

ЗБОРНИК РАДОВА

УНИВЕРЗИТЕТ У НОВОМ САДУ, ФАКУЛТЕТ ТЕХНИЧКИХ НАУКА
ДЕПАРТМАН ЗА ЗАШТИТУ ЖИВОТНЕ СРЕДИНЕ И ЗАШТИТУ НА РАДУ
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САВЕЗ ЗАШТИТЕ НА РАДУ ВОЈВОДИНЕ
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UNIVERZITET U NOVOM SADU, FAKULTET TEHNIČKIH NAUKA
DEPARTMAN ZA ZAŠTITU ŽIVOTNE SREDINE I ZAŠTITU NA RADU
SAVEZ ZAŠTITE NA RADU VOJVODINE
UDRUŽENJE ZA BEZBEDNOST NA RADU „28. APRIL“, MAKEDONIJA

Nacionalna konferencija sa međunarodnim učešćem

UNAPREĐENJE SISTEMA ZAŠTITE NA RADU

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Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije
Pokrajinski sekretarijat za nauku i tehnološki razvoj AP Vojvodine
Pokrajinski sekretarijat za privredu, zapošljavanje i ravnopravnost polova AP Vojvodine

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ANALYSING THE INJURIES IN THREE INDUSTRIAL SYSTEMS FROM MACEDONIA WITH EMPHASIS ON FUTURE STEPS FOR CONTINUOUS IMPROVEMENTS

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Abstract: Taking in consideration that injuries are an inevitable part of the operations in any industrial system, management efforts are aimed on recording the injuries and the causes for the occurrence of the injuries, and also in the matter of taking effective measures to eliminate the evidenced sources for injuries. However, in order to make an effective assessment of the results and to determinate whether the taken steps are towards continuous improvements of the safety systems on direct work places, the first and basic step is to record the number and the nature of injuries into the industrial system. In fact, appropriate records of injuries, as well as the exact determination of the causes for the injury, are the basic steps for taking appropriate measures that would prevent future similar occurrence. Therefore and in accordance with the annual activities of the Society for Occupational Safety Bitola, each year the number and the nature of the injuries in industrial systems into Bitola's are recorded. The basic aim of the paper is to represent the comparative analysis considering the records for spotted injuries among RZZC REK Bitola, A.D. ELEM REK Bitola and P.E. Thermal Power Plant REK Bitola, as parts of the largest manufacturer of electricity in R. Macedonia. The analyses are conducted taking into consideration numerous criteria, and at the end of the paper future steps for more effective system and for reducing the number of the injuries are given.

Key words: OSH systems, Continuous improvements into OSH systems in large industrial systems, Comparative analysis in industrial systems in R. Macedonia considering the injuries as criteria

ANALIZA POVREDA U TRI INDUSTRIJSKA SISTEMA U MAKEDONIJI SA NAGLASKOM NA BUDUĆE KORAKE ZA KONTINUALNO POBOLJŠANJE

Sažetak: Imajući u vidu činjenicu da su povrede neizbežan deo rada bilo kog industrijskog sistema, naponi upravljanja su usmereni ka registrovanju povreda i uzroka koji su doveli do povreda, kao i na preduzimanje efektivnih mera radi eliminacije potvrđenih uzroka povreda. Međutim, da bi se napravila efektivna procena rezultata i utvrdilo da li preduzeti koraci vode kontnuiranom poboljšanju sistema zaštite na konkretnim radnim mestima, prvi i osnovni korak je registrovanje broja i prirode povreda u industrijskom sistemu. Ustvari, odgovarajući zapisi o povredama kao i tačno određivanje uzroka povreda predstavljaju osnovne korake pri određivanju odgovarajućih mera usmerenih ka sprečavanju sličnih akcidenata. Stoga, saglasno sa godišnjim aktivnostima Društva za zaštitu na radu Bitola, svake godine se registruje broj i priroda povreda u industrijskim sistemima u Bitoli. Osnovni cilj rada je da predstavi komparativnu analizu imajući u vidu zapise uočenih povreda u RZZC REK

Bitola, A.D. ELEM REK Bitola and P.E. Thermal Power Plant REK Bitola, koji predstavljaju delove najvećeg proizvođača električne energije u R. Makedoniji. Analize se sprovode imajući u vidu brojne kriterijume, a na kraju rada su dati budući koraci usmereni ka efektivnijem sistemu i smanjenju broja povreda.

