

Surveying workers perceptions in the automotive industry - a preventive tool for monitoring OSH measures

Nicoleta Paula Neag^{1,*}, Alin Gaureanu¹, Nicoleta-Lavinia Calciu¹, and Matei Tamasila¹

¹Politehnica University of Timisoara, Department of Management, Remus str. 14, Timisoara, Romania

Abstract. In an efficient OSH management system, it is necessary to approach continuous improvement, being recommended the PDCA system (Plan Do Check Act). In Romania, there is well-developed legislation, who establishes measures and actions in the field of OSH. The companies comply by creating an implementation plan, but most of them remain at this stage, without verifying the degree of implementation, with adaptation/updating of the measures. In this paper, we highlight some reference elements that can be periodically probed, so that the OSH management system can have a prompt and justified improvement reaction. The mode of obtaining this information regarding the implemented measures can be achieved through a periodic questionnaire that diagnoses two relevant aspects: 1. workers' perceptions - which assess the implementation method; 2. the consequences/accidents - that assess the efficiency of the measures and their application/implementation. The two key elements (perception and consequences) will be used by the questionnaire responding workers after the implementation stage. The profile of these respondents is considered, and depending on their age, function, and level of education, the new applicable measures can be dimensioned. Only through continuous, monitored, and adapted improvement can the most effective measures be implemented, so that prevention fulfils its fundamental purpose, to contribute to the predictability and sustainability of an efficient automotive enterprise.

1 Introduction

The approach of this paper starts from two relevant considerations:

1. Due to the forced competitiveness by the automotive market[1] the results in this industry can be considered as promoters [2] of solutions in research, development, and innovation. In this area of research, it should be noted that the automotive sector in Europe is responsible for 29% of total investment in research and development [3]. The importance of this industry is revealed by the 5.7% contribution to the World Gross Product (Timmer, Dietzenbacher, Los, Stehrer, & de Vries, 2015), cited by [4], respectively 7 % of EU-GDP [5].

* Corresponding author: nicoleta.neag@student.upt.ro

2. If the automotive industry is representative of the research and development sector and is at the forefront of European and global economic development, innovative, applied, and effective safety and health practices in the work.

3. “Continuous improvement of occupational safety and health must be promoted” (Benjamin O, 2008)

Starting from these realities, it is necessary to study the phenomenology of OSH in the automotive field and to disseminate the results for the propagation of certain attitudes and their application at the level of all fields of activity. As at the western border of Romania there is a concentration of companies operating in the automotive industry [6], it is understandable the immediate usefulness of the approach, which can contribute to improving good OSH practices in the field.

Starting from this paper, in which we refer only to an actor in the automotive field, to which we conducted the research, in the following papers we will synthesize a comparison with advantages and disadvantages of good practices established by parent companies in Romania.

A solid benchmark of good practices is needed for them to be embraced by all companies with similar activity, risks, and a large staff.

2 Legal compliance

Although there are legal provisions set out in the European Directive 89/391 / EEC and transposed into the national legislation of Romania by Law 319/2006, detailed in the Implementing Rules approved by GD 1425/2006, amended and supplemented, it is imperative to engage employers to implement and comply with good practices and not only to sterilely comply with generic legal provisions, without indicating the procedures, processes, financing, communication, implementation and monitoring of those provisions.

Good practices come precisely to define these elements of detailing the generic legal provisions. It should not be omitted that the legislation provides for the internal creation of its Own OSH Instructions (IPSSM – Romanian abbreviation), their absence is considered a violation, which is sanctioned by the control bodies.

Whether or not these IPSSMs exist, two essential requirements must be met for the proper conduct of prevention:

- a. Someone to ascertain the existence or non-existence, with the appropriate sanction;
- b. The content, implementation, and consistency of the application must be appropriate.

