

STUDY ON VALUATION OF PLANT AND MACHINERY – CASE STUDY OF EDM WIRE CUTTING MACHINES

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Abstract - Valuation is a crucial process used to determine the worth of tangible assets, including properties and other valuable items. This paper provides an introduction to the concept of valuation, highlighting its evolution from an art to a recognized profession. It explains the three primary operations involved in valuation: estimating the cost of producing or replacing physical property, forecasting the monetary earning power of assets, and determining the overall worth of an asset. The paper emphasizes the interdisciplinary nature of valuation, covering economic, market, legal, and technical aspects. It also outlines the various purposes for which valuation may be required, such as insurance, taxation, sale/purchase, leasing, and collateral security. Additionally, the paper explores the valuation of plant and machinery, discussing its different categories and factors influencing its value. The objectives of the study include understanding the valuation process, estimating the true value of assets, and supporting decision-making processes. A literature review is conducted, examining research on plant and machinery valuation education, depreciation techniques, economic value added, technology valuation, and valuation for financial reporting purposes. The findings contribute to enhancing understanding, improving practices, and promoting professionalism in the field of plant and machinery valuation.

Key Words: Methodology, Industrial Property, Field practice, Valuer, Valuation, Market Value, Finance.

1. INTRODUCTION

Valuation is a critical process that involves estimating the worth of tangible assets, such as properties and valuable items. Over time, it has evolved from an art or business occupation into a recognized profession. Valuation goes beyond simply assessing physical assets; it also involves evaluating the legal rights associated with ownership of tangible or intangible entities. The process encompasses three primary operations: estimating the cost involved in producing or replacing physical property, forecasting the monetary earning power of specific assets, and determining the overall worth of an asset.

Valuation plays a vital role in various financial activities within the economy, including investment decisions, buying and selling transactions, loan approvals, and mortgages. It is particularly significant in business and finance when assessing the value of firms and projects. To perform

valuations effectively, specialized knowledge and skills are required, along with general qualifications. A competent valuer must not only be familiar with the type of assets being valued but also have an understanding of relevant laws, regulations, and constraints that govern the rights of use and enjoyment of those assets.

This introduction provides an overview of the comprehensive nature of valuation, which involves estimating, forecasting, and determining the worth of assets. It emphasizes the interdisciplinary aspects of valuation, covering economic, market, legal, and technical considerations. Additionally, it highlights the various purposes for which valuation may be required, ranging from insurance and taxation to sale/purchase transactions, leasing, and collateral security.

Furthermore, the introduction delves into the valuation of plant and machinery, categorizing it into two main categories: assets forming part of the building services installation and manufacturing process plant, machinery, and equipment. The factors influencing the value of plant and machinery are discussed, including physical, social, economic, and legal aspects. Understanding these factors is crucial in estimating the value of machinery accurately.

The objectives of this study include gaining a comprehensive understanding of the valuation process, assessing the depreciation factors affecting the value of machinery, estimating the true value of assets in the current market trend, and exploring different valuation methodologies. Additionally, the study aims to evaluate the future expectations of machinery, determine the fair market value of specific equipment, and analyze maintenance and repair histories. It also aims to assess obsolescence and technological advancements that may impact the value of plant and machinery.

A literature review is conducted to explore existing research in the field of valuation. The review covers topics such as plant and machinery valuation education, depreciation techniques, the use of Economic Value Added (EVA) in real estate valuation, technology valuation, and valuation for financial reporting purposes. The findings from the literature review contribute to enhancing understanding, improving practices, and promoting professionalism in the field of plant and machinery valuation.

1.1 Plant and machinery valuation

Plant & Machinery valuation may be broadly divided into two categories

- I. That forming part of the factory or commercial building services installation, which are normally included in valuation of land & buildings.
- II. Manufacturing process plant, machinery and equipment, which may have been installed wholly in connection with the occupiers industrial or commercial processes, together with furniture and furnishings, tenants' fixtures and fittings, Vehicles, moulds and loose tools.

The physical Plant & Machinery has 'VALUE' only if there is an interest of a person associated with asset. Any business transaction will be based on the settlement of interests of a person in various assets and liabilities of the business entity and hence valuation of Plant & Machinery in isolation of such interests has no meaning at all. The various interests of a person in the assets evolve different forms of Value which mainly depends upon the need, desire and paying capacity of the person interested in the Plant & Machinery.

To quantify need, desire and interests of the persons or parties involved with the transaction, one should consider essential elements like utility, marketability, scarcity, transferability of the Plant & Machinery along with the physical, legal, social and economic factors associated with them and hence estimation of VALUE requires the quantification of all above mentioned qualitative factors. Each factor should be given an appropriate weightage and the purpose for which valuation is made is the principal determinants of the quantum of weightage to be given to each factor.

