



MODEL FOR QUALITY MANAGEMENT IN INDUSTRIAL ENTERPRISES

Térman Monteiro do Nascimento

69077-739 – Manaus, Amazonas, Brasil

ABSTRACT

Current market dynamics require approaches that respond to needs as quickly as possible. To do so, it is necessary to know the reality of the facts for better decision making. This work aims to present the three realities approach (Genba, Genbutsu and Genjitsu) widely used in a motorcycle industry to analyze problems and as a basis for quality planning. As a way to prove that knowledge is the basis for a good management of the facts, and later, a good quality management, go to the place of occurrence (Genba) provides the basic information manager, allowing a better understanding of the reality, the variables and interferences in the processes and provides material for analysis (Genbutsu) in each of the process steps. The decision based on the data (Genjitsu) guarantees the viability of the actions to solve the problems and maintain the results. Quality management based on the three realities enables concrete results, with the involvement of the team of employees and managers.

KEYWORDS : Quality Management, Three Realities, Genba, Genbtsu, Genjitsu

INTRODUCTION

It is necessary, for a better understanding of this article, to present some concepts of the term Quality. This will place us in the current approach that organizations meet, from the point of view of Quality Management practices. Depending on the context applied, the term Quality can generate different understandings, from the moment that the angle of analysis is changed. Your definition may vary considering the opinion of a client, a provider or an institution. Even within an organization, quality can take on a variety of meanings, depending on the sector or area that defines it.

Aiming to standardize the concepts used in Quality Management, the international standard NBR ISO 8402: 1994¹ defines Quality as "the totality of characteristics of an entity that gives it the ability to satisfy explicit and implicit needs." Any entity that can be considered and described individually.

In Falconi's view (1998), "managing is essentially achieving goals" and "to achieve quality goals, it is necessary to establish new standards - Quality Planning, or to modify existing standards - Quality Improvement." ISO standard 8402: 1994 explains that quality improvement is a set of "actions implemented throughout the organization to increase the effectiveness and efficiency of activities and processes to provide additional benefits to both the organization and customers." These concepts allow us to conclude that Quality Management must define the objectives that must be achieved through process management strategies and the quest for quality improvement.

The aim of this article is to present the results obtained in a motorcycle factory in the definition of the management strategy, the quality of the process to reduce process failures and its correlation with the concepts and theories of scholars, confirming the quality management of the process for the product quality assurance.

(1) – NBR ISO 8402:1994 substituted by NBR ISO 9000:2000

METODOLOGY

The present article used the explanatory research method, aiming to identify the factors that contributed to the occurrence of the leaks, with a quantitative approach collecting data directly in the production line of the welding sector. According to Lakatas (2010), the method of quantitative research consists of investigations of empirical research whose purpose is the delineation or analysis of the characteristics of facts or phenomena, with the purpose of providing data for the verification of hypotheses.

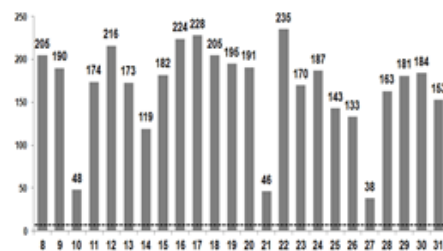
In addition to the field research as a method to identify the details of the problem and propose the necessary improvements to reduce

the internal leakage rates of the fuel tanks. Andrade (2009) indicates that "field research uses specific techniques, which aim to collect and record, in an orderly way, the data on the subject under study." The data presented served to elaborate the hypotheses and define the strategies to solve the problem.

CASE STUDY

The work to reduce internal leakage in the manufacture of fuel tanks was implemented along with production teams, technical group and quality control in the welding sector. At the beginning of the work in July 2009, the welding sector had an internal leakage rate of 2.55% of daily production, with a daily average of 165 cases of fuel tanks presenting some type of failure that caused leakage in the leakage test, as shown below.

The improvement actions implemented between August and October 2009 reduced daily leakage rates to acceptable levels, considering the complexity of the carbon steel welding process. Based on the review actions (PDCA), the qualification of employees and the implementation of new leak detection and containment technologies were strengthened.



