

Working Risk Assessment in SMEDS in the Slovak Republic and Czech Republic

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Abstract

This article is dealing with the area of the working risks and their assessment in the SMEDs in the Slovak Republic and the Czech Republic. The area of the occupational safety and health (OSH) is solved on both the supranational and national levels by legal regulations. It represents the approaches of these countries, describes the current approach and tools for assessing the working risks and the further steps in this area.

Keywords: OSH • Risk assessment • Safety • Small enterprises • Medium-sized enterprises

Introduction

A general obligation of the employers at every workplace is to ensure safety and protection of health of the employees in all aspects connected with work. The goal of the risk assessment is to enable the employer to take the necessary measures for protecting health and providing safety to the employees. The company in the framework of its operation has to cope with several activities (Figure 1). The OSH is one of them; it requires investing financial means to implement the preventive measures.

The most important European legal directive that concerns the risk assessment is the OSH Framework Directive 89/391/EEC. This directive includes the general principles concerning the prevention of the threat at work, safety and protection of health as well as general regulations for implementing these principles. It says the employers are responsible for ensuring the safety and protection of health of the employees in all aspects concerning their operation and the risk assessment is an inseparable part of this obligatory management of the safety and protection of health at work (OSH management). According to the directive the risk assessment has to be the first step of the complex process of the OSH management. It plays a principal role because it enables the employers to implement measures that are necessary for protecting the safety and health of their employees [1].

The Framework Directive is transposed to the national legal guidelines. The EU member states are obliged to adopt this directive; however, they have a possibility to adjust their legal regulations in such a way they will implement stricter measures for the safety. This article will present the approach to assessing the working risks in two member states – the Slovak Republic and the Czech Republic.

The OSH management in the company differentiates the following OSH elements [2]:

- OSH policy,
- risk assessment,

- organisational arrangement,
- trainings,
- emergency measures,
- documentation,
- inspection,
- audit.

The risk assessment is thus one of the most important activities of the OSH framework. The results of the risk assessment are transferred to several documents in this area. The legal regulations directly require its implementation.

Materials and Methods

The legal regulations dealing with this area, practical experience of the authors, professional publications of famous authors in Slovakia and the



Figure 1. Company management strategy.

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Czech Republic and also the internal documents of the companies involving the realised risk assessments are the basis for preparing this article. Except for the aforementioned basic materials we also utilise the experience from solving the projects dealing with developing the tools for the working risk assessment using the web platform OIRA serving for the small companies, micro-companies and entrepreneurs in the Czech Republic.

In the first step it is necessary to define the objects of the study, i.e., the small enterprises and micro-companies. Slovakia and the Czech Republic define the small enterprises and micro-companies according to the article 2 section 2 and Appendix 1 of the EU Commission Directive 651/2014 of 17th June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty and Commission Recommendation of 6th May 2003 concerning the definition of micro, small and medium-sized enterprises – 2003/361/ES. The companies are thus categorised uniformly for all EU countries – on the basis of the number of employees in the company and the annual turnover.

The micro-company is an enterprise with fewer than 10 employees and the annual turnover below 2 million EUR. The medium-sized enterprise is a company with fewer than 50 employees and the annual turnover below 10 million EUR.

In the second step we can deal with the approach in Slovakia and subsequently to define the possible orientation of the further development of assessing the working risks based on the experience in the Czech Republic.

Results

The next part will deal with the results of the survey studies that were detecting the state and tools for assessing the working risks in the small enterprises and micro-companies.

Table 1 Comparison of the fatal working accidents (WA) during 2018/2017 in Slovakia and the Czech Republic [3,4].

The working risk assessment is a very important part because it deals with the safety, health and lives of people. The statistics of the injury rate in Slovakia and the Czech Republic (Table 1 and Figure 2) show that in both countries being assessed the work injuries are an issue. During 2017 and 2018 Slovakia recorded 79 fatal work-related injuries and during the same time period the Czech Republic had 239 fatal work-related injuries. When we compare the number of the fatal injuries we have to take into consideration a lot of factors, e.g. the number of employees, the branch and type of the operation but also

the amount of the evaluated subjects where the injuries arose. Our article does not take into account these factors because we only want to emphasise the need and necessity of assessing the working risks.

