

SAFETY MANAGEMENT DURING ENTRY AND STAY IN INDUSTRIAL PREMISES FOR IRON AND STEEL PRODUCTION

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ABSTRACT

Safety management is the implementation of activities that guarantee the achievement of high safety standards in accordance with minimum regulatory requirements. The premises of the Zenica steelwork are classified, from the point of view of safety and health protection, as hazardous areas. Occupational safety and health tasks are organized within a precisely defined department and are in accordance with the company's rules of procedure. This paper will present the rules of conduct for persons entering or staying in the premises of the Zenica steelwork and represent a form of occupational safety for both employees and visitors for a shorter or longer period of time.

1. INTRODUCTION

An industrial process is a set of activities that are carried out to transform raw materials into a final product. Through an industrial process, various characteristics of the raw material can be changed, such as size, shape or color. All these processes require the involvement of people and machines in order to achieve the ultimate goal within a certain period of time. The combination of these two factors also carries a number of dangers for both employees and those in the immediate environment, i.e. the workplace.

Most organizations and companies are experiencing increasing uncertainty and instability in their security environment. As a result, they are faced with security issues that affect their objectives, and which they want to systematically address within their management system. A comprehensive approach to security management can directly contribute to the business capability and credibility of the organization [1].

Occupational safety and health is a part of the work organization and the implementation of work processes and technologies and it is implemented with the aim of ensuring that all employees enjoy working conditions free from danger to life and health, i.e. to avoid injuries, occupational and other diseases, and if they occur, to mitigate harmful consequences. The following are particularly protected: persons under 18 years of age, women (especially pregnant and lactating women) and older workers [1,2].

In every company an Occupational Safety Measures Programme is determined and adopted, in order to systematically implement and improve occupational safety. According to the Law and regulations on occupational safety, the employer or company is obliged to provide employees with appropriate personal protective equipment. The means of personal protection of employees are determined by the Register of Personal Protective Equipment, which is adopted by the manager based on proposals, e.g. from managers of individual sectors and managers in the field of health and safety. All above mentioned is mandatory, and an example of this is the application of protective measures in a large company - the Steel Plant in Zenica, which is in compliance with the Law and regulations on occupational safety of the Federation of Bosnia and Herzegovina.

Occupational safety is a public interest for every country. Proper occupational safety is a prerequisite for every successful work process, both in Bosnia and Herzegovina and worldwide. Without adequate protection and all the precautionary measures prescribed by law, the risk of injuries, work-related illnesses and even fatal accidents increases drastically. The purpose of occupational safety is to create safe working conditions in order to prevent disruptions in technological and production processes with possible consequences for the health and life of workers. The Law on Occupational Safety published in the FB&H prescribes and defines the conceptual definition of the basic concepts of occupational safety, persons who have the right to safety and health protection at work [3].

The Occupational Safety and Health Regulations contain general provisions, defined by articles, which are in accordance with the Occupational Safety and Health Act and its implementing regulations. The Regulations generally regulate, plan and organize occupational safety and health; regulate the rights, duties and responsibilities of employees in implementing and improving occupational safety and health; training and knowledge testing; conducting periodic inspections and testing of work equipment and personal protective equipment; implementing technical occupational safety measures; determining occupational safety measures and implementing occupational safety and health, and regulating other issues in the aforementioned area that are specific to a particular firm or company.

Responsible organizations recognize that risks can only be effectively controlled within a process integrating three key spectars [1]:

- technical spectar which includes tools and equipment used,
- human spectar which includes people in direct contact with clients and their skills, training and motivation and
- especially organizational spectar which consists of procedures and methods which determine the relationship between tasks.

This paper will present the rules of conduct for persons who come or stay in the Iron and Steel Production Company, i.e. the Zenica steelwork and who are exposed to numerous hazards existing in such complex companies.

2. POSSIBLE HAZARDS WHEN ENTERING THE ZENICA STEELWORK

Conditions for safe work are achieved when the means of work, man and the working environment meet the requirements that are in line with the rules of occupational safety and health and as such they permanently ensure the proper functioning of the work process. In disturbed relationships between man - machine - working environment, there is a risk that a person will act improperly and cause an accident with his actions, which may or may not result in injury, damage or some other loss.

When entering the Zenica steelwork, there are various types of hazards, characteristic of such companies, and it is necessary to use personal protective equipment (PPE) and adhere to the rules and regulations of this company [4].

2.1. Personal protective equipment

Personal protective equipment is used by workers during work, in which it is not possible to fully eliminate risks to safety and health and in cases where the employer cannot sufficiently reduce risks by applying basic rules of occupational safety or appropriate work organization. Each work organization must have prescribed documentation that is in accordance with the standards and legal regulations in force. The organization's management is responsible for implementing occupational health and safety management and must ensure educated staff, i.e. responsible persons. Incident investigations and the implementation of corrective actions aim to improve safety and prevent the recurrence of events with harmful consequences for people and the environment [5,6].

The right of the worker is to receive appropriate protective equipment free of charge, and the obligation of the employer is to provide it. It is also very important that the worker is trained to correctly use personal protective equipment.

Personal protective equipment and equipment at work refers to various means used, Figure 1.



Figure 1. Personal protective equipment [7]

When using personal protective equipment and equipment at work, the prescribed standards in this area must be observed, since the worker is exposed to various hazards during the work process. If these hazards cannot be eliminated or reduced by technical and organizational measures, the use of adequate protective clothing is necessary, and employers are obliged to provide employees with protective equipment that meets the quality requirements prescribed by the standards.

Also, in special working conditions, where there is a risk of falling from a height or into a depth, safety belts and safety ropes prescribed by the standard are used, or for work in

particularly unfavorable atmospheric conditions, means and equipment for protection against adverse atmospheric influences are used [8].