We will refer to generic legal provisions that urge the employer or his superiors to draw up, implement and pursue effective prevention measures. From a point of view, it is ideal that these regulations exist, unfortunately, because they are not assigned, sanctioned, and properly aware, individually, by each worker, they remain more as interpreted in the letter of normative acts. and not in their spirit, which urges prevention. Speaking of the spirit of the law, this is how, at art. 13, letter e) the employer must pay the obligation to draw up its own instructions “in the spirit of this law” ... and “taking into account the particularities of the activities”

As normative acts require a minimum of compliance, most employers will comply with that minimum and very few will understand that in special situations they will have to be creative - proactive or even generative of good practices with appropriate tools in implementing and monitoring efficiency and updating preventive measures.

The first and most often interpreted generic legal provision is the one from art. 6, para. (1) of Law 319/2006 on the fact that “The employer has the obligation to ensure the safety and health of workers in all aspects related to work”. From this provision arises the “presumption of guilt” of the employer, who must in the future bureaucratically justify all actions, to create evidence to apologize in case of events on the spot or connection with the

work of his employees. This bureaucratic process gives rise to a multitude of documentations, documents, files, records, and working time consumed only for compliance, being lost from time to time the purpose of normative acts to streamline prevention.

Tools are needed for efficiency, and some are established in normative acts, non-exhaustive examples being: Prevention and protection plan (Methodological Norms, approved by GD 1425 - Annex 6), training sheet (Annex 11), communication of events (Annex 13), medical examination of workers (GD 355/2007), provision of personal protective equipment (GD 1048/2006 and GD 115/2004).

Where the normative acts do not provide tools, the employer must resort to good practices to be able to fulfil coherently and professionally within an adequate management, the legal requirements by which obligations are established.

It is necessary to adopt such instruments because they come to outline how legal obligations such as those in Law OSH 319/2006 art.13 - letter f. "To ensure and control the knowledge and application by all workers of the measures"; letter h "to provide information". Or generic obligations found in art. 15 of the Methodological Norms approved by updated GD 1425, which refers to the following: hazard identification and risk assessment (point 1); monitoring and updating the prevention and protection plan - PPP (point 2); checking the application of OSH measures by workers (point 5); checking the application of the information received by the workers (point 7 - final thesis).

2.1 Good practices

The simplest and most widely used such tools used and recommended in good practice are those of the checklist type used in already established monitoring systems. [7] – SOR – Safety Observation Report, SOT (Safety Observation Tour), SOS (Safety Observation System), NMR (Near Misses Report) [8], etc. These tools are useful to use periodically and have multiple roles, such as survey, verification, control, proposal collector, feedback, but also the consolidation of a participatory consultative OSH management. By processing, tracking, and digitizing the analysis of these checklists, conclusions can be drawn that influence OSH action policies, by modifying, maintaining, or weighting preventive measures. Whether we call them reports, periodic checks, monitoring, or questionnaires, they must be regulated internally in managerial policies and become a constant exercise of monitoring and feedback of the implementation of OSH measures, which will give predictability and prognosis to this prevention activity.

We find the use of such questionnaires mainly in the industrial activities in the automotive field, which we said are a positive example of performance in the field of OSH. The use of such tools is due to corporate policies based on ISO quality standards (9001, 14001, 45001) through which, good practices are recommended and used as viable methods of efficiency regardless of the scope.

In this context, it is understood why OSHA - US Safety department of labor has established that one of the 10 recommended practices is "IMPLEMENT A REPORTING SYSTEM", which involves "Develop and communicate a simple procedure for workers to report any injuries, illnesses, incidents (including near misses/close calls), hazards, or safety and health concerns without fear of retaliation. Include an option for reporting hazards or concerns anonymously" [9]

The problem is that in Romania the relevant ministry in OSH, which is the Ministry of Labor, has no preoccupations with guiding and recommending such good practices.

Moreover, even within the legislation in force, regarding the obligations of employers, within the OSH Law 319/2006, at art.12, paragraph (2), although it is provided from the date of publication, that the ministry will establish by Minister's order "obligations of different

categories of companies regarding the preparation of documents", this is not achieved even after 15 years - in 2021.

As a result, regardless of the size of the company and the specific risks, the same types of documentation must be made.

In the same way, (Fig.1) the legislation can contribute to the establishment of good practices by ministerial order, guides, guidelines, instructions, which come to complete, to detail the main or secondary legal provisions, as tertiary legislation.

