

# 1. INTRODUCTION

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## 1.1 INTRODUCTION TO THE BASIC CONCEPTS OF OCCUPATIONAL HEALTH AND SAFETY

The reassurance of the health and the safety of the manpower in a working environment is a critical issue and a major responsibility. Stakeholders in this responsibility are:

- the state, for providing the necessary legislation framework and for the proper operation of the competent control authorities
- the employers, for keeping their obligations according to the relevant legislation
- the employees themselves, for being able to anticipate the criticality and delicacy of the issue and to respond with the necessary sensitivity.

According to the labour legislation, the term *labour accident* is defined as an external violent event giving rise to work incapability, whereas the term *work-related disease* as the ill-health that is judged to have been caused by or made worse by a person's work activity or environment.

The issue of occupational health and safety has a strong impact in:

- the employee himself
- the company/ firm/ enterprise
- the state
- the society in general.

To cope effectively with such a problem it is clear that a strong effort is needed from all the engaged parts:

- The employees
- The occupational health and safety personnel
- The production responsible staff
- The employers
- The designers and work planning engineers
- The state and its competent authorities.

Furthermore the efficient labour accident and work related disease control management is considered to be based on:

- the knowledge and the estimations of the experts, meaning the work of the Safety Engineer and the Labour Doctor

- the obligation and the sensitivity of the employer
- the awareness and the participation of the employees and their representatives (Union Trades, Occupational Health and Safety Committees)

At this point it is necessary to stress that the role of the Syndicalistic Movement in the protection of the employees' fundamental rights for proper working conditions and safe working environment is of great importance. Experience shows that the best results are achieved with the consulting support of the experts, meaning the Safety Engineer and the Labour Doctor, in combination with the efficient communication and consultation with the employees. From such a controversy and co-operation the employer is orientated to the most efficient risk control policy.

Based on a strong belief that all kinds of problems should be identified, examined and evaluated in such a way that their solution is correctly planned, we worked on the edition of the **“Occupational Health & Safety Risk Assessment Guide”**. Nevertheless, we consider it necessary to stress the fact that for the assessment and especially the evaluation of the risks in a working environment not only a significant amount of expert knowledge is required, but also a considerable relevant experience. Fortunately or not, it is not a task to be successfully accomplished by everyone, be it an inexperienced worker or even an engineer, or a physician who does not have some relevant experience. On the other hand, it is true that in a very high percentage the employees, especially in our country, are inadequately informed about the issues of occupational health and safety and are ignorant of both the relevant legislation and the preventive measures.

Thus, the edition of this **“Occupational Health & Safety Risk Assessment Guide”** comes as a contribution to the spreading and understanding of the basic occupational health and safety concepts from all the engaged in the working environment parts and mainly as an aid to the employees and their union trades in order to be able to assess the risks in their own workplaces and to claim for their right to proper working conditions.

Furthermore, this guide may be also a useful tool to Small Medium Enterprises' owners, handicraftsmen and even to production engineers, who in many cases have to do the job of a safety engineer without having any prior relevant experience.



## 1.2 LEGISLATIVE FRAMEWORK

In 1989 the Council Directive 89/391/EEC *“on the implementation of measures to promote the improvement of the workers' safety and health on the workplace”*, also referred as General Directive, was issued aiming at the better protection of the workers and at equal conditions among the member states of the EU.

The main characteristic of the above Directive is that it states the general principles on which all the national legislation relevant to occupational health and safety of the member states should be based on. These principles concern the promotion of health and safety issues (work – related diseases prevention, elimination of the potential hazards) and also the statutory framework and procedures (rendering aware, discuss, active participation of the employees, instruction and training).

In Greece the harmonisation with the General Directive was done with the decree law 17/96, which enhanced the regulations already introduced in both law 1568/85 and decree law 294/88 implementing at the same time the new requirements of the above Directive.

Among the new requirements there is the employers' obligation of having a *written risk assessment of all the existing hazards that concern the occupational health and safety of his employees*.

The above assessment is mainly aiming at the identification and prioritisation of the potential hazards in order to correctly plan the necessary actions that could reassure the health and safety of all the employees and of everyone else affected in any way from the operational activities of the company/ firm/ enterprise.

Risk assessment is an internal procedure. It is performed by the Safety Engineer, the Labour Doctor, the Internal Division of Protection and Prevention or the External Division of Protection and Prevention, to whom the employer is providing every needed help in material or personnel. During the assessment procedure the participation of the employees and their representatives is required, as well as their informing after the completion of the assessment on the risk control policy and the implementation plan of the necessary considered preventive measures.



### 1.3 THE RISK ASSESSMENT PROCESS

Risk assessment is the systematical analysis of every aspect of all the tasks performed in the workplace in order to identify:

- what could cause loss or damage
- in which extend could the potential hazards be eliminated
- the protective and preventive measures already in use and those that are necessary to implement for the adequate control of the residual risks

It is important to make a clear distinction between the concepts that are expressed with the terms **Hazard** and **Risk**:

**Hazard:** A source or a situation that under certain circumstances has a potential for harm.

**Risk:** The combination of the likelihood and consequence of a specified hazardous event occurring (human injury or ill health, damage to property, damage to the environment or a combination of these).

