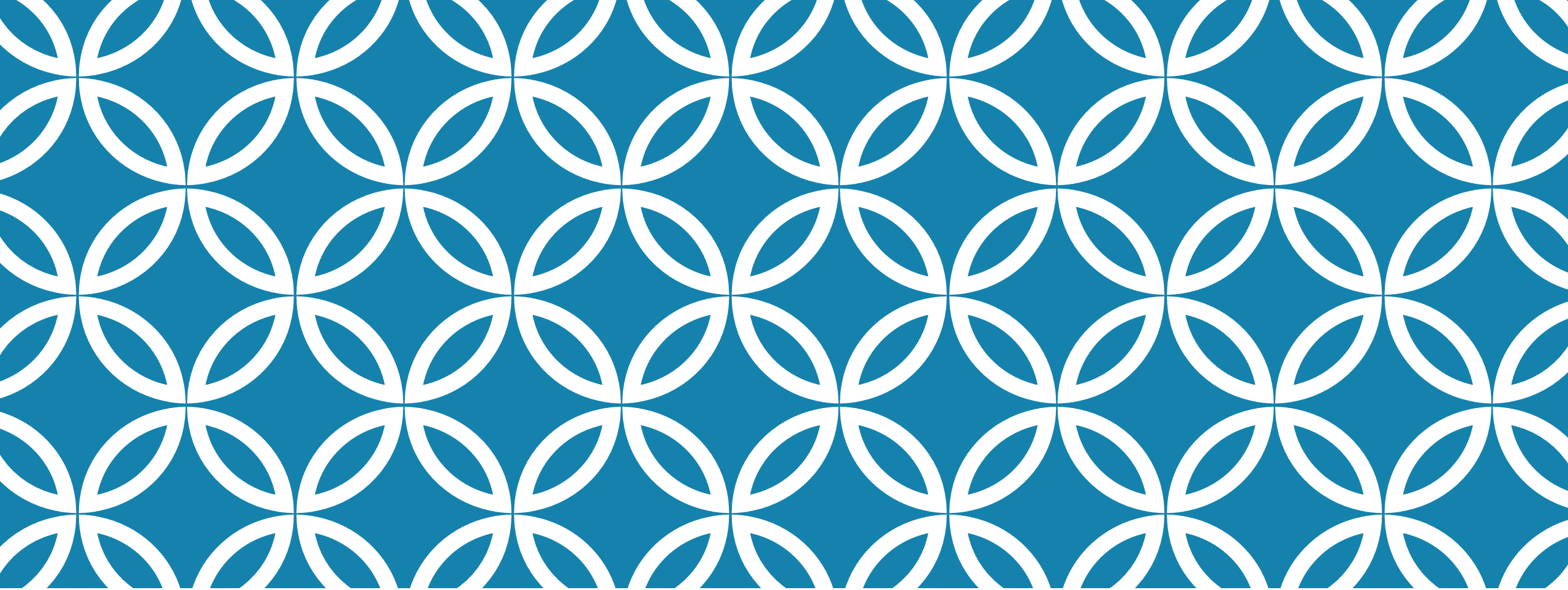

OCCUPATIONAL HEALTH AND SAFETY

Prof. Dr. Vural Emir KAFADAR

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- Alli, B. O., Occupational Health and Safety, ILO, International Labour Office, Geneva, 2008,
- Goetsch, D.L., Occupational Safety and Health for Technologists, Engineers, and Managers, 8th Edition, Pearson, 2010
- Fundamental Principles of Occupational Health and Safety

The process of protecting employees from work related illness and injury. It starts by developing a company Environmental, Safety and Health Policy statement and implementation of a work place safety plan and program.

CHAPTER 1

OCCUPATIONAL HEALTH AND SAFETY BASIC CONCEPTS, PURPOSE AND IMPORTANCE

Introduction

Occupational health and safety is one of the most important aspects of human concern. It aims an adaptation of working environment to workers for the promotion and maintenance of the highest degree of physical, mental and social well being of workers in all occupations.

The positive impact of occupational health service locally may be observed in reducing morbidity and work-related injuries. In addition, this also means fewer losses to employer and worker as there will be a reduction of wage losses and decreased compensation costs.

Making working conditions healthy and safe is in the interest of workers, employers and governments, as well as the public at large. Although it seems simple and obvious, this idea has not yet gained meaningful universal recognition. Hundreds of millions of people throughout the world are employed today in conditions that breed ill health and/or are unsafe.

Each year, work-related injuries and diseases kill an estimated 2 million people worldwide, which is greater than the global annual number of deaths from malaria. Annually, an estimated 160 million new cases of work-related diseases occur worldwide, including respiratory and cardiovascular diseases, cancer, hearing loss, musculoskeletal and reproductive disorders, mental and neurological illnesses.

An increasing number of workers in industrial countries complain about psychological stress and overwork. These psychological factors have been found to be strongly associated with insomnia, depression and fatigue, and burn-out syndromes, as well as with elevated risks of cardiovascular diseases.

Only 5-10% of workers in developing countries and 20-50% of workers in industrial countries (with a few exceptions) are estimated to have access to adequate occupational health services. Even in advanced economies, a large proportion of work sites are not regularly inspected for occupational health and safety in its policy.

Historical and Legal Context

The origins of occupational health and safety concerns can be traced back to the Industrial Revolution (late 18th to 19th century), which was marked by innovations like cotton spinning and textiles, steam engines, iron founding etc. This resulted in the emergence of cotton mills, semi-automated factories and iron industries, which became the „leading sectors", which established the base for the Industrial Revolution.

Although the Industrial Revolution contributed to economic development, it had a negative impact on the health and safety of the workers working in these factories and industries. Men and women workers were exposed to harmful gases, toxins, acids, extreme heat and cold temperatures, light and sound that had a harmful impact on their physical, social, and psychological health.

The injuries, diseases and health hazards faced by workers as a result of the Industrial Revolution drew the interest of scholars and leading thinkers of that period, who felt that issues of industrial health and hygiene must be addressed.

Alice Hamilton, an American toxicologist, physician and educator studied the impact of industrial metals and chemical compounds on human beings. She became a pioneer in industrial diseases and hygiene and contributed immensely to the discipline through her publications, which included Industrial Poisoning in the United States (1925), Industrial Toxicology (1934) and Exploring the Dangerous Trades, an autobiography (1943).

Dr. Alice Hamilton

Occupational health and safety is a cross disciplinary area and it interacts with other disciplines such as occupational medicine, occupational or industrial hygiene, public health, safety engineering, ergonomics, toxicology, epidemiology, health physics, environmental health, industrial relations, public policy, industrial sociology, medical sociology, social law, labour law, and occupation health psychology.

Although the urgency to address the occupational (industrial) health and safety issues emerged during the Industrial Revolution, it becomes much more crucial to address the issue at present with the tremendous expansion of cities across the world, further resulting in wide spread industrialisation and growth of population.

Issues of health, hygiene and hazard control are essential and have to be dealt with by state governments and other bodies responsible for ensuring the safety and well-being of all workers, by ensuring that there are health and safety policies, systems in every workplace and that these are implemented in the best possible manner.

World Health Organization (WHO)

The World Health Organization (WHO) is a specialized agency of the United Nations responsible for international public health. It is headquartered in Geneva, Switzerland and has six regional offices and 150 field offices worldwide.

The WHO was established on 7 April 1948 and convened its first meeting on 24 July of that year. It incorporated the assets, personnel, and duties of the League of Nations' Health Organization and the Paris-based Office International d'Hygiène Publique, including the International Classification of Diseases (ICD). The agency's work began in earnest in 1951 after a significant infusion of financial and technical resources.

The WHO's official mandate is to promote health and safety while helping the vulnerable worldwide. It provides technical assistance to countries, sets international health standards, collects data on global health issues, and serves as a forum for scientific or policy discussions related to health. Its official publication, the World Health Report, provides assessments of worldwide health topics.

According to WHO (1995), occupational safety and health can be defined as a multidisciplinary activity aiming at:

Protection and promotion of the health of workers by eliminating occupational factors and conditions hazardous to health and safety at work

Enhancement of physical, mental and social well-being of workers and support for the development and maintenance of their working capacity, as well as professional and social development at work

Development and promotion of sustainable work environments and work organizations

Occupational Health is a diverse science applied by occupational health professionals engineers, environmental health practitioners, chemists, toxicologists, doctors, nurses, safety professionals and others who have an interest in the protection of the health of workers in the workplace.

Occupational health has therefore gradually developed from a mono-disciplinary risk oriented activity to a multidisciplinary and comprehensive approach that considers an individual's physical, mental and social well-being, and general health and personal development. Across the world, Acts, legislations, and policies were created with the objective of ensuring good health and safe work environments for all workers. Every country has its own act and policy on OHS.

The International Labour Organisation (ILO)

It was founded in 1919 and is a UN agency, located in Geneva, Switzerland, bringing governments, workers and employers together to promote decent work and social safety nets. This is mainly achieved by setting and supervising international labour standards in the form of conventions and recommendations. The ILO plays an extraordinary role in the multilateral efforts to secure human rights and was the first to bring the subject of human rights to the world.

The ILO has 175 member countries, represented by workers, employers and governments.

It is the only international agency in which non-governmental sectors of society participate fully with government. The ILO has a special programme about child labour, called The International Programme on the Elimination of Child Labour (IPEC).

Fundamental Objectives and Principles of Occupational Health and Safety

Objectives of Occupational Health and Safety

The prime objective of OHS at a global level is to ensure that health and safety is accessible to every worker employed in any sector across the economy. The World Health Organisation (WHO) since its inception has included elements of occupational health in its policy. The need to protect the worker from occupational health hazards and promote safety of all at the workplace has been emphasised in key documents of WHO - the Constitution of the WHO, Declarations of Alma Ata Declaration, Global Strategy on Occupational Health for All, WHO General Programmes of Work and several resolutions of the World Health Assembly.

As a result of the changing work-life trends and the growing demand for higher productivity from the worker, there is an urgent need to address issues of OHS at the workplace for each worker. Based on this vision, the Network of WHO Collaborating Centres in Occupational Health, comprising of 52 research and expert institutions from 35 countries, met up twice to discuss the need for a new Global Strategy in Occupational Health.

The proposed strategy aims to set the standards for addressing the upcoming health and safety needs within the workplace. It also aims to address the differing conditions within the workplace as well as the OHS requirement within countries that are in different stages of development.

According to the document, *Global Strategy on Occupational Health for All*, the ten high priority objectives proposed by the strategy are as follows:

- Strengthening of international and national policies for health at work and developing the necessary policy tools
- Development of healthy work environment
- Development of healthy work practices and promotion of health at work
- Strengthening of OHS
- Establishing of support services for occupational health
- Development of occupational health standards based on scientific risk assessment
- Development of human resources for occupational health
- Establishment of registration and data systems, development of information services for experts, effective transmission of data and raising of public awareness through public information
- Strengthening of research
- Development of collaboration in occupational health and with other activities and services.

Principles of Occupational Health and Safety

Occupational health and safety is a multi-disciplinary field, covering issues related to law, medicine, technology, economics and industry specific concerns. The core occupational health and safety principles put forth by the ILO are as follows:

- ***All workers have rights***. Workers, as well as employees and government, must ensure that these rights are protected and foster decent conditions of labour. As the International Labour Conference stated in 1984:

- Work should take place in a safe healthy environment;

- Conditions of work should be consistent with workers" well-being and human dignity;

- Work should offer real possibilities for personal achievement, self-fulfilment and service society.

- ***Occupational health and safety policies must be established.*** Such policies must be implemented at both the governmental and enterprise levels. They must be effectively communicated to all parties concerned.

- ***There is a need for consultation with the social partners (that is, employers and workers) and other stakeholders.*** This should be done during the formulation, implementation and review of such policies.

- ***Prevention and protection must be the aim of occupational health and safety programmes and policies.*** Efforts must be focused on primary prevention at the workplace level. Workplaces and working environment should be planned and designed to be safe and healthy.

❖***Information is vital for the development and implementation of effective programmes and policies.*** The collection and dissemination of accurate information on hazards and hazardous materials, surveillance of workplaces, monitoring of compliance with policies and good practices, and other related activities are central to the establishment and the enforcement of effective policies.

❖***Health promotion is a central element of occupational health practice.*** Efforts must be made to enhance workers" physical, mental and social well- being.

❖***Occupational health services covering all workers should be established.*** Ideally all workers in all categories of economic activity should have access to such services, which aim to protect and promote workers" health and improve working conditions.

❖***Compensation, rehabilitation and curative services must be made available to workers who suffer occupational injuries, accidents and work related diseases.*** Action must be taken to minimise the consequences of occupational hazards.

- ***Education and training are vital components of safe, healthy working environments.*** Workers and employers must be made aware of the importance and the means of establishing safe working procedures. Trainers must be trained in areas of special relevance to different industries, which have specific OHS concerns.

- ***Workers, employers and competent authorities have certain responsibilities, duties and obligations.*** For example, workers must follow established safety procedures; employers must provide safe workplaces and ensure access to first aid; and the competent authorities must devise, communicate and periodically review and update occupational health and safety policies.

- ***Policies must be enforced.*** A system of inspection must be in place to secure compliance with occupational health and safety and other labour legislation.

According to a statement by occupational health institutes collaborating with the WHO (1995) the most important challenges for occupational health for the future will be:

- Occupational health problems linked to new information technologies and automation;
- new chemical substances and physical energies;
- health hazards associated with new biotechnologies;
- transfer of hazardous technologies;
- aging working populations;
- special problems of vulnerable and underserved groups (e.g. chronically ill and handicapped), including migrants and the unemployed; and,
- problems related to growing mobility of worker populations and occurrence of new occupational diseases of various origins.

Interdisciplinary Relationships

Environmental Managers: are those trying to eliminate hazards from the workplace cause many environmental problems.

Toxicology: is the science that studies poison ands toxic substances and their mechanisms and effects on living organisms. In other words toxicology is the study of adverse effects of chemical on biologic systems, or when a substance has a capacity to produce undesirable physiological effect when the chemical reached a sufficient concentration at a specific site in the body.

Toxicologists: are persons who study poisoning and responsible defining quantitatively the level of exposure at which harm occurs and they also prescribe precautionary measures and exposure limitations so that normal recommended use of chemical substance does not result in excessive exposure and subsequent harm

Ergonomics: is a multidisciplinary activity dealing with the interaction between man and his total working environment plus such traditional environmental elements as atmosphere, heat, light, and sound as well as all tools and equipment of the work place.

Chemical engineers are those who design process plant, they choose values, decide on how access will be gained and how cleaning will take place.

Mechanical engineers are those who responsible for choosing materials handling systems or for specifying noise levels on machinery.

Environmental health professionals: are those who apply their knowledge and experience, understand the environmental health hazards, analyse the technical and social approaches and reduce and eliminate human exposures and health impacts.

Industrial hygienists are scientists, engineers, and public health professionals committed to protecting the health people in the workplace and the community

Occupational health and development The health status of the workforce in every country has an immediate and direct impact on national and world economies. Total economic losses due to occupational illnesses and injuries are enormous (WHO 1999). The International Labor Organization (ILO) has estimated that in 1997, the overall economic losses resulting from work-related diseases and injuries were approximately 4-5 % of the world's Gross National Product.

