

# Highlights of OSH training quality: continuous training of trainers

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**Abstract** According to the legal norms in Romania, employer has the obligation to take preventive training of workers in order to avoid accidents at work. The employer uses specialized personnel or specialized occupational health and safety (OSH) services to deal with specific training. In this paper we will present how effective OHS trainings are and what aspects should be addressed to improve them from a qualitative perspective. The quality of these trainings contributes both to the quality of the instructor and the quality of the material, which is directly influenced by the well-trained instructor. This study aims to analyse the statistical results of the use of preventive measures through OSH training before and after an accident at work. In the statistical comparison, we assume that the effectiveness of OSH training can only result from the achievement of their preventive purpose, namely the reduction of work-related accidents and, implicitly, the prevention of major costs of recovering the damage caused by these events. This study as well as the subsequent ones on the effectiveness of OSH training through material quality and quantity aim to integrate OSH training into the complex array of OSH culture, taking into account the principles of knowledge management.

## 1 Introduction

According to statistics from the National Institute of Statistics and an interface of the TEMPO website [1], in Romania, the last 10 years (Table 1) have an annual average of 4146 work accidents, of which 283 (almost 7%) are deadly.

**Table 1.** Work accident in Romania in statistics of last 10 years

Years	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Averages
Total accidents	4601	4953	3839	4040	3908	4083	3575	3575	4013	4314	4704	4146
Temporary disability of work	4213	4534	3487	3700	3613	3808	3352	3351	3814	4125	4496	3863
Fatal accidents	388	419	352	340	295	275	223	224	199	189	208	283

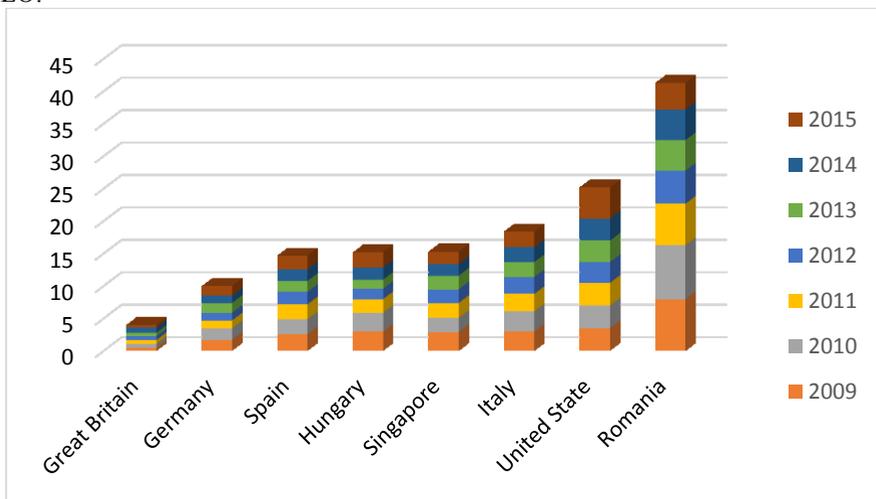
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With regard to international milestones on these statistics, the International Labour Organization (ILO) has worldwide statistics from which we can see where we are. A relevant statistic, is the number of fatal work accidents per 100,000 workers [2], as this statistic is proportional to the labour force, not expressing the nominal values that differ greatly according to the size of the population of each country.

**Table 2.** Fatal work accident per 100,000 workers – a worldwide comparison with Romania statistics

Country / year	2009	2010	2011	2012	2013	2014	2015	Total
<b>Great Britain</b>	0.5	0.6	0.6	0.6	0.5	0.8	0.4	4
<b>Germany</b>	1.7	1.8	1.2	1.2	1.5	1.1	1.5	10
<b>Spain</b>	2.6	2.3	2.3	1.9	1.7	1.8	2.1	14.7
<b>Hungary</b>	3	2.9	2.1	1.6	1.4	1.9	2.3	15.2
<b>Singapore</b>	2.9	2.2	2.3	2.1	2.1	1.8	1.9	15.3
<b>Italy</b>	3	3.1	2.7	2.6	2.3	2.3	2.4	18.4
<b>United States</b>	3.5	3.5	3.5	3.2	3.3	3.4	4.8	25.2
<b>Romania</b>	8	8.3	6.4	5.1	4.7	4.7	4.1	41.3

