

Identification of Improvement Opportunity in Drum Mix Plant Manufacturing using ISO 9001 – QMS Standard

Jainish Doshi¹, Kedar Bhojak², Jigar Doshi³

¹Department of Production Engineering, L.D.R.P. College of Engineering, Gandhinagar, Gujarat, India

²Department of Production Engineering, L.D.R.P. College of Engineering, GHADHINAGR, GUJRAT, INDIA

³Department of Automobile Engineering, Indus Institute of Technology & Engineering

Abstract: Manufacturing problems are very crucial, needs vigilant and immediate attention otherwise it damages to company's not only profit margins but also reputation. Quality Management includes quality assurance and control, is very necessary technique to maintain and continuously improve quality of product and processes. Manufacturing organization applies various quality control techniques to improve the quality of the process by reducing its variability. Out of many techniques used to improve quality, ISO 9001 requirements are very well known and widely used for standardization and process improvement. Our research is in Drum Mix Plant manufacturing, the Gap analysis against the ISO 9001 requirements is conducted to identify various improvement points to improve the manufacturing process. The effective implementation of such an ISO 9001 Quality Management System (QMS) in construction equipments companies requires a proper implementation of the system to allow companies to improve the way they operate, by this means increasing profitability and market share, producing innovative and sustainable construction products, or improving employee and customer satisfaction.

Keywords: Quality Improvement, Drum mix plant, ISO 9001 – Quality Management System

1. Introduction

All organization must be capable of delivering high quality products and services on-time at a reasonable cost to compete in this global environment. In response to these competitive pressures and customer demand, many organizations have developed ISO 9001 quality management systems (QMS). ISO 9001 is an international standard that specifies the basic requirements for a QMS. The two primary objectives of the standard are to help an organization demonstrate its ability to meet customer and regulatory requirements and to enhance customer satisfaction. To that end, the standard contains key requirements clauses focusing on (1) the QMS in general, (2) management responsibility, (3) resource management, (4) product realization, and (5) measurement, analysis, and improvement. Originally released in 1987, the standard was

updated in 1994, 2000, and 2008. ISO 9001 is supported by a broader family of standards. These include ISO 9000 (QMS fundamentals and vocabulary), ISO 9004 (QMS guidelines for performance improvements), and ISO 19011 (guidelines for quality and/or environmental management systems auditing).

The development of a systematic approach to ISO 9001 implementation should help managers in SMEs increase the possibility of a successful implementation. In particular, guidance is required on recognizing the initial state, recognizing the desired state, and defining a path to navigate the transition. This paper presents a conceptual model with those needs in mind. The paper is focuses mainly on QMS requirements for Manufacturing – Production and quality control.

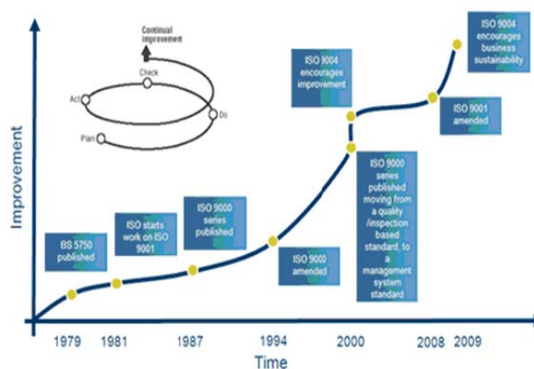


Figure 1: Evolution of ISO 9001 standard

2. Drum Mix Plant

Asphalt plant is also known as asphalt drum mix plant, hot mix plant, continuous asphalt type plant parallel flow type etc. Asphalt plant works on the principal of mixing aggregate with bitumen/asphalt at certain temperature to give a proper mix for paving.

An Asphalt plant is an intelligent assembly of mechanical and electronic equipment where aggregates & minerals are blended, dried, heated, and mixed with asphalt to produce hot mix asphalt (HMA) meeting specified requirements of road building.