Workforce is a backbone of a country development. A healthy, well-trained and motivated workforce, increases productivity and generates wealth that is necessary for the good health of the community at large.

Reasons for occupational accidents:

Workplace

Unsafe building

Old machines

Poor ventilation

Noise

Inaccessible to inspection

Workers

Limited education

Limited skill and training

Employers

Limited financial resources

Low attention and knowledge

In many developing nations, death rates due to occupational accident among workers are five to six times higher than those in industrialized countries; yet, the situation in developing countries is still largely undocumented due to poor recording system.

Workplace and Health

Work is an important component of an individual's daily life. A major proportion of an individual's life is spent at the workplace where he or she is expected to display their commitment and sincerity in performing various tasks. In contemporary times, workplaces demand a high degree of expertise and competency from its workers in every task they perform. This means that a worker's time and quality of work both play key roles in determining their performance and in ensuring the output produced.

This would mean addressing concerns like a worker's health, safety measures within the workplace, a pleasant and secure working environment, policies or systems contributing to an employee's physical, social and psychological well-being. Thus, approaching the workplace or an occupation from the perspective of health and safety is a crucial requirement and is the very basis of OHS.

Work receives considerable attention due to its social and economic importance. The primary function of work in any society is to produce and distribute goods and services. Not enough attention is paid to the importance that work has for the individual. However, studies have shown that work plays a crucial and unparalleled psychological role in developing self-esteem and a sense of work. Work for which there is no economic reward is also satisfying and personally gratifying. This refers to work such as childcare, care for the sick and aged, household-work, voluntary work etc.

The definition of a healthy workplace extended by WHO is “A healthy workplace is one in which workers and managers collaborate to use a continual improvement process and promote the health, safety and well-being of all workers and the sustainability of the workplace by considering the following based on identified needs:

- Healthy and safety concerns in the physical work environment;
- Health, safety and well-being concerns in psychosocial work environment including personal health resources in the workplace.
- Ways of participating in the community to improve the health of all the workers, their families and other members of the community”

Another very important category of labour is child labour. In developing countries across the world, children are forced to start working at a very young age. They are also employed in professions, which can pose serious health hazards and can cause severe disabilities in them. In India, despite the existing legislations the problem of child labour still exists.

Occupational Hazards

An occupational hazard can be defined as any condition that may adversely affect the wellbeing or health of the exposed persons. Identification of hazardous agents and groups of workers potentially exposed to these hazards are essential to characterise a workplace involving any occupational activity.

Occupational hazards can be divided into two categories: *safety hazards* that cause accidents that physically injure workers, and *health hazards* that result in the developing of a disease.

It is important to note that a “hazard” only represents the potential to cause harm. Whether it actually does harm will depend on circumstances, such as the number of workers exposed and the degree and duration of exposure. The occurrence or severity of occupational disease is related to the exposure to factors on the job or in the work environment.

Such factors can be:

Physical – heat, noise, radiation, vibration, cold

Chemical – solvents, pesticides, heavy metals, dust

Biological – Tuberculosis, hepatitis B virus, HIV

Psychosocial stressors – lack of control over work, inadequate personal support

Mechanical –causes of work accidents and injuries

Characteristics of Occupational Diseases

The cause of occupational disease is often overlooked by healthcare providers. This is due to several special characteristics of occupational disease that may obscure its occupational origin.

- The clinical and pathological presentation of most occupational diseases is identical to that of non-occupational diseases; e.g. asthma (excessive airway narrowing in the lungs) due to airborne exposure to toluene di-isocynate is clinically indistinguishable from asthma due to other causes.

- Occupational diseases may occur even after the termination of exposure. An extreme example would be asbestos-related mesothelioma (a cancer affecting the *pleura* and *peritoneum*) which can occur 30 or 40 years after the exposure. The clinical manifestations of occupational disease are related to the dose and timing of exposure; e.g. very high airborne concentrations of elemental mercury is acutely toxic to the lungs and can cause pulmonary failure, while at lower levels of exposure, elemental mercury has no pathologic effect on the lungs but can have adverse chronic effects on the central and peripheral nervous systems.

- Occupational factors can act in combination with non-occupational factors to produce diseases; e.g. exposure to asbestos alone increases the risk of lung cancer five-fold, but along with the long-term smoking of cigarettes, the risk of lung cancer increases between 50 and 70 fold.

- Pre-existing diseases may make a person more susceptible to occupational hazards, e.g., a person suffering from a respiratory disorder is more susceptible to dust hazards, or a person with liver disease to organo-chloride compounds.

Occupational Hygiene

The profession that aims specifically at the prevention and control of hazards arising from work processes is occupational hygiene. The goals include the protection and promotion of workers" health, the protection of the environment and contribution to a safe and sustainable development.

> Occupational hygiene is defined by the International Occupational Hygiene Association (IOHA) as 'the discipline of anticipating, recognising, evaluating and controlling health hazards in the working environment with the objective of protecting worker's health and well being and safeguarding the community at large.

So, it involves the practice of identifying the hazardous agents (chemical, physical and biological) in the workplace that could cause disease or discomfort, evaluating the extent of the risk due to exposure to these hazardous agents, and the control of those risks to prevent ill-health in the long or short term.

Occupational hygiene draws upon, yet integrates, background disciplines such as biology, chemistry, physics, medicine, engineering, toxicology, environmental management etc. In part, it can be regarded as that aspect of the risk assessment field, which focuses on the interface between workplace-derived hazards and chronic human health consequences.

The management of these risks (by means of control programmes) is similarly an integral part of the discipline.

Practice of Occupational Hygiene The classical steps in occupational hygiene practice are:

- The recognition of the possible health hazards in the work environment. The evaluation of hazards, which is the process of assessing exposure and reaching conclusions as to the level of risk to human health.
- Prevention and control of hazards, which is the process of developing and implementing strategies to eliminate, or reduce to acceptable levels, the occurrence of harmful agents and factors in the workplace, while also accounting for environmental protection. Participate in overall risk analysis and management of an agent, process or workplace, and contribute to the establishing of priorities for risk management.
- Understand the legal framework for occupational hygiene practice. Educate, train, inform and advise persons at all levels, in all aspects of hazard communication.

Ergonomics

Ergonomics is the application of scientific information concerning humans to the design of objects, systems and environment for human use. The aim is to ensure that the job must fit the person in all respects and the work situation should not compromise human capabilities and limitations. So, ergonomics comes into everything that involves people. Work systems, sports and leisure, health and safety should all embody ergonomic principles, if well designed.

The term “ergonomics” is derived from two Greek words: “ergon”, meaning work and “nomoi”, meaning natural laws. Ergonomists study human capabilities in relationship to work demands. It is 'the science of making the job fit the worker'; or in other words is 'the application of human sciences to the optimisation of people's working environment`. In broader terms, ergonomics seeks to improve the match between the job and the worker‟s physical abilities, information handling and workload capacities. The subject is synonymous with 'human factors engineering', a term used in North America. Its fundamental importance is recognised in the International Labour Organisation, which defines ergonomics as:

> “The application of the human biological sciences in conjunction with the engineering sciences to the worker and his working environment, so as to obtain maximum satisfaction for the worker which at the same time enhances productivity.”

Ergonomics seeks to adapt work to human physical and psychological capabilities and limitations. In seeking this goal, it draws on many disciplines including anatomy, physiology, psychology, sociology, physics, and engineering.

The multi-disciplinary nature of ergonomics (sometimes called „human factors“) is very obvious. The ergonomist works in teams that may involve a variety of other professions, design engineers, production engineers, industrial designers, computer specialists, industrial physicians, health and safety practitioners, and specialists in human resources.

The overall aim is to ensure that our knowledge of human characteristics is brought to bear on the practical problems of people at work and in leisure. We know that, in many cases, humans can adapt to unsuitable conditions, but such adaptation often leads to inefficiency, errors, unacceptable stress, and physical or mental cost.

Using Ergonomics

How do you use ergonomics? Ergonomics incorporates elements from many subjects including anatomy, physiology, psychology and design. Ergonomists apply their diverse knowledge to ensure that products and environments are comfortable, safe and efficient for people to use. Knowledge of ergonomics is of great value in preventing ill-health and injury from work, as well as in rehabilitating people (e.g. someone with back pain). For example, personal protective equipment will generally not be used unless it is acceptable to employees, (it should fit well be comfortable and not interfere unduly with the task for which it is needed).

Focal areas for ergonomists in any organisation are:

Size and shape: Anthropometry is the branch of ergonomics that deals with human variability in size, shape and strength. Tables of anthropometric data are used by the ergonomists to ensure that places and items they are designing fit the user.

Vision: Vision being the prime channel for information, designers should ensure that the users see the workplace clearly. Many workers using computers cannot see their screens because of the glare or reflection. Similarly, those doing precise assembly tasks under insufficient lighting suffer eyestrain.

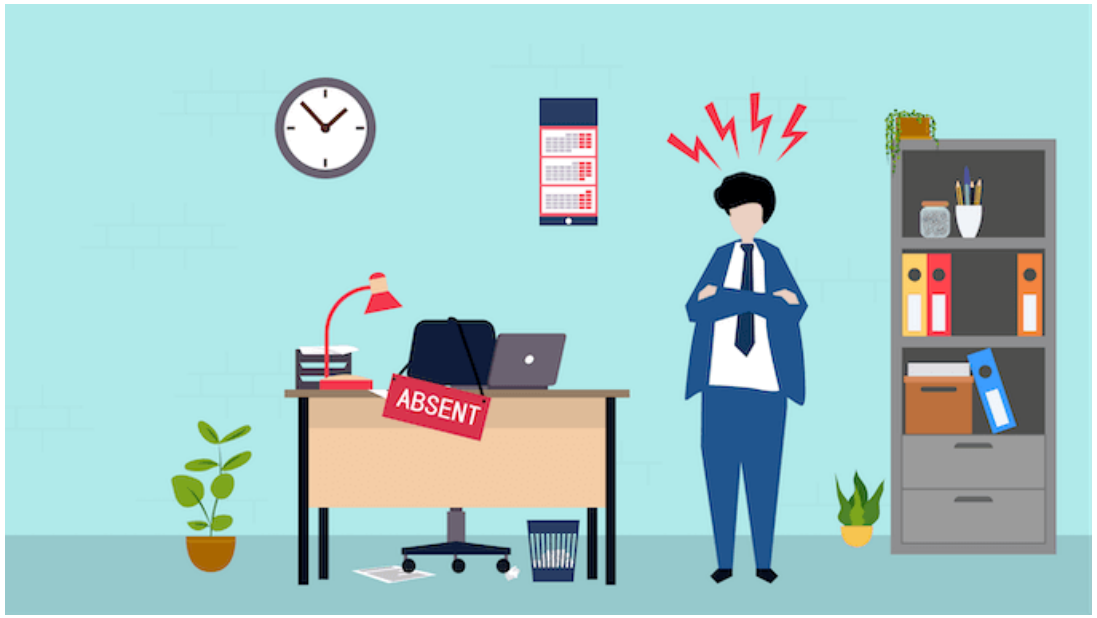
Sound: Sound can be a useful way to provide information, especially for warning signals. However, care should be taken not to overload this sensory channel.
Job design: One goal of ergonomics is to design jobs to fit people. This means taking account of differences such as size, strength and ability to handle information for a wide range of users. Then the tasks, the workplace and tools are designed around these differences. This leads to improved efficiency, quality and job satisfaction.

Human error: Human errors in nuclear and chemical industries, rail and sea transport, aviation, etc. could be catastrophic. However, when disasters occur, the blame is often laid with the operators, pilots or drivers concerned, and labelled as „human error". Often though, these errors are caused by poor equipment and system design. Here ergonomists pay particular attention to the mental demands on the operators, designing tasks and equipment to minimise the chances of misreading information or operating the wrong controls, for example. Ergonomic design is a way of considering design options to ensure that people's capabilities and limitations are taken into account.

This helps to ensure that the product is fit for use by the target users. The various aspects that should be stressed upon for an ideal ergonomic design can be product design, age-related design (accounting for older and disabled people), and design of information (signs and symbols).

Glossary

Absenteeism: It is a habitual pattern of absence from a duty or obligation. Frequent absence from the workplace may be indicative of poor morale or of sick building syndrome. However, many employers have implemented draconian absence policies which make no distinction between absences for genuine illness and absence for inappropriate reasons. As a result, many employees feel obliged to come to work while ill, and transmit communicable diseases to their co-workers. This leads to even greater absenteeism and reduced productivity among other workers who try to work while ill.



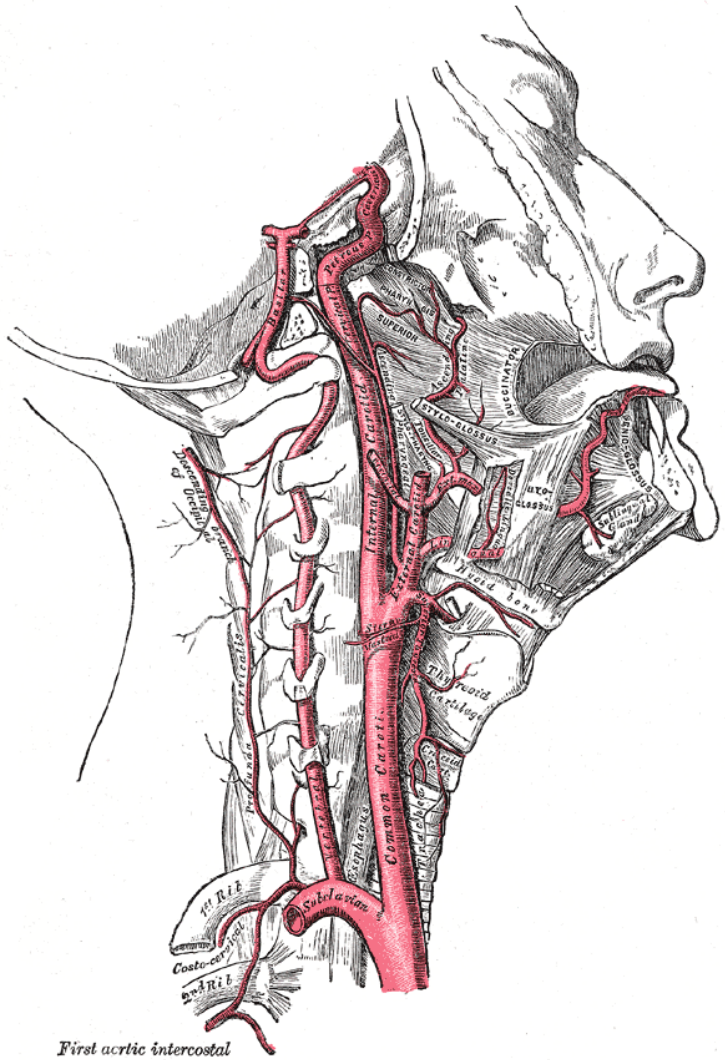
Allergic alveolitis: The term allergic alveolitis / extrinsic allergic alveolitis refers to a group of lung diseases resulting from exposure to dusts of animal and vegetable origin. The name, although complicated, describes the origin and the nature of these diseases. The dust particles must be five microns or smaller to get into the alveoli. Extrinsic allergic alveolitis, once a person is sensitised, can show three different types of responses; acute (intense) response, sub-acute (recurrent) response, and chronic (long-term) response.

