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## THE USE OF DATABASE ON INJURY AT WORK RECORDS IN SERBIA

### **Abstract**

*The risk of an injury at work, occupational disease or damage to the health of employees due to danger is, lately, the common subject of numerous studies. The appropriate identification of the risks is the starting point for development the safety and health of the employees in a company. In order to adequately anticipate the risk based on the statistical data on incidents, e.g. injuries at work, it is necessary to identify the critical points in the enterprise. It is impossible to start in motion a risk-management plan without the serious statistics with the elaborately processed data on an injury. Most companies, conditioned by a strict legal framework in the field of safety and health at work, keep their records on injuries. However, with development in this domain, the need for a uniform database for all injuries that occur on the territory of the Republic of Serbia is created. This paper proposes the form, use and further development of the unified database for injuries at work. The base is modeled after the existing form of the report on injuries at work, and its possibilities are shown through the example of injuries that have occurred in the coal mine Bogovina in 2016.*

**Keywords:** *database, records, injuries at work*

### **INTRODUCTION**

The direct consequences of the inadequate risk management methods in the industry are: the increased number of injuries and accidents at work, disabilities and employees' sickness and their absence from work. The injury occurs as a result of an uncontrolled event or dangerous situation that a worker has found himself in. The injury can be qualified as any mechanical, physical or chemical damage on the employee resulting in a disability and causes physical and mental trauma. [1] The safety and health protection at work, OH&S, refers to the control, review of the safety systems at work and a set of measures aimed at improving the safety of employees. The analysis of the results of an injury can lead to certain conclusions on the injury cause.

Studying the injuries at work in any area of industry depends on the quality of input data from the statistics on injuries at work that have already occurred. It is important that this information is processed in a unique way. A record allowing monitoring the different aspects of injury, such as the number, type and severity of injury, the injured part of the body and many more, offers many possibilities for research. It is necessary to connect this information to several other parameters in order to come to a conclusion. Such an analysis of information is the best achieved through a database. SQL Server Management Studio is a free application from Microsoft, and this software has been precisely used in this paper to create a database of injuries at work.

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## LEGAL REGULATIONS WHICH REGULATE THE RECORDING OF INJURIES AT WORK IN SERBIA

The obtained data processing through the questionnaires provides conclusions related to the security of a company, business or municipality. The obtained conclusions are essential for improvement the safety and health of the employees in the company, as well as for evaluation the safety measures at the state level. By investment in such statistics, which would be updated by the companies, the state would create the conditions for monitoring the implementation of the law and regulations, application the standards and the safety inspection work in the companies which are essential to the process. A review of the system by the competent and responsible persons would enable OH&S to make decisions, based on the output data that would level Serbia with the global trends.

Database structure is a complete match to the Report on the injury at work or Form No. 1, which is filled out by the employer in the case of an accident. As such, it should be available to every employer on the Agency for the Safety and Health at Work website. These data should be also available to the researchers who monitor injuries and risks within the framework of certain activities.

Form No. 1 consists of seven chapters, each for a different kind of data collected. If the form is filled out electronically, it is necessary to have a drop-down list for each of the seven factors. This should be done in order to prevent the person responsible for the safety and health at work to fill in the data randomly and avoid having non-uniform information due to using a capital letter, spacing or using letters like č, đ, š, ž and ć. Of course, the data such as the name of the injured, the names of the witnesses, a unique personal identification number and the name of the person responsible cannot be uniform. Only the database with data collected this way can be used for further research.

Legal basis for keeping the records is already established by the Act on Safety and Health at Work (Official Gazette RS, Nos.101/05 and 91/15), Article 51 says:

“The report on injuries at work, occupational disease or damage to the health of employees due to danger which happens at the place of work, is to be delivered, by the employer, to the injured or affected by the disease employee, and to the organizations responsible for health and pension insurance. The content and method for filling out the report form, mentioned in paragraph 1 of this Article, is determined by the Minister of Labour, Employment, and Social Issues of the Republic of Serbia.

The employer shall, at the request of a labor inspector or a representative of the employees, submit a safety report, stating the health of employee and measures which have been taken.”[3]

The Act on Safety and Health at Work clearly defines the way of processing the injury. The Minister of Labor, Employment, and Social Issues of the Republic of Serbia issued the Regulations on the content and methods for filling out and issuing a form on the injury at work and occupational disease (Official Gazette RS, No.72/2006 and 84/2006 - correction) which states the following forms (Act 5, Paragraph 1):

- Form No. 1 THE REPORT OF AN INJURY AT WORK
- Form No. 2 THE REPORT OF AN OCCUPATIONAL DISEASE.