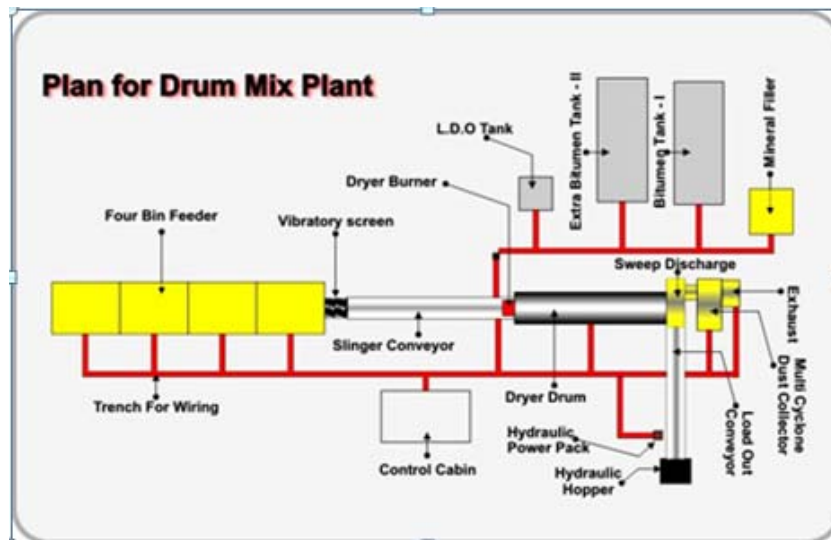


Figure 2: General Layout of Drum Mix Plant

The Asphalt Plant Consist of:

- Cold Aggregate Four-Bin Feeder
- Single Deck Vibratory Screen for oversized material removal
- Slinger (Cold) Conveyor
- Dryer Auto Burner
- Drying Cum Mixing Thermo drum with Dust Collector
- Load out conveyor with Gob hopper
- Asphalt Tank
- Mineral Filler Unit
- Centralized Control Panel with insulated Cabin
- Fuel Storage Tank
- Pollution Control Unit (Optional).

3. Research Problem

The research is based on the live problems faced in manufacturing processes of reputed Drum Mix plant (Road Construction Manufacturing Equipment) manufacturing company based at Vatva, Ahmedabad. The past data of the company’s manufacturing shows the production losses are high and needs immediate attention, as its effect company’s

reputation and customer satisfaction. The major problems identified are

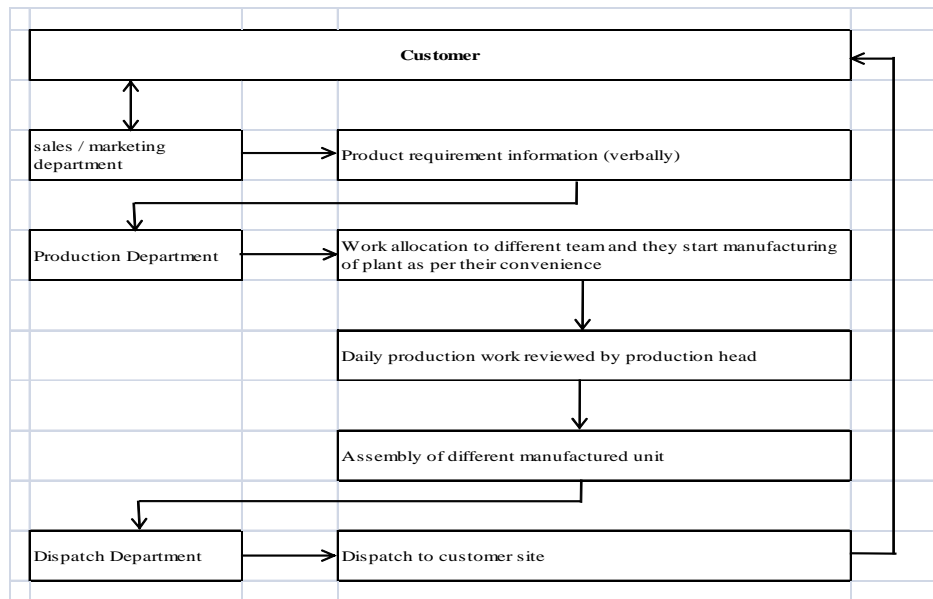
1. Customer complaints related
2. Higher Final Rejection (Rejection of parts from customer / at customer site)
3. Wrong dispatch / short fall in parts

The major problem and their percentage are shown in below table.

