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STUDY ON VALUATION OF PLANT AND MACHINERY – CASE STUDY OF GEAR SHAFT MANUFACTURING PLANT

Mr. Kaushik Dixit[1], Prof. Amol K. Raundal[2]

[1]M. Tech, Valuation (Plant and Machinery) Student, Sandip University, Nashik, Maharashtra, India
[2] Professor, Sandip University, Nashik, Maharashtra, India

Abstract - *The objective of this project was to evaluate the fair market value of a Gear shaft manufacturing plant by conducting individual asset-based valuations. All assessed assets were found to have positive values, indicating their worth in the market. Factors such as market prices, maintenance history, and obsolescence were taken into account to determine the fair market value of specific machines. The project contributes to transparent financial reporting and assists in making informed decisions regarding asset management and financial planning. In summary, it offers valuable insights into the valuation of plant and machinery assets.*

Key Words: **Gear shaft manufacturing, Plant and machinery Valuation, Fair market value, Obsolescence.**

1. INTRODUCTION

Valuation is the process of estimating the value of tangible assets, carried out by approved individuals or organizations to meet the requirements of interested parties. It has evolved from an art or business occupation into a recognized profession. Valuation involves estimating the cost of producing or replacing physical property, forecasting the monetary earning power of certain classes of property, and determining the overall worth of assets. It plays a crucial role in financial activities such as investments, buying and selling transactions, and loan approvals. Specialized knowledge and abilities, along with an understanding of relevant laws and regulations, are necessary for accurate and reliable valuations.

1.1 Plant and machinery valuation

Plant and machinery valuation can be divided into two categories:

I. Assets that are part of the factory or commercial building services installation, typically included in the valuation of land and buildings.
II. Manufacturing process plant, machinery, and equipment, along with other items like furniture, vehicles, and tools, installed for the occupier's industrial or commercial processes.

The value of physical plant and machinery is derived from the interests associated with the assets. Any business transaction involving these assets is based on settling the interests of individuals in the various assets and liabilities of the business entity. Therefore, valuing plant and machinery in isolation from these interests is meaningless. The value of the assets depends on the needs, desires, and paying capacity of the individuals involved.

To quantify the interests of the parties involved, several essential elements should be considered. These include utility, marketability, scarcity, and transferability of the plant and machinery. Additionally, factors such as physical attributes, legal aspects, social factors, and economic conditions associated with the assets need to be taken into account. Estimating the value requires the quantification of these qualitative factors, assigning appropriate weightage to each factor based on the purpose of the valuation.

Factors influencing the value of machinery include:

- Physical factors: Model, make, type, capacity, etc.
- Social factors: Consumer preferences, tastes, and requirements.
- Economic factors: Investment, demand and supply dynamics, interest rates.
- Legal factors: Taxation policies, industrial regulations, environmental protection acts.

Considering and evaluating these factors is crucial in determining the value of plant and machinery.

2. PROCEDURE FOR THE VALUATION OF PLANT AND MACHINERY

The standard procedure for conducting the valuation of plant and machinery is as follows;

1. Instruction
2. Data collection
3. Data analysis
4. Report writing and submission

2.1 Instruction

It is important to know who has given the instruction for valuation or what is the source of instruction. Instruction may be received either from Owner/s, Lessor, Lessee, Bank, Financial Institution, Official Liquidator, Insurance Company, Potential buyer, Government authority or any concerned person etc.

Instruction must be crystal clear about Scope of work, location of Plant & Machinery to be valued, Purpose for which valuation is required and date of valuation.

2.2 Data collection

Valuer must ask client to furnish the list of Plant & Machinery to be valued along with original cost with breakup and year of purchase and manufacturing process flow diagram prior to his plant visit.

First visit the entire factory along with the factory personnel and take the overview of Factory and then visit the factory alone and inspect the Plant & Machinery and note down the details of it in the following manner by interviewing the operators, supervisors, engineers, sweepers etc.

