

Ergonomics at Volkswagen Brasil. Multidisciplinary work to equalize Health, Productivity and Quality

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Abstract. Following the technological developments and presented to the multidisciplinary processes as automakers, Volkswagen Brazil, represented by its ergonomists, through this paper, shows the importance of ergonomic efficiency of management applied to various levels of life of a product, since its creation to its final implementation on production lines.

The preventive work of ergonomists during the processes leading to production of a vehicle is accomplished through assessments on a simulated system called the Digital Factory. Since the initial stages to final product delivery there is a need for a multidisciplinary aligning the concepts of ergonomics, productivity and quality of product. Industrial Engineering, Process Engineering, ergonomists and workers are involved in the analysis made through the Workshop's showing the importance of discussion between the various users of the systems. The processes of series are also equipped with a set of certifications flow of job and planned audits on items that describe processes and applied ergonomics.

Keywords: Ergonomics, productivity, quality, multidisciplinary.

1. Introduction

The Ergonomics program of Volkswagen Brasil starts with the history of the Standard Norm 17 from the Ministry of labor at 23 November of 1990 (figure 1).

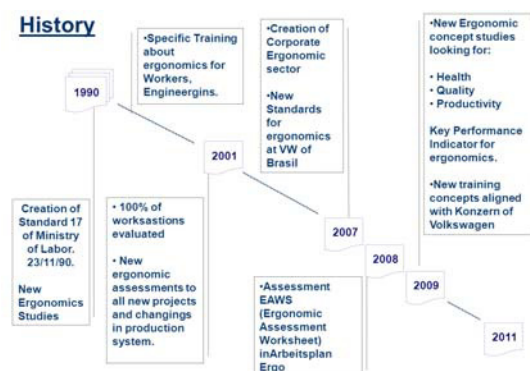


Figure 1 –History of Ergonomics in VW Brasil.

The ergonomic evaluation started with the medical services sector with coordination of human

resources. The methods for evaluation were provided by international recognized institutions.

Even in the beginning of the ergonomic program the demand for ergonomic evaluation came from the products that were already been produced at Volkswagen. With this purpose, the areas of human resources, industrial and process engineering were already working together.

The focus of alternation of the biomechanical demands was always the main purpose of ergonomic assessments.

In the next years as showed in the figure 1, all workstations were evaluated taking into consideration different methods like, NIOSH, Moore & Garg, RULA, etc.

2. Ergonomics, Productivity and Quality

Within the focus and criteria of the Contemporary Ergonomics, Alan Wisner [1] pointed out and cited by Mario Vidal [2], as was predicted in 1967 is now widely observed in the new industrializing processes (Figure2). The factors

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resulting from work direct consequences on health, productivity and quality of the process.

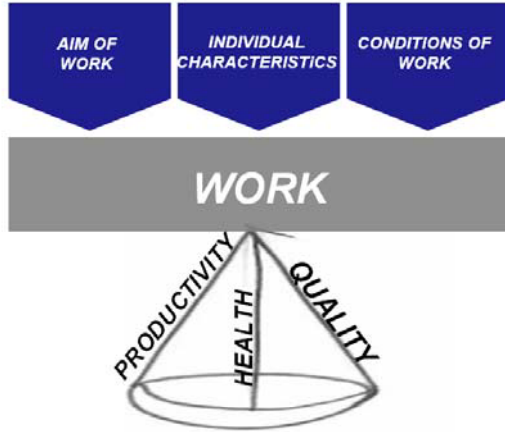


Figure 2 –Focus and Criteria of Contemporary Ergonomics

Aiming the harmonization of these items, the working method to the start of an ergonomic program was developed at Volkswagen Brasil.

3. Ergonomics at Volkswagen Brasil

Taking into consideration the history of ergonomics in the company and the purpose in following the focus and criteria of contemporary ergonomics, the ergonomic sector of Volkswagen Brasil works to align the theme with the production system purposes. In the elements of production system the ergonomics element makes part of the basis showing the importance and relevance of the theme in the processes.

To develop a good management about ergonomics the coordination of this sector stays with the human resources ergonomics service that has the knowledge to develop evaluations taking into consideration biomechanics concepts, physiology of workers and kinesiology concepts for activities.

The Standards developed by Volkswagen Brasil follows national laws and standards and follows the Konzern Standards of Group Volkswagen.

To integrate the ideas for improvement ergonomics on workstations the multidisciplinary work happens in many situations and meetings. The main idea is involve all the “pieces” of the process, workers, engineering’s, ergonomists, maintenance and other related areas (figure 3).

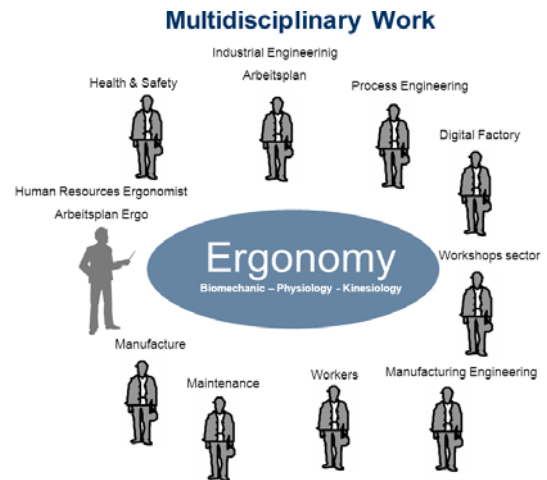


Figure 3 –Multidisciplinary work

The multidisciplinary meetings involving ergonomic subjects’ starts with the main demands (figure 4) and each point generate a new kind of ergonomic evaluation.