The Table 2 and Figure 3 show the number of the serious bodily injuries (work-related injuries) during 2017 and 2018 – Slovakia recorded 187 serious bodily injuries (work-related injuries) and the Czech Republic 2,295 ones.

Both Tables 1 and Table 2 bring the individual causes of the work injuries being followed according to the national legal guidelines in both countries. Just these statistics and especially the causes can be a suitable tool and can serve as a spring board for the risk assessments and their orientation in individual companies.

Obligations resulting from the legal guidelines in the risk assessment area in the Slovak Republic

In the next part we will deal with the legal regulations that describe the risk assessment in the OSH field in Slovakia. The basic legal document in the OSH framework is the law No. 124/2006 Coll. about ensuring and protecting health at work. This law defines the general principles of prevention and the basic conditions for providing safety and protection of health at work and serves for excluding the risks and factors determining the development of the work-related injuries, job-related illnesses and other health damages caused by work [5].

The government regulation No. 395/2006 Coll. about minimal requirements on providing and using the personal protective equipment is another legal regulation providing information for realising the risk assessment. This government regulation states the minimal requirements on providing and using the PPE necessary for protecting life and health of the employees at work [6].

Both legal regulations provide particular information for assessing the risk and we will analyse them in the next section.

The law No. 124/2006 Coll. about safety and protection of health at work as amended brings not only the basic definitions of the terms connected with the risk assessment and the OSH as a whole but also a lot of information defining the general obligations of the company operators.

We chose the following obligations stated by this law [5,6]:

The assessment of the irremovable dangers and threats of the designed solutions in the determined operational and user conditions, the risk assessment for their usage and the design of the protective measures against these dangers and threats has to be part of the projects, machinery designs

Table 1. Comparison of the fatal working accidents (WA) during 2018/2017 in Slovakia and the Czech Republic.

Cause of WA (classification according to the Law 500/2006 Coll. of the Ministry of Labour, Social Affairs and Family of the Slovak Republic)	Slovakia		Czech Republic	
	Year			
	2018	2017	2018	2017
Bad or inappropriate state of the injury source	2	2	1	2
Missing or insufficient protective measure and provision	1	3	4	3
Personal protective equipment (PPE) was not assigned, was ineffective or incorrect	0	0	2	4
Bad conditions or wrong layout of the working place or communication	1	0	2	1
Insufficient lighting, low visibility, noise, vibrations	0	0	-	-
Wrong organisation of work	2	4	20	25
Failing to be informed about the conditions of safe operation and insufficient classification	0	0	26	32
Usage of dangerous procedures or methods of work including operation without authorisation	13	14	30	22
Failing to use or removing the ordered safety devices	0	1	-	-
Failing to use or incorrect usage of the assigned PPE	0	0	3	8
Threat due to other persons, e.g. jokes, quarrels, taking attention away	3	6	9	5
Insufficient personal abilities to carry out the working tasks	3	1	25	3
Threat by the elements and animals	1	0	4	2
Causes not detected	12	10	-	-
Failure of technique, material defects	-	-	1	2
Summary of several negative influences – development of a dangerous situation without anybody's fault	-	-	2	1
Total	38	41	129	110

