International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2014): 5.611

A Review on Study and Analysis the Wastage Reduction of Fluorescent Powder in CFL 23 W in Philips Pvt Ltd Mohali, Using Six Sigma Methodology

Gurpreet Singh[1], Desh Bandhu[2]

[1]Master Student, Mechanical Engineering, Department, Surya School of Engineering and Technology Bapror, Rajpura, Punjab, India

[2]Assistant Professor, Mechanical Engineering, Surya School of Engineering and Technology Bapror, Rajpura, Punjab, India

Abstract: ***This paper focus on the six sigma methodology for improve the efficiency and reduce the wastage in industries. Work related to the wastage reduction of fluorescent powder in cfl 23 watt Quassi Fully Spiral and*** **increase efficiency.** ***The production efficiency and quality of the industrial system is a major economic stake for their business concern. Six sigma is a technique of quality and profitability based mastering statically process. This tecnique is based five steps (DMAIC) Define, Measure, Analyze, Improve, Control. The application of this method helps to reduce costs and reduce losses or wastages.***

Keywords: Study and Analysis the Wastage Reduction of Fluorescent Powder in Cfl 23 w in Phillips Pvt Ltd Mohali

1. Introduction

Six Sigma is a much disciplined process which enables the organization gives nearly perfect product and services. Six Sigma is beneficial to reduce the wastage and improve the quality of product. The figure of six sigma arrived statically current average maturity of most business enterprises maturity of most business enterprises. A term (Greek) used in statistics to represent standard deviation from mean value, it is indicator of the degree of variation in a set of a process. Sigma measures how far a given process deviates from perfection. Higher sigma value capability, better performance in results. According to the six sigma the possibility of defects 3.4 per millions. So as six sigma helps to reduce defects and reduce wastage, increases the profit of organization. The name six sigma that variation that exists plus or minus six standard deviation of the process output. The major benefits of Six Sigma to improve process flow, reduce total defects, improve production rate, reduce wastage and help to maintain quality .According to Ayadi youssouf et al. (2014**)** Lean Six Sigma is a method of improving the quality and profitability based on mastering statically of process and it is also a management style that based on a highly regulated organization dedicated to managing project. The method is based on five main steps summarized in the acronym (DMAIC): Define Measure, Analyze, Improve and Control. Application of the method on the maintenance processes with using maintenance methods during the five phases of the method will help to reduce costs and losses in order to strive for optimum results in terms of profit and quality.

2. Six Sigma Methodologies

- BPMS
- DMAIC
- DMADV
- DFS

2.1 Business Process

Management System (BPMS)
BPM strategies emphasize on process improvement and automation to derive performance. Combining BPM strategies with sigma six is more powerful way to improve performance.

2.2 DMAIC

- **Define - Measure - Analyze - Improve – Control**
- **Define:** Define the Problem or Project Goals that needs to be addressed.
- **Measure:** Measure the problem and process from which it was produced.
- **Analyze:** Analyze data & process to determine root causes of defects and opportunities.
- **Improve:** Improve the process by finding solutions to fix, diminish, and prevent future problems.
- **Control:** Implement, Control, and sustain the improvements solutions to keep the process on the new course.

2.3 DMADV Methodology

It refers to a data-driven quality strategy for designing products & processes. This methodology is used to create new product designs or process designs in such a way that it results in a more predictable, mature and defect free performance. (Rever, 2010)

2.4 DFSS Methodology

Design for Six Sigma. DFSS is a data-driven quality strategy for designing design or re-design a product or service from the ground up. Sometimes a DMAIC project may turn into a DFSS project because the process in question requires

complete redesign to bring about the desired degree of improvement.

3. Six Sigma Table

This sigma levels show the perfection level of the process. The sigma level depends upon the defects per million.

Table 1: Sigma Levels (Zhang et al, 2011).

Sigma Level Process Capability	Defect Per Million Opportunities
2	308,537
3	66,807
4	6,210
5	233
6	3.4

4. Other Methods

- DMADOV – prior + Optimize
- IDEAS – Identify/Design/ Evaluate/Affirm / Scale up
- IDOV – Identify / Design / Optimize / Valídate
- DMEDI – Define/ Measure / Explore/ Develope / Implemente
- DCCDI – Define/Customer/Concepts/Design/Implement (Rever, H. 2010)