A multidisciplinary team ensures well-structured much of the success of ergonomics in action. Teams are able to improve the performance of individuals when the task requires multiple skills, trial and experience, by being more flexible, react better to changes. The diversity of knowledge in areas favors the generation of specific ideas.

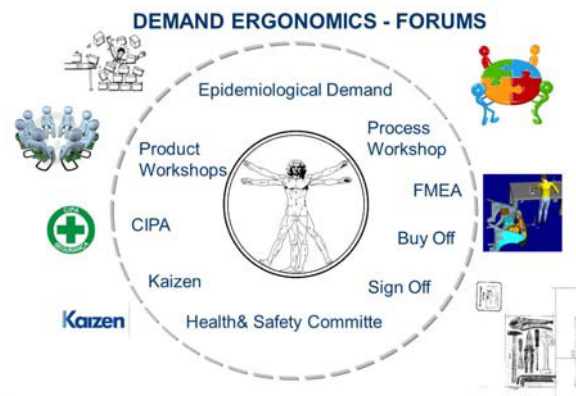


Figure 4 –Demand Ergonomics

There are four basic steps for an ergonomic evaluation on the product system. It can be created in the first steps of the process (development) or in the actual process. Observing the responsibilities, the basic flow (figure 5) takes into consideration the multidisciplinary work.

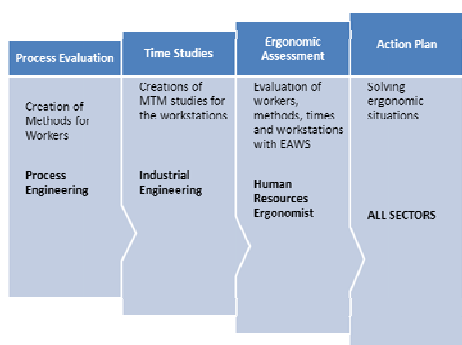


Figure 5 –Flow of activities and responsibilities.

4. Ergonomic Assessment to new Products and Process

It is known that every investment is used to prevent considerably less when compared to correction, under this concept, ergonomic evaluations of the products to be manufactured at Volkswagen Brasil also receiving an assessment in the early stages of development.

All new solutions can be evaluated and implemented in accordance with each item ergonomic point.

The ergonomically designed workplace will not only allow an optimal condition to the worker in biomechanical aspect, but also improve the flow of the production process or positively affect in the quality of the product.

Technologies of Digital Factory are used to develop ergonomically workstations. Researches on motion capturing systems are being tested.

Anthropometrical studies with own values for employees Volkswagen are still helping in the creation and recreation of workstations.

The interaction and synergy of the process management tool, primarily as 3P (Production Preparation Process) and FMEA (Failure Analysis Method and Effects) related at the ergonomics subject, enable technicians in the concepts of the actual process simulations to anticipate, recognize, measure and propose changes in the planning of new jobs, eliminating and minimizing the unfavorable conditions (figure 6).

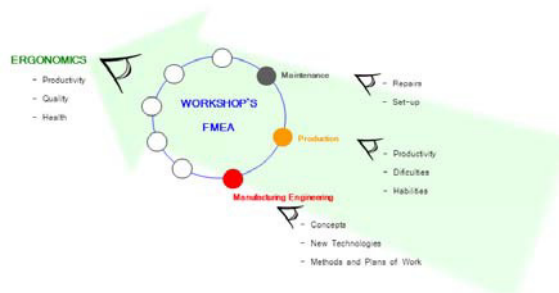


Figure 6 –Ergonomic concepts to the production system.

5. Method for Ergonomic Assessment

The Volkswagen Brasil use as the group Volkswagen an evaluation method called the EAWS which “[...] is a mean of analyzing and evaluation risks of physical stress and is applicable in the planning and in the production phase. The method considers the four workload types “postures”, “forces”, “manual materials handling” and “repetitive loads of the upper limbs.” [3]

6. Qualification on Ergonomics

The training in ergonomics are developed and taught by ergonomists, residents in each of Volkswagen Brasil plants, they are taught in two different methodologies, one directed to managers, engineers and cell leaders and other dedicated employees of the production area and administrative.

The training of productive employees is applied at specific structures, which were specially built and developed for training of employees of the productive areas. These structures allow users to an approximation of the real work situation, because it has identical workstations to the production area.

Employees receive theoretical and practical training in ergonomics, which are oriented on the importance of the subject to maintain your health and others involved and also the importance of the theme for the work.

The topics covered are for example: definitions of ergonomics, harmonious postures, work pace, workstation rotation, ambidexterity, ergonomics and quality, ergonomics and productivity.

7. Conclusions

The improvement of ergonomics in the automotive industry contributes to increased productivity, health and quality. The concern is connected with the harmonization of work and daily life activity in order to improve both the health and well-being of employees, as well as efficiency, quality and performance at the work systems.

References

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- [3] IAD/MTM, *Grading Manual* (2009).