



An innovative methodology for measuring the effective implementation of an Occupational Health and Safety Management System in the European Union



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ABSTRACT

The first target of the European Union's safety policy is to improve the implementation of Occupational Health and Safety Management Systems, especially for small and medium enterprises (SMEs). Safety investments are un-competitive if compared to other investments, especially for SMEs, due to responsibility attribution management that does not guarantee the exemption of responsibility in the case of unpredictable accidents and to an insufficient incentive policy for enterprises, virtuous in safety investments. For SMEs safety investments are un-profitable also because the individual SME has no real perception of accident risks due both to difficulties in assessing and monitoring the real risk and to the small number of employees. The authors have introduced an index (Efficacy Index) to objectively quantify the effective implementation of an Occupational Health and Safety Management System (OHSMS). The paper shows how the index can be practically applied to a company and what kind of information can be collected and processed to determine the effective implementation of the OHSMS. The paper also aims to define a procedure to demonstrate the exemption of responsibility of a company in the case of an unpredictable accident and to allow further reduction of assurance premiums. In fact, only the exemption of responsibility for employers through effective implementation of the OHSMS, together with an adequate incentive policy, can significantly improve occupational health and safety.

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1. Introduction

One of the primary targets of the European Union (EU) is to assure European workers an increasingly safe work environment (European Commission, 2014). To do that the European Union legislation issues directives regarding Occupational Health and Safety; each directive shall be implemented by each Member State (MS) through national laws.

The most important European Directive is the "Framework" Directive 1989/391/EEC, which is the basic law and which presents the common principles of occupational safety and health in the EU. The common principles present in the 1989/391/EEC are stated in nineteen daughter directives that specify how the Framework Directive shall be applied in specific hazards at work. Each member state issues national law that follow the European Directives, taking into account the national occupational safety situation (Brück, 2016).

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Italy, France and Spain present a similar Occupational Safety situation in terms of fatal accidents with, respectively, 3, 3.4 and 3.1 fatal accident at work per 100,000 persons employed in 2012. From this point of view, one of the most virtuous member states is Germany with 1.5 fatal accident per 100,000 persons employed, similar to the UK data (Eurostat, 2016a). Another important Occupational Safety index is the number of non-fatal accidents at work per 100,000 persons employed; a non-fatal accident is defined as an accident that involves at least four full calendar days of absence from work (Eurostat, 2016b). Regarding this last index, the UK again has the best results with 900 non-fatal accidents at work per 100,000 persons employed, but Germany has a result of 2200 such accidents, which is higher than the Italian figure (1700); France and Spain present respectively 3050 and 2900 non-fatal accidents per 100,000 persons employed (Eurostat, 2016a). These data demonstrate how complex the situation is in terms of occupational safety, and why the European Community can only define general directives and allow Member States to implement and adapt them according to the national context. The complexity increases if data are taken from a wider context, which may include, for example, United States of America, Canada and Japan.

In fact, the analysis and comparison between these countries and the EU framework is made more difficult by the different statistic approaches which are followed, as well as by the different legislative framework. So, the paper limits its data analysis on European Union.

The member states previously mentioned have applied the European Directive by issuing national laws:

- Italy: Legislative decree 81, 9 April 2008
- France: CT, Code du Travail
- Germany: national laws for Occupational Health and Safety (ArbSchG and ASiG)
- Spain: National Laws 31/1995
- UK (Not an EU Member State): Management of Health and Safety at Work Regulations

The EU safety policy is particularly focused on Small and Medium Enterprises, i.e. enterprises with a maximum of 250 employees and a turnover lower than 50 M€ (European Commission, 2003), the business size with the most critical situation (European Commission, 2014), since SMEs have a higher overall accident rate than larger enterprises (Fabiano et al. 2004; Kines and Mikkelsen, 2003; Mayhew, 2000; Stevens, 1999; Salminen, 1993; McVittie et al., 1997; Suruda and Wallace, 1996) and greater severity (Fabiano et al., 2004; McVittie et al., 1997). Nevertheless, for an individual SME the total recordable injury frequency (defined as the number of fatalities, lost-time injuries, cases of substitute work and other injuries requiring treatment by a medical professional per million hours worked) is lower than for a bigger enterprise. In other words, SMEs belong to the company size with the highest accident rate, but an individual SME has only a slight probability of encountering accidents because of the low number of employees (Bianchini et al., 2015). So, OHSMS investments are often considered as unprofitable by SMEs not only because of responsibility attribution management and an insufficient incentive policy but also because the individual company has no real perception of the accident risk. Moreover, OHSMS investments are unattractive without an adequate incentive policy because the economic benefits of prevention are not clear for a company in the short term (Champoux and Brun, 2003; Hasle and Limborg, 2006; Lamm, 1997).