The acute attack is triggered by heavy exposure to dust. It starts with fever, muscular aches and a general, unwell feeling or malaise. These symptoms are accompanied by tightness in the chest, a dry cough, and shortness of breath. The subacute response occurs most frequently in people exposed to relatively low levels of dust. It is marked by cough, shortness of breath, sweating, sore throat, headache, and nausea.

The chronic response develops after persistent acute attacks and recurrent sub-acute responses. It is marked by increasing shortness of breath, occasional fever, loss of weight, and general lack of energy. The victim suffers permanent lung damage and, in the worst cases, death may occur.

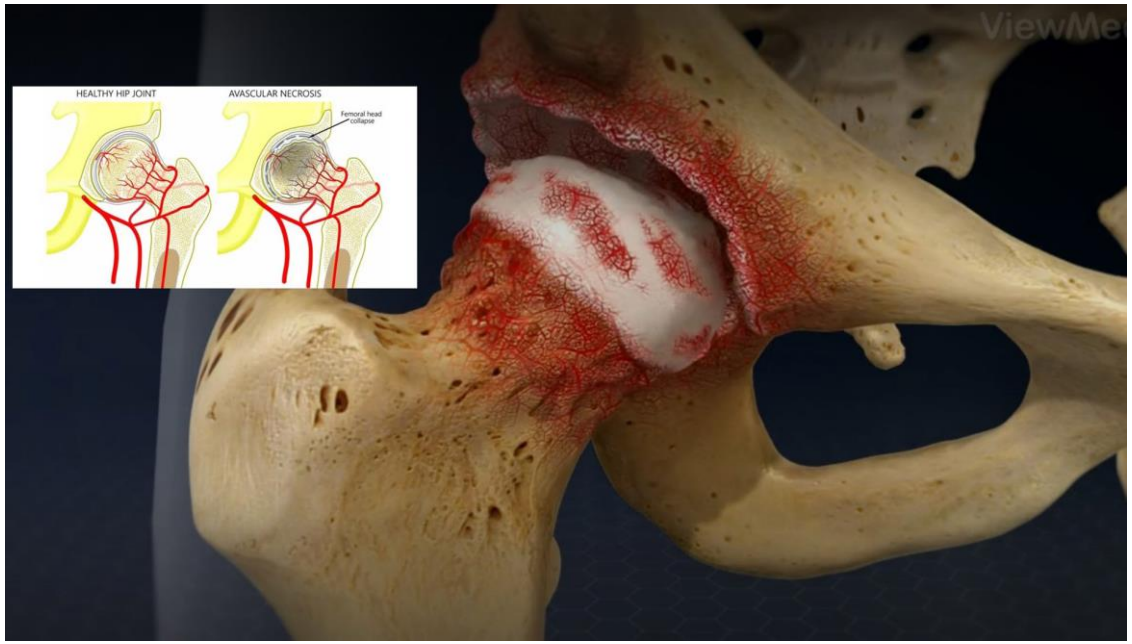
Asphyxia: Asphyxia or asphyxiation is a condition of severely deficient supply of oxygen to the body. In the absence of remedial action it will very rapidly lead to unconsciousness and death. Asphyxia is the same as suffocation. It comes from the Greek roots a-, "without" and sphuxis, "pulse, heartbeat".

Anoxia means the pathological state in which tissues do not get (enough of) oxygen. Technically, it is a condition of impaired gas exchange which leads, if persistent, to hypoxemia and hypercapnia; process is identified by foetal acidosis (as measured in umbilical arterial blood), which reflects the degree of anaerobic metabolism required during periods of hypoxia or increased oxygen demand.



Atrophy: *Thinning* of the top two layers of skin, the dermis and epidermis, causing a depression in the skin. Also known as aging, discoid lupus erythematosis, lichen sclerosis et atrophicus, morphea, radiodermatitis, striae, steroid side effect.

Bone necrosis: Bone necrosis/Ischemic bone necrosis/ avascular necrosis are diseases resulting from the temporary or permanent loss of the blood supply to the bones. Without blood, the bone tissue dies and causes the bone to collapse. If the process involves the bones near a joint, it often leads to collapse of the joint surface. This disease also is known as osteonecrosis, aseptic necrosis, and ischemic bone necrosis.



Brucellosis: *Brucellosis* (Undulant fever or Malta fever) is an infectious disease caused by the *Brucella* bacteria, which induces inconstant fevers, sweating, weakness, anorexia, headaches, depression and muscular and bodily pain. The popular name of the condition is originated due to the inconstance (or undulance) of the fever, which rises and falls constantly. Brucellosis is named after its researcher David Bruce.

The disease is transmitted either through contaminated or untreated milk (and its derivates) or through direct contact with infected animals, which may include sheep, pigs, goats, cattle, camels, bison, and other ruminants. This also includes contact with their carcasses.

Dead hand/ White finger: Vibration-Induced White Finger (VWF), also known as "Dead Finger" or "Dead Hand" is the result of impaired circulation (poor blood supply in the fingers, caused by the prolonged use of vibrating tools. VWF may appear after only several months on the job, or may not appear until twenty to forty years on the job.

The longer a person uses a vibrating tool, and the faster the tool vibrates, the greater the risk of health effects. The length of the initial symptom-free period of vibration exposure (i.e., from first exposure to the first appearance of a white finger) is known as the latent interval. It is related to the intensity of the vibration - the shorter the latent period, the more severe the resulting VWF if vibration exposure continues. The technical name for VWF is Raynaud's Syndrome of Occupational Origin.

Epithelioma: A benign or malignant tumour derived from epithelium.

Erythema: In medicine, this term is applied to redness of the skin due to blood vessel distension.

Gangrene: Death of tissue, usually due to loss of blood supply.

Epithelioma

Erythema

Gangrene

Industrial hygiene: Science and art devoted to the anticipation, recognition, evaluation, prevention, and control of those environmental factors or stresses arising in or from the workplace, which may cause sickness, impaired health and well being, or significant discomfort among workers or among citizens of the community.

Keratosis: Keratosis or actinic keratosis is a precancerous skin growth usually caused by sun exposure. Also called keratosis - actinic (solar), solar keratosis, sun - induced skin changes – keratosis. Actinic keratosis occurs most commonly in fair skin, especially in the elderly and in young individuals with light complexions. The growths occur in sunexposed skin areas. The growths begin as flat scaly areas that later develop a hard wart like surface. They are classified as precancerous growths. If left untreated, approximately 10 per cent of actinic keratoses develop into squamous cell carcinoma.

Occupational disease: Disease or disability resulting from conditions of employment (usually from long exposure to a noxious substance or from the continuous repetition of certain acts

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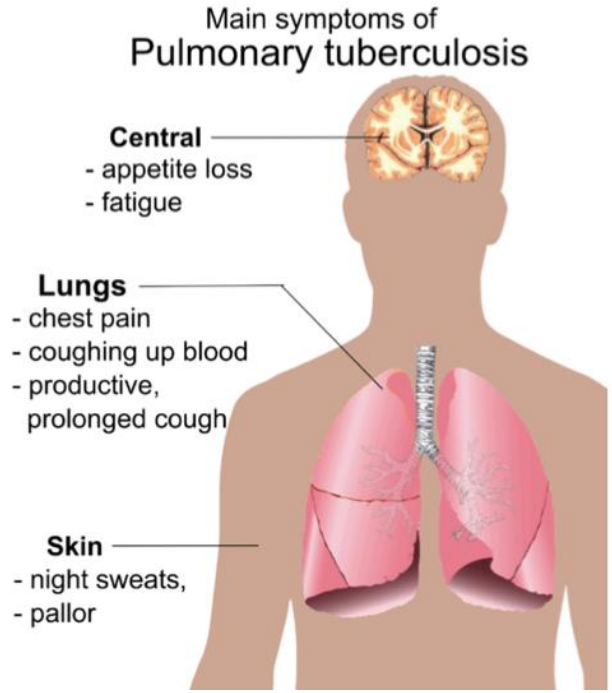
Occupational Hazards: An occupational exposure the worker has that is greater than a normal physical danger by the very nature of the work in which the worker is engaged.

Occupational Health: Occupational health is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people, and people to their jobs. (ILO/WHO 1950)

Oedema: Oedema (edema) is a build-up of excess fluid in the body tissues. If the fluid is in the tissue under the skin it leads to a puffy, shiny appearance and a doughy feel. Most commonly, oedema is seen in the ankles or legs, as the fluid is gravity-dependent. Oedema is not a disease in itself. Rather, it is a clinical sign which may be associated with an underlying medical problem. Oedema occurs when the body's normal balance of fluid intake and output is disturbed.

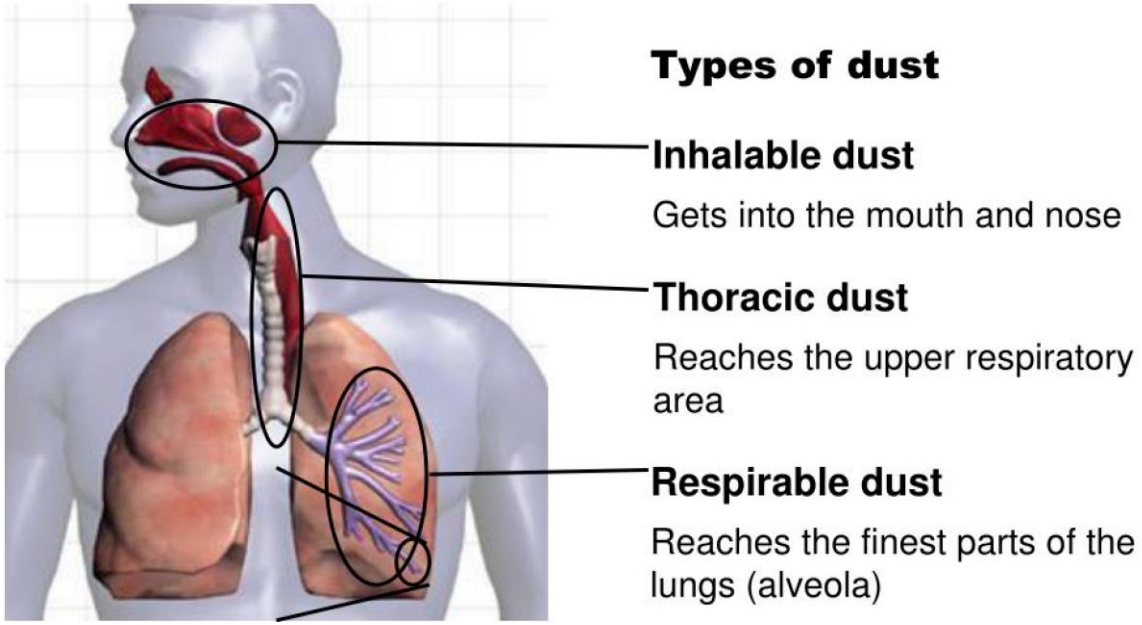
Polycythaemia: It is an increase in the red cell mass of the blood. This is seen as an increase in PCV, haemoglobin concentration and RBC count. Absolute polycythaemia results from increased bone marrow production of RBCs and may be primary, as with polycythaemia vera or myeloproliferative disease, or secondary to hypoxia and renal disease. Absolute polycythaemia must be distinguished from relative polycythaemia that occurs with dehydration (high plasma protein), hypovolemia (low plasma protein), shock or splenic contraction (normal plasma protein).

Pulmonary tuberculosis: It is the infection of the lungs by Mycobacterium tuberculosis. The usual course of untreated disease is tuberculous pneumonia, formation of tuberculous granulation tissue, caseous necrosis, calcification, and cavity formation. It may spread to other lung segments via the bronchi, or to other organs via the blood or lymph vessels. Symptoms may include weight loss, lassitude and fatigue, night sweats, and wasting, with purulent sputum, hemoptysis, and chest pain.



Respirable dust: It refers to those dust particles that are small enough to penetrate the nose and upper respiratory system and deep into the lungs. Particles that penetrate deep into the respiratory system are generally beyond the body's natural clearance mechanisms of cilia and mucous and are more likely to be retained.

Safety: It is the condition of being protected against failure, damage, error, accidents, or harm. Here protection involves both causing and exposure. It can include physical protection or that of possessions. Safety is often in relation to some guarantee of a standard of insurance to the quality and safe function of a thing or organisation. It is used to ensure that the thing or organisation will do only what it is wanted to do. Safety is the state of being safe.



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END OF CHAPTER 1

CCUPATIONAL HEALTH AND SAFETY

Prof. Dr. Vural Emir KAFADAR

CHAPTER 2

BASIC PRINCIPLES IN LABOR LAW AND THE PLACE OF OCCUPATIONAL HEALTH AND SAFETY

Introduction

Every community has laws and other legislation to regulate life and the relationships between people and institutions. Working at a safe workplace is one of the fundamental human rights. The first written regulation on occupational safety and health was during the Ottoman era, in the year 1865.

That Law aimed to regulate safety and health issues specifically in the coal mines. However, this Law was not approved by the Sultan and not implemented. Some years later, in 1869, another law was published and implemented to regulate the safety and health issues in coal mines. Following the establishment of a Grand National Assembly in 1920, two other laws entered into force for the regulation of rights and benefits of the coal mine workers, as well as to regulate workplace conditions.

Following the establishment of the Grand National Assembly of Turkey in 1920, two laws on occupational health and safety came into force before the declaration of the republic:

“Law on Coal Dust Trade in Zonguldak and Ereğli Region for the Benefit of Workers” dated 28 April 1921 and numbered 114; and “Law on Rights of Mining Workers in Ereğli Region” dated 10 September 1921 and numbered 151.

With these laws; relief funds were established, compensation in cases of occupational accidents and work diseases was provided, working periods and vocational training issues were organized and provisions about insurance and premium system were introduced.

In the following years of the Republic of Turkey, legislations which contain several provisions on occupational health and safety and form the basis of today’s regulations were published such as “Weekly Rest Days Law” (1924), “Code of Obligations” (1926), “Public Hygiene Law” (1930) and “Municipalities Law” (1930).

The first “Labour Law” numbered 3008 was published in 1936 and had been in force till the year 1967. Although a new approach had been adopted on social security and occupational safety by this Law; due to the onset of the Second World War, progress about these issues could not be achieved until the establishment of the Ministry of Labour in 1946.

The General Directorate of Workers’ Health and Safety was established within the structure of the Ministry of Labour in the following years. It was restructured in 2000 with its current name as the Directorate General of Occupational Health and Safety (DGOHS).

The second Labour Law numbered 931 was published in the late 1960s; however, it was annulled by a Constitutional Court decision. Labour Law numbered 1475 came into force in 1971 with detailed provisions on occupational health and safety.