2.2. Hazards and causes of hazards at the Zenica Steelwork

When entering the Zenica steelwork, there are various types of hazards, characteristic of such companies, and the most important of them are listed in Table 1, with an indication of the causes of the hazard and the use of personal protective equipment (PPE) [4].

These hazards are being constantly present and when entering the company, the personal protective equipment must be used, along with mandatory adherence to the rules of conduct and movement. Therefore, in order to prevent accidents due to the aforementioned hazards, the use of protective equipment is mandatory. Failure to comply with the instructions is sanctioned and there is a ban to enter the Company's area and premises.

Table 1. Hazards and causes of hazards in the Zenica steelwork [4]

Hazards	Causes of danger	Personal protective equipment
Falls and trips	Stairs, elevations, depressions	Appropriate shoes
Falling from a height	Platforms, bridges between halls, scaffolding, etc.	Safety belt, ladder, footrest
Falling of objects	For overhauling at height or working on a platform, etc.	Protective helmet
Sprains	Walking off the mark and inadequate footwear	Safety shoes
Noise	Siren noise, shocks, steam release, etc.	Hearing protection
Intrusion of a foreign body into the eyes	Various particles of particles and splashes of liquid metals	Safety glasses
Pressing against a wall or other obstacle	Cranes with raised / prominent loads, excavators, car cranes, road and rail vehicles	
Winding up or pulling down	Caused by rotating mechanisms or conveyor belts	
Other hazards	Electric shock, burns, radiation, chemical corrosion, gas poisoning, etc.	

Since there is no personal protective equipment for all of the above, it is important to emphasize that there are warning signs for a large number of hazards, which must be observed in order to prevent possible injuries or fatalities. Some of the most common personal protective equipment in the Zenica Steelwork are given in Figure 2.



Figure 1. Some of the personal protective equipment required in the Zenica Steelwork [4]

The warning signs also include certain prohibitions. Prohibitions while in the Zenica Steelwork are set out in the internal regulations for protection and safety. These regulations for visits or stays in the specified area prescribe in the form of an order the following [4]:

- Movement is only allowed on marked roads and access roads (without entering the shunting track),
- Entry into dangerous areas and areas where movement is otherwise prohibited,
- Entry into any areas with suspended loads is prohibited,
- Handling of control units of machines and technology is prohibited,
- Touching electrical cables, lines or pipes is prohibited,
- Protective devices (shields) must not be removed or damaged,
- Observance of safety signs and colors is mandatory,
- Use of personal protective equipment (PPE) is mandatory,
- Entry into material storages (heaps) and objects stored at workplaces (safety sensitive position) is prohibited,
- Compliance with the no smoking order (Fire protection) due to possible explosion is mandatory.

In addition to persons staying in the Company, the rules of conduct must be respected by persons performing driver duties during loading or unloading, who are also persons who enter and occasionally stay in the Company premises. These are the following mandatory instructions [4]:

- Respect and comply with the instructions given by the person responsible for loading,
- Do not enter the vehicle into production facilities and halls without the permission of the person responsible for loading,
- Do not stay in the vehicle loading area or under suspended loads during loading process,
- Use your own ladder or any other means to climb to or from the loading area during loading,
- Before starting to reverse, use the horn and while reversing, the turn signal should be ON,
- In production facilities and halls, the engine should be turned off except when entering and exiting the vehicle,
- Do not remove snow, material residues, garbage, etc. from the loaded area or tarpaulin anywhere within the Company,
- On the scales, respect the weighing priorities of vehicles that have the logo of the Zenica Steelwork.

With the entry into force of the new Law on Occupational Safety in the FB&H and accompanying by-laws, the process of its implementation in practice is underway. However, the development of an occupational safety system at the employer, in accordance with the

new occupational safety policy in the FB&H, is a long-term process that will be established over a longer period of time. Currently, the current issues are the status of workers for occupational safety, who can manage occupational safety, risk assessment and the development of an internal act of the employer, i.e., the Rulebook on Occupational Safety, Organization and Management of Occupational Safety. Especially having in mind that the issue of occupational health and safety organization is different in different companies, organizations and institutions (public and private sector), and taking into account whether they are small, medium and large companies, all above mentioned should be adapted to those conditions [5].

3.CONCLUSIONS

Proper occupational safety is a prerequisite for any successful work process, both in Bosnia and Herzegovina and worldwide. Without adequate protection and all the precautionary measures prescribed by law, the risk of injuries, work-related illnesses and even fatal accidents increases dramatically. However, safety and security in a company does not only apply to employees but also to those who come to the premises of the said company for work or visits.

Today, work organizations are experiencing increasing insecurity and instability in the security environment. As a result, they are faced with security problems that affect their goals, and which they want to systematically address within their management structure. A proper approach to security management can directly contribute to the business ability and credibility of the organization.

Persons entering the Steelwork during visits or possible work obligations, as well as persons performing driver duties during loading or unloading in the premises of the Zenica Steelwork, must comply with the internal safety regulations when entering these areas, and internal transport areas. Also, these persons must be familiar with them before entering the premises of the Steelwork.

This paper presents the rules of conduct for persons who come to or stay in the Iron and Steel Production Company, i.e. the Steelwork in Zenica, and who are exposed to numerous risks, which are characteristic of the production process of this Company.

Compliance with regulations in a large and demanding company is necessary but also mandatory. They are reflected in the form of orders, regulations, warning signs, indicating dangerous places and the use of personal protective equipment. Failure to comply with the above regulations and rules of conduct is subject to sanctions, as well as a ban on entering the premises of the Steelwork.

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