Ključne reči: OSH sistemi, Kontinualno poboljšanje OSH sistema u velikim industrijskim sistemima, Komparativna analiza industrijskim sistemima u R. Macedonia uzimajući povrede kao kriterijum

INTRODUCTION

That security is one of the key elements (if not the most important one) considering organizational actions, there are numerous facts that confirm the statement. But, what is essential is that everyone would like to work in an environment where the person is feeling safe. Given that in the past few years, the awareness is more and more greater and organizational activities are aimed at creating safer workplaces, and NGO organizations working in this field are moving to increased number of trainings, activities and educational seminars aimed on the one hand to bring the legal regulations more closer to the organizations, but on the other to provide a safer work places for employees regarding the organizations where they work. As part of these activities is the annual survey of the number of injuries in enterprises in Bitola's region in R. Macedonia, conducted by the authors of the paper as a team members of the Society for Occupational Safety Bitola from Bitola, R. Macedonia. The purpose of the paper is to represent the number and the nature of the injuries recorded in three business entities: AD ELEM REK Bitola, P.E. Thermal Power Plant REK Bitola and RZZC REK Bitola as indissoluble parts of the largest mining and power plant REK Bitola. The records of the injuries are conducted by three separate sources such as: the organizations, the NGO Bitola and the competent occupational inspectorate from Bitola. All of the records are a relevant indicator about the number of injuries in these three entities in 2012. The data are analyzes considering several key criteria's such as: the gender of the injured person, the age of the injured person, qualifications, part of the body that is injured, a day in which the injury occurred, type of the spotted injury, cause for the injury and number of lost working days as a result of the injury. This paper presents some of this criteria's which are analyzed comparatively, considering the previously mentioned business entities.

SHOT OVERVIEW OF BUSINESS ENTITIES THAT WERE UNDER RESEARCH

Taking into consideration the fact that there were three business entities under research: AD ELEM REK Bitola, P.E. Thermal Power Plant REK Bitola and RZZC

REK Bitola, the tabular view that is given into addition of this part represents a comparative description of the business entities and their basic characteristics.

Table 1. – Comparative overview of the business entities that were under research

BUSINESS SUBJECT	OCCUPATION	Number of employee	GENDER	
			Male	Female
AD ELEM REK Bitola	Electrical energy production	1781	1668	113
P.E. Thermal Power Plant REK Bitola	Production	815	727	88
RZZC REK Bitola	Services	324	233	91

Having in mind that the basic aim of the paper is to represent the injuries, considering several criteria's that were previously mentioned, the tabular view number 2 given in addition is an appropriate representation of the injuries, considering total numbers and considering gender criteria.

Table 2. – Overview of the injuries

BUSINESS SUBJECT	Number of employees	Number of injuries	GENDER	
			Male	Female
AD ELEM REK Bitola	1781	75	69	6
P.E. Thermal Power Plant REK Bitola	815	38	37	1
RZZC REK Bitola	324	10	6	4

PRESENTING THE INJURIES CONSIDERING SEVERAL CRITERIA'S OF OVERVIEW

In the section that follows, there are given several tabular views which are representation of the injuries considering several key criteria's such as: body part that is injured, type of the injury, age of the injured person and the nature of the injury.'The criteria's that are chosen to be represented aren't randomly selected. In fact they represent a starting point for undertaking future activities primarily to increase the safety at the workplaces, but also in a matter to reduce the number of injured persons (considering the fact that in these types of organizations it is almost impossible to avoid injury). However the representation of the data 'is started with a tabular view which is also the percentage overview of injured persons, and a representation of total lost work days as a result of an injury.

Table 3. - Percentage overview of the injured persons/Lost days as a result of an injury

BUSINESS SUBJECT	Number of employees	Number of injuries	Overview	
			In percent (%)	Lost work days
AD ELEM REK Bitola	1781	75	4.2%	872
P.E. Thermal Power Plant REK Bitola	815	38	4.7%	311
RZZC REK Bitola	324	10	3.1%	121

The tabular view 4, given in addition represents the body part that is injured. Considering the criteria a fact is that most of the injured persons has an injury that is on the arm/s or on the leg/s. So, the conclusion is that an additional research is necessary in a matter to discover the reason for these injuries. The conclusions from this research are a solid base for further steps in a matter of reducing the injuries (considering arm and leg injury).

