

“Proposal for an integrative methodology for the ergonomic program”

López Millán Fco. Octavio¹, De la Vega Bustillos Enrique Javier¹, Lucero Duarte Karla Patricia¹, Díaz Muro Martha Estela¹

¹Instituto Tecnológico de Hermosillo

Abstract

This paper collects the experience for both, academic and professional practice, and deal with the stages and level of involvement from different elements on the organization. The work is focused in some kind of concentric cycles, the very outside are those that interact in a year period, the inner cycles are those that acts in a daily or weekly intervention. The success of the program still depending on the will of the managers but any action directed on benefit of the people at work, enable the moral as well as the indicators for health and safety.

Keywords: Ergonomic program, assessment tools, work design

1. Introduction.

Industrial grow in twenty century become on a engine for the world economy, is relatively easy to see how it was, just take a look on automotive or electronics, for instance, and will perceive a big quantity of models, colors, styles, technologies, etc. This growing has not been easy; it has some negative consequences, environmental and occupational health had been affected negatively.

Automotive industry generate a lot on jobs, directly and indirectly way, and from the sixties decade and until present time, and its growing could consider constant, with some crisis periods. According with data from the International Organization of Motor Vehicle Manufacturer (2011) from 1997 to 2010, world production of automobiles has been in more than 50,000,000 cars each year, in 2010 and 2008, production reach more than 70 million cars. The ILO (2000) present a model for jobs created by the automobile industry, using the French Industry as a example, and data are impressive; for 182,000 jobs in manufacturing cars, there are 313,000 jobs related directly with it, manufacturing industry demands 773,000 jobs, that

means almost 50% of manufacturing labor is in automobile industry. In world terms, the automobile industry generates (IOMVM, 2011) in 2010 about 8 million jobs, in México, 137, 000 people worked for automobile industry. INEGI (2010) registered 436,851 manufacturing jobs. The data shows a picture about the magnitude of people working in manufacturing jobs, locally and wide world.

Occupational health has been abundantly studied; risks factors, illnesses, disorders and much more. The benefits of occupational health or occupational ergonomics programs has been probed so many times, just for instance, the detailed of research on the field is shown in Ismail et al (2008), going to the relationship between the work station design and the discomfort of the people. But the point is how the occupational ergonomics program should be design. Chengalur et al (2004), mention a six sigma approach, it is basically a problem solving methodology, of course it is a very useful tool, but mainly deals with engineering controls and covers efficiently the proactive approach. There is a important amount of societies and organisms, like OSHA, that provide very good guidelines to structuring an ergonomics program, but remain the same, are general guidelines.

2. Method

Is relevant to point that having an ergonomic program is a good sign and the results of it should be good, that is due to the work in ergonomics. Is important delimitate the use of this method to industrial work design. The layers are all important too and they all interact constantly.

First layer, ¿ where is the beginning?

It was mentioned that all the parts or layers interact, but it is required to point a start, and it should be the commitment of high level managers and it should be translated to a written policy, assigning responsibility program and assigning an

annual budget, following by the conforming of a group to design the ergonomic general program or evaluate the current program, tuition by an ergonomic certified consultant, the program has to become on the ergonomic operating system. It is relevant to propose an ergo day as a component on the ergonomics program, which is a highly effective strategy to create or improve the feeling for the ergonomics. The ergo day could be every three years and is good to use some allusive promotional items like t shirts or buttons. But, ¿what is an ergo day? Simply, is a specific day when all administrative personnel in the plant works like labor, a complete shift. Say all means plant manager, areas managers, support people and so on. They will be assigned to a work station; they will receive the correspondent training on manufacturing process, safety and quality. At the end of the ergo day, is recommended write all opinions down focused in perception about how good, or no good, direct work is. Ergo day promotes the eye on the process, opening the chances to get feedback about the ergonomics and detecting potentials issues.

Ergonomics operating system engaged the second layer; it is how the program works like a process. The commitment this time goes to form or support a local ergonomics committee (LEC). The Occupational Health Clinics for Ontario Workers (2011) Ergonomics Committee Workbook is a very useful guide.

As a fundamental element of the Ergonomics Program (EP) it is anthropometrics, this tool is so relevant for ergonomics language, it is the way to really match the ergonomics proposals and achieve the human centered design mentioned in the International Ergonomics Association (IEA) definition. Bustillos et al (2010) shows how anthropometrics can be used to design or redesign workstations.

The second layer includes mapping the risk of occupational injuries or disorders. Mapping is one of the main activities for the LEC. Usually a color code is helpful and the standard is green, yellow, red and black associated with the low, moderate, high and very high risk of occurrence an occupational injury. The question is ¿how to map? There are a wide variety of assessment ergonomics methods, one of the most simply and effective is the Fatigue Muscular Analysis

(FMA), better known as Sue Rodgers method, Chengalur et al (2004). It provides a result in a color code form. Complementary analysis could be measurement of energy expenditure, especially when walking conditions is part of the job.

From risk mapping has to pass to an action plan, the final target is only green code workstations. That is, yellow and red code workstations should become green code workstations and black code, needs to get an immediately action to lower the level risk. It is important to establish additional criteria to code workstation, for instance, a medical complain should be a red code until root cause is determined, it implied a complete assessment of workstation. No matter a green code, if a person remains in the same workstation for more than six months doing the same job, it should be code as yellow. The 8 D's method is a useful tool to contain and prevent the same risk occurrence.

Additional assessment may be required depending on the kind of issue found, if static postures are the problem, it could be evaluated with 3D SSPP™ tool, if exist manual material handling, NIOSH revised equation or Liberty Mutual Tables could be helpful.

The second layer includes standardization. Standards are for:

- Force limits,
- Time on awkward postures, over shoulder or overhead for instance,
- Workloads efficiency and recovery time.
- Weights for tools and materials,
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- Periodicity for updating the risk map,
- Excel templates for assessments,
- Medical records related to occupational complains.
- Training

The third layer deals on work level. That is, how the people participate on work and workstation design and how team leaders are encouraged to take care of people. Is so important that every time that a process part is modified, ask to people about the changes, take opinions about the way they feel on new tools, about how they feel at the end of the shift; so tired, painful, stiffness or numbness. A good strategy is teach people to care themselves on ergonomics as usually in safety does.

Promote cross-assessments between work areas people. Promote people to buying processes; tools, mechanical aids, workstation design and work design.

3. Conclusion

There is, may be, no much new findings on this proposal, but it is an exercise going to put in some order the experience of several years on ergonomics practice and can be trust that it works. While ergonomics remain on job designers mind, we can be sure that people heal is going on right direction.

When people notes that industrial engineering goes to the production line not just to give them more work but going to ask about ergonomics improvements, people moral raises.

When an ergonomic program works well, managers trust increases, especially when morale people and safety and health costs go down every year.

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