There are no strict rules for the risk assessment process. However, in all the known methodologies the following general steps are suggested:

1. Identify the potential hazards
2. Identify those who may be exposed to these hazards
3. Evaluate or estimate the risk
4. Identify and evaluate the risk control measures that are already in use and consider and implement additional risk control measures
5. Monitor the measures/ Review and feedback corrective actions.

#### 1.3.1 IDENTIFY THE POTENTIAL HAZARDS

In order to identify the potential hazards, the working environment inspection is necessary in order to record and analyse the different tasks and work phases. There are several approaches for the examination and separation of the potential hazards, such as:

- **By type:**
  - Physical Hazards (noise, insufficient or improper light, high or low temperatures, vibrations, radiation, etc)
  - Chemical Hazards (hazardous substances)
  - Biological Hazards (viruses, fungi, bacteria etc).
- **By source:**
  - Hazards associated with materials or equipment (hazardous raw material, subproducts or final products, improper equipment, improper job site, inadequate maintenance of the machinery and equipment, improper design etc)

- Hazards associated with the working environment (physical, chemical, biological, non-ergonomic design, psychological factors, bad organisation of work etc)
- Hazards associated with human factors (ignorance, negligence, avoidance or wrong actions etc).
- **By production phase:**  
E.g. hazards associated with the preparation, production, transportation, storage, delivery of a product
- **By job site:**  
E.g. hazards identified in the offices, the warehouses, the main production/secondary processing departments etc

### **1.3.2 IDENTIFY THOSE WHO ARE EXPOSED TO THESE HAZARDS**

For the identification of the personnel who might be exposed to the identified hazards, first it is necessary to define the groups of workers that are engaged in the same tasks (e.g. operators, maintain personnel, office employees etc) and then the individuals among them that are considered to be more vulnerable, the very young and the very old aged ones, women in pregnancy, apprentices, workers with health problems etc.

### **1.3.3 EVALUATE OR ESTIMATE THE RISK**

Qualitative or quantitative methods can be applied for the risk assessment, depending on the type of operational activity. In most cases qualitative methods are used that either rank risk as Low – Medium – High or estimate it with a simple mathematical formula, e.g.:

$$\text{Risk} = \text{Lik.} \times \text{Sev.},$$

**Where Lik.:** likelihood of occurrence

**Sev.:** severity of the harm

The different grades of likelihood and severity or their combination in such methods are given in tables.

Quantitative methods (e.g. Fault Tree Analysis) are using numerical data relevant to the equipment, environment and human factor “failure” cases, these methods and are more commonly used in industries with large scale accidents. Statistical data and information from databases are also frequently required in such methods.

During the risk evaluation step, the existing preventive and protective measures are identified and evaluated. If these measures eliminate or reduce the risks to an acceptable level and they satisfy the legislative requirements, the relevant standards, the internationally accepted “good practice” and – last but not least - they are also known and applied by the employees, then the risks are considered adequately controlled. If this is not the case, new or additional preventive and protective measures should be implemented. After a significant amount of time, feedback should be taken from the implementation of these new measures in practice for the necessary monitoring and reviewing to be done.

Additionally, cases of employees’ permanent exposure in particular hazard (e.g. high level of noise, hazardous chemical substance etc) should be treated with special care. Depending to their level, several such hazards may cause serious occupational diseases and illnesses. In such cases the active involvement of the Labour Doctor is considered necessary for the risk assessment to be complete, as well as the following actions:

- Measurements of the level of the hazards and the hazardous substances
- Statistical analysis
- Frequent medical examinations.

### **1.3.4 IDENTIFY AND EVALUATE THE RISK CONTROL MEASURES THAT ARE ALREADY IN USE – CONSIDER AND IMPLEMENT ADDITIONAL SUCH MEASURES**

The ultimate goal of the whole risk assessment process is to propose and establish an efficient system of safety management. The general principles towards this direction, as indicated in decree law 17/96 legislation framework are the following:

- i. Risk elimination
- ii. Evaluation of the risks that cannot be eliminated
- iii. Tasks fit to human
- iv. Replacement of the hazardous with the non hazardous or the less hazardous
- v. Prevention planning based on relevant technology, organisation of the work, working conditions and environment, employers-employees good relationship
- vi. Risk control in its source
- vii. Collective preventive measures taken in priority over personal protective measures
- viii. Implementation of the latest technological upgrades
- ix. Provide all the necessary instructions to the personnel

According to the above, the proposed risk control measures should have an hierarchical order such as:

1. Risk elimination
2. Risk isolation
3. Send away the employee from the potential hazard source
4. Risk reduction by the use of collective preventive measures
5. Personal Protective Equipment, Safety signs, personnel training on occupational health and safety issues.

### **1.3.5 MONITOR THE MEASURES/ REVIEW AND FEEDBACK CORRECTIVE ACTIONS**

Risk assessment is not a procedure that is done once and for all. The assessed facts have to be reviewed and re-examined in order to be completed or modified, especially in cases when:

- Raw materials, equipment or work methods have been changed
- New risks are created from the implementation of the new risk control measures or existing risks that are still there despite the above implementation
- New evidence (such as new regulations, EU directives, standards or technological innovations) that may help towards the enhancement of the existing risk control measures.