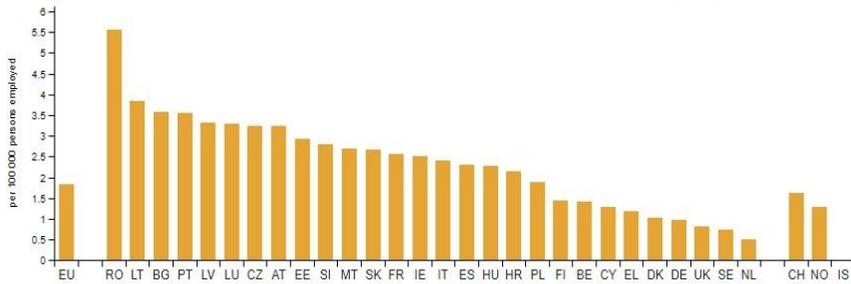
The selection of comparative countries excludes undeveloped or emerging countries, and it was intended that the countries compared to have uninterrupted statistics reported to the ILO.



**Fig. 1.** Total fatal accidents at work between 2009-2015 per 100,000 workers – source ILO.

We can easily see that our rate, being one of the highest in the world (Fig.1), and is the highest at European level after Eurostat statistics of year 2015 [3] (Fig.2).

In this context, of the statistical gravity of work accidents in Romania, must use all the instruments capable of competing for the improvement of these statistical situations.



**Fig. 2.** Fatal accidents at work, 2015 (incidence rates per 100,000 persons employed) – source Eurostat

An important indicator of these results is education, safety culture, and from this perspective, it is appropriate to research the competence of OSH instructors that directly influence the quality and implicitly the effectiveness of OSH training. The precariousness of these learning processes, the transfer of knowledge, leads to failure in the training of workers and contractors [4], being one of the main causes of incidents of work.

Efficiency would be all the more enviable if training were to be done in those who had already gone through the early stages of OSH training [5]. Moreover, it is vital that SSH training is carried out for both young and old [6] because both groups lack learning assimilation even if they come from abilities different cognitive. It is therefore essential for the instructor to be able to deliver the training according to the beneficiary's receiving capabilities. This capability also arises from the perception of the training beneficiary who will integrate these training into culture and security behavior [7].

The delivery of OSH training is also vital for the professional quality of the instructor [8], which defines the quality of the material as well as the mode and dosage of knowledge sharing – knowledge management [9-11].

## 2 Method of study

To observe the effectiveness of OSH training, we will extract the share of training measures for Workers in Prevention and Protection Plans (PPP) and compare them with the share of training measures for employees under the Occupational Accident Investigation Report (OAIR), inquiry into work accidents.

The statistical material I collected during the 6-year (2010-2016) period of activity of a training company in the field of OSH. In the training of OSH specialists, they had to carry out practical applications for documenting and writing several OSH documents, including the two mentioned ones. This student documentation was based on the internal OSH documentation of the company they are working.

Thus, these two types of documents to be compared are selected for analysis, as both contain training measures for staff:

- PPP - before the accident
- OAIR - after accident.

### a. Relevance of comparative documents

#### i. *Prevention and Protection Plan (PPP)*

The role of PPP - the internal document through which the employer demonstrates its synthetic and applicative concern to prevent accidents at work.

Achieving PPP (Fig.3) - is a result and also an applicative synthesis of the risk assessment of injury for each job in a company.