The employer is obligated to fill in the form within twenty-four hours of learning that the injury occurred. [3]

The Regulations stipulates that there should be five (5) copies of the form printed/filled out, two copies for the Republic Health Insurance Fund and three copies for the employer. [4] The employer is to keep one copy of the authenticated form, one

copy is given to the employee, and the third copy of the form is delivered to the organization responsible for pension and disability insurance through the Ministry of Labor, Employment, and Social Issues- Department for Safety and Health at Work.

The main issue is that the most of the employers do not deliver the form to the Department for Safety and Health at Work, instead, it is directly sent to the organization responsible for pension and disability insurance, thus, the processing of the data and drawing of the conclusions about the safety in the field of injuries are prevented. The Department for Safety and Health at Work has initiated a project to form The Registry of the injuries at work, but the data are still unavailable.

Presently, the Republic Health Insurance Fund has recorded and has access to the information related to the total number of injuries and gender of the injured employees, which is unusable from the point of studying the safety for the most of activities.

#### **CREATING A DATABASE ACCORDING TO THE REPORT ON INJURY AT WORK IN THE REPUBLIC OF SERBIA**

The form THE REPORT OF AN INJURY AT WORK was used as a starting point for creating database because it contains data necessary for the appropriate processing of injuries. Based on the form that was formulated in the Regulations on the content and method of issuing the report of injury at work, and occupational disease forms, the database that fully matches the look of the REPORT OF AN INJURY AT WORK is created. After filling in the form by the OH&S service in the company, where the incident happened, the user can print it or send it for further processing. All data entered in the report are signed a unique ID number, and they are saved in the database for further analysis. Filling in this

form is, certainly, the employer's obligation in order to fulfill the legal procedure, and cannot be considered as an additional requirement regarding the database. The database has an option for further data processing in the category- injuries at work are not adequate for the injuries occurring outside this category, e.g. transport or agriculture. Such injuries should be processed in the Registry of injuries.

In order to ease the data entry, an application with the appropriate user interface should be created. The overall idea is to create the so called drop-down columns wherever that is possible, so the user could choose only one indicator, e.g. a code, registry number, street or a city. All the injury data would be uniformed by that way.

This is particularly applied to the portion of the form which contains the prescribed codes for identifying the causes and sources of injuries given in the Records and notifications of occupational injuries and occupational diseases determined by the International Labor Organization (aka. The ILO), the part of the form which contains the Code of Practice, as well as the part of the form which is supposed to be filled by a doctor and refers to the classification of violations according to the code diseases ICD 10. [6]

It is necessary to clearly define the questionnaire so the user of database cannot, for example, mark finger or upper arm, because in the drop-down column there is only "upper extremities" as an option. The data base Injury\_at\_Work is designed as part of the tool for the study of the injuries in the mining industry by a person in charge of this area in an organization and it also requires an addition of queries which are not set in the Report of an injury at work. It is, especially, necessary to separate injuries of workers engaged directly in the production process from those which are not, and enable the option which clearly connects worker with the production process. However, the topic of this paper is formulation, dis

play and analysis of desired data from the existing Report of an injury at work, and the possibility of use these records for as many as possible agencies in Serbia, and the database was designed carrying such a concept in mind. Still, each industry can add its own queries for the purposes of their analysis.

Figure 1 shows the database of injuries at work diagram. There are seven entities in the database: Injured, Employer, Eyewitness, Manager, Injury, Workplace and Doctor's findings. Those entities represent the integral part of the Form No. 1, and contain columns that match the required items in a specified form. In addition to these columns, each entity or a table contains the

so-called primary key, or the primary column (injured ID or employer ID) with the automatically generating unique number that identifies each row in the column or, in other words, each group of data related to the specific victim. All groups of data are related to a specific injured person, so the table Injured represents the main entity or the main column. The problem of linking the groups of data between tables is solved by introduction a column with a foreign key constraint. The foreign key can be found in all tables except in the main table. As table Injured is the main table, the primary key of table Injured – injured ID is set as a foreign key for the rest of tables.