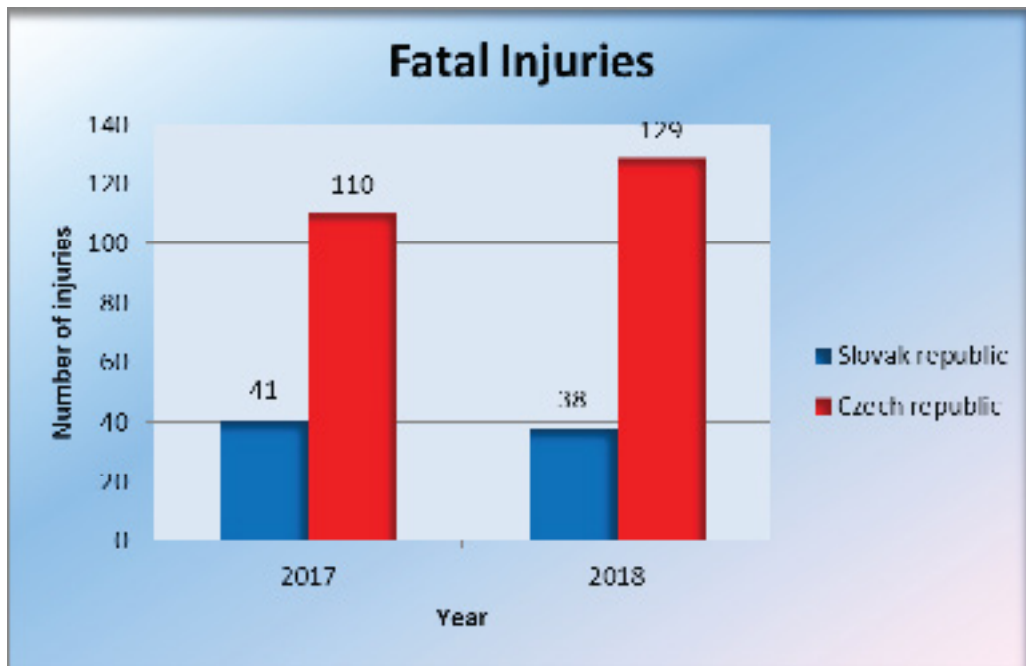


Figure 2. Comparison of the fatal working accidents (WA) during 2018/2017 in Slovakia and the Czech Republic.

Table 2. Comparison of the serious bodily injuries (work-related injuries) during 2018/2017 in Slovakia and the Czech Republic.

Cause of WA (classification according to the Law 500/2006 Coll. of the Ministry of Labour, Social Affairs and Family of the Slovak Republic)	Slovakia		Czech Republic	
	Year			
	2018	2017	2018	2017
Bad or inappropriate state of the injury source	1	7	20	32
Missing or insufficient protective measure and provision	2	12	23	21
Personal protective equipment was not assigned, was ineffective or incorrect	0	1	8	9
Bad conditions or wrong layout of the working place or communication	0	1	12	11
Insufficient lighting, low visibility, noise, vibrations	0	0	-	1
Wrong organisation of work	5	7	35	29
Failing to be informed about the conditions of safe operation and insufficient classification	2	2	4	11
Usage of dangerous procedures or methods of work including operation without authorisation	16	27	95	99
Failing to use or removing the ordered safety devices	0	0	4	5
Failing to use or incorrect usage of the assigned personal protective equipment	0	1	16	15
Threat due to other persons, e.g. jokes, quarrels, taking attention away	10	12	13	12
Insufficient personal abilities to carry out the working tasks	11	35	61	60
Threat by the elements and animals	2	5	5	5
Wrongly or insufficiently estimated risk	-	-	729	716
Undetected causes	20	8	124	120
Total	69	118	1149	1146

or other technical equipment and working procedures. The risk assessment that cannot be excluded especially during the selecting process and during the usage of the PPE, materials, substances and working procedures belong to the general principles stated by the law. It also states it is necessary to realise measures for removing the dangers in the place of their development.

The employer is obliged to [2,5,6]:

- Find out the dangers and threats, assess the risk and work out a written document about the risk assessment for all activities realised by the employees,
- Remove the danger and threat and if it is impossible on the basis of the achieved scientific and technical knowledge to carry out measures for their limitation and prepare measures for their removal,
- Work out a list of available PPE on the basis of the risk assessment and evaluation of the dangers resulting from the working process and the working environment,