Factors on which the Value of any machinery depends

- Physical - Type, model, capacity, make etc.
- Social - Taste and preference of consumers using products.
- Economic - Demand and supply, availability of money and credit, Interest rate.
- Legal - Taxation policy, regulation of industry, environmental protection.

2. Methodology

The procedure for the valuation of plant and machinery typically follows the following steps:

1. Instruction: The valuer receives clear instructions regarding the scope of work, location of the plant and machinery to be valued, purpose of valuation, and valuation date. The instructions may come from various sources such as owners, lessors, lessees, banks, financial institutions, insurance companies, potential buyers, government authorities, etc.
2. Data collection: The valuer collects relevant data from the client, including a list of plant and machinery to be valued, original cost with a breakdown, year of purchase, and manufacturing process flow diagram. Other information may include ownership details, company history, purpose

of asset utilization, maintenance records, electrical layout, production details, etc.

3. Data analysis: The valuer analyzes the collected data and performs an ABC analysis to identify important plant and machinery based on their value. This analysis helps prioritize the focus on key assets during the valuation process. The valuer may also determine the appropriate valuation approach (cost, market, or income approach) based on the type of assets, purpose of valuation, and client's instructions.
4. Assumptions and Limiting Conditions: In the absence of certain information or data, the valuer may make reasonable assumptions based on their experience, judgment, expert opinions, and available records. These assumptions help in estimating factors such as economic balance life and future market conditions. The valuer should also identify any limiting conditions that may affect the valuation process.
5. Depreciation: Depreciation is an important consideration in plant and machinery valuation. The valuer assesses the factors causing depreciation, such as physical deterioration, economic obsolescence, functional obsolescence, and technological obsolescence. Various methods can be used to calculate depreciation, including the straight-line method, written down value method, annuity method, sinking fund method, and production unit method.
6. Report writing and submission: The valuer prepares a comprehensive valuation report that includes findings, opinions, conclusions, and recommendations. The report should be clearly written, addressing the subject matter, referencing client's instructions, identifying the plant and machinery, stating the purpose and valuation date, and specifying the professional fees. The report is submitted to the client along with a covering letter and any relevant supporting documents.

It is important for the valuer to maintain proper documentation of the collected data, inspection notes, working papers, expert opinions, and other relevant materials for future reference and potential cross-examination.

2.2 Methods to Calculate Depreciation

In Accounting, there are various methods for calculating depreciation. A company can adopt any of these methods of calculating depreciation depending on its needs. Some of the methods for calculating depreciation are:

- i) Straight-line method
- ii) Written down Value method
- iii) Annuity method
- iv) Sinking Fund method
- v) Production Unit method

3. CASE STUDY

3.1 Basic Details of Property

Company Details	
Year	2022-2023
Company name	Jhadav Industries
Property Owner Name	Mr. Rahul Jhadav
Property Address	MIDC, Ambad , Nashik, Maharashtra, 422103, India
If the asset is under joint Ownership/Co-ownership, share of each owner	Joint Ownership
Latitude, Longitude	19.88530° N, 73.97905° E
Reference Date	2022
Valuer	Rohit Prakash Pawar
Whether indigenous or imported	Indigenous
Date of Inspection	Nov 2022
Valuation for	Study Purpose
Purpose of Valuation	To Assess the Fair Market Value of gear manufacturing plant
Brief Description	This Industry is Located in the well-known area of Ambad.
Age of Company	20 years

Table No 3.1- Basic Details of Property

3.2 Machinery details and calculation

Sr. No	Machinery Name	QT Y	YOM	Useful Life	Used Life	Balance d Life	Current replacement cost	Depreciation Cost	Fair Market Value
1	EDM Wire Cut Model No.- EX400 Worktable Dim - 650 x 550 x 220 mm Excetek (Taiwan) with distilled water plant.	1	2019	25	4	21	48,00,000	6,91,200	41,08,800
2	EDM Wire Cut Model No.- Ezeewin Work table Dim- 400 x 300 x 400 mm Electronica (Pune)	1	2014	25	9	16	14,00,000	4,53,600	9,46,400
3	EDM Wire Cut Model No.- NXG Work table Dim – 400 x 300 x 350 mm Electronica (Pune)	1	2016	25	7	18	14,00,000	3,52,800	10,47,200
Total							76,00,000	14,97,600	61,02,400

Table No 3.2-Calculation of the machinery as per Cost

3.3 Present consideration and Further scope of work

In the present project work, the valuation of plant and machinery is conducted primarily using the cost approach. This is because plant and machinery assets are often of a specialized nature, and there is limited market evidence available for the sale of such machinery. The following steps are followed to arrive at the final value:

- Ascertain Gross Current Replacement Cost (a): The gross current replacement cost is determined by considering the cost of acquiring the machinery at present.
- Calculate depreciation and obsolescence (b): Depreciation and obsolescence are calculated to determine the reduction in value due to the aging or outdated nature of the machinery.
- Depreciated Replacement Cost: The difference between the gross current replacement cost (a) and the depreciation and obsolescence (b) gives the depreciated replacement cost.