Amount of internal leakage – Jul/09

Source: own author

The model used to deal with the quality problems that occur in the production process considers that only knowing the root cause of the problem we can eliminate the problem through concrete and definitive actions. However, recognizing the cause of the problem is not as simple as imagined. It is necessary to deepen in the events involved in the production process, from the beginning until its conclusion or delivery of the product to the final client. The analysis of the symptoms or phenomena that result from the divergence in the defined specifications - quality problems - can not be the main point of analysis to eliminate nonconformity. The effective eradication of problems will only be obtained from the moment that the focus of the analysis turns to the origin of the causes.

1st REALITY GENBA - GOTO THE SITE OF THE OCCURRENCE

Often we are led to supposedly obvious conclusions, but the results

persist in being negative or not expressive. A visit to the place of occurrence, if performed with a critical eye, provides an opportunity to raise information about the process not yet perceived due to the daily routine. The coolness of the office does not reflect the dynamics of the "shop floor," nor does it allow opportunities for improvement to be better formulated, since the response to problems is there, in the productive process, just waiting for a chance to be observed and put into practice. The first reality is that it is necessary to go to the place of occurrence, to understand what is happening. Through deepening the understanding of the situation, we can plan actions to balance the processes.

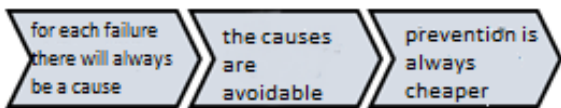
The work to reduce leakage in the welding sector started from the identification of the presented data. The defect index showed great possibility of occurrence in the field, which required a quick and effective solution to contain the internal occurrences. To take corrective actions it was necessary to understand which phenomena interfered in the process. After a detailed evaluation of the process stages and their variables through incursions in the area, three main points of greater incidence of internal leakage problems were identified: Automatic Welding (AW), Manual Welding (MW) and Resistance Welding (RS). The three processes represented 70% of the occurrences of internal leakage. This information alone has already shown that the approach to the place of occurrence (Genba) has broadened and strengthened the possibilities of problem solving.

Based on the information obtained was confirmed through the problem parts (Genbutsu) under which conditions the problems were most likely to occur. The team performed a detailed analysis of the conditions and characteristics of the leaks, in addition to the process conditions at that moment to determine the starting point for solving the problems, defining the most relevant Control Items in each of the evaluated processes, based on the work instructions already existing.

2st REALITY GENBUTSU – ANALISAR O PRODUTO OU PROCESSO

The actions to reduce the internal leakage rate in the welding sector followed as the variables emerged. Thus, each time they went to the process to analyze the variables (Genba), samples were taken for analysis and comparison between the parameters used in the process with those defined in the working instructions (Genbutsu). Palmberg (2009) is right when he says that "analysis and improvement of processes contribute to planning, structuring, problem solving and continuous improvement of all work processes considered to be fundamental to the business".

Considering that the problem evaluated by the team generates rework, the financial consequence for the organization becomes dangerous, considering the risks with the quality of the final product. According to Crosby (1994), "quality does not cost, but it is an investment with assured return". In this sense, the actions of the leak reduction work revealed an important role in controlling the costs of reworking and unused parts in the welding sector, since the standardization of actions in the critical processes would reduce the costs of the sector. Quality costs are based on a tripod, as shown below.



System of Quality Costs
Source: author adaptation

The 2nd reality (Genbutsu) gives managers the detail of each process, presenting previously unknown or little perceived variables. With the data of the parameters of the work instructions and the parameters really used in the process, the team was able to identify improvement points, and the possible root causes of the

problems, evaluating the problems with the quality tools.

The quality tools are techniques that allow decision making, after analyzing the data collected, offering a greater probability of solving the problems, as explained previously.

