


Can you analyse the cost behaviour between in-house and outsourced equipment maintenance?

In-house vs. Outsourced Equipment Maintenance Decision Making Costing

Elements of Cost	Compressor			Dispenser		
	In-house	Outsource CAMC	AMC	In-house	Outsource CAMC	AMC
Direct Employee Cost	✓					
Cost of Consumables and Spares	✓			✓	✓	
Cost of Repairs and Maintenance Department:						
a) Maintenance Cost	✓			✓	✓	
b) Employee Cost	✓	✓	✓	✓	✓	✓
c) Overhead Cost	✓			✓		
Cost of Procurement Department	✓	✓	✓	✓	✓	✓
Stores and Inventory Carrying Cost	✓			✓	✓	✓
Other Cost- Vehicle Hiring Cost	✓	✓		✓	✓	
Outsourcing Charges		✓	✓			✓



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THE INTRODUCTION:

The company in question is a JV of India's leading oil marketing and gas distribution companies. The company's product portfolio includes Compressed Natural Gas (CNG), catering to more than ~14 Lacs CNG vehicles and Piped Natural Gas (PNG), catering to more than ~21 Lacs domestic PNG customers.



THE PROBLEM:

Compressors and dispensers are the principal equipment used in a CNG station for filling CNG in vehicle tanks. The operational costs of these types of equipment are primarily maintenance-related. Therefore, the company in question needs assistance in designing a framework for strategic decision-making to enable accurate gauging of maintenance costs of in-house vs. outsourced compressors and dispensers.

In addition, given the company's huge customer base, the availability of stations during working hours is paramount. This renders the correct computation of costs a challenging process compounded by the additional burden of resource requirements during the maintenance of compressors and dispensers.



THE SOLUTION:

To evaluate the cost of maintenance, the compressors and dispensers are initially categorised into in-house and outsourced categories. These outsourced compressors/ dispensers are further subcategorised into AMC (machines under warranty) and CAMC (after the machines' warranty has expired).

The costs so ascertained are then allocated to the different makes/ models of the compressors/dispensers based on capacity, which is the most reasonable and scientific basis, using the cause-and-effect principle in accordance with the relevant Cost Accounting Standards issued by the Institute of Cost Accountants of India. This trend analysis was performed and studied on three years of cost data. Identification of cost elements and the cost computation of compressors/ dispensers' category specific are as follows:

Elements of cost	Compressor			Dispenser		
	In-house	Outsource CAMC	AMC	In-house	Outsource CAMC	AMC
Direct Employee Cost	✓					
Cost of Consumables and Spares	✓			✓	✓	
Cost of Repair and Maintenance Department:						
a) Maintenance Cost	✓			✓	✓	
b) Employee cost	✓	✓	✓	✓	✓	✓
c) Overheads	✓			✓		
Cost of Procurement Department	✓	✓	✓	✓	✓	✓
Stores and Inventory Carrying Cost	✓			✓	✓	
Other Cost-Vehicle Hiring Cost	✓	✓		✓	✓	
Outsourcing Charges		✓	✓		✓	✓

Cost Elements	Cost Computation
In-house maintenance	
Direct Employee Cost	Includes the salary/cost to the company (CTC) of station technicians deputed for the operation and maintenance of compressors/dispensers.
Cost of Spares and Consumables	Includes the consumption cost of spares, lubricants, oil, CO2, etc., for the maintenance of compressors/dispensers.

Cost Elements	Cost Computation
Repair and Maintenance Cost (R&M)	It includes the following costs: <ul style="list-style-type: none"> • Expenses booked under Repair & Maintenance GL accounts • Employees costs pertaining to the maintenance department (identified through the cost centre) • Overheads pertaining to the maintenance department (identified through the cost centre)
Cost of Contract/Procurement	It includes costs that pertain to the procurement department (identified through the cost centre): <ul style="list-style-type: none"> • Employees cost • Depreciation expenses • Insurance cost • Overheads
Stores and Inventory Carrying Cost	It includes the following costs: <ul style="list-style-type: none"> • Employees costs pertaining to the stores' department (identified through the cost centre) • Overheads pertaining to the stores' department (identified through the cost centre) • Inventory carrying cost computed based on the average stock multiplied by the company's basic return on investment %
Other Cost	Other costs include vehicles hired for in-house equipment maintenance.
Outsourced Maintenance	
Outsourcing Charges	These are the annual maintenance charges (AMC).
Cost of Contract/Procurement	Procurement department's responsibility is to initiate and complete the AMC/CAMC tendering process. The cost formula is the same as that of in-house maintenance, and the cost is segregated into in-house and outsourced equipment based on the equipment's capacity.
Maintenance Cost	It includes the employees' costs pertaining to the maintenance department (identified through the cost centre). The cost is segregated into in-house and outsourced equipment based on the equipment's maintenance frequency.
Hiring of Vehicle Cost	It includes vehicles hired for outsourced equipment maintenance.



THE RESULTS:

Weighted average cost/Equipment/Month analysis was observed for all three years. It was concluded that equipment's in-house maintenance activity is more economical compared to equipment's outsourced CAMC maintenance activity. Another observation was that following the procurement of the new equipment (Outsourced AMC category), the maintenance activity was at a minimal cost given the machines are new, under warranty, and require minimum maintenance.

Weighted Average Cost/Equipment/Month (3 Years) in relative terms

In-house (after the machines' warranty has expired)	Outsourced CAMC(after the machines' warranty has expired)	Outsourced AMC (machines under warranty)
100	120	10



FREQUENTLY ASKED QUESTIONS:

Q. What is cost behaviour analysis?

A. Cost behaviour analysis is a process of understanding how costs change with changes in volume or activity levels. It helps companies identify fixed and variable costs and determine how changes in volume or activity levels affect total costs.

Q. What is in-house equipment maintenance?

A. In-house equipment maintenance refers to the process of maintaining equipment using the company's own personnel and resources. This can include routine maintenance such as cleaning, lubrication, inspection, and more complex repairs and overhauls.

Q. What is outsourced equipment maintenance?

A. Outsourced equipment maintenance refers to the process of hiring an external vendor or service provider to maintain equipment. This can include routine maintenance as well as more complex repairs and overhauls.

Q. Why is it important to analyse the cost behaviour between in-house and outsourced equipment maintenance?

A. Analyzing the cost behaviour between in-house and outsourced equipment maintenance is important because it can help companies identify the most cost-effective maintenance strategy for their equipment. By understanding the fixed and variable costs associated with each approach, companies can make informed decisions about resource allocation, pricing strategies, and production planning.

Q. What are some factors to consider when comparing the cost behaviour of in-house vs. outsourced equipment maintenance?

A. Factors to consider when comparing the cost behaviour of in-house vs. outsourced equipment maintenance include labour costs, equipment costs, materials costs, training and certification requirements, and downtime costs. Additionally, companies may need to consider the level of expertise and resources required for different types of maintenance activities.

Q. How can companies determine the most cost-effective approach to equipment maintenance?

A. Companies can determine the most cost-effective approach to equipment maintenance by analysing the fixed and variable costs associated with in-house and outsourced maintenance and comparing these costs to the expected benefits of each approach. Factors to consider include labour costs, equipment costs, materials costs, training and certification requirements, and downtime costs. Additionally, companies should consider the level of expertise and resources required for different types of maintenance activities.