NATIONAL OCCUPATIONAL HEALTH AND SAFETY SYSTEM

Labour Life has a complicated structure with different stakeholders. While the main structure consists of a tripartite body of workers, employers, and the state; each of the constituents has its own subbodies.

Directorate General of Occupational Health and Safety (DGOHS)

This unit was established in 1946. However, in order to increase the efficiency of the department, The General Directorate of Workers' Health and Safety as it was originally named, was restructured as a "Directorate General of Occupational Health and Safety" on 2000.

The tasks assigned by Law to DGOHS are provided below:

- To determine the national policies and prepare programmes,
- To perform the prepatory work of legislation in the field of OHS and ensure the implementation of legislation,
- To ensure co-operation and co-ordination with national and international organizations and institutions,
- To provide necessary recommendations in order to ensure efficient inspection and monitor its results,
- To carry out standard studies, prepare and develop norms, carry out activities such as; measurement, evaluation, technical control, training, counselling, expertise, etc. and evaluate and authorize institutions that carry out such activities,

Labour Inspection Board (İTKB)

Labour inspection is one of the key functions of the state in order to enforce the legislation and to monitor the work life. The role of the labour inspection is described in the ILO Convention numbered 81 which was ratified by Turkey in 1950 and classified as one of the "priority conventions" by ILO itself.

The importance of an effective inspection system is also emphasized in the ILO Convention numbered 155 on Occupational Safety and Health, again ratified and implemented by Turkey.

The Labour Inspection Board functions in 2 main paths:

a) Inspections in the field of occupational health and safety;

b) Inspections in the field of working conditions such as employment status, wages, working hours, unionization.

The Labour Inspection Board carries out the following duties:

- Carrying out planned or occasional inspections and taking measures,
- Monitoring and investigating practices in workplaces according to international conventions,
- Monitoring compliance with the legislation on working conditions,
- Conducting works related to the preparation and improvement of national labour inspection legislation, in line with the inspection results preparing a "General Evaluation Report" which states problems, applicability of the legislation and measures to be taken by relevant institutions,
- Collecting, evaluating and assessing statistics.

Social Security Institution (SGK)

Social Security Institution is established with the objective of the realization of a sound social security system at the contemporary standards that will provide individuals with social protection, based on the principles of effective, equitable, easily accessible social insurance taking the actuarial balance and sustainability into consideration.

- To implement the social security policies in line with the national development strategies and policies as well as annual implementation programs and to undertake endeavours for the improvement of these policies,
- To inform natural and legal persons for whom it serves with regard to their rights and obligations and to facilitate the exercise of these rights and fulfilment of these obligations,
- To provide coordination and collaboration among the public agencies in the field of social security.

♦ To follow up international developments, to collaborate with the European Union and International organizations, to undertake the necessary studies with regard to social security agreements to be concluded with foreign countries, to monitor the proper implementation of international agreements.

In case occupational accident and occupational diseases occur, there are three kinds of benefits provided by SGK:

a) Benefit for temporary disability

b) Permanent incapacity income

c) Survivors Benefits

In addition to Labour Inspection Board, the Social Insurance Inspection Board also carries out inspections on occupational diseases and occupational accidents in terms of legal dimensions of the case.

Occupational Health and Safety Research and Development Institute (İSGÜM)

İSGÜM was founded in 1969 as a sub-institution of Directorate General of Occupational Health and Safety of Ministry of Labour and Social Security by an agreement signed between Turkish Government and ILO in the scope of International Programme for the Improvement of Working Conditions and Environment (PIACT).

İSGÜM is the only public organization executing workplace measurements and biological analysis together and evaluating the results in the scope of occupational health and safety. It conducts activities with the central laboratory in Ankara and six regional laboratories throughout Turkey.

Main objectives and tasks of İSGÜM are:

- Carrying out project, training, guidance etc. with the issues of preventing occupational diseases & accidents at national and international level.

- Improving suggestions according to applied research & development projects with the purpose of preparing& developing legislation, standard and rules.

- Authorizing, controlling and supervising the laboratories to serve in the field of occupational hygiene, test and analysis.

- Conducting risk assessment, analysis, test and measure for the working environment with the purpose of improving occupational health & safety.

Labour and Social Security Training and Research Centre (ÇASGEM)

The aim of ÇASGEM is to engage in the activities of training, research, surveying, publishing, documentation and consulting at national and international levels on working life and social security subjects.

The main tasks of ÇASGEM on OHS issues are:

- Providing training for OHS professionals (occupational physicians and occupational safety experts). Conducting research and organizing seminars on occupational life, social security, employee-employer relations, occupational health and safety, occupational medicine, total quality management, labour inspection, employment, productivity, research of labour market, ergonomics, environment, first aid, labour statistics and similar subjects to provide education to employers, employee or directors who work in private or public sector and to personnel of the Ministry, its subsidiaries and other related organizations.

National Occupational Health and Safety Council (NOHSC)

National Occupational Health and Safety Council (NOHSC) has been established in accordance with the Eighth Five Year Development PLan and ILO Convention No. 155, in order to socialize occupational health and safety, to solve the problems by reaching a consensus with social partners and to ensure health and social welfare of workers. Its legal basis has been clarified with the No. 6331 Law. The First NOHSC Meeting was held on 6th of May 2005.

DGOHS has been appointed to execute the secretarial work of this National Council which will convene at least twice annually.

The aims of the NOHSC are to bring together the social partners (trade unions and employers' organizations), universities, nongovernmental organizations and other relevant institutions and organizations in the field of occupational health and safety, and to create a platform where the partners could discuss, express their opinions and define the priorities, needs, policies and strategies in the field of OHS.

OHS SITUATION IN TURKEY WITH FIGURES

In 2014

221.336 occupational accidents and **494** occupational diseases took place in our country in 2014.

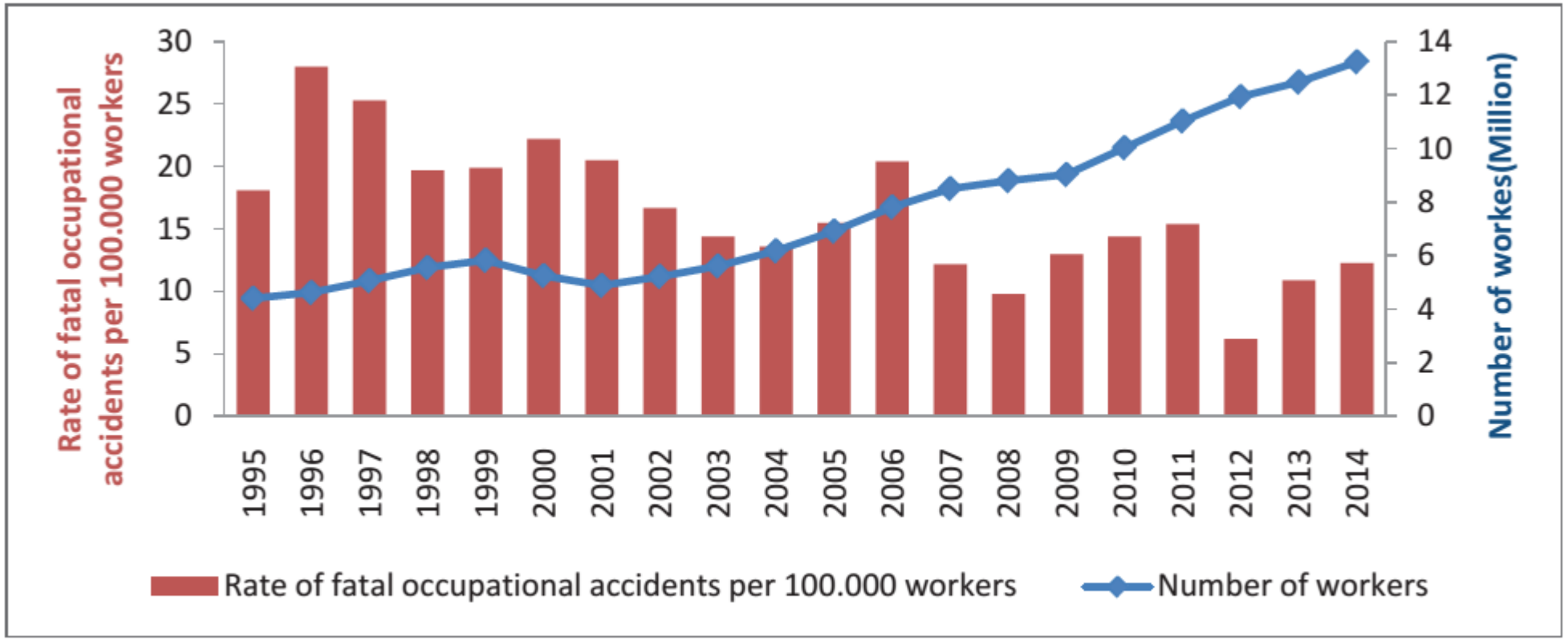
1.626 workers lost their lives due to occupational accidents.

Every Day

606 occupational accidents.

5 workers losing his/her life due to occupational accidents.

4 workers becoming permanently incapable.



Source: Social Security Institution, 1995-2014

Constitution

The two main parties of working life are the employers and the employees. Establishing a safe and productive working life is to the advantage of both groups. Therefore in this context, the interests and expectations of these two parties are parallel to each other.

The community in general and the government also benefit from a productive working life. Legislation in the field of occupational safety and health mainly regulates the relationship between both sides, aiming to ensure a safe working life. Occupational safety and health legislation in Turkey is configured in line with the Constitution.

The Constitution in Turkey has been revised several times, most recently in 1982. There are up to 20 Articles in the Constitution regulating various areas of working life; i.e., the right and responsibility to work, organizing unions, right to social security, etc. The Articles related to working life play a central role in protecting the labour force, ensuring proper placement of the workers and providing a safe working environment. Two of the Articles directly concern occupational safety and health.

“No one can be employed at the workplaces not suitable for their age, gender and capacity. Children, women and the disabled are protected by Law” (Article 50). “Everyone has the right to live in a healthy and balanced environment” (Article 56). The Constitution refers to the environment in general, nevertheless based on this Article, the working environment should be “safe and healthy”.

Occupational Safety and Health Law (No. 6331; 2012)

The Occupational Safety and Health Law (No. 6331; 2012 (OSH Law) was published in the Official Gazette in 2012. Before 2012, occupational safety and health issues were regulated in the Labour Law, related regulations and some other general laws. The OSH Law applies to all jobs and workplaces in both the public and private sector, regardless of their field of activities or number of workers, and covers all employees, interns, employers and their representatives.

The Turkish Armed Forces, the Police Department and specific activities in civil defence services are not covered by the OSH Law. Furthermore, the OSH Law does not apply to domestic services, persons producing goods and services in their own name and on their own account, prisons and similar institutions. The OSH Law regulates the duties, authority, responsibilities, rights and obligations of employers and employees in order to ensure occupational safety and health in the workplace and to improve the existing safety and health conditions. The ultimate aim of the OSH Law is to prevent occupational diseases and accidents, and other physical and mental health problems of the workers related to work and the work environment.

The OSH Law defines the main stakeholders namely employees, employers and the State, and their duties and responsibilities in working life. The Law also defines the basic terminology related to work life such as workplace, hazard, risk, occupational disease, occupational accident, prevention, safety and health unit, occupational safety and health professionals and their responsibilities.

According to the OSH Law, the employer should perform risk assessment and has the responsibility of taking all necessary measures to ensure occupational safety and health. Therefore the employer shall fulfil the responsibility of avoiding risks, evaluating risks which cannot be avoided, combating the risk at its source, adapting the work and working conditions to the individual, adapting to technical progress, substituting dangerous substances or procedures with a non-dangerous or less dangerous ones, provide appropriate training and instructions to the workers, etc.

Article 4 of the Law defines the duties, authority and responsibilities of the employer and workers. As per Article 4, the employer has a duty to ensure the safety and health of workers in every aspect related to work. In this respect the employer shall take the measures necessary for safety and health protection of workers, including provision of necessary organization, designating safety and health staff, informing and training of workers, carrying out risk assessment, implementing measures related to occupational safety and health in accordance with the legislation, etc.

In case an employer enlists competent external services or persons, this shall not discharge him from his responsibilities in this area. Also the workers' obligations in the field of safety and health at work shall not affect the principle of the responsibility of the employer.

As indicated in Article 6 of the Law, in order to provide occupational safety and health services the employer shall designate workers as occupational safety expert, occupational physician and other health staff, meet the need for means of space and time to help designated people or organizations fulfil their duties, ensure cooperation and coordination among the occupational safety and health staff, etc.

Labour Law (No. 4857; 2003)

The first Labour Law came into force in 1936. Since then, it has been revised and amended several times at 25-to-30 year intervals. The most recent version was enacted in 2003 (No. 4857; 2003) (Labour Law). In the Labour Law the general conditions of working life are described such as work contract, minimum age for work, payments, etc.

The Labour Law used to have a special section for occupational safety and health where, inter alia, the employers' responsibility for taking all relevant measures to ensure occupational safety and health and the workers' obligation to follow the rules and measures in this regard were clearly described. The Labour Law also regulates the inspection of workplaces and fines to be imposed in case of violations. Following the enactment of the OSH Law, all the articles of the Labour Law regarding occupational safety and health were repealed.

The Labour Law regulates other areas relevant for the employment relationship and occupational safety and health including:

Minimum age for work: Article 71 of the Labour Law defines minimum age for work as 15 years. Working hours, maternity leave: According to the Law, the weekly working period is 45 hours. Activities included in the working period, rest periods, night work, underground work, working periods during maternity are described in Articles 63-76 of the Labour Law. Article 74 defines maternity leave as 16 weeks; 8 weeks before and after delivery, and three hours daily leave for breast feeding until the baby is six months old, then one and half hours until the baby is one year of age.

Law of Obligations (No. 6098; 2011)

The Law of Obligations (No. 6098; 2011) (Law of Obligations) was first enacted in 1926 to describe the obligations of people to each other. It was revised in 2011. The Law of Obligations describes specifically the mutual obligations of employers and workers. In this sense, employers have the responsibility to protect workers' health by providing for a safe working environment. In case of any harm caused to health of workers as a result of work, employers should compensate the workers' losses. On the other hand, workers should obey the rules and regulations of safe work.

General Health Law (No. 1590; 1930)

The General Health Law (No. 1590; 1930) (General Health Law) came into force in 1930 as a general law, covering all issues relevant to health. At that time there was no legislation regarding occupational safety and health, and the General Health Law filled this gap, until the first Labour Law was enacted.

The General Health Law has a specific section on occupational safety and health (Articles 173 to 180).

This section regulates the minimum age for working, duration of work, protection of workers' health and workplace health services. The Law provides for the establishment of an in-house workplace health service for workplaces employing 50 or more workers. Establishing the occupational health service is clearly defined as an employer responsibility. This article of the General Health Law remained in force for more than 70 years, until the Labour Law (No. 4857) was adopted in 2003.