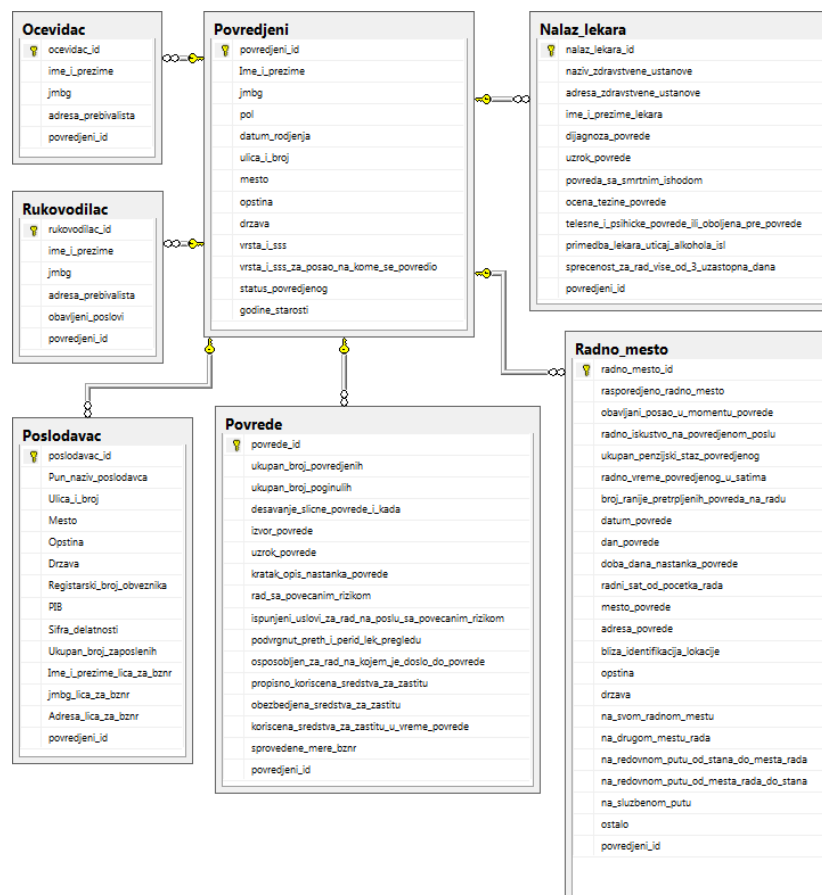


Figure 1 Database of injuries at work - table diagram with their interrelations

## POSSIBILITIES OF SEARCHING THE DATABASE

The data of injured workers are entered directly into the SQL Server Management Studio database table to the requirements of each individual column. The improvement of model will lead to development the user interface where all data on injured worker will be entered according to the Report of an injury at work.

Injuries at Work Database was created in the way that each table represents one set of data from the form, for example, a group of data on employer is a table in the database that is linked to other tables. Figure 2 shows the basic table, Injured table which generates the ID number (injured ID) for each of the injury that occurs.