No.	Workplace	Risk evaluated	Technical measures	Organizational measures	Hygienic-sanitary measures	Measures of another type	Actions to achieve the measure	Deadline	Person responsible for the measure	Observations
0	1	2	3	4	5	6	7	8	9	10

**Fig. 3.** PPP – Prevention and Protection Plan

The constituent parts of PPPs are provided by the Annex 7 of methodological norm (approved in Government Decision 1425/2006) for the application of the OSH Law no. 319/2006, and contain the following column information:

1. The assessed jobs
2. Identified injury risks,  
What measures are being taken to mitigate or eliminate those identified and assessed risks according to the likelihood of the occurrence frequency and the possible consequences:
3. Technical
4. Organizational (**here we have the possibility of retrieving the OSH training measure**),
5. Hygienic-sanitary
6. Other specific measures
7. What activities are being undertaken to support the implementation of appropriate measures
8. The deadlines for fulfilling them.
9. What human resources are responsible for doing the actions
- 10 Observations

Other features of PPP:

- is updated whenever necessary - to change the assessed risks that may arise from:
  - a. changing the worker's tasks,
  - b. the purchase of means of production that develops or reduces the risks already assessed
  - c. rectification of post-event assessment (accidents at work)
  - d. requesting a re-evaluation by any interested party
- as a rule, is written by an OSH specialist,
- is assumed by the employer
- is endorsed by the internal entity with a participatory role in OSH decisions, which, depending on the total number of employees in a company, can be made up of one of the following:
  - a. between 1 and 9 workers: workers themselves know, analyze and endorse PPPs
  - b. between 10 and 49 workers: they delegate one or more representatives to endorse PPP
  - c. more than 50 workers: advises on PPP is task of the OSH Committee (CSSM - the consultative structure equally formed of members representing the interests of the employer, employees' representatives and the occupational doctor)

*ii. Occupational Accident Investigation Report (OAIR)*

It is a document that is part of the accident investigation file.

In general, the purpose of investigating work-related accidents is to:

- identify causes of production
- establish responsibilities
- establish the nature of the accident (whether or not an accident at work)
- take steps to prevent such accidents from happening again - here are the training measures

The relevance of this PPP comparison document results from the fact that we find here what corrective measures are being taken to improve prevention. By taking these corrective measures, it is basically to improve the measures initially taken in PPP, which, with the occurrence of accidents, proved to be ineffective.

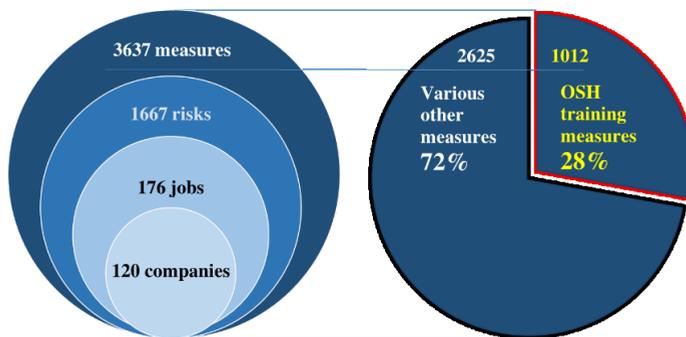
**b. Observing statistical data**

*i. PPP*

As a result of investigating a few jobs in 120 selected companies, the following statistics (Table 1) of the training measures under PPP resulted. We mention that the 120 PPPs are unique, selected from about 300 PPPs that created after a stereotypical pattern - this is another deficiency of OSH specialists who do not customize PPPs to each company.

**Table 3.** Statistics of unique 120 PPP information

Companies	Number of jobs		Risks	Total measures	Various other measures	OSH training measures
	Prod.	Adm.				
		124		52		100%
120	176		1667	3637	2625	1012



**Fig. 4.** Statistics of 120 PPP

From the 120 companies surveyed, we selected a significant number of 176 jobs that are in the executive (direct productive) and administrative field. A more extensive selection needed for the measures proposed in PPP to outline as accurately as possible the range of activities and their inherent risks. Since we are interested in the percentage of training in the workplace, this selection does not affect the results obtained, but on the contrary from the diversity of the positions studied, we receive the most conclusive average of the risks for which various measures, including OSH training, are suitable.