Social Insurance and Universal Health Insurance Law (No. 5510; 2006)

Before the Social Insurance and Universal Health Insurance Law (No. 5510: 2006) was enacted, the insurance of workers was mentioned in some laws specific to certain areas of working life. The Law on Insurance of Occupational Accidents and Diseases, the Law on Insurance Institution, and the Law on Insurance of Illness and Maternity for a long time served to regulate some rights and benefits of the workers.

In 1964 the Social Insurance Law was enacted, including several provisions regarding occupational accidents and diseases.

The Social Insurance and Universal Health Coverage Law came into force in 2006. It aims to provide social security coverage for workers. The Law applies to workers registered with the Social Security Institution, i.e. those with insurance premiums paid. People working in industrial establishments and services sectors, civil servants, agricultural workers and self-employed people paying insurance premiums are covered.

Ministry of Health (MoH)

The Ministry was established in 1920, and is responsible for organizing the provision of preventive and treatment services. The Ministry is the main government body responsible for health sector policymaking; the implementation of national health strategies through programs; and the direct provision of health services. For a long time, occupational safety and health issues were the responsibility only of MOLSS, and the Social Insurance Institution as the related institution. The MOLSS and the Social Insurance Institution had more than 100 general hospitals and 3 hospitals for occupational diseases.

In 2005, the responsibility for all the hospitals and other health institutions was transferred to the responsibility of Ministry of Health (Law on Transfer of some health institutions to Ministry of Health, No. 5283, 2005).

Until that time, there was no Ministry of Health activity in the field of safety and health issues of the working population. Following the transfer of occupational disease hospitals to the Ministry of Health, the Ministry was actively involved in occupational safety and health issues.

In 2010, a Workers' Safety and Health Unit was established under the Ministry of Health. In 2011, based on Government Decision No. 663 (Organization and Function of the Ministry of Health and Related Institutions), a Workers' Health

Department was established. The Department has 4 divisions:

- Control of Occupational Diseases and Accidents
- Workplace Safety and health
- Education and Projects
- Planning and Implementations

Ministry of Science, Industry and Technology

The history of the Ministry goes back to the first Parliamentary Government in 1920. At that time the Ministry was responsible for industry, agriculture and commercial affairs. During the following years, in some governments, there were two different ministries - the Ministry of Industry and the Ministry of Commerce; some governments combined the two ministries under the name, the Ministry of Industry and Commerce.

During the reforms of the governmental structure in 2011, the Ministry was responsible for science, industry and technology under the name, the Ministry of Science, Industry and Technology. Two unit under the Ministry are relevant to the occupational safety and health:

Turkish Standards Institute (TSE):

The TSE was established in 1960 as an independent institution, with the mission to implement standardization, evaluation of fitness, and calibration activities in order to increase quality of life in the community through increased national and international trade. The main tasks of the TSE are, to prepare standards in various areas, also prepare standards on request, to adopt relevant international standards, and to encourage the implementation of standards. Among the standards, more than 900 are on occupational safety and health, such as construction safety, machinery safety, textile, personal protection, and petroleum and petroleum products.

TSE has adopted various international standards, e.g. TS EN ISO 9001, (Quality Management System), TS EN ISO 14001 (Environment Management System), TS ISO 18001 (Occupational Safety and health Manage- ment System), TS EN ISO 13485:2003 (Medical Equipment Management System), TS ISO 10002 (Consumer Satisfaction Systems), TS EN 16001 (Energy Satisfaction System).

The TSE certifies institutions meeting the requirements of these standards. More than 800 institutions have been certified so far. The institute provides education to public and private institutions in the industry and services sectors. Since 2001, the TSE has provided education and training to various institutions in the industrial and services sectors on TS 18001 to establish an occupational safety and health infrastructure and safety culture.

There are huge number of standards and other data in the field of occupational safety and health which have been developed and published by various international organizations. The TSI is planning to translate more of them into Turkish, which will be helpful for the employers who would like to use them.

A new standard (ISO 45001) is currently under development in the field of occupational safety and health management systems. The new standard aims to provide a harmonized approach to safety and health management systems, designed optimally for the enterprises' own needs in order to promote health and safety in the workplace. The new standard is being developed in collaboration with ILO, ISO and other relevant institutions.

The draft version of the standard was published already is being discussed, and the ISO 45001 is expected to be published in 2016. This new approach requires the organization to consider foreseeable internal and external risks that could impact its activities and occupational safety and health performance, such as introduction of new technologies or adverse weather effects such as flooding, etc.

OCCUPATIONAL SAFETY AND HEALTH LABORATORIES

Occupational safety and health laboratories are essential components of working life. These laboratories serve to support risk assessment studies and provide evidence in labour inspections.

Institute of Occupational Safety and Health Research and Development

The Institute of Occupational Safety and Health Research and Development (İSGÜM) was founded 26 March, 1969 by Decree No. 6/11568 of the Council of Ministers following the ratification of the "Pre-implementation Agreement on Special Fund for Occupational Health and Safety" signed in 1968 between the representatives of the Republic of Turkey, Special Fund Administration for United Nations Development Programme (UNDP) and International Labour Organization (ILO) within the scope of the Programme for the Improvement of working Conditions and Environment (PIACT) aiming to meet occupational health and safety requirements in Turkey.

In the years following inception, several attempts were made to strengthen İSGÜM through regional laboratories. In addition to the central institution and laboratory in Ankara, İSGÜM has regional laboratories in 8 provinces (Adana, Bursa, Gaziantep, İstanbul, İzmir, Kayseri, Kocaeli and Samsun).

According to the İSGÜM Regulation (Regulation on Rights, Duties and Responsibilities of Institute of Occupational Safety and Health Research and Development published in Official Gazette No.29417 on 15 July 2015) İSGÜM's functions are as follows:

- Carry out activities for the prevention of occupational accidents and occupational diseases at national and international levels
- Ensure the prevention of harm from workplace hazards, if not possible, minimize them to protect workers' health
- Try to adjust production procedures and working conditions to the workers' capacities and special conditions
- Carry out measurements, analyses, tests and risk assessment studies for workplaces
- Carry out education in its area of interest
- Carry out studies for the development of recommendations for legislation, standards and norms
- Develop projects and guides on a sectoral basis
- Organize seminars, conferences, meetings; develop brochures, posters, spot films; publish books to increase safety culture in the community

- Collect data in its area of interest and develop information for use by relevant institutions
- Define strategies, targets and activities and follow their implementation
- Carry out other works given by the Directorate General

Occupational health and safety is an extensive multidisciplinary field, invariably touching on issues related to, among other things, medicine and other scientific fields, law, technology, economics and concerns specific to various industries.

Despite this variety of concerns and interests, certain basic principles can be identified, including the following:

- All workers have rights. Workers, as well as employers and governments, must ensure that these rights are protected and foster decent conditions of labour. As the International Labour Conference stated in 1984: work should take place in a safe and healthy working environment; conditions of work should be consistent with workers' well-being and human dignity; work should offer real possibilities for personal achievement, self-fulfillment and service to society.

- Occupational health and safety policies must be established. Such policies must be implemented at both the governmental and enterprise levels. They must be effectively communicated to all par-ties concerned.
- There is need for consultation with the social partners (that is, employers and workers) and other stakeholders. This should be done during formulation, implementation and review of such policies
- Prevention and protection must be the aim of occupational health and safety programmes and policies. Efforts must be focused on primary prevention at the workplace level. Workplaces and working environments should be planned and designed to be safe and healthy.
- Information is vital for the development and implementation of effective programmes and policies. The collection and dissemination of accurate information on hazards and hazardous materials, surveillance of workplaces, monitoring of compliance with policies and good practices, and other related activities are central to the establishment and enforcement of effective policies.

Health promotion is a central element of occupational health practice. Efforts must be made to enhance workers' physical, mental and social well-being.

☐ Occupational health services covering all workers should be established. Ideally, all workers in all categories of economic activity should have access to such services, which aim to protect and pro-mote workers' health and improve working conditions.

☐ Compensation, rehabilitation and curative services must be made avail-able to workers who suffer occupational injuries, accidents and work-related diseases. Action must be taken to minimize the consequences of occupational hazards.

☐ Education and training are vital components of safe, healthy working environments. Workers and employers must be made aware of the importance and the means of establishing safe working procedures. Trainers must be trained in areas of special relevance to different industries, which have specific occupational health and safety concerns

Workers, employers and competent authorities have certain responsibilities, duties and obligations. For example, workers must follow established safety procedures; employers must provide safe workplaces and ensure access to first aid; and the competent authorities must devise, communicate and periodically review and update occupational health and safety policies.

☐ Policies must be enforced. A system of inspection must be in place to secure compliance with occupational health and safety and other labour legislation.

BRIEF OVERVIEW

♦ Occupational health and safety is handled for the first time within the scope of an independent, specific law.

♦ All workers are included within the scope of the Law regardless of whether they work in public or private sector.

♦ A proactive approach rather than a reactive one has been adopted.

♦ Workplaces are categorized by hazard classes according to the nature of their main activity.

♦ Occupational health and safety services are to be provided by every workplace.

♦ Employers are given the opportunity to provide services from joint health and safety units.

♦ The expenses in micro enterprises arising from receiving OHS services are to be supported by the State.

- ♦ Risk assessment is carried out in advance in order to prevent occupational accidents and occupational diseases.
- ♦ Workers are to receive regular health surveillance.
- ♦ Recording and notification of occupational accidents and occupational diseases are to be carried out in an efficient and updated manner.
- ♦ “Occupational Health and Safety Committee” is to be set up in all workplaces recruiting fifty or more workers.
- ♦ Emergency plans are to be prepared in workplaces.
- ♦ Employers have to inform all workers on occupational health and safety issues and their rights in work life.
- ♦ Workers can actively participate in decision making process on occupational health and safety activities in the workplace.
- ♦ Workers are able to use their right to refrain from work in the event of serious and imminent danger.

♦ In workplaces with more than one employer, occupational health and safety activities are to be carried out in coordination.

♦ Operation may be ceased in whole or any part of the premises in case of any vital danger.

♦ Workplaces bearing a risk of major industrial accident are not allowed to start operation without a “safety report” and “majör accident prevention policy document”.

♦ Effective administrative sanctions are to be applied in order to facilitate the implementation of the Law efficiently.

Employers' Responsibilities in Brief

- Improvement in OHS conditions and sustaining the improvement.
- Consideration of suitability of the worker for the job in terms of OHS.
- Development of a general prevention policy with consideration of risk assessment reports.
- Taking all measures including training and providing information in order to prevent occupational risks.
- Having all necessary controls, measurements, investigations and research conducted.
- Monitoring, controlling and eliminating nonconformities.
- Taking further precautions to prevent workers entering places where vital danger exists.
- Coordinating with other employers where multiple employers share the same workplace.

Workers' Rights and Responsibilities in Brief

♦ Benefit from OHS services without a Limit in the size of the workplace in terms of the number of workers.

♦ Actively participating and providing feedback OHS exercises.

♦ Right to refrain from work until necessary measures are taken in case of serious and imminent danger.

♦ Receiving training and information on OHS issues.

♦ Being represented and having a say in OHS committees.

♦ Not to endanger health and safety of himself or of coworkers.

♦ Proper use of all equipment given for production and protection.

References:

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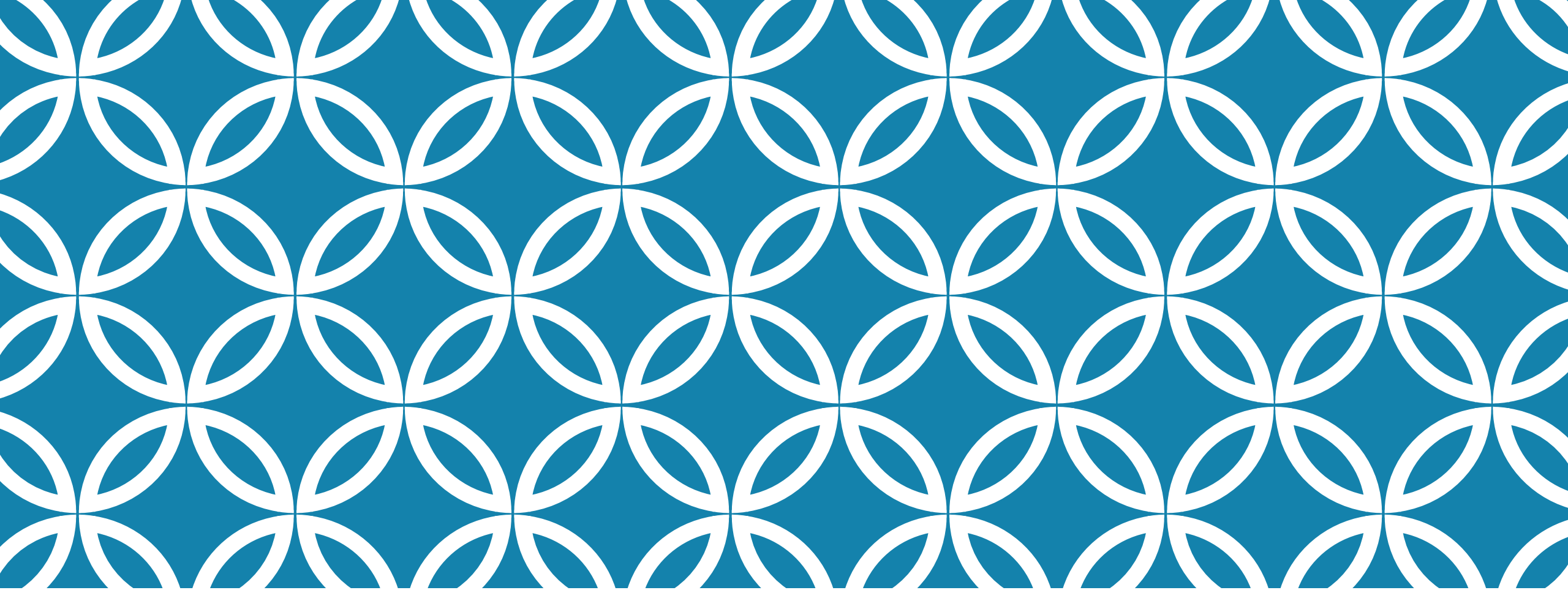

OCCUPATIONAL HEALTH AND SAFETY

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CHAPTER 3

OCCUPATIONAL HEALTH AND SAFETY LEGISLATION
LAW NO. 6331 DATE OF ENACTMENT: 20/06/2012

Object, Scope and Definitions

Object of this law is to regulate duties, authority, responsibility, rights and obligations of employers and workers in order to ensure occupational health and safety at workplaces and to improve existing health and safety conditions.

Scope and exceptions

(1) This Law shall apply to all works and workplaces in both public and private sector, employers of these workplaces and their representatives, all workers including apprentices and interns regardless of their field of activity.

(2) However, this Law shall not be applicable to the following activities and persons:

a) Activities of the Turkish Armed Forces, the police and the Undersecretary of National Intelligence Organisation except for those employed in workplaces such as factories, maintenance centres, sewing workshops and the like.

b) Intervention activities of disaster and emergency units.

c) Domestic services.