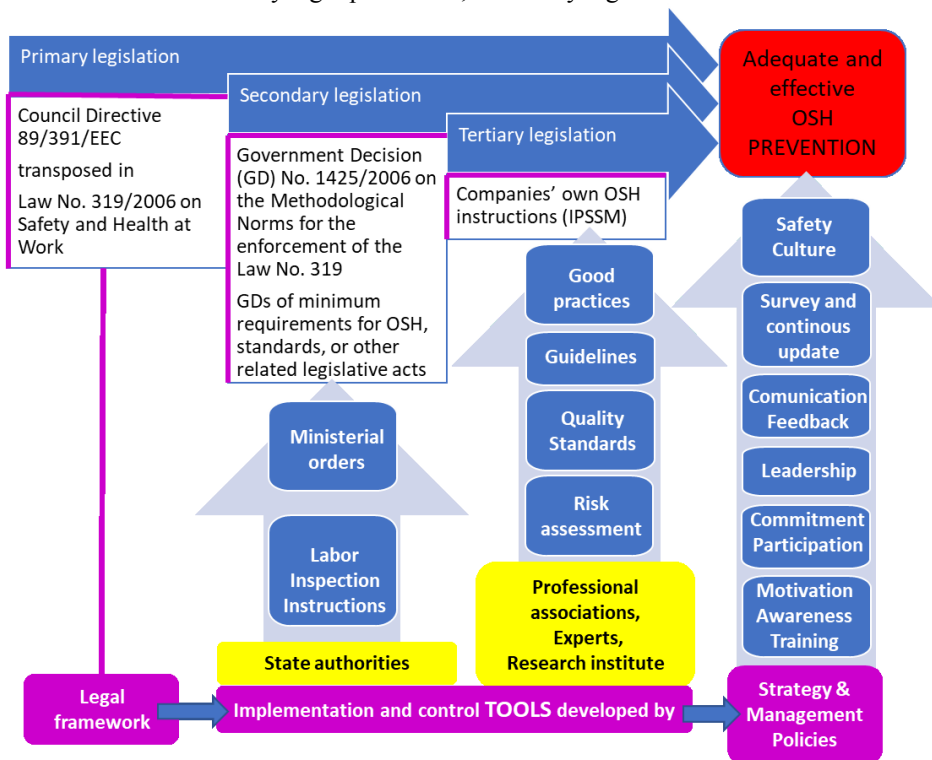


Fig.1. The contribution of regulations and recommendations to adequate prevention

3 Methodology and results

3.1 Questionnaire survey

For an image of what it means to identify the level of safety from the perspective of workers' perceptions, a survey was conducted within an automotive company. The questionnaire contained 13 questions and was completed with the participation of 227 people and was used in the Dissertation for the master's degree of Nicoleta-Lavinia Calciu - Study on occupational safety and health management within the company S.C. XXX S.R.L. - 2020, UPT / MPT, 57 pag.

We use this questionnaire to demonstrate the usefulness of information that may result from monitoring OSH status in an enterprise.

The usefulness of this surveillance is much more important if the questionnaire is used periodically, thus making it possible to observe data over time as well as evolutionary trends, which can create the framework for future actions to combat harmful trends, according to [10] "If we can predict it: we can prevent it!"

Out of the total number of questions in the dissertation, in this research, we use the answers to only 11 questions in the questionnaire that we consider relevant. The questionnaire used dissemination through the Google Forms application and the answers were collected in the first part of 2020.

These investigated questions are about the degree of satisfaction of the OSH system within the company, about the OSH training, as well as the perception of the reasons for the injury. We also have three questions that outline the SSM interest profile.

1. Personal protective equipment
2. Working conditions
3. Individual work equipment
4. Work environment
5. Technical equipment
6. On-the-job training
7. Accidents suffered at work
8. Perception of the causes of work accidents
9. Age
10. Level of education
11. Function

3.2 Results – the quantitative reinterpretation

After the qualitative perceptions highlighted in the initial study, we transformed the answers into quantitative values with formulas in Excel, obtaining the following results entered in table 1 and exposed in fig.2 and 3.