povredeni_id	ime_i_prezime	jmbg	pol	datum_rođenja	ulica_broj	mesto	opština	drzava	vrsta_j_sss	vrsta_j_sss_zaposao_na_kome_se_povredio	status_povredenog
1	Neven Anđelić	20040770020	m	1974-07-16	Zlot bb	Zlot	Bor	Srbija	osnovna škola	NK jamski vozač	u radnom odnosu
2	Đorđe Anđelić	20040770020	m	1974-07-16	Bogovina bb	Bogovina	Bojevac	Srbija	osnovna škola	NK jamski vozač	u radnom odnosu
3	Oliver Anđelić	20040770020	ž	1974-07-16	Čupiceva br.3	Zaječar	Zaječar	Srbija	dipl.inž. geologije	Geolog	u radnom odnosu
4	Adnan Anđelić	20040770020	m	1974-07-16	Podgorac b.b.	Podgorac	Bojevac	Srbija	osnovna škola	NK jamski vozač	u radnom odnosu
5	Edin Pašalić	20040770020	m	1974-07-16	Bogovina bb	Bogovina	Bojevac	Srbija	osnovna škola	PK kopač	u radnom odnosu
6	Neven Anđelić	20040770020	m	1974-07-16	Ilino b.b.	Ilino	Bojevac	Srbija	osnovna škola	KV kopač	u radnom odnosu
7	Đorđe Anđelić	20040770020	m	1974-07-16	Šarbanovac b.b.	Šarbanovac	Bor	Srbija	SSS-IV stepen, rudarski tehničar	SSS-paloc mina	u radnom odnosu
8	Oliver Anđelić	20040770020	m	1974-07-16	Podgorac b.b.	Podgorac	Bojevac	Srbija	SSS-III stepen	II smenski bravar	u radnom odnosu
9	Neven Anđelić	20040770020	m	1974-07-16	Podgorac b.b.	Podgorac	Bojevac	Srbija	SSS-III stepen	KV oplemenjivač	u radnom odnosu
10	Edin Pašalić	20040770020	m	1974-07-16	Podgorac b.b.	Podgorac	Bojevac	Srbija	osnovna škola	KV kopač	u radnom odnosu
11	Edin Pašalić	20040770020	m	1974-07-16	Bogovina bb	Bogovina	Bojevac	Srbija	osnovna škola	PK kopač	u radnom odnosu
12	Edin Pašalić	20040770020	m	1974-07-16	Bogovina bb	Bogovina	Bojevac	Srbija	osnovna škola	KV kopač	u radnom odnosu
13	Neven Anđelić	20040770020	m	1974-07-16	Zlot b.b.	Zlot	Bor	Srbija	osnovna škola	Bravar u radionici	u radnom odnosu
14	Đorđe Anđelić	20040770020	m	1974-07-16	Solunskih bor...	Bojevac	Bojevac	Srbija	SSS IV stepen-ekonom.teh	PK kopač	u radnom odnosu
15	Edin Pašalić	20040770020	m	1974-07-16	Bogovina b.b.	Bogovina	Bojevac	Srbija	VS menadžment	NK jamski vozač	u radnom odnosu
16	Edin Pašalić	20040770020	m	1974-07-16	Bogovina b.b.	Bogovina	Bojevac	Srbija	KV-automehanicar	NK jamski vozač	u radnom odnosu
17	Đorđe Anđelić	20040770020	m	1974-07-16	Bogovina bb	Bogovina	Bojevac	Srbija	osnovna škola	NK jamski vozač	u radnom odnosu
18	Neven Anđelić	20040770020	m	1974-07-16	Valakonjska 29	Bojevac	Bojevac	Srbija	KV metalostrugar	PK kopač	u radnom odnosu
19	Edin Pašalić	20040770020	m	1974-07-16	Šarbanovac b.b.	Šarbanovac	Bor	Srbija	osnovna škola	NK jamski vozač	u radnom odnosu
20	Edin Pašalić	20040770020	m	1974-07-16	Valakonje b.b.	Valakonje	Bojevac	Srbija	osnovna škola	PK kopač	u radnom odnosu
21	Edin Pašalić	20040770020	m	1974-07-16	Podgorac b.b.	Podgorac	Bojevac	Srbija	SSS-III elektro	II smenski električar	u radnom odnosu

Figure 2 The table Injured in SQL Server Management Studio

The table Injured contains basic information about the injured worker: name and surname, personal identity number, address, job title, gender, qualification and other.

To make a more vivid picture of possibilities for searching the database Injury at work, the Reports of an injury at work from the coal mine Bogovina in 2016 were entered into database. [8]

SQL (structured query language) is used for searching the database, i.e. relational query language which offers the possibility for different results, for example, how many injuries occurred in the coal mine Bogovina in 2016 that are specified according to:

- The qualification of the injured workers,

- Cause of the injury 21- landslides and caving of earth, rocks and stones [5],
- The severity of the injury.

Figure 3 presents the result of mentioned request that shows that ten injuries, caused by the caving of material occurred, which is a high percentage considering that in that year the total of 21 injuries happened. Only one of those injuries was described as severe injury, while the remaining nine were evaluated by doctors as the minor injuries. After studying the first column in Figure 3, it can be concluded that the production workers employed directly at the site are prone to this type of the injury.

	vrsta_i_sss_za_posao_na_kome_se_povredio	uzrok_povrede	ocena_tezine_povrede
1	NKjamski vozač	21	laka
2	Geolog	21	laka
3	NKjamski vozač	21	laka
4	KV kopač	21	laka
5	PK kopač	21	laka
6	KV kopač	21	laka
7	NKjamski vozač	21	laka
8	NKjamski vozač	21	teška
9	PK kopač	21	laka
10	PK kopač	21	laka

**Figure 3** View from database according to the query:  
the qualification of injured workers, cause of injury 21 and severity of injury