**Table 4.** Analyse of information from PPP (Table 3)

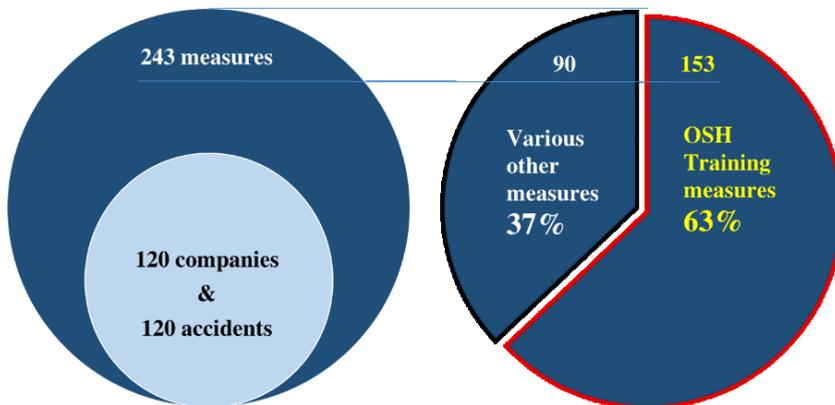
Collected data	Observation
176 jobs with 1,667 identified risks	An average of almost 10 workplace risks/job.
1,667 identified risks with 3,637 proposed measures	Around 2 measures per 1 identified risk.
Of the two observations above, show at 176 jobs have 3637 measures	Around 20 measures per 1 job, the worker has to comply with 20 rules for the risks identified as unacceptable in the risk assessment
The number of OSH training measures proposed to mitigate or eliminate the identified risks is 1,012; it results that out of the total 3,637 measures for 176 jobs	The weight of 27.82% (within a quarter and a third) OSH training measures, which means that of the 20 labor safety rules, almost 5-6 rules, needs to be given from specific OSH training, per 1job.

ii. **OAIR**

After studying the Occupational Accident Investigation Report from the same 120 companies, we note the following:

**Table 5.** Statistics of 120 OAIR

Companies & Accidents	Total measures after work accidents	OSH training Measures		Various other measures	
		Count	Percentage	Count	Percentage
120	243	153	63%	90	37%



**Fig. 5** Statistics of 120 OAIR

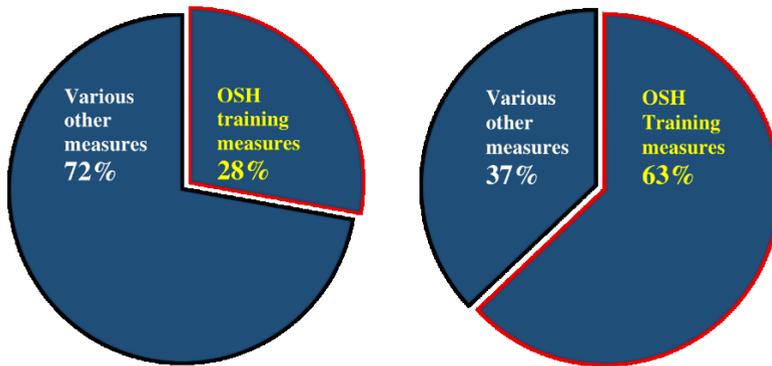
**Table 6.** Analyse of information from OAIR (Table 5)

Data collected	Observation
For the 120 investigated work accidents we have applied 243 remedial measures	We have an average of 2.02 measures per accident.
Out of the total of 243 corrective measures, we have 153 training measures	It results that we have 62.96% corrective measures for OSH training / accident

**c. Analysing the obtained data**

It is important to keep focusing on the share of OSH training proposed in PPPs vis-à-vis OAIR training measures (Fig.6). To distinguish the two types of measures, we will name them as follows:

- Proposed training measures (PT) = OSH training measures proposed in PPP
- Corrective training measures (CT) = OSH training measures undertaken in OAIR.



**Fig. 6** Comparison of percentages of OSH training measures proposed before accident vs. Corrective after accident

If at the initial PPP phase we say that PT occupies more than a quarter of all measures, we notice that after an accident at that company the CT share is more than half, to two thirds, practically every accident is adopted on average at least a CT

If choosing the CT means that it is trying to remedy the PT that was ineffective in preventing the accident by countering the causes that triggered the risks.

**i. Causes of poor OSH training**

The OSH training obligation of a company's staff has in most cases been only a compliance activity and not actual information, and this is also due to the capping of OSH specialists, which should provide workers with effective OSH training just quantitative and qualitative. The quality of the training has three components to be achieved by a competent instructor:

1. The actuality of information, materials and training methods
2. Selection and processing of materials according to the branch of activity
3. Adaptation of training to the optimal perception of those trained in pedagogical and psychological terms [7].