Table 1. Questionnaire data

Qualitative assessment	Note Quantitative assessment	PPE	OSH training	Work condition	Individual work equipment	Technical equipment	Work environment
		Number of respondents according to grades					
very bad	2	2	7	3	3	4	3
bad	4	16	14	13	15	13	14
neutral	6	66	91	62	60	60	62
good	8	32	42	104	100	97	93
very good	10	38	72	42	46	50	53
Total respondents		154	226	224	224	224	225
Average note		7,14	7,39	7,50	7,52	7,57	7,59

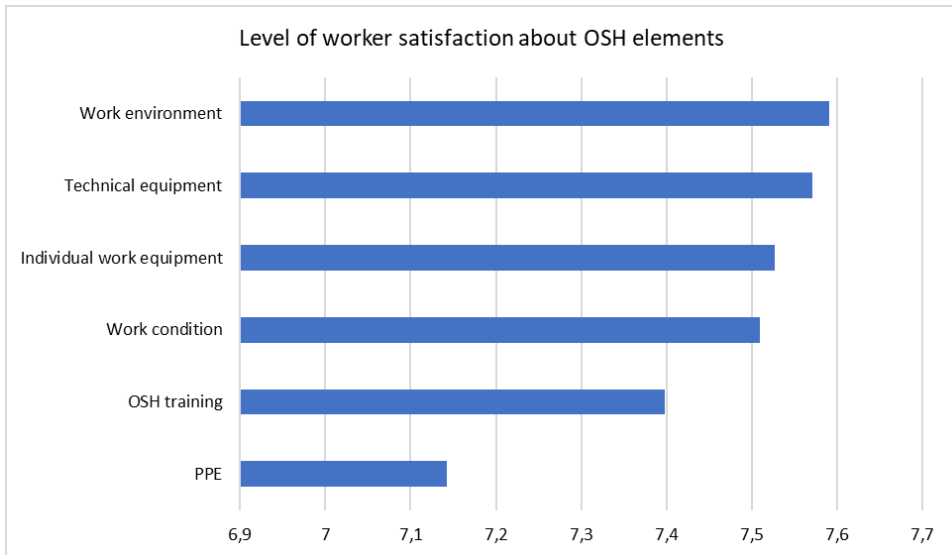


Fig. 2. Level of worker satisfaction about OSH elements

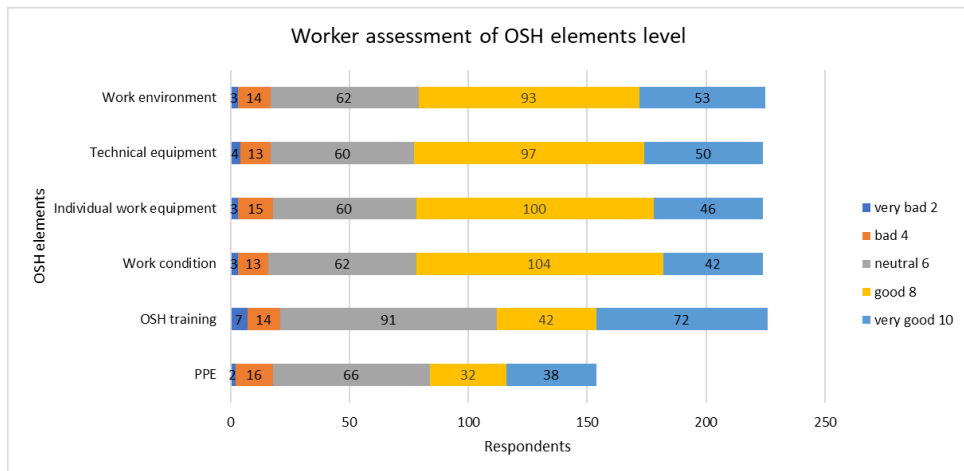


Fig. 3. Worker assessment of OSH elements level

We consider that the evaluation, as well as the monitoring and analysis of data in a quantitative rather than qualitative way, is much more comprehensive.