Different kinds of implementation actions have been proposed to improve the safety conditions in SMEs: most of them concern developing engineering strategies that decrease the probability that an employee may have an accident (Hasan et al., 2003; Pohjola, 2003). In addition, investments in educating and training employees regarding un-safe behavior have been suggested (Paul and Maiti, 2007; Whysall et al., 2006). These strategies are more difficult to apply in SMEs than in big companies because SMEs can involve fewer human, economic and technological resources in OHS (Micheli and Cagno, 2010) and because SMEs are less able to effectively assess and control risks. The recent economic crisis highlights this characteristic even more, because the current standard working method does not provide the possibility to plan the work and to introduce an OHSMS, which needs to be controlled and monitored.

A further criticality that makes safety investments even less affordable is the lack of responsibility exemption for virtuous companies in terms of investments in security when an unpredictable accident occurs, i.e. an accident with very low probability of occurrence as well as a result of a series of impossible to predict concatenated events. The incidence of unpredictable accidents in the total number of accidents increases when the national occupational safety increases, because of the impossibility to implement actions to predict unpredictable accidents.

Therefore, especially for SMEs it is not sufficient to propose strategies and technology for safety, but in order to improve occu-

pational safety, the investments in OHSMS must first be competitive on the market. Two characteristics are therefore required:

- A payback time similar to other investments.
- Assurance of exemption of responsibility in the case of an unpredictable accident if the company has implemented an OHSMS in an effective way (Bianchini et al., 2015).

The first characteristic depends on the company size. In particular, in Italy, with the current incentive policy (i.e. insurance premium reduction) the payback time of prevention investments is uncompetitive if compared to other investments, especially for SMEs (Bianchini et al., 2014, 2015). Moreover, the current management of the responsibility attribution of an accident (i.e. of the effective implementation of an OHSMS) is handled in an on-off way nowadays; as a consequence, an owner of a company could be held totally responsible also in the case of unpredictable events. This fact makes prevention investments even more unreliable, again especially for small and medium enterprises, which have only a slight probability of encountering accidents because of the small number of employees (Hasle et al., 2009; Bianchini et al., 2015).

One of the most important issues of the Italian Consolidated Act regarding occupational health and safety is the exemption of responsibility attribution for employers that adopt and implement an OHSMS in an effective way (Italian Legislative decree 81, 9 April 2008, Art. 30), but at the moment it is not clear how to measure effective implementation in an objective way.

Among other functions, an OHSMS should be able to differentiate predictable events, i.e. events with high probability of occurrence, from unpredictable ones. It is very important to point out that the adoption and implementation of an OHSMS in an effective way implies that the employer has made an evaluation of the probability of occurrence, that defines the predictability of an accident, as well as the severity level of the consequences of different accidents and, on the basis of this risk analysis, the employer has also implemented all the possible actions to prevent predictable accidents, and not the unpredictable ones.

An index that can evaluate the effective implementation of OHSMS adoption has already been introduced in recent studies (Bianchini et al., 2013, 2014, 2015). This index, called the “Efficacy Index” (EI), evaluates the economic effort of the company in relation to its specific situation in term of un-safety costs.

The EI should be used when an unpredictable accident occurs, in order to avoid the attribution of the accident responsibility to enterprises that have implemented an OHSMS in an effective way. Thus, the EI may become the instrument to measure the effective implementation of an OHSMS within an enterprise and to assess with objective criteria, to be defined in advance, the legal responsibility of the enterprise itself in the case an accident occurs.

The paper shows the results of the application of the EI to a real Italian SME's context and what information can be collected to measure the effective implementation of an OHSMS (Bianchini et al., 2015). The EI procedure to objectively determine the effective implementation of an Occupational Health and Safety Management System could be applied to all EU Member States, in order to guarantee the exemption of responsibility for virtuous enterprises in the case of unpredictable accidents.

2. Materials and methods

2.1. Italian context: actual situation in occupational safety

According to the data of the National Institute for Insurance against Accidents at Work (Inail, 2015), 663,000 cases of work-related injuries were reported in Italy in 2014, a reduction of about

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