Table 4. - Presenting the data considering body part that is injured as a criteria

BUSINESS SUBJECT	Body part that is injured			
	Head	Body	Arm	Leg
AD ELEM REK Bitola	8	13	26	31
P.E. Thermal Power Plant REK Bitola	4	6	15	18
RZZC REK Bitola	/	1	4	5

If the results represented into table 4 are seen the fact is that the numbers for ELEM REK (78) and PE REK (43) aren't the same one as the one's represented into table 3 (total injured persons). The reason is because some of the injured persons have had a multiple injury (for example: one spotted injury - injured body parts one arm one leg).

In addition of the paper it's given another tabular view num. 5, which represents the type of the injury. The type of the injury is divided in three levels of injury such as: light injury, heavy injury and death. Fortunately, there wasn't spotted a injury with fatal consequences in these business entities in 2012.

Table 5. - Presenting the data considering the type of the injury as a criteria

BUSINESS SUBJECT	Type of injury		
	Light	Heavy	Death
AD ELEM REK Bitola	68	7	/
P.E. Thermal Power Plant REK Bitola	38	/	/
RZZC REK Bitola	10	/	/

Considering these types of data gathered, the conclusion is that most of the injuries were light injuries. But, in AD ELEM Bitola there were 7 causes of heavy injury that gives as a right to conclude that further steps should be taken in a matter for reducing these kinds of cases in 2013.

And at the end of the paper there are two tabular views considering the age of the injured person and the nature of the injury as a criteria's. Considering the age of the injured persons the age period from 18 to 65 (what is a work period according the law regulations in R. Macedonia) years is divided in several subcategories such as: 18-25, 25-35, 35-45, and 45-65. On the other hand, the nature of the injury is also divided in several subcategories considering the source of the injury such as: electrical, mechanical, chemical nature, lack of HTZ equipment and other source. All of the results are represented into table 6 and table 7 in addition.

Table 6. – Presenting the data considering the age of the injured person as a criteria

BUSINESS SUBJECT	Age of the injured persons			
	18-25	25-35	35-45	45-65
AD ELEM REK Bitola	/	4	8	63
P.E. Thermal Power Plant REK Bitola	/	7	10	21
RZZC REK Bitola	/	1	2	7

Considering the age of the injured person as criteria the results shows the category of workers that should suppose to be an experienced worker (age from 45-65 years) is the category of people that has almost 85% of the total amount of injuries. The reasons for this situations are multiple, but in a direct communication with worker from the subjects that were under research and other business entities the most common reason is the feeling of safety (nothing could happen to me), that these categories of people (experienced workers) have. So the future steps include several educations (discussion sessions and trainings) considering these questions and those categories of workers (45-65).

Table 7. – Presenting the data considering the nature of the injury as a criteria

BUSINESS SUBJECT	Nature of the injury				
	Mechanical	Chemical	Electricity	Lack of equipment	Other reason
AD ELEM REK Bitola	62	/	2	/	11
P.E. Thermal Power Plant REK Bitola	33	/	/	/	5
RZZC REK Bitola	10	/	/	/	/

Considering the data from the research considering the nature of the injury most of the injuries are from mechanical character. So further steps should be taken with an aim for reducing the injuries, considering the mechanical nature as a source for an injury.

CONCLUSION

The results presented into the paper actually represent a starting point for further additional activities. All of the further activities should be with an aim for reducing the total number of injuries. If we see the results from the paper all of the so called risk factors, or causes for injuries (mechanical nature, age group 45-65 and most injured body parts-arms and legs) are spotted, all of the future activities should be in that matter. However if the results are compared with the ones from past years, a positive movement is spotted in a matter of occupational safety at direct work places. At the end, I must say that the following of the results will continue and will also be a part of another paper in future.

REFERENCES

- [1] Internal data from the Society for Occupational Safety Bitola from Bitola, R. Macedonia
- [2] Data from the Occupational and Safety local inspectors, Bitola, R. Macedonia