ç) Persons producing goods and services in their own name and on their own account without employing workers.

d) Prison workshop, training, security and vocational course activities within the framework of improvements carried out throughout the enforcement services for convicts and inmates.

Definitions

(1) For the purposes of this Law, the following terms shall have the following meanings:

a) Ministry: Ministry of Labour and Social Security;

b) Worker: any natural person employed at public or private sector workplaces, regardless of their status in their relevant laws;

c) Workers' representative: any worker authorised to represent workers in matters such as participating in occupational health and safety related activities, monitoring these activities, requesting measures, making propositions and the like;

ç) Support staff: any person with appropriate equipment and sufficient training who is specifically put in charge of issues related to occupational health and safety such as prevention, protection, evacuation, firefighting, first aid besides their main duty;

d) Training institution: public institutions and organisations, universities and enterprises established by companies operating in accordance with the Turkish Code of Commerce authorised by the Ministry to provide training for occupational safety specialists, occupational physicians and other health-care personnel;

e) Young worker: any worker who is of at least fifteen years of age but less than eighteen years of age;

f) Occupational safety specialist: any engineer, architect or technician who are authorised by the Ministry to work in the field of occupational health and safety and who have occupational health and safety expertise certificate;

g) Occupational accident: any occurrence taking place at the workplace or due to the performance of work which leads to death or physical or mental impairment to the physical integrity of the victim;

ğ) Employer: any natural or legal person or any institution and organisation which is not a legal entity who has an employment relationship with the worker;

h) Workplace: any organisation in which material and non-material elements and workers are organised together to produce goods or services, where the employer is linked in qualitative terms to the goods or services produced and which includes locations linked to the workplace organised under the same management and other premises and equipment such as rest rooms, nursing rooms, canteens, sleeping, washing, examination and maintenance facilities as well as physical and vocational training locations and courtyards;

ı) Occupational physician: any physician who is authorised by the Ministry to work in the field of occupational health and safety and who has occupational medicine certificate;

i) Workplace health and safety unit: any unit established to provide occupational health and safety services at the workplace with required equipment and personnel;

j) Council: National Occupational Health and Safety Council;

k) Committee: occupational health and safety committee;

1) Occupational disease: any illness caused by exposure to occupational risks;

m) Joint health and safety unit: any unit which is established by public institutions and organisations, organised industrial zones and companies operating under the Turkish Code of Commerce in order to provide occupational health and safety services to workplaces, with required equipment and personnel and which is authorised by the Ministry;

n) Prevention: all the measures planned or taken in order to eliminate or reduce occupational health and safety risks at all stages of work undertaken at the workplace;

o) Risk: probability of loss, injury or other harmful result arising from hazard;

ö) Risk assessment: activities required for identifying hazards which are existing in or may arise from outside the workplace, analysing and rating the factors causing these hazards to turn into risks and the risks caused by hazards and determining control measures;

p) Hazard: potential which exists at the workplace or may arise from outside the workplace to cause harm or damage which could affect the worker or the workplace;

r) Hazard class: hazard group in which a workplace is identified to fit in, taking into account the nature of the work performed, substances used or produced at every stage of work, work equipment, production methods and types as well as other issues related to work environment and working conditions in terms of occupational health and safety;

s) Technician: any person with the title of technical instructor, physicist and chemist as well as any graduate of an occupational health and safety programme at universities;

ș) Occupational nurse: any nurse/health technician who is authorised to perform the nursing profession pursuant to the Nursing Law dated 25/2/1954 and numbered 6283 and who has the occupational nurse's certificate issued by the Ministry in order to work in the field of occupational health and safety.

(2) Employer's representatives who act on behalf of the employer and are involved in the work and the management of the workplace are considered as employers as far as the implementation of this Law is concerned.

SECTION TWO
DUTIES, AUTHORITY AND RESPONSIBILITIES OF THE EMPLOYER AND WORKERS

General responsibility of the employer

(1) The employer shall have a duty to ensure the safety and health of workers in every aspect related to the work. In this respect, the employer shall;

a) take the measures necessary for the safety and health protection of workers, including prevention of occupational risks and provision of information and training, as well as provision of the necessary organization and means and shall ensure that these measures are adjusted taking account of changing circumstances and aim to improve existing situations.

b) monitor and check whether occupational health and safety measures that have been taken in the workplace are followed and ensure that nonconforming situations are eliminated.

c) carry out a risk assessment or get one carried out;

d) take into consideration the worker's capabilities as regards health and safety where he entrusts tasks to a worker;

e) take appropriate measures to ensure that workers other than those who have received adequate information and instructions are denied access to areas where there is life-threatening and special hazard.

(2) In case an employer enlists competent external services or persons, this shall not discharge him from his responsibilities in this area.

(3) The workers' obligations in the field of safety and health at work shall not affect the principle of the responsibility of the employer.

(4) Measures related to health and safety at work may in no circumstances involve the workers in financial cost.

Principles of protection from risks

(1) The employer shall fulfil these responsibilities on the basis of the following principles:

a) avoiding risks.

b) evaluating the risks which cannot be avoided.

c) combating the risks at source.

d) adapting the work to the individual, especially as regards the design of work places, the choice of work equipment and the choice of work and production methods, with a view, in particular, to avoiding or minimizing if cannot be avoided, the adverse effects of monotonous work and work at a predetermined work-rate on health and safety

e) adapting to technical progress.

f) replacing the dangerous by the non-dangerous or the less dangerous.

g) developing a coherent overall prevention policy which covers technology, organization of work, working conditions, social relationships and the influence of factors related to the working environment

h) giving collective protective measures priority over individual protective measures

i) giving appropriate instructions to the workers.

Occupational health and safety services

(1) In order to provide occupational health and safety services including activities related to the protection and prevention of occupational risks, the employer shall:

a) designate workers as occupational safety specialist, occupational physician and other health staff. In case there is lack of personnel in the undertaking competent enough to be designated, the employer shall enlist a joint health and safety unit to partially or fully provide these services. Provided that the employer has the required qualifications and documents, these services can be offered by the employer considering the hazard class and the number of workers.

b) meet the need for means, space and time to help designated people or organizations fulfil their duties.

c) ensure cooperation and coordination among all people and bodies responsible for providing health and safety services at workplaces

d) implement measures related to occupational health and safety and that are in accordance with the legislation and notified in writing by the designated persons or organizations providing services

e) inform designated persons, external services consulted and other workers and their employers from any outside enterprise or undertaking engaged in work in his undertaking or enterprise receive adequate information as regards the factors known to affect, or suspected of affecting, the safety and health of workers.

(2) Public bodies and organizations as defined in Public Procurement Law no. 4734 dated 4/1/2002 may get occupational health and safety services either directly from circulating capital enterprises operating under the Ministry of Health or as defined in law no. 4734.

(3) It is not obligatory to hire other health care staff in enterprises where there is a full time occupational physician.

Occupational physicians and occupational safety specialists

(1) Rights and authorities of occupational physicians and occupational safety specialists might not be restricted in the execution of their duties. Occupational physicians and safety specialists shall seek and maintain professional independence and observe the rules of ethics in the execution of their functions.

(2) Occupational physicians and occupational safety specialists shall inform the employer in writing of the main occupational health and safety measures required to be taken in the undertaking or enterprise. In case the employer fails to implement any of these measures against life-threatening hazards, the occupational physician shall notify the Ministry of this situation.

(3) Occupational physicians and occupational safety specialists as well as external services consulted shall be accountable to the employer for neglect of duty in the execution of their offices.

(4) Where an occupational physician or occupational safety specialist is found to be in neglect of his/her duties resulting in an occupational accident or occupational disease which causes disruption in the integrity of the body such as death or disability, his/her certificate of authorization shall be suspended.

(5) In order to be able to be designated as an occupational safety specialist, one shall obtain class (A) certification to be considered as qualified enough to work in enterprises classified as very hazardous and at least class(B) certification to work in enterprises classified as hazardous and at least class (C) certification to be hired in less hazardous enterprises. The Ministry might introduce sector-specific arrangements for the designation of occupational safety specialists and occupational physicians.

(6) In the event that it is required to hire full time occupational physicians and safety specialists due to the working hours, the employer shall establish a workplace health and safety unit. Without prejudice to the provisions of the law applicable to workers, the weekly working hours as defined in the Labour Law no. 4857 dated 22/5/2003 shall be taken into account.

(7) The personnel qualified enough to be hired as occupational physician or occupational safety specialist in public bodies and organizations according to the relevant legislation might be assigned in other public bodies and organizations in addition to their fundamental duties following the approval and consent of the relevant personnel and top management provided that the working hours are not to exceed the duration indicated in their contract and they have the required certification.

An additional payment equal to the product of an indicative figure (200) and quotient of the monthly salary of civil servants shall be awarded by the organization benefiting from this additional service to the personnel assigned in public bodies other than the one that they were originally assigned.

There shall be no deduction in this payment other than the deduction due to stamp tax. Assignments exceeding eighty hours in total in a month shall not be included in the additional payment provided that the daily working hours are not exceeded.

(8) Without prejudice to the legislation on full time employment in public health care services, the restrictive provisions of other laws shall not apply to employment of occupational physicians and other health care staff in workplace health and safety units and joint health and safety units and fulfilment of their duties the scope of which shall be limited to the number of workers in the enterprise benefiting from the service.

Determining the Hazard Class

(1) Considering the short-term insurance premium tariff as defined in article 83 of the Law no. 5510 dated 31/5/2006 on Social Insurance and Universal Health Insurance and in line with the views of commission composed of all parties concerned and set up under the chairmanship of Directorate General of Occupational Health and Safety, the Ministry shall issue a circular on assigning a hazard class to enterprises.

(2) The hazard class for enterprises shall be assigned based on the main activities conducted.

Risk assessment, control, measurement and research

(1)The employer shall conduct an assessment of risks to health and safety of workers or get one carried out, taking account the following points:

a) The situation of workers who might be affected by certain risks.

b) Choice of work equipment, the chemical substances or preparations used.

c) Workplace organization and housekeeping.

d) The situation of female workers and other workers such as young workers, older workers, disabled, pregnant or breastfeeding workers who need specific policies.

(2) The employer shall identify the occupational health and safety measures to be taken as well as the protective gear or equipment to be used a consequence of the risk assessment.

(3) Measures to be taken for the safety and health protection of workers and the working and production methods implemented by the employer must assure an improvement in the level of protection afforded to workers with regard to safety and health and be practicable at all hierarchical level within the undertaking and/or enterprise.

(4) The employer shall ensure that controls, measurements, examinations and research are carried out to identify the risks which are linked to the working environment and to which the workers are exposed.

Emergency plans, fire-fighting and first aid

(1) The employer shall;

a) assess the foreseeable emergency situations which could arise and identify those that might possibly and potentially affect workers and work environment taking into account the work environment, substances used, equipment and environmental conditions present in the workplace and take measures to prevent and limit adverse effects of emergency situations.

b) conduct measurement and assessments to afford protection against adverse effects of emergency situations and prepare emergency plans.

c) designate a sufficient amount of persons adequately equipped in prevention, protection, evacuation, fire fighting, first aid and other related issues taking into account the size and specific hazards of the undertaking, nature of the activities, number of employees and other persons present in the enterprise. The number of such workers, their training and equipment available to them shall be adequate and the employer shall arrange emergency drills and trainings and make sure that the rescue teams are always available to respond.

d) arrange any necessary contacts with external services, particularly as regards first aid, emergency medical care, rescue work and fire-fighting.

Evacuation

(1) In the event of serious, imminent and unavoidable danger, the employer shall:

a) take action and give instructions to enable workers to stop work and/or immediately to leave the work place and proceed to a place of safety.

b) for as long as the situation remains unchanged and unless there is a strict necessity; not ask workers, except for those who are adequately equipped and specially assigned to do so, to resume work.

(2) The employer shall ensure that all workers are able, in the event of serious and imminent danger to their own safety and/or that of other persons, and where the immediate superior responsible cannot be contacted, to take the appropriate steps in the light of their knowledge and the technical means at their disposal, to avoid the consequences of such danger. Their actions shall not place them at any disadvantage, unless they acted carelessly or there was negligence on their part.

Right to Abstain from Work

1) Workers exposed to serious and imminent danger shall file an application to the committee or the employer in the absence of such a committee requesting an identification of the present hazard and measures for emergency intervention. The committee shall convene without delay and the employer shall make a decision immediately and write this decision down. The decision shall be communicated to the worker and workers' representative in writing.

(2) In the event that the committee or the employer takes a decision that is supportive of the request made by the worker, the worker may abstain from work until necessary measures are put into practice. The worker shall be entitled to payment during this period of abstention from work and his/her rights arising under the employment contract and other laws shall be reserved.

(3) In the event of serious, imminent and unavoidable danger; workers shall leave their workstation or dangerous area and proceed to a place safety without any necessity to comply with the requirements in the first paragraph. Workers may not be placed at any disadvantage because of their action.

(4) Where the necessary measures are not taken despite the requests by workers, workers under labour contract might terminate their employment contract in accordance with the provisions of the law applicable to them. As for the workers under collective bargaining agreement, the abstention period as defined in this article shall be deemed as actual work time.

(5) In compliance with the article 25 of this law, the provisions of this article shall not apply in the event of cease of work in the enterprise.

Recording and Notification of Occupational Accidents and Diseases

(1) The employer shall;

a) keep a list of all occupational accidents and diseases suffered by his workers and draw up reports after required studies are carried out.

b) investigate and draw up reports on incidents that might potentially harm the workers, work place or work equipment or have damaged the work place or equipment despite not resulting in injury or death.

(2) The employer shall notify the Social Security Institution of the following situations within a prescribed

time as follows:

a) Within three work days of the date of the accident.

b) Within three work days after receiving the notification of an occupational disease from health care providers

or occupational physicians.

(3) Occupational physicians or health care providers shall refer workers who have been pre-diagnosed with an

occupational disease to health care providers authorized by the Social Security Institution.

(4) Occupational accidents referred to health care providers shall be notified to the Social Security Institution within ten days at most and authorized health care providers shall notify the Social Security Institution of the occupational diseases within the same period of time.

(5) The procedures and principles as regards this article shall be defined by the Ministry following the receipt of approval from the Ministry of Health.

Health Surveillance

(1) The employer shall;

a) ensure that workers receive health surveillance appropriate to the health and safety risks they incur at work.

b) Health examination of workers is required under the following situations:

1) Pre-assignment.

2) Job change after the assignment.

3) In case of return to work following repetitive absence from work due to occupational accidents, occupational diseases or health problems upon request.

4) At regular intervals recommended by the Ministry in the course of employment taking into account the workers, the nature of work and hazard class of the enterprise.

(2) Workers to be employed in enterprises classified as hazardous and very hazardous shall receive a medical report before employment.

(3) Medical reports required to be received as per this law shall be obtained from occupational physician working in workplace health and safety unit or joint health and safety unit. Any objection to the medical reports shall be filed to an adjudicator hospital assigned by the Ministry of Health. The decision made by the hospital shall constitute the definitive judgement.