The Replacement Cost New can be determined using one of the following methods:

- i) Floating inquiry or getting quotations:
 - By obtaining quotations from suppliers, a precise replacement cost new can be determined. It is essential to provide accurate technical specifications to the suppliers to ensure accuracy.
- ii) Applying a price index to historical or original cost:
 - Historical or original cost can be adjusted using a price index to estimate the replacement cost new. Care must be taken to ensure the accuracy of the historical cost and appropriate application of the price index.

When applying a price index, certain considerations should be taken into account:

- In cases where a second-hand machine is purchased and the original cost is not available, obtaining a quotation is advisable.
- If a machine remains under capital work in progress for more than one accounting year and is capitalized in a subsequent year, the price index should be applied to the respective years of purchase and not the year of capitalization.
- Imported machines require extra care due to factors such as differences in price index, custom duty rates, and currency exchange rates at the time of purchase and valuation.

After determining the replacement cost new, the next step is to calculate depreciation, and if obsolescence is present, it should be appropriately accounted for. The straight-line method of depreciation is commonly used to calculate the physical depreciation of plant and machinery. The valuer must consider the age of the machine, estimate

the scrap value, and determine the economic life of the machine to calculate the physical depreciation accurately.

The difference between the gross current replacement cost and the calculated depreciation represents the depreciated replacement cost (D.R.C.) or Fair market value, which is a crucial factor in the valuation process.

4. RESULT AND DISCUSSION

This case study focuses on determining the fair market value of three EDM wire cutting machines used in the production of dies. The machines in question are an Excetek EDM wire cutting machine (model EX400), an Electronica Pune model Ezeewin EDM wire cutting machine, and an Electronica Pune model NXG EDM wire cutting machine.

To calculate the fair market value, the cost approach method and straight-line depreciation method are adopted. The straight-line depreciation method is chosen due to its simplicity and widespread use. It involves subtracting the salvage value (10% of the replacement cost) from the original cost of the asset and dividing the result by the expected useful life of the machine (25 years). This calculated amount of depreciation is then applied each year to the original cost of the asset.

For the Excetek EDM wire cutting machine, with a present-day replacement value of 48,00,000 Rs, the fair market value is determined to be 41,08,800 Rs.

For the Electronica Pune model Ezeewin EDM wire cutting machine, with a present-day replacement value of 14,00,000 Rs, the fair market value is calculated as 9,46,400 Rs.

For the Electronica Pune model NXG EDM wire cutting machine, with a present-day replacement value of 14,00,000 Rs, the fair market value is determined to be 10,47,200 Rs. After calculating the fair market values of all the machinery and equipment, the total valuation is found to be 61,02,400 Rs. An obsolescence factor of 7.5% is considered due to rapid technological development in the industry. The final valuation of the plant is determined to be 56,45,000 Rs, taking into account factors such as age, obsolescence, and economy of operation.

Based on thorough inspection, appraisal, and analysis, considering the present-day replacement costs, overall condition, and other relevant factors, the fair market value of the machines is assessed to be 56,45,000 Rs

5. CONCLUSION

In conclusion, this project has been conducted with the objective of comprehending the process of plant and machinery valuation. Throughout the project, valuable knowledge has been gained regarding the calculation of fair market value for plant and machinery assets. The focus of this project was to assess the fair market value of a EDM wire machine plant.

The assessment of fair market value was carried out on an individual asset basis, taking into consideration the prevailing market conditions and the transaction costs

associated with each asset. It is important to note that no discount was applied to the sale of the entire machinery.

One notable observation from this project is that there were no negative values assigned to any of the assets, indicating that all the machinery possessed positive value within the market context.

A specific analysis was conducted to determine the fair market value of the EDM wire cut machine. This involved comparing the market prices of similar EDM wire cut machines, evaluating the maintenance and repair history of the equipment, and assessing the impact of obsolescence and technological advancements on its value.

An important outcome of this project is the provision of documentation that enables transparent financial reporting. The fair market value assessments conducted in this project contribute to ensuring accuracy and accountability in financial statements related to the plant and machinery assets.

Furthermore, the findings from this project serve as a valuable resource to support decision-making processes related to asset management and financial planning. The fair market value assessments provide insights into the worth and potential of the machinery, assisting in making informed decisions regarding investment, utilization, and future strategies.

In conclusion, this project has successfully enhanced our understanding of the plant and machinery valuation process. It has provided knowledge on calculating fair market value, particularly in the context of EDM wire machine plant. The assessments conducted in this project, considering asset basis and various factors, contribute to transparent financial reporting and support decision-making processes related to asset management and financial planning.

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