- Ensure that the employees of a different employer and natural persons who are not entrepreneurs and are not employers who will realise the operations in the given premises and in its spaces will obtain the necessary information and instructions for ensuring the safety and protection of health valid for the given workplaces and spaces especially the information about the dangers and threats that can occur during operation and about the risk assessment results,
- Inform regularly in an understandable way and provably every employee with the existing and foreseeable danger and threat, with impacts that can cause damaging health and the protection against them. The employer is obliged to inform the employee about these facts when he/she is employed, transferred to another workplace, transferred to another type of operation, when a new technology, a new working procedure or a new machine is implemented,
- Provide the employees and representatives of the employees (also those responsible for safety) with the necessary information about the dangers and threats that can occur during operation and about the

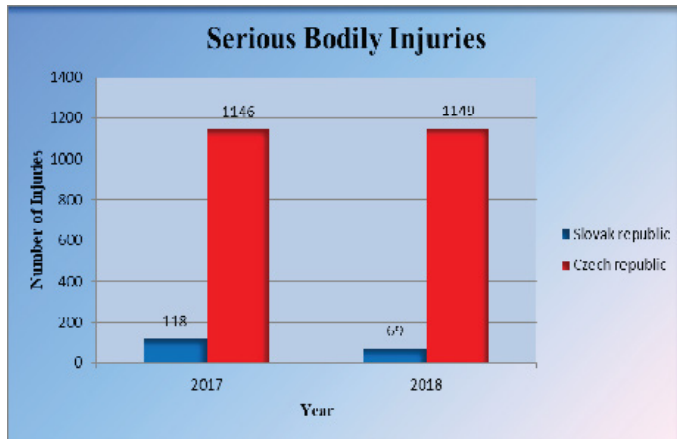


Figure 3. Comparison of the Serious Bodily Injuries during 2018/2017 in Slovakia and the Czech Republic.

risk assessment results in a suitable and understandable way,

- Give the employees or the employee representatives in the area of safety materials and give them enough time for expressing their opinion to the risk assessment, to determining and realising the protective measures including providing the PPE and means of the collective protection.

The government regulation No. 395/2006 Coll. about minimal requirements on providing and using the personal protective equipment.

This government regulation states the minimal requirements on providing and using the PPE necessary for life and health protection of the employees at work. In spite of the fact this regulation does not deal with the risk assessment directly, the employer will not avoid the risk assessment because it is closely connected with fulfilling these duties.

The obligations determined by the regulation that are connected with the risk assessment [6]:

- Before selecting the PPE for the risk assessment and before evaluating the dangers resulting from the working process and the working environment the employer is obliged to analyse the dangers and to determine those ones that cannot be neither excluded nor limited by the technical means, the means of the collective protection or the methods and forms of the organisation of work and that can threaten the life or health of the employee,
- Based on the danger seriousness and the duration of its activity, the character of work and workplace, the properties and effectiveness of the given PPE the employer is obliged to determine the conditions for utilising the PPE, especially the duration of its usage.

After assessing the obligations relating to the risk assessment we can summarise the duties as follows:

- To realise the risk assessment for making decisions about the measures for improving the safety, protection of health and working conditions,
- To detect and assess the dangers for making a list of the PPE
- To map the information of the technology suppliers, machine manufacturers and used substances concerning the threats resulting from using the product in the determined operational and user conditions,
- To inform the employees about the threats that can occur at work and in connection with the operation, to instruct them how to protect against them,
- To repeat the risk assessment periodically,
- To implement the specific procedure for limiting the threat and

possible consequences where the hazardous substances are stored or a threat of life and employees' health of a larger extent or threat for other persons in the surroundings can develop.

All the aforementioned obligations resulting from the legal regulations are realised through the risk assessment. The risk assessment is of a great importance and if we are to summarise just this importance and purpose of the risk assessment it will overlap with the individual obligations as follows [2]:

- The organisation of work, the management system and taking the safety measures,
- Making the list of the PPE,
- Designing and manufacturing the machines and products,
- Designing new technologies and working procedures,
- Designing new works,
- Developing, manufacturing and distributing new substances,
- The activities in the environmental area,
- The education, instructions and trainings of the employees.

