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- Conferences: 20 (14 in Poland, 6 abroad: Hong Kong, Czech Republic, Hungary, Spain)
- Workshops: 27 (e.g Writing in the Science, The Power of Social Media, Smart Cities, Developing Your Research Project, Learning Online: Learning and Collaborating, Learning Online: Searching and Researching)
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Prof. Angelo Robert Nicholas MOLSON was born in Hammersmith (London of Hammersmith and Fulham, England) and is a multicultural artist – author and has written more than 150 articles, e-books, novels, reviews, papers and reports for International Conferences, Global e-Conferences, e-Journals, Periodicals, Newspapers, Seminars, Magazines and e-bookstores. He has participated as an academic - author - editor - researcher - reviewer and scientific expert advisor for many Publications, Exhibitions, e-Conferences and International Events in Belgium, Cyprus, France, Germany, Greece, Italy, Philippines, Poland, Slovakia, Slovenia, Spain, Thailand, U.K., U.S.A., Other.

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Injuries into the largest industrial entity from Bitola

Part from an extensive research considering the OSHAS system into the biggest power plant in R. Macedonia

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Abstract—**One of the basic aims of the paper is to present only a part from an extensive survey considering the injuries into Bitola's industrial entities, an survey which was conducted into the time frame from January till December 2015. The paper represents the situation with injuries into the largest power plant in R. Macedonia - A.D. ELEM REK Bitola. All of the data gathered were analyzed considering several key criteria's.**

Keywords- quality control, integrated management system, industrial entities in Bitola, injuries

I. INTRODUCTION

In Bitola region in the period from January to December 2015 a complete analysis – extensive research concerning the application of quality control systems and integrated management systems was conducted. The purpose of the survey was to consider all industrial entities that are in Bitola region and analyze the methodologies, techniques and formally adopted procedures for quality control in various industries, but also to analyze consistency in the application of integrated management systems. In fact the analysis itself was divided into several stages, including the basic subject of the paper – injuries on direct work places. For this purpose in cooperation with the regional inspectorate for health and safety, all of the injuries that occurred in Bitola's industrial entities were recorded and analyzed. Subject of analyzes were most of the industrial entities that are working into the specified region, but as a segment which is shown into the paper is A.D. ELEM REK Bitola, as a representative subject. The reason why this capacity is subject of analysis and presentation in this paper is the size (both in terms of number of employees directly employed into the capacity as well as in terms of indirect jobs that have been created into the subject) but also in terms of the importance that the capacity has in a matter of electricity production (the largest producer of electricity in Macedonia with a combined market share of more than 70%). In addition to the labor selected segments from the research are displayed, such as: gender of the injured person, type of injury, a quarterly record of injuries, repeatability of the injury, number of days lost due to injury etc.

II. PRESENTING THE RESULTS FROM THE RESEARCH

In this paper as an object of analysis is taken the largest producer of electricity in Macedonia. We are talking about A.D. ELEM REK Bitola, which is the mining and power plant which marks its beginnings since the 1982 and today represents an important segment of the energy production for Macedonia with a total production of over 70% of market needs. Also it is an important economic entity in Bitola and Bitola's region with over 1600 employees, which brings him among the three largest business entities in the Bitola region in staffing among Socotab Bitola and Kromberg and Schubert. The plant also represents indirect employees for the subcontractors working activities with a numerous employees. This fact makes him an important industrial entity into Bitola's region which is especially important for the development of the economy in Bitola and beyond. Therefore the object of research is appropriate and the industrial entity which is shown is the right representative example for the segment of the research that is shown into the paper.

This section provides a detail overview of the recorded injuries in A.D. ELEM REK Bitola in the period from 01.01.2014 till 01.01.2015. What is particularly important is that the survey was done with cooperation with the regional health and safety inspectors, but also data from the Health fund were used (regarding the absence due to an injury). In the area of research and analysis as an representative industrial capacity into the paper A.D. ELEM REK Bitola is given, in which the results are a realistic portrayal of the real situation in terms of injuries. It is more than important to mention that the area of analysis includes several criteria's such as: gender of the injured person, the total number of injuries, day from the week when the injury is spotted, age of the injured person, body part that is injured, type of injury, time frame, the total number of working days that are lost due to an injury, repeatability of the injury, etc. This paper presents only sub line piece from the research which itself includes several selected criteria's.