Quantitative quantification of responses creates the premises for a more accurate analysis of the questionnaires and their comparison with the results of periodic monitoring.

A suggestive image of the questionnaire is also the questioning about the possible incidents suffered at work (Fig.4.). Here we can see that 57% of those surveyed suffered minor incidents, of which most 70% cuts.

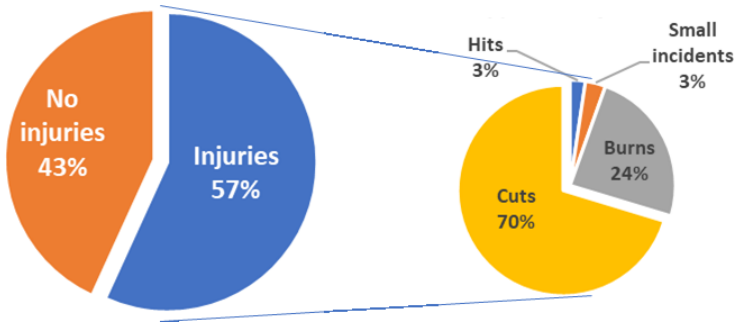


Fig. 4. Minor injuries and types were identified in the questionnaire.

In this context, although respondents point out that the causes of incidents stem from mixed user misconduct, through carelessness, mishandling, and non-compliance with instructions, the responsibility for accidents is generally attributed primarily to the employer or the state (49%), and only 17 % of their behavior, the remaining 34% being mixed, as seen in Fig.5.

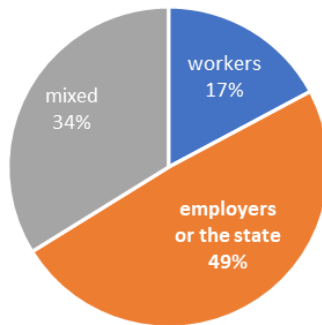


Fig. 5. Worker perception about responsible for injuries at work

Another utility of such observation and monitoring questionnaires is to create a preponderant profile of respondents, to ensure that the measures are as accurately addressable as possible.

The following aspects related to the function, age, and level of education of the respondents were relevant from the questionnaire, see Fig.6.

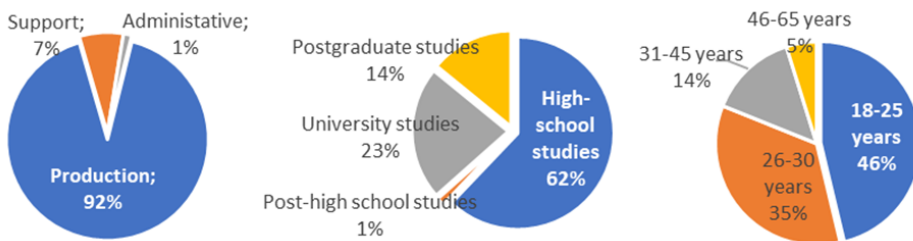


Fig. 6. Respondent profile

As a result, the profile of respondents is mostly from production, with high school graduates and young people between 18 and 25 years.

3.3 Data analysis

The analysis of the obtained results reveals the following aspects that can be monitored and that imply the application of specific OSH measures.

3.3.1 *Employee satisfaction with OSH elements:*

- Personal protective equipment and OSH training have the lowest appreciation and perception;
- The work environment has the highest level of appreciation;
- Individual or general means of production are also valued at a similar level;
- The following measures should be taken for such assessments - verification and immediate action on the following issues:
 - o PPE condition - quality, verification of periodicity of granting or degree of wear;
 - o Diversity of PPE - proposals for suppliers and PPE;
 - o Teaching, use, storage procedures;
- Checking the training materials and the andragogical level of the instructors to make the training attractive and with topics of interest;
- Keeping the work environment clean, organized, free of toxins or stress;
- Investigating the types of deficiencies of the means of production and improving them;
- Following the following monitoring how the percentages of the types of assessments evolve on each element. The change in plus or minus that influences the grade of the item needs to be closely investigated, thus finding the root source of the deficiency much easier.