The companies are obliged - in the framework of fulfilling the obligations in the risk assessment area according to the legal regulations – to work out the following documentation [2]:

- Assessing the risk for all areas – according to §6 section 1 letter c) of the law 124/2006 Coll., and the § 4 of the government regulation 395/2006 Coll.
- Evaluating the dangers resulting from the working process and working environment according to the § 6 section 2 letter a) of the law 124/2006 Coll., and the § 4 of the government regulation 395/2006 Coll.

We have learned about the obligations in the framework of the working risks assessment resulting from the legal regulations of the Slovak Republic and their utilisation and forms. In the next part we will introduce the procedures of the working risks assessment that are used.

These facts show that the risk assessment is the basic part of an effective prevention.

Approach to working risk assessment

As a matter of fact, the risk assessment is a systematic verification of the things and events that can harm people at the workplace, it considers if the current safety measures are sufficient to avoid the injuries, illnesses, it evaluates the specifics of the individual workplaces even beyond the safety regulations and is the basis for the effective safety measures.

At the EU level there are no fixed rules for realising the risk assessment. However, when we assess the risks it is always necessary to respect two principles [7]:

- To organise the assessment in such a way it will ensure solutions for all dangers and risks (e.g. not to marginalize such tasks like e.g. cleaning that could be realised outside the working hours or the auxiliary activities – e.g. pressing the waste);
- To start the assessment with the question if it is possible to remove the risk after the risk identification.

The European manual for the risk assessment at the workplace suggests an approach based on several various steps. This is not the only method for realising the risk assessment to achieve the same goal. There is no single "appropriate" method to assess the risks and in different situation various approaches can be suitable [7]. The direct procedure of the risk assessment is most suitable for the majority of the enterprises (especially the SMEDs) and includes the following five steps [7]:

- **Step 1: Determining the risks and threatened persons:** Detecting that information at the workplace that could cause harm and identifying those employees who could be exposed to these dangers.

- **Step 2: Assessing the risks and the sequence of their importance:** Assessing the existing risks (their seriousness, probability of the possible harm) and determining the sequence of their importance.
- **Step 3: Defining the corrective measures:** Determining the suitable measures for the risk removal or getting them under control.
- **Step 4: Adopting measures:** Implementation of the preventive or protective measures through a plan that determines the priorities.
- **Step 5: Monitoring and inspection:** The assessment should be checked in regular intervals – it has to be always relevant.

However, it is important to say there are also other methods that bring the results of the same quality especially in the case of more complicated risks and circumstances. The selection of the approach to the assessment will depend on many factors: e.g. the character of the workplace, the type of the process and the realised task, the technical complicatedness, etc. In some cases, only a single measure covering all the risks at the workplace or in the operation can be sufficient. In other cases, different approaches to various parts of the workplace can be suitable.

In Slovakia there are no fixed rules for the risk assessment and therefore everybody can choose his/her own approach but it has to be understandable and exact. The basic purpose is to improve the safety and protection of health at work. The safety documents have to describe and explain this methodology thoroughly. The following application assesses all circumstances concerning the operation.

The algorithm shown in the Figure 4 is the main general procedure for the risk assessment in Slovakia. It includes the basic steps for assessing any of the aforementioned obligations.

This algorithm is based on the European standard; however, it is completed by some Slovak specifics included in the first Slovak publication dealing with the risk assessment. It is especially the step 3 - defining the corrective measures, i.e., defining the way how the injury can arise and the step 4 – the assessment if the legal requirements of the regulations and standards are fulfilled and subsequently the realisation of the measures according to the safety directives. The basic algorithm has been used as a basis for several risk assessment methods. The methods are implemented according to the purpose for which the risk assessment procedure is carried out [8].

