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SAFETY IN LABORATORIES

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ABSTRACT

The control regulations of hazardous substances (COSSH) have the aim to protect the user from other unwanted effects of substances that are harmful to health. This is only possible by using risk evaluation and implementation adequate prevention control or minimizes exposure to substances.

The prevention or the reduction of laboratory's users exposure to hazardous substances can be achieved by: finding out what the health hazards are; deciding how to prevent harm to health; providing control measures to reduce harm to health; making sure they are used ; keeping all control measures in good working order; providing information, instruction and training for laboratory users and others; providing monitoring and health surveillance in appropriate cases; planning for emergencies. The hazardous substances can take many forms such as chemicals, products containing chemicals, fumes, dusts, vapors, mists, nanotechnology, gases and asphyxiating gases and biological agents (microorganisms). The control of risk measures is essential and it is based on the elimination, substitution, reduction, engineering control and additional measures. Besides COSSH, The European Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures – the CLP Regulation – came into force in all EU member states.

However, COSSH is used widely in Europe while these control regulations are not used in the practice in Bosnia and Herzegovina's laboratories. To proceed with a laboratory's work we are obligated to use the control regulations to protect ourselves as well as a surrounded environment. Any kind of spillage of hazardous substances can cause the environmental disaster that can be dangerous to humans, flora and fauna and the whole environment.

Keywords: safety, laboratory, COSSH

1. INTRODUCTION

The Control of Substances Hazardous to Health Regulations 2002 is a United Kingdom Statutory Instrument that states general requirements on employers to protect employees and other people from the hazards of substances used at work by risk assessment, control of exposure, health surveillance and incident planning. The employees' have to take care of their own exposure to hazardous substances and prohibitions on the import of certain substances into the European Economic Area. The regulations reenacted with amendements the Control of Substances Hazardous to Work Regulations 1999 and implement several European Union directives [1,2].

However it must be understood, that this assessment alone might not ensure that all the risks associated with the substance and the activity being undertaken will be adequately controlled. There may be other hazards associated with a substance such as those associated with its physical properties e.g. explosive, flammable, oxidising, which will also need to be considered. Measures must be taken to control these risks too, as required by the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002. Any hazards associated with other aspects of the work e.g. equipment used, proximity of other hazards, must also be considered and this is achieved by carrying out a suitable and sufficient risk assessment of the entire activity [3].

2. COSSH AT UNIVERISTIES

The COSHH Regulations, which apply to all areas of the University, require that before any work involving the use of substances hazardous to health commences, the risk to the health of those exposed is considered and appropriate safety precautions adopted. This document will assist those handling substances hazardous to health to do this.

The term '"substance hazardous to health" is closely defined in the Regulations and covers chemicals and preparations (mixtures, proprietary products, microbiological agents, allergens and dusts). Also included are substances, which are still subject to the Regulations and may not fall into these neat categories, e.g. sensitising agents, welding fumes, soldering fumes etc.

The Head of a School or Head of Administrative Directorate and their equivalents (HOS) is responsible for ensuring:

a) the requirements of the COSHH Regulations are complied with within their area of responsibility.
b) Principal Investigators/Supervisors undertake COSHH assessments in areas under their control. These people must have knowledge of the work being undertaken and a basic knowledge and understanding of COSHH. This responsibility should appear in the School/Directorate Safety Policy.
c) regular safety inspections take place of all their areas of responsibility and include monitoring of COSHH compliance. The inspections must be adequately documented and followed up where necessary.
d) routine checking and maintenance of control measures eg fume cupboards and other ventilation systems is undertaken.
e) all staff are made aware of COSHH, its objectives and procedures to be followed.
f) local rules exist where necessary to ensure COSHH compliance.

Principal Investigator/Supervisor is responsible for ensuring:

a) procedures carried out within their area of responsibility are adequately assessed and recorded.
b) appropriate control measures are identified and are used in practice.
c) persons working in their area of responsibility have received adequate instruction, information and training in respect of hazards which may form part of their job, and that they understand the risks involved and how the risks are controlled.
d) liaison with Health & Safety Services occurs where a need for monitoring or health surveillance is identified.
e) the HOS is informed where it is anticipated that the Regulations cannot be complied with.