3.3.2 *Analysis of incidents, in number, diversity, and causality.*

- Comparisons with incidents reported on a hierarchical scale or to the Territorial Labor Inspectorate.
- Stimulating the declaration of any small incident to prevent the biggest ones. By taking measures, deficiencies are removed and attitudes that prevent more serious incidents are corrected, because [11] shows in his well-known pyramid about the statistical interdependence between the number of small incidents even without injury, with minor and major or fatal (Fig.7).



Fig.7 . Heinrich pyramid of injury – reinterpreted

- Regarding causality, observing a contradiction in the identification of causes, it is necessary to be aware of responsibilities, consequences, and concepts, which can be achieved during regular OSH training. The aim is not to change the statistics of workers' perception, but to create a more informed and mature perception, which will issue non-contradictory assessments.

3.3.3 Respondents profile

- Regarding the profile of the respondents, it is of interest to monitor the participants in regular questionnaires to calibrate the conclusions according to the type of participants, and the measures are thus taken to be able to produce reactions in the perceptions of the respondents.

3.4 Discussions

By creating a surveillance and monitoring management, which uses clear and precisely designed tools for the identified needs, a more efficient and structured activity of implementation, monitoring, control, and participatory feedback (proposals from the source) is foreshadowed. The results obtained lead to punctual and properly calibrated measures, which become barriers to current or future hazards that have accidental potential.

Practically, the theoretical notions expressed by both Visser's bow tie [12] (Fig.8), or cheese metaphors [13] are observed, through which good practices contribute to the creation of preventive barriers.

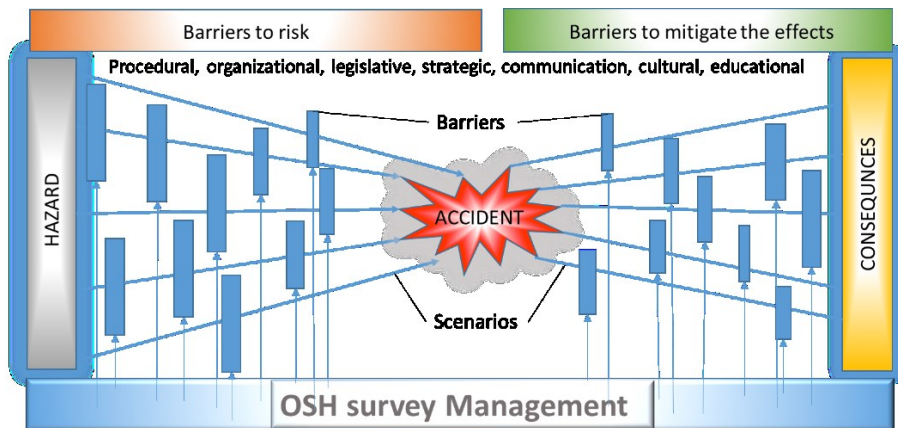


Fig. 8 - Reinterpreted butterfly metaphor of OSH barriers, source Visser, 1998

4 Conclusions

The conclusions of such a study refer to the following aspects:

- - The usefulness of tools for monitoring the implementation of OSH policies to prevent negative events in the workplace, while also finding barriers to reduce the effects of certain events.
- - The need to adopt such instruments through government decisions, to be designed and recommended according to the number of employees and the risks in companies

- - Until the legal regulation, the employer, through its OSH specialists or auditors, is interested in developing good practices and supervision questionnaires to effectively implement and monitor OSH, which is complementary to the legal provisions
- - Continuous calibration of instruments so that they are effective for the specific situations in each unit. When a specific deficiency is discovered, the questionnaire is diversified to the point of reducing the deficiencies, counterbalanced by reducing the questionnaires for more than acceptable results.

Regarding future research, it is considered to correlate the complex risk assessment, which also considers the level of security culture, with the elaboration of instrument proposals, as good practices in monitoring the implementation of OSH, tools to be tested and calibrated over time, to demonstrate their effectiveness in reducing the number of accidents and ensuring the well-being of workers at work.

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