Preparation for the risk assessment

The whole process of the risk assessment corresponds with the introduced algorithm, however, before its realisation it is necessary to carry out a few steps that can be comprised in preparation phase for the risk assessment. The preparation has to be systematic and should orient on the following facts [9]:

- To state the purpose for which the analysis is carried out,
- To set up a time schedule and strategy for the risk assessment,
- To create a working team and other persons that will participate in the assessment process and risk management and their preparation,
- To ensure the necessary materials, information for the risk assessment
- To describe the used method of the risk assessment,
- To involve the top management employees to realising the assessment results and risk management,
- To implement the risk assessment results to the organisation of work and employees' training.
- To ensure a systematic repetition of the risk assessment.

Subsequently we can deal with the sequence of the individual steps for the risk assessment on a general level. We will briefly look at the individual parts of the procedure according to the aforementioned algorithm.

While the risk assessment objective includes the prevention of the working

risks (this should be always the goal) in practice we are not always able to achieve this target. If the risks cannot be removed they should be limited and the remaining risks should be checked. Later in the framework of the evaluation programmes the remaining risks are assessed again and we can evaluate the possibility of removing the risk from the point of view of new knowledge [10].

The Figure 4 obviously shows that only the principal steps of the risk assessment are defined and there is no concretisation which methods are to be used and how to proceed. Therefore, the commonly available and published methods are utilised in Slovakia and the Czech Republic. Our investigations have found out they are the procedures and methods described in the further text.

Methods and approach used for assessing the working risks in Slovakia

In Slovakia we most frequently utilise the check list and point method that is due to its simplicity suitable also for utilising in small enterprises and micro-companies. The Complex Method is the next method that is implemented; however, it is more complicated. Two types of the checklists are used for identifying the hazards and threats – Universal List and Specific List. The individual questions in the checklist are answered by Yes, No and *Impossible to Answer*. The simple point method is understandable and simple for assessing the rate of threat. It is a suitable method for verifying the risks at the workplace. They are determined as a basis for the safety measures in operation. It is expressed semi-quantitatively – through the assigned point values from 1 to 5 for the probability assessment and the point values from 1 to 4 for assessing the effect includes also a written comment concerning the seriousness. The assessment of the risk rate utilises the definition of the risk in the form of a matrix for the numerical risk assessment that consists of the values of the effect and quantity [11].

Methods and approach used for assessing the working risks in the Czech Republic

In the framework of the tool analysis we did not succeed in defining on which approach the tools are built in most cases, e.g. if they are based on a standard. The tools were mostly based on the semi-quantitative risk analysis. They are the index and point methods using the checklists with open questions. The method of the risk matrix, i.e., the probability versus effect is the most frequent risk assessment method. The tools that would utilise more complicated assessments (e.g. Bayesian networks or Petri net) were not found. In most cases simple tools were used [9].

Discussion and Analysis

After detecting the state and methods of assessing the working risks in Slovakia and the Czech Republic we can say that the basic approaches and tools used in both countries are very similar. The risk assessment is based on the international legal regulations and Slovakia and the Czech Republic included them to the national legal regulations and directives. The basic assessment procedure is relatively general in both countries and there are no methods and tools that are ordered to be utilised. This fact opens a space for the individual companies to define their own procedures and to implement their methods for the risk assessment.

In general the small enterprises and micro-companies use the simplest methods – the checklist, the point and index methods. However, they are not defined in any way and it is possible to adapt them, to state various indexes and weights to individual events, etc. Here we can see a problem in the risk assessment area because there is a high rate of subjectivity and it is impossible to eliminate it.

As they are small companies with a small number of employees, the simple methods are suitable for them, however, it would be useful to objectify and adjust them – they should be simple for implementation, effective and at the same time as objective as possible. One of such means that have begun to be used recently is e.g. the web platform OiRA that utilises the pre-defined and adjusted checklist and other procedures. It can significantly help solving the problems we have outlined in this article.

