Value Engineering-A Case Study of tie bar of Auto Feeder

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***Abstract*- Study of Value Engineering is the main objective of this paper. This objective is achieved through a case study on Auto Feeder. A typical 58 JUMBO JADHAO DELUXE AUTO FEEDER is selected for applying & studying Value Engineering concept. In the present case study, it is observed that the unnecessary increase in cost is due to the use of expensive material, increase in variety of hardware items and thereby increasing the inventory and so on. Therefore some components from AUTO FEEDER i.e. Tie Bar, Small Bracket for Idler Pulley, Nail Strip, Mounting Bracket for Upper Roll, Upper Roll, Glass Frame & Spacer Wooden Block are selected and value engineering technique is applied for the cost reduction & value improvement of these components of Auto Feeder.**

INTRODUCTION

Value engineering is developed as a cost reduction technique in USA in 1947. The concept of value engineering was developed by L. D. Miles. Value engineering aims at a systematic identification and elimination of unnecessary costs. It critically investigates and analyses the different aspects of material (purchase), design and production of each and every component of the product. Value engineering examines the design, mode of manufacturing, material used, function and cost of each and every component in order to produce it economically without decreasing its utility, function or reliability thus, it enables to produce the products with the same performance, quality and efficiency with a less overall unit cost and consequently greater profits. Value analysis/engineering is normally applied to existing rather than new products.

Fig.1.‘58 JUMBO DELUXE’ AUTO FEEDER

TIE BAR OF AUTO FEEDER

Steps followed during the analysis are given below:

1.Plan For Product Selection

Product selected is Tie Bar of auto feeder in ginning machine which is used to support the side panels of auto feeder for strength purpose. The present specifications of this part and its material used are costlier. Value of this product can be increased by maintaining its functions and reducing its cost or keeping the cost constant and increasing the functionality of the product.

Fig.2 Tie Bar

2. Obtain Product Information

Product specifications are:

Material : Mild Steel
Diameter of tie bar : 42mm
Thickness of tie bar : 4mm
Pieces Produced annually: 8000
Process used :Cutting, Welding & Painting
Weight : 3.96kg
Total Present cost : Rs. 254/piece

3 Functional Analyses of Present Functions:

Table 1: Functional Analysis

Name	Basic Function Verb	Basic Function Noun	Secondary Function Verb	Secondary Function Noun
Tie Bar	Tie	Side Panels of auto feeder	Support	Side Panels of auto feeder

6Develop Alternate Design or Methods

4 Evaluation Phase

Each of design criteria was given a weightage factor. This was carried out as follows: each of the above criteria was compared with others, and depending on their relative importance, three categories were formed, viz. major, medium, and minor. A score of 3, 2 and1 respectively was assigned to each of the levels. The details areas given in the Table II:

Table 2: Weightage Analysis

Weightage analysis	Points
Major difference	3
Medium difference	2
Minor differences	1

Table.3: Paired Comparison

Design Criteria	Major difference	Medium difference	Minor difference
Function			×
Cost	×		
Maintainability		×	
Quality		×	
Space			

From the above paired comparison we get the following result

Table 4:Attributes

Attribute	Score
Function	1
Cost	3
Maintainability	2
Quality	2
Space	0

5 Cost Analysis

Table 5: Cost Evaluation

Item	Material cost(Rs)	Machining cost(Rs)	Total cost including Overheads(Rs)
M.S Tie Bar	163	32	254
Alternative (Fiber Tie Bar)	147	25	231
Difference /part	16	7	23

RESULT

The total savings after the implementation of value engineering are given below:

- Cost before analysis – Rs. 254
- Cost after analysis – Rs. 231
- Saving per product – Rs. 23
- Percentage saving per product – 9.05 %
- Annual Demand of the product – 8000
- Total Annual Saving – Rs. 184000

CONCLUSION

Concept of Value Engineering is applied to auto feeder to analyze tie bar and it is analysed in terms of cost reduction. Value analysis it able to increase the value of the product by substituting another material in place of the one that is currently in use. The various advantages have been observed in terms of cost reduction, increase in overall production, reduction in man power, and reduction in scrap.

REFERENCES

[1] Office of Management and Budget, "Value Engineering," Circular No. A-131, May 21, 1993
[2] Society of Japanese Engineering," GUIDEBOOK FOR VE ACTIVITIES = A BASIC VE MANUAL =", http://www.sjve.org/download/914/stream/ 1981.
[3] Miles, L.D., Techniques of Value Analysis and Engineering, McGraw-Hill, 1972
[4] Value Engineering Manual, January 1, 2004
[5] Value Management: Surviving In The Millennium Via Diligence Rewarded. Management Accounting, McDowell, T. 1996.
[6] Cooper, R. and Slagmulder, R., Target Costing and Value Engineering Productivity Press, Portland, OR, USA (1997).
[7] Jay Mandelbaum & Danny L. read, 2006, "Value Engineering Handbook, IDA paper P-4114, pp. 37, 54, 73
[8] Value Engineering Manual, West Virginia Department of Transportation Division Of Highways Engineering Division, January 1, 2004
[9] Value Engineering, Department of Defense Office of the Assistant Secretary Of Defense (Acquisition and Logistics), March 1986
[10] Value Standard and Body of Knowledge, June 2007

[11] Fong, P. S. W. 1999. Function-Oriented Creative Group Problem Solving. Creativity and Innovation Management
[12] Value Engineering and its Effect in Reduction of Industrial Organization Energy Expenses
[13] Habibollah Najafi, Amir Abbas Yazdani, Hosseinali Nahavandi, World Academy of Science, Engineering and Technology, 2010
[14] Dod 4245.8-H Value Engineering March 1986