(4) The employer shall cover all expenses arising from health surveillance and any additional expense related to this surveillance. The health surveillance may in no circumstances bring financial burden to workers.

(5) Health data of workers undergoing a medical examination shall be kept confidential in order to ensure protection of individual privacy and prestige.

Training of Workers

(1) The employer shall ensure that each worker receives safety and health training. This training shall be provided on recruitment, in the event of a transfer or a change of job, in the event of a change in equipment or introduction of any new technology. The training shall be adapted to take account of new or changed risks and repeated periodically if necessary.

(2) Workers' representatives shall be entitled to appropriate training.

(3) Workers failing to present documents to prove that they have received vocational training on their job might not be employed in jobs classified as hazardous and very hazardous which require vocational training.

(4) Workers who have had occupational accident or disease shall receive additional training on reasons for the accident or disease, ways to protect themselves and safe working methods. Futhermore; workers who are away from work for any reason for more than six months shall receive refresher training before return to work.

(5) Workers from outside undertakings and/or enterprises might not start to be employed in jobs classified as hazardous and very hazardous unless they can present documents to prove that they have received appropriate instructions regarding health and safety risks.

(6) The employer who is the party to temporary employment relationship shall ensure that the worker receives training on health and safety risks.

(7) Trainings mentioned in this article may in no circumstances bring financial burden to workers. Time spent on trainings shall be deemed as actual work time. In case the time allocated for trainings exceeds weekly working hours, hours worked in excess of weekly working hours shall be considered as overtime.

References:

OCCUPATIONAL HEALTH AND SAFETY LAW, Official Journal, 30 June 2012, SATURDAY, Volume : 28339

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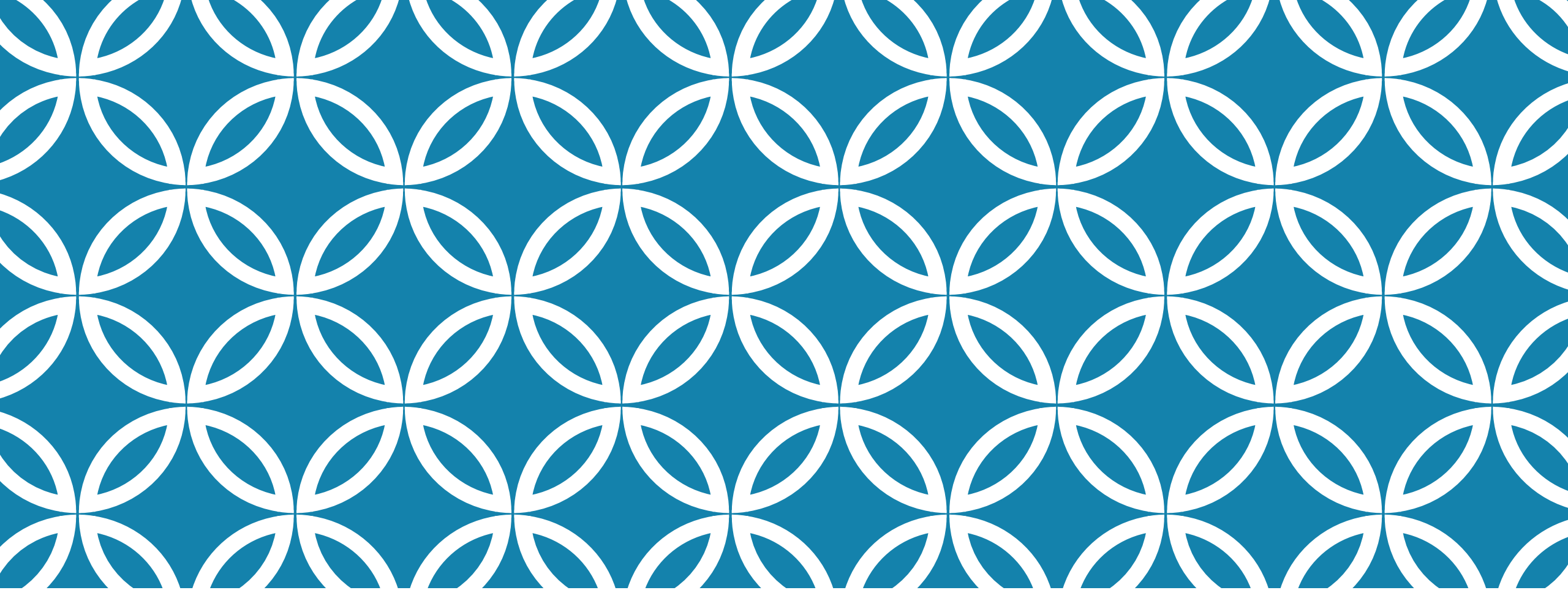

OCCUPATIONAL HEALTH AND SAFETY

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CHAPTER 4

WORK ENVIRONMENT SURVEILLANCE - OHS SERVICES

The term “surveillance” is derived from the French word meaning “to watch over”.

What is surveillance of the working environment?

Surveillance is a core activity in the practice of occupational health. Two broad groups of surveillance are commonly performed-hazard surveillance and health surveillance. While the focus of the former is hazards at the workplace, the latter type of surveillance pertains to the health of a person of group of workers.

What is OHS surveillance?

Occupational health surveillance provides information on where, how and why workers get sick or hurt on the job. This information is used to improve worker health and safety through appropriate prevention activities.

SURVEILLANCE OF THE WORK ENVIRONMENT

Surveillance of the working environment, planning periodic maintenance, control and measurements required to be carried out in the workplace in accordance with occupational health and safety legislation, having them done through accredited organizations and controlling their applications.

Participating in studies to prevent accidents, fires or explosions in the workplace, to have drills done.

Making suggestions to the employer about the prevention of work accidents, to follow the practices,

Participating in the preparation of emergency plans for situations such as natural disasters, accidents, fires or explosions, monitoring and controlling periodic trainings and exercises on this issue and acting in line with the emergency plan.

There are four broad trends in employee tracking and surveillance technologies:

- forecasting and marking tools,
- biometric and health data,
- remote monitoring and
- time tracking and gamification, and algorithmic management.

One of the factors that threaten the working environment is occupational diseases. Occupational disease is a condition that occurs when the health of the employee, affected by normal physiological systems, is exposed to risk factors such as physical, chemical or biological agents.

Work environment surveillance is an important process in occupational health practice. There are basically two types of surveillance: hazard surveillance and health surveillance. The focus of hazard surveillance is on hazards in the work environment. Health surveillance is about the health of a person from a certain group of workers. These two types of surveillance have an important place in occupational health practice.

Surveillance studies reveal the hazards in the work environment and trends or emerging patterns in occupational diseases. In order to be effective, surveillance activities need to be continued as preventive and corrective action.

The International Labor Organization defines occupational health surveillance as the systematic collection, analysis, interpretation and distribution of data for prevention. It is necessary to identify potential workplace hazards before experiencing irreversible health problems.

Unlike work environment surveillance that investigates workplace hazards, employee health surveillance identifies and collects data to deal with harmful exposures in the work environment. Health surveillance results should be transferred to the enterprise's continuous risk assessment process.

The main work environment surveillance services

- Workplace hygiene surveillance
- Toxic gas and steam surveillance
- Dust exposure monitoring
- Noise exposure surveillance
- Ambient air quality surveillance
- Working environment gas surveillance
- Lighting surveillance
- Ambient temperature monitoring
- Air pollution surveillance
- Particle inspection
- Humidity monitoring

WORKPLACE HYGIENE SURVEILLANCE

Industrial hygiene monitoring refers to the practice of measuring the amount of harmful and non-harmful contaminants that exist within a workplace.

Occupational hygiene monitoring strategies are aimed at assessing the nature, extent and control of workplace hazards. Monitoring of the conditions in the workplace is important for the purpose of preventing illness or injury of workers.

Monitoring is the process of obtaining measurements of specific hazards (for example, noise or airborne contaminants) that workers may encounter during work activities. Information obtained from appropriately established monitoring strategies can assist the development of risk assessments guiding decisions on the level of controls implemented at the workplace.

WHY IS HYGIENE IMPORTANT IN THE WORKPLACE?

People spread germs and pose a health risk in countless ways. They sneeze without a tissue, leave dirty cups in the office kitchen, and use the bathroom without washing their hands. Think these are minor issues? Think again.

Hygiene measures are important because they contribute to a healthy workplace and a healthy workforce, meaning staff are happier, less likely to take sick leave and more productive. For both employers and employees, it's a win-win scenario.

EXAMPLES OF POOR HYGIENE PRACTICES AT WORK

So, what does poor hygiene look like in the workplace? It can take many forms. The hygiene practices your company needs to follow will depend on what the business does. If you run a restaurant or a bakery, you'll need to take all the necessary hygiene precautions to maintain safe handling of food. If you work in a chemical plant, you'll need a strict hygiene policy for using hazardous substances.

In a general sense, poor hygiene practice could be any of the following:

Handling food without washing their hands.

Leaving paper towels, toilet paper and body fluids on the bathroom floor.

Not adhering to a clean desk policy by leaving unwashed plates and clutter in a private workspace.

Not regularly showering or wearing soiled clothing.

HOW DO YOU MAINTAIN A HYGIENIC WORKPLACE?

Provide staff with a written workplace hygiene policy. Inform them of your intentions and expectations for a clean workplace. This helps communicate to staff that a hygienic workplace is a serious issue . A hygiene policy might include an employer's expectations about:

Personal hygiene rules – Including regularly washing hair, hand washing and grooming.

Not attending work with a contagious illness – This can help with infection control.

A clean desk policy- Employee's might be responsible for cleaning and tidying their own desk.

A kitchen hygiene policy – Including how to prepare food safely and maintain good hygiene practices while preparing food, eating and cleaning up afterwards.

Rules to ensure staff maintain hygiene in the staff bathroom.

This hygiene policy can be included in your employee handbook and shared via internal communication (you could send email reminders and place posters around the workspace).

Keep bathrooms and kitchens clean

Bathrooms and kitchens are a breeding ground for bacteria and a workplace environment where it's vital to have high levels of hygiene discipline.

To maintain basic hygiene in your bathrooms, ensure they are well stocked with antibacterial soap, toilet paper and hand towels. You should also remind employees using the bathroom to wash their hands and leave the sink and cubicles clean for other staff.

Keeping the office kitchen hygienic is also crucial and you should ensure all staff clean up after themselves when preparing and eating food. Pay close attention to high-use areas, such as the fridge, surfaces and sink. Regular cleaning and maintenance of utensils and equipment is a must in any workplace hygiene policy.

Provide antibacterial wipes, sanitiser and tissues

Provide items such as antibacterial wipes, sanitisers, and tissues to help your staff maintain a clean and hygienic workspace. Employees are more likely to use these items if they are readily available.

Shared facilities and equipment can soon harbor high levels of harmful bacteria. High risk 'hotspots' to regularly clean include:

Bathrooms: toilets, toilet bowls, cubicle handles, flush buttons/handles.

Common areas: kitchens, cafeterias, hallways.

Reception and entrance areas: reception desks, sign-in clipboards, pens, door handles.

Lifts and stairwells: handrails, lift buttons.

Desks and meeting rooms: keyboards, equipment, monitors.

Keep your workplace clean

Make sure your workplace is regularly cleaned. Not only does this help prevent the spread of infection, but a presentable workplace also maintains a sense of professionalism. You might choose to implement a cleaning schedule, with responsibilities divided between staff.

If you don't have capacity within your own team to clean your workplace, you could consider contacting an external cleaning service.

Handwashing

Ask all employees and visitors to wash and dry their hands:

Before and after eating.

After coughing or sneezing.

After going to the toilet.

When changing tasks and after touching potentially contaminated surfaces.

An alcohol-based hand sanitiser with at least 60% ethanol or 70% isopropanol as the active ingredient must be used as per the manufacturer's instructions when it is not possible to wash and dry hands.

TOXIC GAS AND STEAM SURVEILLANCE

A Toxic Gas Monitoring System (TGMS) owner is the person who has overall responsibility for the TGMS within a company or organization.

A TGMS is a critical life safety system that alerts personnel of a potential leak or exposure to toxic gas in a monitored space. Or, in some cases the TGMS also detects a significant decrease or increase in available oxygen in a monitored space or location. A TGMS owner can be an Health, Safety & Environmental (HSE) manager, safety coordinator, building manager, laboratory department head, or any other assigned person within an organization.

Toxic Gas Types

Common toxic gases in the oil and gas industry include:

Hydrogen Sulphide (H2S)

Carbon Monoxide (CO)

Oxygen Depletion (O2)

Carbon Dioxide (CO2)

Ammonia (NH3)

Benzene (C6H6)

Some of these poisonous gases may be easily identifiable by an individual upon exposure while others are not. For instance, hydrogen sulphide has an Odor similar to that of a rotten egg, whereas carbon monoxide is a colourless, odourless, and tasteless toxic gas. By the time a person may or may not realize they are in the presence of a toxic gas they may have already been exposed at a life-threatening level.

Wireless Gas Monitors

Obtain an early warning of gas presence to prevent your employees from entering potentially hazardous areas

Hot-swappable smart sensors are lab calibrated prior to installation, resulting in 50% periodic maintenance savings

Save 60% on installation equipment costs by eliminating the need for expensive wiring

DUST EXPOSURE MONITORING

Almost any place of employment can present a potential threat to health and safety from airborne particulates and aerosols. It is important to note, however, that dust hazards are not necessarily visible to the human eye and that the finest particles can represent the greatest threat because of their ability to travel deepest into the lungs. Effective monitoring is therefore key to the implementation of an effective risk management strategy.

There are two major reasons for monitoring dust in the workplace; to enable air quality management, and for regulatory compliance. The immediate effects of dust can be irritation to eyes, headaches, fatigue, coughing and sneezing.

As such, poor indoor air quality can lower employee performance and cause increased absenteeism through sickness. In addition, particulates are known to create long-term deleterious effects, contributing to serious illnesses. In combination with outdoor exposure (to pollution form vehicles for example), the Government has estimated that 29,000 premature deaths occur in the UK every year as a result of particle pollution. This means that, particularly in urban areas, natural ventilation may not necessarily improve indoor air quality.

Employers are responsible for ensuring that staff and visitors are not exposed to poor air quality in the workplace, so it is necessary to conduct monitoring. Accurate and effective monitoring data can be used to check exposure levels and to help identify safe working practices.