3st REALITY GENJITSU – TOMAR DECISÃO COM BASE EM DADOS

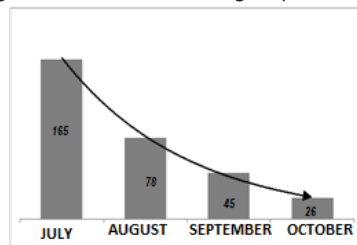
The principle of the Three Realities emphasizes that it is important to always seek the reason of each data collected in Genba-Genbutsu, to obtain the true Genjitsu. The quality of decisions is directly linked to the quality of information collected locally. According to Paim (2007), "process management has been seen as an attempt to reduce the time between the identification of a problem in the processes and the implementation of the respective solutions. To reduce this time, actions must be well structured, but on the other hand, they must allow processes to be diagnosed, and solutions be identified and implemented in the shortest time possible".

Definitive solutions were adopted to reduce the rate of internal leakage in the welding sector. In each of the critical processes, new methodologies were evaluated and implemented in the process, ranging from raw material change, components, parameters and equipment, to training with employees in the new process concepts.

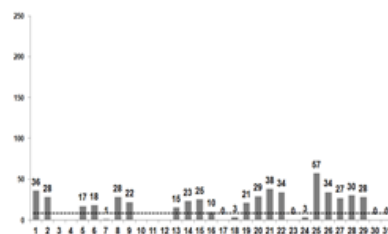
The NRB ISO 9001: 2008 standard describes that process approach involves the definition and systematic management of processes to achieve the intended results according to the quality policy and the strategic direction of the organization. The management of processes and the system as a whole can be achieved using the PDCA cycle, which can be briefly defined as:

The results obtained in the welding sector reflected the efficiency of the management system adopted through the three realities. At the beginning of the internal leak reduction work, the daily average was 165 cases in July 2009. After the implementation of the improvements in the processes, through the analysis in the process (Genba), the analysis of the actual data obtained (Genbutsu), the team presented measures that were able to reduce the leakage rate from August 2009.

When considering changes in some stages of the process, training was implemented for the employees involved. Juran (2013) states that there is no improvement without the capacity to perform something, so the training is something that must be considered as indispensable and carried out in a theoretical and practical way, considering the results obtained during the process of awareness.



Number of leaks Jul/09 ~ Oct/09
Source: own author



Number of daily leaks – Oct/09
Source: own author

CONCLUSION

The present article presented a quality management approach, which seeks to strengthen the managers' knowledge so that they are able to make decisions regarding the strategies and methodologies to be adopted to obtain quality in their processes. A simple model that encourages team involvement to consolidate practices and results for the organization. However, it is important to stress that the dynamics of the market and the technologies do not allow perennial satisfaction. Quality management requires constant learning to solve new variables presented daily.

The applicability of the model is feasible in both industrial companies, businesses and even services, since it does not require specific tools or determines clear techniques. Just the dedication to know the process, focusing on the satisfaction of the end customer.

REFERENCES

- [1] ABNT, Associação Brasileira de Normas Técnicas. NBR 8402: Gestão da Qualidade e Garantia da Qualidade: 1994.
- [2] ABNT, Associação Brasileira de Normas Técnicas. NBR 9001: Sistemas de Gestão da Qualidade: 2008.
- [3] Andrade, Maria Margarida de. Introdução à metodologia do trabalho científico: Elaboração de trabalhos na graduação. 9. Ed. São Paulo: Atlas, 2009.
- [4] Campos, Vicente Falconi. Gerenciamento da rotina do trabalho do dia-a-dia. Belo Horizonte: DG, 1998.
- [5] Crosby, P. B. É Preciso Praticar uma Filosofia de Qualidade, Revista Controle de Qualidade, nº 73. São Paulo: Banas, 1998.
- [6] LAKATOS, Eva Maria; MARCONI, Marina de Andrade. Fundamentos de Metodologia Científica. 7. ed. São Paulo: Atlas, 2010.
- [7] Os 10 Passos Para Melhoria da Qualidade Segundo Juran – Qualidade Brasil. Disponível em <<http://www.folhavoria.com.br/economia/blogs/gestaoeresultados>>, acesso em 23 de janeiro de 2017.
- [8] Paim, R. Tarefas para gestão de processos. 2007. Tese (Doutorado). COPPE/UFRJ, Rio de Janeiro, 2007.
- [9] Palmberg, Klara. Exploring process management: are there any widespread models and definitions. 2009 The TQM Journal Vol. 21 No. 2, 2009.