If the condition that the severity of injury should be high and caused by 21 is added to the existing requirement, the results will be as shown in Figure 4. The database shows that injury occurred on 3 March 2016 (Monday) at 10.30 am at the

OT4 site, Jama "East Field", Bogovina and that the injured worker was taken to ER in Zaječar where he received the S42 diagnosis - fracture of a shoulder and upper arm (Fractura regionis deltoideae et brachi). [6]

	vrsta_i_sss_za_posao_na_kome_se_povredio	uzrok_povre...	ocena_tezine_povrede	datum_povrede	dan_povrede
1	NKjamski vozač	21	teška	2016-03-14	ponedeljak

doba_dana_nastanka_povrede	mesto_povrede	adresa_povrede	naziv_zdravstvene_ustanove	dijagnoza_povrede
10:30	OT4, Jama Istocno polje	Bogovina	ZC Zaječar	S42-kamen

**Figure 4** The result of execution the query for closer determination of severe injury by criteria 21

Overview, which is especially interesting in light of studying the injuries at work in the mining industry, is linked to description of injury and location of injury. Figure 5 shows table or query result, which shows the two above-mentioned parameters. It is clear that the majority of injuries occurred in the

pit during cleaning the material and support construction at the site (nine injuries), movement of workers (four injuries) and during transport of intermediate goods (five injuries). Other injuries are located outside the pit or they are less interesting due to their frequency and response of the OS&H.

kratak_opis_nastanka_povrede	mesto_povrede
1. prilikom prebacivanja kotira grabuljastog transportera isti mu je prikještio prst	ETH 2, Jama Istocno polje
2. prilikom čišćenja materijala pao je kamen iz stropa i povredio mu prst leve ruke	OT3, Jama Istocno polje
3. okliznuo se prilikom dopreme građe	TH1, Jama Istocno polje
4. prilikom čišćenja materijal mu povredio palac leve ruke	ETH2, Jama Istocno polje
5. prilikom bušenja ispitnih bušotina na ortu komad materijala povredio joj vrat i rame	ETH 2, Jama Istocno polje
6. prilikom čišćenja ortu komad materijala udario ga po licu	OT3, Jama Istocno polje
7. prilikom igranja stonog tenisa na RSI polomio nogu	Hotel Zvezda
8. prilikom premeštanja grabuljara isti mu povredio nogu	OT3, Jama Istocno polje
9. prilikom silaska okliznuo se i povredio nogu	VV3, Jama Istocno polje
10. prilikom silaska u jamu okliznuo se i povredio nogu	GTN, Jama Istocno polje
11. prilikom čišćenja trase dalekovoda napeta grana povredila mu oko	Spolja, trasa dalekovoda
12. prilikom punjenja minskih bušotina materijal sa ortu povredio mu lice i rame	PV2, Jama Istocno polje
13. prilikom podgrađivanja materijal mu povredio levu ruku	OT2a, Jama Istocno polje
14. prilikom podgrađivanja obrušeni materijal povredio mu vrat i levo rame	OT2a/1b, Jama Istocno polje
15. sekao transportnu traku	Spolja, Mašinska radionica
16. prilikom čišćenja materijala komad materijala udario ga po levom ramenu	OT4, Jama Istocno polje
17. prilikom dopreme delova za montažu grabuljara povredio	OT1, Jama Istocno polje
18. prilikom čišćenja materijala sa radišta došlo je do odvajanja dela kamena iz stropa i povredio mu leđa	ETH 2, Jama Istocno polje
19. prilikom dopreme repmaterijala zakacila ga je natezna koja je bila okacena na vozicak, i tom prilikom povredio je desno koleno	TH1, Jama Istocno polje
20. prilikom praviljenja mesta za stupac odvojio se kamen iz boka i povredio mu glavu, denu ruku i leđa	TU2, Jama Istocno polje
21. prilikom prolaska kroz hodnik, okliznuo se i pao na leđa i povredio levu stranu tela (rebro)	VU1B, Jama Istocno polje

**Figure 5** View from database according to the query relating to the description of the injury and location of the injury

Based on the data, it can be concluded that the coal mine Bogovina must conduct the additional training and introduce better security measures that would increase the safety in movement of workers in the pit during cleaning the working site because most of injuries occur at these job positions.