In addition of the paper, tables and graphs are given and the same ones are the best representation for the selected criteria's.

TABLE I. ANALYZING THE DATA CONSIDERING CRITERIA – GENDER OF THE INJURED PERSON

Male	Female	TOTAL
112	12	124
In percent (%)		
90.3	9.7	100%

Analyzing the data presented into Table 1, it's more than obvious that most of the registered injuries and injured persons are male, which is not so surprisingly having in mind the type

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of activities doe on direct work places. From this aspect it is also crucial to mention that the number of total injuries recorded into Bitola's region is 323, so if we correlate with the injuries recorded into A.D. ELEM REK Bitola conclusion is that they represent more than 1/3. That is the reason why the exact business entity is chosen as an representative example. On the other hand taking into consideration the number of employees into the business entity that was under consideration, we can conclude that considering the total number of employees (1781) and considering the fact that we have spotted 124 injuries the percent of injuries into the industrial entity is 6.96%. Seeing more deeply and considering that we have 1668 male employees and 113 women employees into the entity, and considering the facts represented into the table 1, we can conclude that we have 6.96% percent employees that were injured from the male gender and also 10.61% women injured persons.

TABLE II. ANALYZING THE DATA CONSIDERING CRITERIA – PROFESSIONAL QUALIFICATION OF THE INJURED PERSON

Primary education	High school	College degree	University degree
12	100	10	2
In percent (%)			
9.7	80.6	8	1.7

Analyzing the data presented into Table 2, the situation proves that most of the injured persons have secondary education, and if we analyze the job places and the description of working activities it is not so strange, due to the fact that the process of work and work activities seek this kinds of qualifications.

TABLE III. ANALYZING THE DATA CONSIDERING CRITERIA – TYPE OF INJURY

Mechanical	Electrical	Other reasons
115	4	5
In percent (%)		
92.7	3.3	4

Analyzing the data presented into Table 3, most of the injuries are from mechanical nature, but further analysis are more than necessary for the injuries recorded as a result of an electricity and other reasons. Considering the work activities and the data for the injuries, the injuries from an electrical nature had several sources that are evidenced as a reason for injury such as: welding, burns from improper work with welding instruments, burns from welding and explosion caused from sparks from an electrical cable. On the other hand injuries recorded under other sources include several other reasons such as: assault from a colleague, stretch ligaments, loss of balance at work and a heat wild animal. Seeing the reasons presented before, it's more than obvious that further steps for creating safer work places are more than needed.

TABLE IV. ANALYZING THE DATA CONSIDERING CRITERIA – INJURED BODY PART

Leg	Eye	Arm	Head	Fingers	Body
57	4	47	12	15	17
In percent (%)					
37.5	2.7	30.9	7.9	9.8	11.2

Analyzing the data presented into Table 4, it is more than obvious that the total amount of injuries shown here (152) does not correspond with the total number of injured people (124). The reason is that the analysis of the injured persons shows that there were 28 cases of multiple injuries. On the other hand analyzing further and seeing the tabular view it is more than obvious and also expected that most of the injuries will be and are recorded on the hands and on the feet.

TABLE V. ANALYZING THE DATA CONSIDERING CRITERIA – REPEATABILITY OF INJURY

Twice	Three times	Four and more
20	3	1

Analyzing the data shown in Table 5, we could say that the most characteristic is that the analysis of the recorded injuries led to findings who say that the same person (worker) had two, three, four and even more injuries during the year. This fact led to additional activities into the industrial entity which included additional training, assignment of protective equipment and even rotation on other job places into the entity during the working month. On the other hand analyzing these 24 injuries and correlating the same ones with the total amount of injuries spotted into the industrial entity (A.D. ELEM REK Bitola) which were 124, we could say that these multiple injuries during the year at the same person are significant 19.35% from the total amount of injuries spotted into the year.