Prepare the inventory of Plant & Machinery. While preparing the inventory Micro Identification needs to be carried out. The ingredients of micro-identification are as under:

- Description
- Model
- Type
- Size or capacity
- Serial number given by manufacturer
- Name of manufacturer
- Name of supplier
- Year of manufacturing
- Details of attachments/accessories
- Type of drive and details of drive – v-belt, geared motor, gear (type of gear box, ratio) hp of motor
- Any special foundations,
- Clients' asset no., identification no.

Note down the condition of individual machine as under and give the rating of physical and working conditions of Plant & Machinery based on your experience, by getting the information from the operator, technical supervisor and maintenance in-charge of the factory:

- N - Brand new
- E - Excellent / just like new
- V - Very good
- G - Good
- F - Fair
- P – Poor

2.3 Data Analysis

Valuer has to carry out detailed analysis of the Plant & Machinery to be valued and identify the important Plant & Machinery (value-wise), so he can concentrate more on those Plant & Machinery and try his level best to get all the relevant information from the plant itself as well as from the market of those machinery. The experience says that, about 20% to 30% of the total numbers of Plant & Machinery will cover almost 70% to 80% of total value of Plant & Machinery in the unit.

There are three basic approaches to the valuation of Plant & Machinery:-

a) Cost approach
b) Market approach
c) Income approach

The selection of Basis of Valuation mainly depends on the purpose of valuation, types of Plant & Machinery and any specific instruction given by the client.

2.4 Report writing and submission

Report Writing means the information and opinion, which the client is seeking to be put in to words in the best possible manner. Important decisions depend on the information & advice given in a report. Advice should not be obscurely expressed, it should be skilfully worded to convey the meaning as intended.

Always submit the report in duplicate or triplicate (as instructed by the client) to the person who has appointed you as valuer or the person who has instructed you to prepare valuation report along with the covering letter. Covering letter should refer to:

(a) Subject matter
(b) Reference to client's letter/s
(c) Brief identification of Plant & Machinery
(d) Purpose
(e) Date of valuation
(f) Findings/ opinion/conclusion
(g) Mention about the professional fees for framing Report on Valuation of Plant & Machinery (with Report reference no. and date). Enclose the bill along with Report.
(h) Signature and date

Valuer must keep all information he has gathered to complete the topic assignment by properly filing it and assigning the file(s) with the same reference number as the report, making it simple for him to find it later. In order for the valuer to defend his position during a future cross-examination in court, it is important to keep all relevant documents, such as the inspection note, inventory book, working papers,

quotations, indices used, remarks, plans, expert opinions, and any other documents that the client may have provided.

3. CASE STUDY

Table -1: Basic Details of Property

Company Details	
Year	2022-2023
Company name	S.K Engineering
Property Owner Name	Mr. Sham Mohan
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	Self
Whether indigenous or imported	Indigenous
Date of Visit	Nov 2022
Valuation for	Study Purpose
Purpose of Valuation	To Assess the Fair Market Value of Gear shaft manufacturing plant
Brief Description	This Industry is Located in the well-known area of Ambad
Age of Company	20 years

Table -2: Calculation of the machinery as per Cost approach method

Sr. No.	Machinery Name	QTY	YOM	Current replacement cost	Depreciation Cost	Fair Market Value
1	CNC Machine Model- VX200 super	1	2016	17,00,000	5,35,500	11,64,500
2	CNC Machine Model- MONO165	1	2017	13,50,000	3,64,500	9,85,500
3	CNC Machine Model- VX200	1	2012	14,00,000	6,93,000	7,07,000
4	Hobbing Machine Model- H250	1	2012	5,31,000	2,62,845	2,68,155
5	Hobbing Machine Model- 6 Module	1	2010	7,50,000	4,38,750	3,11,250
6	Hobbing Machine Model- 6 module	1	2010	7,50,000	4,38,750	3,11,250
7	Centre facing Machine	1	2022	16,50,000	74,250	15,75,750
8	Centre facing Machine	1	2010	30,000	17,550	12,450
9	Pillar Drill Machine	1	2008	5,50,000	3,71,250	1,78,750
10	Retro Feed CNC Lathe Machine	1	2008	1,25,000	84,375	40,625
11	Medium Duty Lathe Machine	1	2006	2,25,000	1,72,125	52,875
12	Heavy Duty Lathe Machine	1	1994	2,25,000	2,93,625	56,250
13	Heavy Duty Lathe Machine	1	2000	28,000	28,980	7,000
14	Power Hacksaw	1	2018	1,50,000	45,000	1,05,000
15	Material Lift	1	2022	16,50,000	74,250	15,75,750
			Total	**99,95,000**	**39,87,765**	**61,40,090**