Figure 6 shows an overview of the table base on the next requirements: the type and qualification of injured, the source of injury 531 and the minor injury. Source of the injury 531 is, according to the Records and notifications of injuries at work, a code for an injury that occurred due to the block

caving in an underground facility (tunnel, mine and other). [5] This is the most common source of injury in the mining industry that often results in serious and fatal injuries of workers, and is a direct result of irregularities of the safety and support in corridors. The analysis shows that ten out of twenty-one injuries in the coal mine Bogovina are caused by caving (Figure 3), seven injuries are caused by block caving, and the three remaining are the consequence of caving at the work site. Caving at the work site during the construction of underground facilities is unpredictable and cannot be easily influenced.

vrsta_i_sss_za_posao_na_kome_se_povredio	izvor_povrede	ocena_tezine_povrede
1. SSS-palioc mina	531	laka
2. II smenski bravar	531	laka
3. KV kopač	531	laka
4. PK kopač	531	laka
5. KV kopač	531	laka
6. NKjamski vozač	531	laka
7. PK kopač	531	laka

**Figure 6** View from database according to the query relating to the type and qualification of injured, source of the injury 531 and the minor injury

The worker's age are always interesting for studying, primarily due to a decline of labor and physical abilities of worker compared to the younger workers without enough experience. By comparison of these two categories, a conclusion can be made

concerning the quality of training the workers at the beginning of their career. Table in Figure 7 shows that the most of workers belong to a group older than 35 (90%), while only two workers were "young", that is to say, younger than 35.

	vrsta_i_sss_za_posao...	godine...	kratak_opis_nastanka_povrede	ocena_...
1	NK janski vozač	42	prilikom prebacivanja korita grabuljastog transportera isti mu je prikještio prst	laka
2	NK janski vozač	35	prilikom čišćenja materijala pao je kamen iz stropa i povredio mu prst leve ruke	laka
3	PK kopač	39	okliznuo se prilikom dopreme građe	laka
4	NK janski vozač	28	prilikom čišćenja materijal mu povredio palac leve ruke	laka
5	Geolog	41	prikom bušenja ispitnih bušotina na ortu komad materijala povredio joj vrat i rame	laka
6	NK janski vozač	35	prilikom čišćenja orta komad materijala udario ga po licu	laka
7	PK kopač	52	prilikom igranja stonog tenisa na RSI polomio nogu	teška
8	KV kopač	52	prilikom premeštanja grabuljara isti mu povredio nogu	teška
9	SSS-paloc mina	41	prilikom silaska okliznuo se i povredio nogu	laka
10	II smenski bravar	43	prilikom silaska u jamu okliznuo se i povredio nogu	laka
11	KV oplemenjivac	49	prilikom čišćenja trase dalekovoda napeta grana povredila mu oko	laka
12	KV kopač	29	prilikom punjenja minskih bušotina materijal sa orta povredio mu lice i rame	laka
13	PK kopač	41	prilikom podgrađivanja materijal mu povredio levu ruku	laka
14	KV kopač	47	prilikom podgrađivanja obrušeni materijal povredio mu vrat i levo rame	laka
15	Bravar u radionici	53	sekao transportnu traku	laka
16	NK janski vozač	34	prilikom čišćenja materijala komad materijala udario ga po levom ramenu	teška
17	NK janski vozač	35	prilikom dopreme delova za montažu grabuljara povredio	laka
18	PK kopač	40	prilikom čišćenja materijala sa radišta došlo je do odvajanja dela kamena iz stropa i povredio mu leđa	laka
19	NK janski vozač	42	prilikom dopreme reprofmaterijala zakacila ga je natezna koja je bila okacena na vozicak, i tom prilikom povredio je desno koleno	laka
20	PK kopač	45	prilikom pravljenja mesta za stupac odvojio se kamen iz boka i povredio mu glavu, denu ruku i leđa	laka
21	II smenski električar	46	prilikom prolaska kroz hodnik, okliznuo se i pao na leđa i povredio levu stranu tela (lebro)	laka

**Figure 7** View from database according to the query: the type and qualification of injured, age, description of injury and severity of injury

However, if the following table (Figure 8) is considered as it shows the column Work experience of the injured, it can be concluded that even if the worker is experienced according to his age, his work experience suggests otherwise. Only five workers have an extensive work experience for over 20 years, two of them have over ten years, and other thirteen have five years of experience or less. This indicates that these workers are inexperienced and poorly trained for the work they perform, and due to this fact they are injured in such a large number. This phenomenon can be also explained by the prohibition of employment in the public sector, in which the Coal mine Bogovina belongs to. The workers are

placed at jobs where their abilities do not match the requirements, but due to a lack of adequate personnel, they are provided with adequate re-training and internal qualification where they have to master the new skills in a relatively short period of time.