The qualitative characteristics of the training cannot be achieved and improved continuously if its training does not have the same goal of continuous improvement [12]. Even though the quality of the training of the instructor directly influences the quality of the

training, the length and experience of OSH training help, but cannot be considered sufficient to be the only indicator of the quality of the instructor and, implicitly, of the training, for the following reasons:

- only works with limited risk variables in its field,
- cannot have an overview of causes and consequences
- the OSH culture to be improved is limited to a low horizon
- lack of motivation to reach new levels of knowledge
- lack of confrontation of ideas and OSH experience exchanges
- the lack of clarity of the principles leads to a narrow view of interpretation, and implementation difficulties

Continuing education reaches a plurality of fields (engineering, management, human resources, ergonomics, medicine, economics, psychology, pedagogy, etc.)

Continuous education removes self-contained barriers and can lead to changes in the efficiency of training as follows:

The broad spectrum of domains treated, unitary and holistic, leads to the stimulation of creativity in addressing training and finding effective measures as well as appropriate prevention, monitoring, and feedback tools.

The self-esteem and isolation through simplistic approaches to OSH leads to capping and lack of challenge, which are the ingredients of laxity, routine, indifference and disinterest, which are implicitly transmitted in training material and also to the inefficiently trained staff.

## ii. *Types of OSH instructors in Romania*

Personnel in charge of OSH training in Romania is of two types:

### 1. Instructors trainers of the educational level:

- University teachers for Postgraduate, Masters or Ph.D. courses in OSH

Forms OSH specialists who can work in internal or external OSH services

- Providers of adult professional training

Forms Designated Mandatory Workers to work in companies with more than 50 workers, representatives of OSH workers, employers.

### 2. Trainers of workers or subordinates.

- Designated workers with OSH

Training of specialists who are in charge of conducting OSH activities and thereby training of companies.

- Team Leaders of workplace

Following special in-house training, they are competent to retrieve, refine and transmit SSH training materials received from SSM specialists to subordinate workers

- Employers

They may be specialized, but they are not bound to train of a minimum of 40 hours of OSH specialization, for qualifying to lead the OSH activity for small firms - up to 50 workers and with activities with minimal injury risks.

Majority refuse that specialization, but paradoxically, they can create OSH strategies and policies within firms - even if they do not have special minimum training in OSH

- Internal or External OSH Services members - Specialized OSH and related services.

They have superior OSH training and train a large staff and manage a multitude of risks.

They are the only ones who have mandatory two levels of SSH training, both at the level of vocational training of adults, as well as at a university or postgraduate level

If for the first category there are systems of continuous training with precise specifications, but only from the perspective of the educational field and NO in the OSH specialization, for

the other levels of trainers, we have no ongoing, imposed and controlled training which to increase the quality of the training activities and ensure its updating.

Such an update is needed because throughout the holistic management process, processes are continually developing and adapting to specific situations, and training needs to update by linking to these interdependent and evolutionary processes.

It is bizarre that the only category of staff that has periodically mandatory and controlled retraining, is the category of workers in general, but most of the time their training is neither evolving nor instructive, but strictly to avoid the risk of injury.

It is true that the instructors and trainers are also part of the workers in general, but the self-training is only related to the risks from their activities and does not aim to improve the professional OSH level.

### *iii. Plans to encourage continuing professional training of OSH trainers*

Plans to approach the continuing professional training of OSH specialists:

- Legislation
- Management
- Education
- Professional Associations
- Staff-Volunteer / Self-taught

The issue would not only be to the law, which should require continuous training, but also the management that should be concerned, from engaging such OSH specialists to monitoring their performance and supporting their ongoing training, as a policy on labor efficiency.

Managers need to be aware that competent instructors, training and continuously connecting to the latest news in the field depend on how workers perceive risks and measures to prevent accidents at work, and if this training process is brief and inefficient we they still have work-related accidents involving costs that affect economic efficiency. Even if there is full training, if it is poor quality or even formal (only for compliance with the legal provisions), their inefficiency is demonstrated in the perpetuation of work accidents.