This observation led to the specific future steps which includes: analysis of the injury not only from statistical nature but by several other aspects such as repeatability of the injury and the injured person, future analyses of the workplaces where these kinds of injuries are spotted, future steps with these kinds of injured persons etc., with an aim to take appropriate protective measures in order to reduce the number of injuries on direct work places.

On the other hand the data that is worth mentioning is the total number of working days lost as a result of an injury, which is in total 2557 working days.

From that aspect an according to the records of injuries and the number of lost working days due to injury, the table below is the best representative of the number of injuries and sick leaves that followed as a result.

TABLE VI. ANALYZING THE DATA CONSIDERING CRITERIA – NUMBER OF LOST WORKING DAYS DUE TO INJURY

Lost Working Days	Number of injured persons
Up to a week	24
From 7 to 14 days	46

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Up to 30 days (14-30)	43
More than a month	41

Analyzing the data presented into the tabular view 6, what is worth mentioning are the sick leaves that includes more than 30 working days. The reason why these sick leaves are so important is the Macedonian legislation from which up to a 30 day leave it's on the company cost, but further than that the health fund as a government institution pays the rest of the sick leave to the worker. So therefore these findings are from a national interest considering that these cases are 41 – only in this industrial entity. This is the reason why a national strategy for reducing the injuries in direct work places is more than necessary.

TABLE VII. ANALYZING THE DATA CONSIDERING CRITERIA – QUARTERS IN THE YEAR AS A CRITERIA

First	Second	Third	Fourth
28	40	32	24
In percent (%)			
22.6	32.2	25.8	19.4

Analyzing the last table 7, where an analysis of the number of recorded injuries is presented in appropriate annually quarters, the most characteristic records are the ones from the second quarter. Analyzing in more detail, in fact this quarter is the one in which most of the recurrent injuries are also recorded, but unfortunately the records led to the fact that also most of the multiple injuries occurred in this quarter.

Based on these findings future actions are more than obvious such as: research on whether there is an increase in production and operating activities during these months, whether in this period some risky activities or repair activities were performed, whether during these months the expected replacement of protective equipment was done, if there were new employees and so on.

In fact the paper represents only a small part from an extensive survey in which all industrial facilities which are in Bitola region were analyzed. However the data presented in the paper led to conclusion that this entity is a representative sample itself where 124 cases of injuries on direct work places were spotted, from which the future analyzes conclude that every single employee could be hurt.

Analyzing other relevant information's which aren't presented in the paper the actual conclusion led to another relevant fact which confirms the notion that anyone could be hurt, from young employees to the most experienced ones. Seeing further the data from the research the most injured persons are in the age frame 45-64, although these workers are one of the most experienced staff in the industrial entity. Just in A.D.ELEM REK Bitola 56% of the injuries are seen on workers from the age frame 45-64 years old. That is the reason why everyone should be a part of the activities for safer work places. At the end, the information's presented into the paper lead to the conclusion that the research should not stop just on statistics and obtaining newer information's, the same one should generate concrete actions that would have to solve the injury reasons and to lead to reducement of the total amount of injured persons (workers) and finally to more safer work places.

III. CONCLUSION

This paper is only a small part from a larger survey in the Bitola region, with several basic aims such as: generating an idea how the quality control is done in industrial entities, how integrated management systems are implemented and used into industrial entities, what is the situation with the injuries and the injured persons in the same ones and also what are the actions that should be done with an aim to create a more safer work places. In fact this paper represents a solid overview of the situation with the injuries into the largest power plant in Macedonia, A.D. ELEM REK Bitola. The reason why this industrial entity is chosen is because over 1/3 of the total injuries spotted in Bitola are into the same one. The data presented into the paper are only a small segment from the conducted research, but they are a solid proof that anyone regarding the education, work experience, job place, access to the protective equipment and previously conducted training on workplace hazards and appropriate protection measures could be injured. That is why the paper is only an introduction to the specifically targeted research, which is conducting at the moment, which should give an overview on the measures that are taken to prevent injuries in all of the industrial entities into Bitola's region. This paper and the research that is conducting at the moment could be a guide to future concrete actions in a matter to prevent and reduce hazards and total amount of spotted injuries on a year base.

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