5. Literature Review

Alexandra Tenera and Luis Carneiro Pinto (2014) proposes a Lean Six Sigma (LSS) project management improvement model supported by the DMAIC cycle and integrating an enlarged and adapted set of statistical tools, given the nature of the project management main variables and the involved processes[1]. The proposed model was tested in a Portuguese telecommunication company context in which project management processes system are based on Project Management Institute (PMI) standards. The model allowed identifying company's main project management problems, associated causes and the selection of the causes to be first attended. The proposed model also permitted to systematically address the actions and solutions to be implemented in order to keep, in the long run, the continuous improvement of the project management processes in the organization. **Ayadi youssouf et al. (2014)** research work focuses on the optimization of maintenance for industrial systems by the use of Lean six Sigma bases. Lean Six Sigma is a method of improving the quality and profitability based on mastering statically of process and it is also a management style that based on a highly regulated organization dedicated to managing project. The method is based on five main steps summarized in the acronym (DMAIC): Define Measure, Analyze, Improve and Control. Application of the method on the maintenance processes with using maintenance methods during the five phases of the method will help to reduce costs and losses in order to strive for optimum results in terms of profit and quality [2].

Khaled Mili et al. (2014) Discusses how to route straddle carriers in port container terminals [3]. This problem is solved in the context of optimizing transport operations. The contribution of the work lies in the formulation and subsequent development of a Six Sigma Approach solution for the problem. Generating and prioritizing the critical Six Sigma transportation plans, however, are real challenges in practice. This study aims to develop a novel approach based on a combined ANP and DEMATEL technique to help container terminals determine critical Six Sigma transportation plans. An empirical case study is used to explore the effectiveness of the proposed approach. **Dyah Diwasasri Ratnaningtya and Kridanto Surendro (2013)** studies reveals that Six Sigma could be used for reducing information variance in healthcare, especially information that used in Hospital Information System. Information quality is a key element to determine the level of healthcare in hospital. By the improvement of information quality, the quality of healthcare would improve to support the patient's satisfaction. A method used for information quality improvement is Six Sigma. **Abbas Saghaei et al. (2012)** presented real case which illustrates the results of applying model upon the industrial production of electronic sets. The quality level measurement of a given process is essential to some phases of six sigma methodology [16]. So far, different indicators have been applied to estimate the capabilities of a process such as classic yield, defect per unit, sigma quality level and rolled throughput yield. However, the examination of the efficiency of total processes in a certain organization is a recent study undertaken. **Sudi Apak et al. (2012)** research work was an initiative to implement the six sigma methodology in a Hydrogen power plant with the aim of encouraging governments to support the use of renewable energy i.e. hydrogen energy. The aim of research work is to assemble public and private sector officials in an international strategic planning process to advance the efficient development of a hydrogen economy infrastructure and to understand six sigma methodology and its contribution to energy efficiency [21]. **Jonny and Jessica Christyanti (2012)** have done research in Indonesia in which many housing constructors are using asbestos as roofing which is partly supplied by PT BBI among many other suppliers [19]. Before the initiative was conducted, the sigma level was at 4.91 sigma with defects per million (DPMO) level at 200 units. By implementing six sigma methodologies, the team found that this condition was mainly caused by side flat as its dominant defect type due to speeding up the curing time without simultaneously increasing its temperature. To solve this problem, the team has proposed that the company should increase its temperature up to 350°C by DOE (Design of Experiment) if it needs to speed up the curing time from normally 5 hours to 4 hours. As the result, the quality figure was better with improved sigma level to 5.02 sigma and DPMO level at 180. This result might not be significant because there were still many other defect types found in the product that should be followed up by continuous improvement in the company. **Morgan Swink and Brian W. Jacobs (2012)** assesses the operational impacts of Six Sigma program adoptions through an event study methodology, comparing financial data for 200 Six Sigma adopting firms against data for matched firms, which serve as control groups for the analyses [14]. We employ various matching procedures using different combinations of pre-adoption return on assets (ROA), industry, and size as matching criteria. By comparing performance outcomes across a hierarchy of operating metrics, we establish a

pattern of Six Sigma adoption effects that provides strong evidence of a positive impact on ROA. Interestingly, we find that the performance impact of Six Sigma adoption is negatively correlated to the firm's quality system maturity (indicated by prior ISO 9000 certification).

6. Conclusion

From the researcher reported by different researchers it can be concluded that by using Six sigma DMAIC methodology quality can be improve and wastage can be reduced. Which help to save money and reduce losses .This technique is used in many industries but still lack of awareness in Indian industries. It can help to achieve
High production rate, reduce losses and help to reduce wastage.