All Staff and Students are responsible for ensuring:

a) any new procedure does not begin until it has been assessed and the necessary control measures established.
b) procedures are conducted using identified control measures and any personal protection that is stipulated.
c) faults are reported immediately to their supervisor/line manager [3].

3. REQUIREMENTS

EH40, 2007 describe in Regulation 6 requires that an employer not carry out work liable to expose employees to a substance hazardous to health without a risk assessment and implementation of the steps necessary to comply with the regulations. The assessment must include consideration of any information provided by the supplier of a substance (CHIPS) and must be reviewed regularly, and also when there is reason to think the assessment no longer valid, if the system of work is changed or if necessary because of the results of health monitoring. The assessment must also consider any occupational exposure limit, in particular, those mandated by the HSE.

Regulation 7 requires that an employer prevent exposure to hazardous substances of, if this is not reasonably practicable, that he adequately controls exposure.

Employers must take all reasonable steps to ensure that control measures, and any necessary equipment of facilities, are properly used or applied. Employees must use the control measures properly, return them after use and report any defective equipment.
Regulation 9 requires that employers maintain control measures in efficient working order and in good repair.
Where the risk assessment indicates that workplace monitoring of exposure is necessary, the employer must perform such monitoring unless he can demonstrate another means of preventing or controlling exposure.
There are many methods for monitoring a persons exposure to inhalation risks, the most common is to use personal air sampling pumps. These are usually flow controlled, rechargeable pumps worn by the operator, which pull a known volume of air through a sampling media such as filters or charcoal tubes. Pumps are generally worn for 8 hours or for a full working shift. The sample media is then sent for weighing if sampling for simple dusts, or for more in depth analysis via accredited laboratory.
Regulation 11 requires that health surveillance of employees is carried out where: an identifiable disease or adverse health effect may be related to the exposure; there is a "reasonable likelihood" that the disease or health effect may occur under the particular conditions of work; valid techniques exist for detecting indications of the disease of health effect; and the technique presents a low risk to the employee.
Regulation 12 demands that all employees liable to exposure to hazardous substances are provided with suitable and sufficient information, instruction and training, including:

1. Details of the hazardous substances including: names of substances and the risk that they present to health; any relevant occupational exposure standard, maximum exposure limit or similar occupational exposure limit; access to any relevant safety data sheet;
2. Other legislative provisions which concern the hazardous properties of those substances;
3. Significant findings of risk assessment;
4. Appropriate precautions and actions to be taken by the employee in order to safeguard himself and other employees at the workplace;
5. Results of any monitoring of exposure and, in particular, in the case of a substance hazardous to health for which a maximum exposure limit has been approved, the employee or his representatives shall be informed forthwith, if the results of such monitoring show that the maximum exposure limit has been exceeded; and
6. Collective results of any health surveillance undertaken in a form calculated to prevent those results from being identified as relating to a particular person.

Some biological agents can cause severe human disease and be a serious hazard to employees. Further diseases may be likely to spread to the community and there may be no effective prophylaxis or treatment available. Where employees are working with such an agent, or material that may contain such an agent, they must be provided with written instructions and, if appropriate, notices must be displayed that outline the procedures for handling such an agent or material.
Regulation 13 requires that employers prepare for possible accidents, incidents and emergencies involving hazardous substances by: preparing emergency procedures, including provision of first aid; making available technical information on possible accidents and hazards and bringing it to the attention of the emergency services; and installing alarms and other warnings and communication systems.

4. CONCLUDIONS

COSSH is used widely in Europe while these control regulations are not widely used in the practice in Bosnia and Herzegovina's laboratories. However, to proceed with laboratories experiments, the health risk form should be applied. All laboratory workers are obligated to use the control regulations to protect ourselves as well as a surrounded environment. Laboratories in Bosnia and Herzegovina should have same kind of the form which will describe the assessment of health risk with proposed

experiment in details together with guidelines which will be kept in laboratories. With this procedure the safety of employers and employees as well as all workers in laboratories will be on the high level. Any kind of spillage of hazardous substances can cause the environmental disaster that can be dangerous to humans, flora and fauna and the whole environment. By this way our working and wide environment will be protected.

6. REFERENCES

[1] Office of Public Sector Information (2002)
[2] Health and Safety Executive (2005a)
[3] Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002
[4] EH40, Occupational Exposure Limits. HSE Books. 2007