On a managerial level, there are good quality standards or good practices and competent managers, trained on these organizational perceptions of continuous improvement. However, at the legislative level, which should give the tone of such concepts, there is no provision in this respect, which is to keep a high standard of training for OSH specialists, but only to their basic professional formation.

It is true that OSH specialists should be concerned about the continuous personal improvement of the professional training level, and this process would best be carried out within the framework of professional associations that have this objective.

Besides the legislative, managerial, professional field, which can contribute to the continuous improvement of the professional education, is the educational system that can ensure (within a legal framework) the optimal conditions for carrying out the act of improving the professional level.

## **3 Similar examples of continuous training of professionals**

In support of what has is presented in the analyzes, causes and plans above, we will show examples of legally regulated training for professionals to maintain skills as high and optimal as possible for the efficiency of specific activities:

- Retraining of OSH coordinators construction sites – periodical of each 3 years – art 55 of GD 300/2006, in conjunction with a MMSSF Order 242/2007
- Instructors in the ISCIR field [13,14]
- Personnel serving special installations by ISCIR (forklift driver, crane operator, etc.) – periodical of each 4 years – PT CR 8/2009 cap.4
- Getting professional annual points for staying in profession or advancing into leadership positions
  - o lawyers [15]
  - o judges, prosecutors [16]
  - o mediators [17]
  - o insurance agents [18]
  - o private agents of security systems [19]
  - o rating assessors [20]
  - o getting professional titles by doctors [21]
  - o professional point and titles by professors [22]
  - o military degrees in army, police, firefighters

A supportive example of care for the training and specialization of OSH specialists is found in US regulations that provide for OSH training by industry. This training is done only by higher education colleges, and the OSHA Training Institute (OTI) Education Centers [23] is the authority that manages this activity. Here you can find information about:

- OSHA Course List [24]
- description of OSHA courses [25]
- list of OSHA education centers [26]
- a map of OSHA centers [27]

US - OSHA is concerned and monitors compliance with training requirements, and we found on page 1 of the Mission Statement on Training and Education the next ” *OSHA’s mission is to ensure the protection of workers and prevent work-related injuries, illnesses, and deaths **by setting and enforcing standards, and by providing training, outreach, education and assistance**”*

## 4 Conclusions

As a result of this study, we have demonstrated that training in Romania is deficient and inefficient, as long as they have to be an important part of the measures taken after the work accidents.

We have found suggestive and countless examples of the ongoing training of various professional structures that are conducive to making their work more efficient.

We have exemplified good practice developed in the United States with regard to specialization, monitoring and guidance towards the best qualification of OSH professionals.

We believe that this aspect of continuing professional training of OSH instructors can no longer be left to the business managers' strategies (more or less efficient), but must be transformed into a state policy and becomes a legal regulation with minimal requirements to help reduce the number of accidents.

Only through a national unitary approach, through a legislative act correlated with the European legislation and inspired by similar training models, the professional level of the instructors can be increased and maintained, which will implicitly increase the quality of the preventive SS (IP) and the conversion or convergence of Accident Corrective Training (IC) measures, towards other effective measures to halt accidents at work.

The legislative act should address the following issues:

- rebuilding term - rewriting skills,
- state or private education institutions that can organize the training, eventually the state institution in the field supervising, coordinating, verifying, monitoring and sanctioning trainers and trainees,
- the content of the study programs, which will holistically address all aspects of OSH,
- possibilities of automatic reconsideration by obtaining professional points conferred by:
  - a. participation in research and support of specialized works at professional or scientific conferences that check the level of plagiarism.
  - b. graduation of university, postgraduate, adult education courses, etc.
  - c. support activities, volunteering, involvement, participation in meetings, presentations, organized within professional associations
- motivations - the professional gradations awarded as a result of the time course of the professional or adjacent training.

Processes, methods, tools, machinery, people/generations are evolving, and the training approach must keep the step with all these changes in a unitary and visionary way. Even more so, since OSH training has a preventive character, it must be constantly in the face of these transformations and creatively anticipate measures, reactions, and safety attitudes [28-29].

The paper gives way to other studies and legislative proposals to improve the organizational capacity for sustainable development.

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