References

[1] Alexandra Tenera, Luis Carneiro Pinto (2014) UNIDEMI, Mechanical and Industrial Engineering Department, Caparica, 2829-516, Portugal vol-119, pp 912-920.
[2] Ayadi youssouf, Chaib Rachid,(2014) Badji Mokhtar university , Annaba laboratory environment and transport engineering. Mentouri university , Roumania,vol-55,pp 512 – 518
[3] Khaled Mili (2014) Higher Institute of Business Administration of Gafsa, Jemmel 5020, Tunisia vol-111, pp-1195-1205.
[4] Brook, Q. (2010). Lean Six Sigma and Minitab: The Complete Toolbox Guide for All Lean Six Sigma Practitioners (3rd Ed.). Hampshire: Opex Resources. vol-31, pp 551-573
[5] Cheng, C-Y & Chang, P-Y (2012). Implementation of the Lean Six Sigma framework in non-profit organizations: A case study. Total Quality Management & Business Excellence, vol-23, pp- 431-447.
[6] George, M. (2003). Lean Six Sigma for Services. New York: McGraw-Hill vol-47, pp 556-559
[7] Mehrjerdi, Y. (2011). Six-Sigma: methodology, tools and its future. Assembly Automation, vol-31, pp 79-88.
[8] Rachid Chaïb, Ion Verzea, Mohamed Benidir (2010), Contribution to the Performances Improvement of a Machine Boring Mill Operation, Recent revue, Vol. 11 No. 3 (30), Pp.173-179 ; Brasov- Romania, ISSN 1582-0246
[9] Aib Smain, Aib Abdelatif, Chaib Rachid et Ion Verzea, (2012), Diagnosis of Geometrical Defects And Rebuilt Method of Machine-Tools Accuracy; Recent revue, Vol. 13 No. 1 (34), March 2012, Pp.112-116 ; Brasov-Romania, ISSN 1582-0246
[10] Lin, Y. H., Chiu, C. C., & Tsai, C. H. (2008). The Study of Applying ANP Model to Assess Dispatching Rules for Wafer Fabrication. Expert Systems with Applications, vol-34, pp 2148–2163.
[11] Lin, C. T, Lee, C, & Wu, C. S (2009). Optimizing a Marketing Expert Decision Process for the Private Hotel. Expert Systems with Applications, vol- 36, pp 5613–5619.
[12] Liou, J. J. H, Tzeng, G. H, & Chang, H. C. (2007). Airline Safety Measurement Using a Hybrid Model. Journal of Air Transport Management, vol-13, pp 243–249.
[13] Morgan Swink and Brian W. Jacobs (2012) Neeley Business School, TCU, PO Box 298530, Fort Worth, TX 76129, United States Vol- 30 Pp. 437-453.
[14] R.D.Snee, (2004) "Six Sigma: The Evolution of 1000 Years of Business Improvement Methodology," International Journal of Six Sigma and Competitive Advantage, vol-40, pp. 4-20.
[15] Abbas Saghaei , Hoorieh Najafi , Rassoul Noorossana(20 Department of Industrial Engineering, Science and Research branch, Islamic Azad University, Tehran, Iran Vol- 140, Pp. 368-373.
[16] Y. Kwak and F. Anbari, (2006) "Benefits, Obstacles, and Future of Six Sigma Approach," Technovation, vol-45, pp. 708-715
[17] Anderson, R, Eriksson, H., Torstensson, H., (2006) Similarities and Differences between TQM, Six Sigma and Lean. The TQM Magazine vol-18 (3): p. 282-296.
[18] Jonny and Jessika, Christyanta, (2012) Universitas Bina Nusantara, Jl. K.H. Syahdan No. 9, Palmerah, Jakarta, 11410, Indonesia, vol-65 Pp. 306-312.
[19] Srinivasan, V., (2008) Standardizing the Specification, Verification, and Exchange Of Product Geometry: Research, Status And Trends. Computer-Aided Design, vol- 40(7): p. 738-749.
[20] Sudi Apak, Güngör Tuncer (2012), Erhan Atay Beykent University, İstanbul, 34396, Turkey vol- 41: p.410- 417.
[21] Day, D., Defining GD&T. Quality, 2007. 46(7): p. 18.

Author Profile

Gurpreet Singh has completed his B.tech (Mechanical Engineering) from Surya School of engineering & technology Bapror, Rajpura, Punjab. He is pursing currently M.tech in Mechanical engineering from Surya School of engineering & technology Bapror, Rajpura, Punjab.

Desh Bandhu is working as Professor, Mechanical Engineering, Surya School of Engineering and Technology Bapror, Rajpura, Punjab, India