4. RESULT AND DISCUSSION

In this case study we determine the fair market value of machine involve in a manufacturing process of a gear shaft manufacturing plant. Basically, company does job work of the gears of Mahindra automobiles about 10 to 12 types of different gears. And the machines involve in this process are CNC turning machine, Hobbing machine, Lathe machine, Centre facing machine, and Hexsaw cutting machine.

Company was purchased CNC turning machine of Macpower in year 2016. Its maximum turning diameter is 200mm and it is semi-automatic type of machine. Its model number is VX200 Super. The present-day replacement value of identical machine is 17,00,000 Rs. Expected life of machine is 20 years. This is the basic information of machine on basis of this information we had calculated fair market value of the machine. To determine the fair market value of machine we have adopted cost approach method and straight-line depreciation method.

The straight-line method of depreciation is the most simple and easy to use depreciation method. It is the most commonly used method of depreciation. It is also called the original cost method, Fixed Instalment method or Equal Instalment method.

Under this method, the depreciation calculation is done by deducting the residual value from the Cost of the asset and then the amount is divided by the number of years the asset was used for or its useful life. The same amount of depreciation is charged every year on the original cost of the asset. The amount of depreciation is charged to the Profit and Loss Account every year. For calculation purpose we considered salvage as 10% of the replacement cost. By using this basic information and straight-line depreciation formula we calculate fair market value of CNC turning machine is 11,64,500 Rs.

In this case study we have valued Lathe machine Crown make, Manufactured in year 1994 which is working over the useful life for such machinery we have considered the fair market value as the 25% of the current replacement cost.

Similarly, we have calculated the fair market value of each machinery considering there make, model, specification and year of manufacturing. Some of the machines are working over the useful life for such machines we have considered fair market value as 25% of the current replacement cost as they are being maintained in working condition. The present-day replacement value of identical machine is 2,25,000 Rs fair market value is

After calculating fair market value of all machinery or equipment we get total valuation of 61,40,090 Rs. After considering obsolescence factor of 7.5%. we get final valuation of plant is 56,80,000 Rs. Obsolescence factor is considered due to the rapid technological development Modern day Machines with advanced Features and latest design are more precise, faster in production, economical in working, less labour oriented and more reliable. As such an Obsolescence factor of 7.5% has been adopted to arrive at the fair Assessed Value.

As a result of thorough inspection, appraisal and analysis and taking into consideration present day replacement cost of similar machines, their general overall condition, upkeep and other factors such as age, obsolescence and economy of operation-as compared with latest and new items incorporating improved design/ technique, in my considered opinion, Fair Market Value of machines under reference as on date works out as Rs 56,80,000 (Fifty-six lakhs eighty thousand rupees only).

5. CONCLUSION

In conclusion, this project was undertaken to gain a deeper understanding of the process of plant and machinery valuation, specifically focusing on the fair market value assessment of a Gear shaft manufacturing plant. Through this project, valuable knowledge has been acquired regarding the calculation of fair market value for plant and machinery assets.

The assessment of fair market value in this project was conducted on an individual asset basis, considering the current market conditions and transaction costs associated with each asset. It is important to note that no discount was applied to the sale of the entire machinery.

Throughout the project, it was observed that there were no negative values assigned to any of the assets, indicating that the machinery possessed positive value within the market context.

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