FPE Price for Design, Manufacture and Supply of One (1) No. 6-High Single Stand Reversing type Cold Rolling suitable for 1000 mm wide strip x 1000 mpm max. speed Ex-work's Price : Rs. 48.20 Crores
Replacement Cost	Replacement cost is estimated as INR 57 Crores post adjustment made on account of Transportation, Erection & Commissioning, Technical Know How, Foundation, Consultancy fees, Technological Obsolescence etc.

a) Price Escalation Indices: The current replacement cost can be worked by applying appropriate price escalation indices published by the appropriate agencies to original cost / historical cost of plant & machinery. However, prior to using such historical cost information, the valuer should consider the following:

Timing and cost of the historical expenditures: Care must to taken while consider the historical date of purchase. It is possibility that the entity's cost and date may not be historical in nature due to prior purchase accounting or the purchase of used plant and equipment assets.

The basis of value: Care must be taken while consider the historical cost as it is possibility that the assets may produce in house and not included the profit margin.

Specific cost included: A valuer must consider all significant costs that have been included and whether those costs contribute to the value of the asset and for some bases of value, some amount of profit margin on costs incurred may be appropriate.

Preoperative expenses like administrative & general overheads, preliminary site survey, employee benefits, R&D cost, In-house development, interest during construction, profit on self fabricated equipment using in house workshop etc. may be an examples of specific cost.

Non-market components: Any costs, discounts or rebates that would not be incurred by, or available to, typical market participants should be excluded. Machinery procured under some government incentives like EPCG, EOU, any subsidy etc. may be an example of non-market components.

Example for a representation purpose:

Subject Asset	One 10 MVA Power Transformer with ratio 66kV/11kV was purchased in the year of 2012 and Ex-work's price was Rs. 67,06,758/-. 

Price Escalation Factor	Since, the valuation is doing in the year 2023 hence, the price escalation factor to be find out by using the whole sale price indices published by appropriate government agency. Therefore, considering the appropriate category of price indices, the price escalation factor is derived as 1.11.
Replacement Cost	Hence, the ex-work's price of Transformer under valuation in the year 2022 is estimated as 74,00,000/- Replacement cost is estimated as INR 90 Lacs post adjustment made on account of Transportation, Erection & Commissioning, Foundation etc.

c) Cost to capacity benchmarking: Under the cost-to-capacity method, the replacement cost of an asset with an actual or required capacity can be determined by reference to the cost of a similar asset with a different capacity.

This method may only be used as a check method unless there is an existence of an exact comparison plant of the same designed capacity that resides within the same geographical area.

It is noted that the relationship between cost and capacity is often not linear, so some form of exponential adjustment may also be required.

The following equation is used to Compute the Ex-works/Basic cost by C to C method:

$$\frac{Cb}{Ca} = \left(\frac{Sb}{Sa}\right) \wedge N$$

Cb = Approximate cost of equipment having Size Sb

Ca = Known cost of equipment having Size Sa

$\frac{Sa}{Sa}$ is the ratio known as the Size Factor

"N" is the exponent, and an analysis shows that the size factor's exponent is vary from 0.6 to 0.9. However,

- If N<1, there is an economy of scale means higher size has cost advantage
- If N>1, there are diseconomies of scale means higher size is more expensive
- If N=1, linear relationship between two size means no effect from size

Example to estimate the size factor;

Given Information

A quotation received from Sugar Mill manufacturer having different capacities and price details are as under:

S.No.	Capacity (in TCD)	Ex-works Price (In Crores)
A	1250	32
B	1500	37
C	2500	55

Objective

Based on above details, we can compute ex-works price for other unknown capacities 800, 1000, 1300, 1800, 2200 TCD.

Estimation of Exponent

Average Exponential factor has been derived as under:

	Capacity	Ex-works Price (In Crore)	Equation	Exponent Factor
A	1250	32	N= LOG((Ca/Cb))/ LOG((Sa/Sb))	0.8
B	1500	37	N=LOG((Cb/Cc))/ LOG ((Sb/Sc))	0.78
C	2500	55	N=LOG((Cc/Ca))/ LOG ((Sc/Sa))	0.78

Hence, average derived exponent factor for sugar mill is 0.78 and same is to be used to Compute the ex-works price for other capacities.

Estimation of Ex-works Price of Unknown capacities

Unknown Capacity (In TCD)	Ex-works price Sa, Ca	Ex-works price Sb, Cb	Ex-works price Sc, Cc
Cu			(In Crores)
800	22.59	22.66	22.61
1000	26.89	26.97	26.91
1300	32.99	33.09	33.03
1800	42.53	42.65	42.57
2200	49.73	49.88	49.78

We can see here is that there is not significant variation in cost estimation of unknown capacities while comparing with different knows size factor which represents the fairness of cost of known capacities.

Financing Arrangements: Generally, the value of an asset is independent of how it is financed. However, in some circumstances the way items of plant and equipment are financed, and the stability of that financing may need to be considered in valuation such as Leasing the assets or financing the assets.

In such cases and depending upon the purpose of valuation, it is appropriate to identify the assets and to report their values separately from the other assets.

E.g. The value of operating lease assets (right to use assets) identify and report their value separately.

Hence, prior to undertaking a valuation, the valuer should establish (in conjunction with Client and/or advisors) whether assets are subject to operating lease, finance lease or loan, or other secured lending. Accordingly, the separate value to be concluded in the valuation report.