Figure 8 shows that the most of injuries occurred in the morning, 15 of them, which was expected since the mine operates in two shifts, but the biggest number of workers works the first shift, such as maintenance workers, and supervisory technical staff.

This paper provides an example of accessible database that would facilitate the job of data updating on injuries for Serbia in companies, and would support the regi-



ster creation. There are no reports from the previous period in the Safety Management Bureau. This provides an opportunity to the companies to translate the

printed reports into digital reports within database, and in that way to help the Safety Management Bureau with data updating from the previous period.

	obavljeni_posao_u_momentu_povrede	radno_iskustvo_na_povredjenom_poslu	mesto_povrede	doba_dana_nastanka_povrede
1	prebacivao korito transportera	21	ETH 2, Jama Istocno polje	01:00
2	čišćenje materijala	11	OT3, Jama Istocno polje	21:30
3	prisustvovala bušenju	6	ETH 2, Jama Istocno polje	10:45
4	čišćenje materijala	11	OT3, Jama Istocno polje	04:00
5	igrao stoni tenis na RSI	-	Hotel Zvezda	11:00
6	pomeranje grabuljastog transportera	20	OT3, Jama Istocno polje	11:00
7	silazak u jamu	1	VV3, Jama Istocno polje	8:30
8	silazak u jamu	5	GTN, Jama Istocno polje	7:45
9	čišćenje trase dalekovoda	0	Spolja, trasa dalekovoda	12:30
10	pomagao je palocu prilikom punjenja mina	3	PV2, Jama Istocno polje	18:00
11	čišćenje materijala	3	OT2a, Jama Istocno polje	11:30
12	čišćenje materijala	3	OT2a/1b, Jama Istocno polje	13:15
13	sekao transportnu traku	0,4	Spolja, Mašinska radionica	11:30
14	doprema građe	3	TH1, Jama Istocno polje	19:30
15	čišćenje materijala	5	ETH2, Jama Istocno polje	11:00
16	čišćenje materijala	4	OT4, Jama Istocno polje	10:30
17	doprema repromaterijala	11	OT1, Jama Istocno polje	10:45
18	čišćenje materijala	3	ETH 2, Jama Istocno polje	10:00
19	doprema repromaterijala	25	TH1, Jama Istocno polje	9:30
20	pravio mesta za stupac	23	TU2, Jama Istocno polje	19:30
21	kretao se hodnikom	30	VU1B, Jama Istocno polje	11:00

**Figure 8** View from database according to the query: performed work at the moment of injury, work experience at injured job, location of injury and time of the day of injury occurrence

Combining the all data in a single database will provide a clear picture of security situation of the safety at work in Serbia. In the event that data are implemented in the Register of an injury, a clear cost of an injury at work will be available using data from the Health Fund.

## CONCLUSION

Any injury that occurs, however bizarre, carries a message to the employer and management of the Safety and Health Protection Management Bureau of the Republic of Serbia. Ignoring these events, such as, for example, a frequent minor finger injury on a machine can be easy, but, in the worst case scenario, it can result in a fatal outcome, varying degrees of disability

and, almost always, in disruption the production process, or in additional costs for the state or company. Although death seems like an exaggeration, in the underground mining of mineral raw materials, the miners get hurt on the drive drum conveyor belt which first pulls in a finger, than a hand, and then the whole body of a victim.

Database allows the generation a large amount of data in a very simple manner, and without additional hiring or cost to the employer. A disposal of this kind of data allows better access to the evaluation and implementation the laws, regulations and standards. Also, the advantage of this kind of data available is ability to identify the vulnerable groups of interest. Injuries are typically grouped around a certain accident situation which happened multiple times.

Any company that has a way of recording such injuries can easily study the risk factors at any time, new needs in the production process, the need for change in the act on risk assessment, new trainings, and enhanced control and so on.

Direction of further development and additions to this base would be in a direction of adjustment to certain jobs, and supplement to the database, related to the absence from work, for example, the cost of absence and treatment of workers, length of disability of the injured, course and outcome of recovery, and possible degree of disability as well as development the application for easier database manipulation on injuries at work.

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