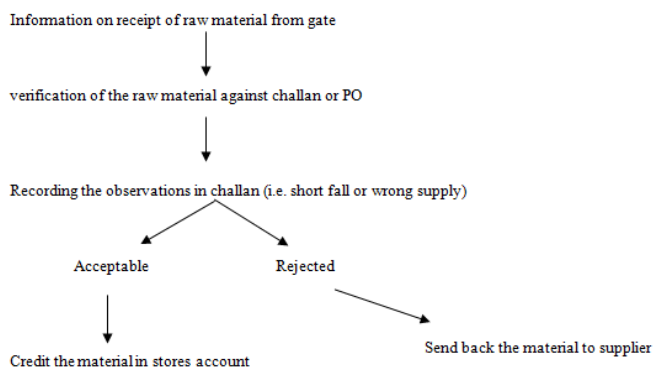
Sr no	Problems	Unit	Sept-12	Oct-12	Nov-12	Average
1	Final Rejection	%	8.1%	7.2%	5.2%	6.8%
2	Machine Breakdown hours	Hrs	115	107.5	98	106.8
3	Wrong dispatch / short fall in parts	%	13%	11.8%	8.3%	11.0%

Table. 1 Rejection Data for Drum Mix Plant Manufacturing

Gap Analysis – Mapping Against the Requirements of ISO 9001 – QMS in Production Manufacturing Process Study



4. Quality Control Process Study



In QMS context, gap analysis is a tool that helps a company to compare its current / actual performance with its standard requirement. At its core are two questions: "Where are we?" and "Where do we want to be?" If a company or organization is not making the best use of its current resources, then it may be producing or performing at a level below its potential. This concept is similar to the base case of being below one's production possibilities frontier.

The goal of gap analysis is to identify the gap between the current system and the QMS system requirement. This helps provide the company with insight into areas which could be improved. The gap analysis process involves determining, documenting and approving the variance between QMS requirements and current capabilities. The followings are the process wise gaps identified in the company:

1. No manufacturing planning
2. No daily production records
3. No quality planning (at any stage)
4. No in-process inspection
5. No Final inspection in company premises
6. No preventive maintenance

Above points clearly suggest that basic manufacturing system needs improvement.

5. Conclusion

The main findings of the above research offer a strongly justified and formal answer to the many and important dilemmas presented in the organization about ISO 9000 long-term effectiveness and value to improve manufacturing process. The basic conclusion drawn, based on the combination of gap analysis and process study, is that the manufacturing process needs to be improved by implementing planning and maintaining daily production records. Also need identified to strengthen the Quality control system by preparing in process and final quality planning and checking system. All in all, management of an organizational should have appropriate policy in place for establishing positive organizational culture and ethical mindset of staff members. As a result, ISO 9001 can help prove quality with fulfilling customers' requirement of fairness and improvement in product.

6. Future Scope

The research will be continued to implement the measures against above mentioned gaps in Drum Mix plan manufacturing system. Also the implemented system in manufacturing to be analyzed for some period and during that data on rejections and complaints shall be monitored to measure the improvement in the system. The improvement in system through implementing ISO 9001 requirement shall be identified.

References

[1] Katerina D. Gotzamani and George D. Tsiotras An empirical study of the ISO 9000 standards' contribution towards total quality management

- [2] Bambang Triguna and rsyah Vaughan Coffey Debby Willar, An Empirical Study of Applying ISO 9001 Elements in Large Size Indonesian Contractors.
- [3] Aluvi A. Patrick and G. Kimutai, THE ROLE OF ISO 9001:2000 CERTIFICATION IN KENYA'S SUGAR INDUSTRY: A CASE OF MUMIAS SUGAR COMPANY
- [4] Shirley YEUNG Mo-ching, Meeting customers' requirements with ISO audit – quality management system (QMS) performance and organizational culture assessment
- [5] Byrnes, D. (1992), ``Exploring the world of ISO 9000'', *Quality*, October, pp. 19-31.
- [6] Gotzamani, K. (2000), ``The quality assurance standards ISO 9000 implementation in the Greek industry. Evaluation of their contribution towards real quality improvement and introduction to total quality management'', PhD thesis, Department of Business Administration, University of Macedonia, Thessaloniki
- [7] Kochan, A. (1993), ``ISO 9000: creating a global standardisation process'', *Quality*, October,
- [8] McAdam, R. and McKeown, M. (1999), ``Life after ISO 9000: an analysis of the impact of ISO 9000 and total quality management on small businesses in Northern Ireland'', *Total Quality Management*, Vol. 10 No. 2, pp. 229-41.

Author Profile



Jainish Doshi received the B.E degree in Automobile Engineering from Indus Institute of Technology in 2011, respectively. He is pursuing M.E in production engineering in L.D.R.P Institute of Technology and research 2011-2013. Now he is doing his project work on "how ISO 9001- QMS affect on performance of product quality" in drum mix manufacturing company.