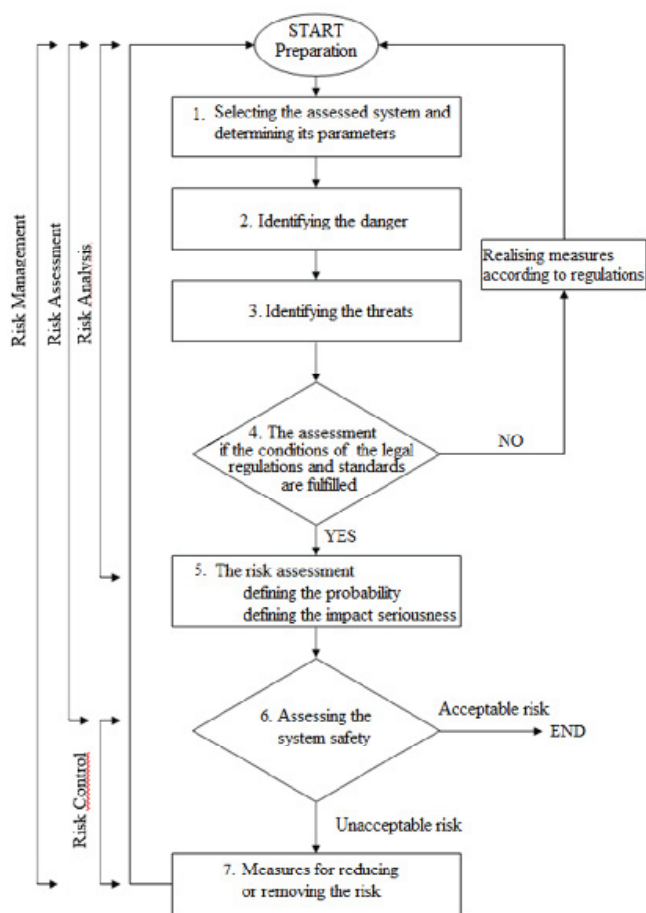


Figure 4. Algorithm - Risk management - for the risk assessment process in the Slovak Republic.

Conclusion

In this article we processed the basic requirements resulting from the legal regulations in the framework of the working risk assessment in the small enterprises and micro-companies. We were dealing with the risk assessment process and its individual steps. Then we presented the results of the survey studies dealing with utilising the risk assessment tools and orientation of the next research. The web platform OiRA is one of the suggested solutions. The effectiveness of this platform is currently tested in the Czech Republic in the project "Development of Tools for Assessing Working Risks Using the Web Platform for Small Enterprises, Micro-Companies in the Czech Republic". The Slovak Republic was also invited to join this project and this article was prepared on the basis of this collaboration. This article is based on the input survey study that was realised. In Slovakia there is currently available only one module of the OiRA platform fulfilling all parameters for a simple risk assessment for this type of companies. This module is a calculation tool for the hairdresser services: [https://www.ip.gov.sk/odstrante-rizika-pomocou-](https://www.ip.gov.sk/odstrante-rizika-pomocou-nastroja-oira-nova-infografika-pre-kadernikov/)

[nastroja-oira-nova-infografika-pre-kadernikov/](https://www.ip.gov.sk/odstrante-rizika-pomocou-nastroja-oira-nova-infografika-pre-kadernikov/). In the Czech Republic several modules for various specialisations have been developed so far.

Limitations & Recommendations for Future Studies

The findings achieved by our research open us a space for improving the objectiveness of the risk assessment, the simplification of the risk assessment implementation for the small enterprises, the micro-companies and natural persons.

One of the basic means for such a uniform assessment is also the OiRA project. In Slovakia there is currently available only one module of the OiRA platform fulfilling all parameters for a simple risk assessment for this type of companies. This module is a calculation tool for the hairdresser services: <https://www.ip.gov.sk/odstrante-rizika-pomocou-nastroja-oira-nova-infografika-pre-kadernikov/>. In the Czech Republic several modules for various specialisations have been developed so far and therefore we can say that the Czech Republic can serve as a model example for the subsequent implementation of similar assessment systems also in Slovakia. In the framework of the further research and detection it would be also suitable to find other approaches and similar products in other countries too.

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How to cite this article: Mária, Polorecka, and Anna Cidlinová. "Working Risk Assessment in SMEDS in the Slovak Republic and Czech Republic." *Int J Pub Health Safety* 5 (2020), 204