Here are some examples of activities that can create dust:

Filling bags or emptying them into skips or other containers

Weighing loose powders

Cutting of materials

Sieving and screening operations

Conveying materials by mechanical means or by hand

Stockpiling large volumes of processed materials

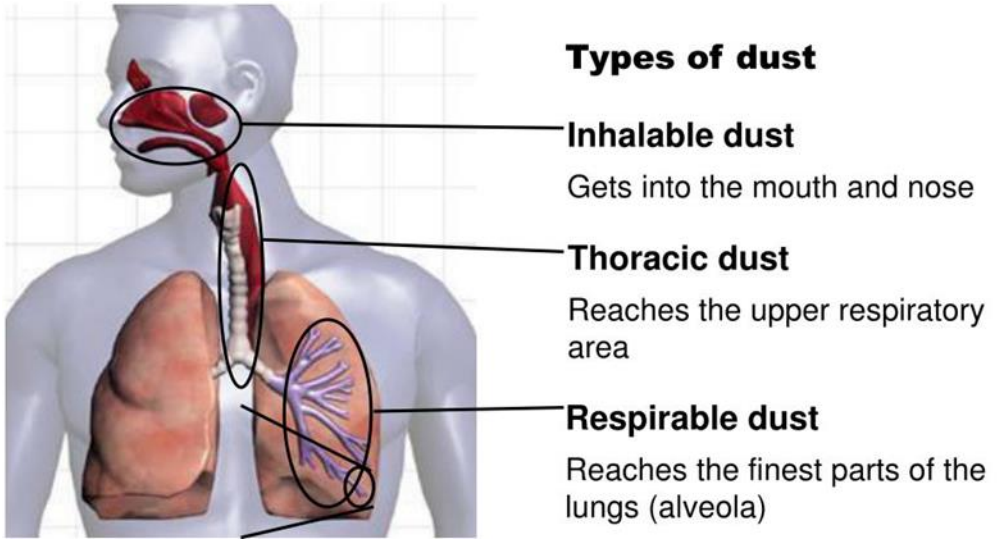
Crushing and grading

Activities involving diesel engines

Milling, grinding, sanding down or other similar operations

Cleaning and maintenance work

Clearing up spillages



HOW DO YOU MONITOR DUST IN THE WORKPLACE?

How do you monitor dust in the workplace?

The most commonly used methods are:

- sampling the air in the worker's breathing zone or in the general background.
- wipe sampling of the skin.
- biological monitoring and biological effect monitoring.
- measuring noise or vibration levels.

What is the workplace exposure limit for dust?

The workplace exposure limit (WEL) for general respirable and inhalable dust is 4mg/m3 and 10mg/m3 respectively based on an eight-hour working shift. Other more specific types of dust have lower exposure limits as they are considered to be more harmful.

NOISE EXPOSURE SURVEILLANCE

What is noise exposure monitoring?

The purpose of noise exposure monitoring is to determine a worker's 8-hour time weighted average (TWA) or accumulated noise dose over the work shift (personal noise dose). It is also used to measure how noise varies over time according to the job task.

How do you measure noise exposure?

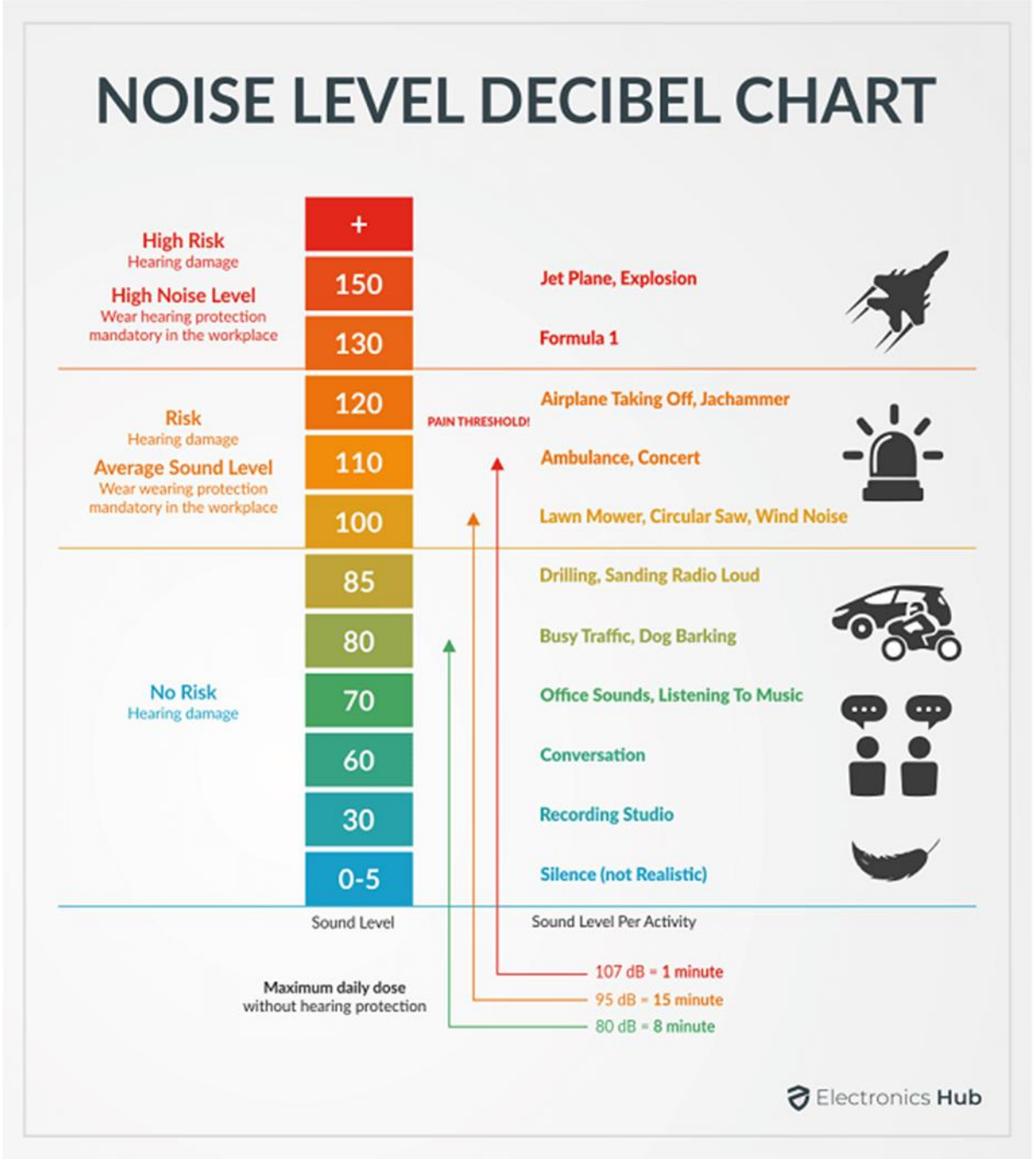
The most popular approach to occupational noise measurement is to take 8-hour measurements with wearable sound level meters called noise dosimeters. This way, the overall amount of sound exposure over 8 hours is obtained and transformed into a noise dose.

What is the noise exposure limit for ISO?

ISO 1999:1990 is the standard for measuring exposure to noise among workers. The goal of noise measurements is to verify action levels set at 80, 85, and 87 decibels. Each action level defines what measures must be taken to avoid hearing loss among employees.

What is the safe exposure limit for noise?

Although the limits vary from country to country, there is a generally accepted standard of a time weighted average (TWA) of 85 dB (A).



Manager responsibilities

You should take measures to eliminate or reduce noise exposure.

You should look at:

- methods of work
- work equipment
- layout of workplace
- quiet areas for breaks
- providing information and training

Exposure action values

Noise is measured in decibels (dB).

There are two action levels where damage can occur:

80dB: At 80dB or a peak exposure value of 135dB you must provide information and training and make hearing protection available.

85dB or above: At or above 85dB, you must identify the reasons for the excess noise. You should:

- put in place a programme to reduce the noise
- get a registered medical practitioner to carry out hearing checks and audiometric testing
- put up clearly visible signs indicating that the noise level is likely to exceed 85dB

87dB

No worker should be exposed to 87dB (taking hearing protection into account)

Hearing protection

You should provide your employees with hearing protection where necessary.

The main types of hearing protection are:

- earmuffs, which completely cover the ears
- earplugs, which are inserted in the ear canal
- semi-inserts (also called 'canal caps') which cover the entrance to the ear canal

You should ensure that employees use hearing protection when required to do so.

AMBIENT AIR QUALITY SURVEILLANCE

Air quality monitoring involves the systematic, long-term assessment of pollutant levels by measuring the quantity and types of certain pollutants in the surrounding outdoor air. In the context of the workplace, an air quality monitoring system involves detecting and measuring a range of pollutants like dust, mould, chemicals, and other particulates that can impact employee health and productivity.

Air quality monitoring helps maintain a healthier workplace environment. Poor air quality can cause a variety of health issues, including allergies, respiratory conditions, and even cardiovascular disease.

What are the major pollutants that affect indoor air quality?

Particles & PM10 (particulate matter 10 microns or less): Smoking is one of the biggest sources of particulates. the risks from inhalation of secondary tobacco smoke are declining in the workplace. Vehicles, especially diesels, generate high levels of particulates, which may enter the building if inlet filtration is not efficient. Dusts from other processes such as printing or shredding will be minimal in offices. Asthmatics are particularly susceptible to particulate pollution. Weather is also a contributory factor to indoor air quality as more pollution is formed on dry, windy days and more may be drawn in by the air conditioning systems.

Nitrogen oxide (NOx) and other toxic gases: Nitrogen oxide is readily emitted from vehicles and power stations and it converts into the more harmful nitrogen dioxide in the air. NOx can also be emitted from gas appliances such as cookers and hobs in domestic kitchens, often reaching considerable levels. This may trigger asthma attacks or cause breathing difficulties in those who are more susceptible.

Radon: This is responsible for half of every person's radiation exposure. It is prevalent in areas with a high proportion of granite, such as Edinburgh, and although outdoor ambient levels of exposure are low, these are more concentrated indoors, especially if there is inadequate ventilation. Specialist detection badges and equipment or a monitoring service from the National Radiation Protection Board can be used.

Solvents: These are usually generated inside the building and come from a variety of sources including glue, furniture, carpets and fabrics. Even high usage of perfumes and deodorants, if no effective ventilation is in place, can build up to levels that can affect some people, especially those with low tolerance thresholds.

Carbon monoxide (CO): Many examples of buildings can be found where the air intakes have been fitted at street level, which can pull in and concentrate levels of pollutants such as CO, which has no odour and is very easy to overlook, often with serious consequences.

Moulds and fungi: Many people suffer respiratory problems when exposed to fungal spores. Breathing difficulties can be exacerbated by high levels of humidity and dampness. Both of these are affected by external air quality and atmospheric conditions. It is essential to ensure adequate levels of fresh air intake and efficient air filtration.

Thermal environment: Outdoor weather conditions often have even more impact on the indoor working environment. Even with air conditioning systems, employees may be exposed to high levels of solar heat gain via windows or be affected by radiant heat from the walls and fabric of the building. Humidity is a key element in air quality, and if the air is too dry, this may exacerbate conditions such as rhinitis and dry eyes. All these factors may lead to increased levels of stress, which in turn will affect employees' wellbeing and productivity.

Monitoring the environment

A wide variety of instruments and equipment is available, which can be used to take readings and air samples from indoor environments. These include direct reading detection tubes or detectors for gases and vapours, particulate samplers or sampling pumps, heat stress meters, light meters, temperature and humidity detectors and dataloggers.

Data on the ambient air quality is also available from local authorities. Such information can be used to ascertain what effect ambient air quality may be having on the occupants of a building.

World Health Organisation guideline levels for typical indoor pollutants

CO < 5ppm

CO2 < 1500ppm

Formaldehyde < 0.1ppm

NO2 < 0.15ppm

Ozone < 0.08ppm

Respirable dust < 0.15ppm

Bacteria < 1500cfu/m3

Fungi/yeasts < 750cfu/m3

WORKING ENVIRONMENT GAS SURVEILLANCE

Workers in the oil and gas industries face the risk of fire and explosion due to ignition of flammable vapors or gases. Flammable gases, such as well gases, vapors, and hydrogen sulfide, can be released from wells, trucks, production equipment or surface equipment such as tanks and shale shakers.

Protecting employees from workplace hazards is your obligation under OSHA regulations. One of the things that you need to be concerned about is the air quality within your facility or on the job site. If gases build up in a confined area, for example, there could be serious consequences for anyone working in the area. Gas monitors help minimize the danger by warning workers of dangerous gas levels, so they can evacuate the area.

What Is a Gas Monitor?

Simply put, a gas monitor is a type of device used to detect the presence of harmful gases. Monitors can either be portable, or fixed systems that sound an alarm when high levels of a target gas are detected. There are four types of gas monitors that are generally used including:

Electrochemical Gas Sensors — This type of gas monitor is common in manufacturing facilities and other buildings to detect toxic, explosive, or otherwise dangerous gases in the air. Your home's smoke and carbon monoxide detectors are also electrochemical gas sensors.

Catalytic Bead Sensors — This type of sensor has been used to detect dangerous gases for more than 50 years. Catalytic bead sensors are relatively inexpensive, non-gas specific, and reliable for use in industrial facilities, around machinery, and other areas where gases may be an issue.

Infrared Gas Sensors — These sensors can detect harmful levels of industrial and environmental gases including methane, carbon monoxide, and carbon dioxide. Infrared gas sensors are commonly used in the transportation, oil & gas, and mining industries.

Photoionization (PID) Gas Sensors — You'll find this type of monitor being in industrial and manufacturing facilities where there is a potential for spills or leaks of hazardous materials, oil, or gasoline. PID gas sensors are also used to detect VOCs in a variety of industrial settings.

Which Gases Need to Be Monitored?

The reason for monitoring gases is simple, to protect workers from high levels of dangerous or explosive gases such as methane, carbon monoxide, and carbon dioxide. In addition, you may want to monitor the oxygen levels in the air as high levels can be explosive and low levels can cause serious issues for workers. You'll need to evaluate the risks within your facility to determine which gases you'll need to monitor for your employee's safety and well-being.

LIGHTING SURVEILLANCE

Adhering to lighting regulations in the workplace can be difficult and complex within various industries such as warehousing, office, manufacturing, pharmaceutical and hospitality for example.

Unfortunately there are not always clear and concise guidelines demonstrating exactly what lighting levels you should be maintaining.

From the workers' perspective, poor lighting at work can lead to eye-strain, fatigue, headaches, stress and accidents. On the other hand, too much light can also cause safety and health problems such as "glare" headaches and stress. Both can lead to mistakes at work, poor quality and low productivity. Various studies suggest that good lighting at the workplace pays dividends in terms of improved productivity, and a reduction in errors.

For example, in the ILO Manual, Improving Working Conditions and Productivity in the Garment Industry, it indicates that improved lighting in some factories resulted in a 10% increase in productivity and a 30% reduction in errors.

Improvements in lighting do not necessarily mean that you need more lights and therefore use more electricity – it is often a case of:

- making better use of existing lights;
- making sure that all lights are clean and in good condition (see figüre);
- ensuring that lights are positioned correctly for each task; and
- making the best use of natural light

Figure 1: Here is a strip light covered in cobwebs and never cleaned. It is a waste of electricity costs and provides poor lighting for the workers.

Improving lighting levels in the factory

Although there is often a need for shading windows to reduce heat inside a factory, there is also a need to make sure that all windows, skylights, etc., are clean and in the best position to allow the maximum amount of natural light into the workplace.

Companies can always use appropriate shading methods for reducing the temperature – they should not rely on the windows being dirty. Skylights and windows located higher up the factory walls let in a lot more light than lower windows which often get blocked with stock, raw materials, etc.

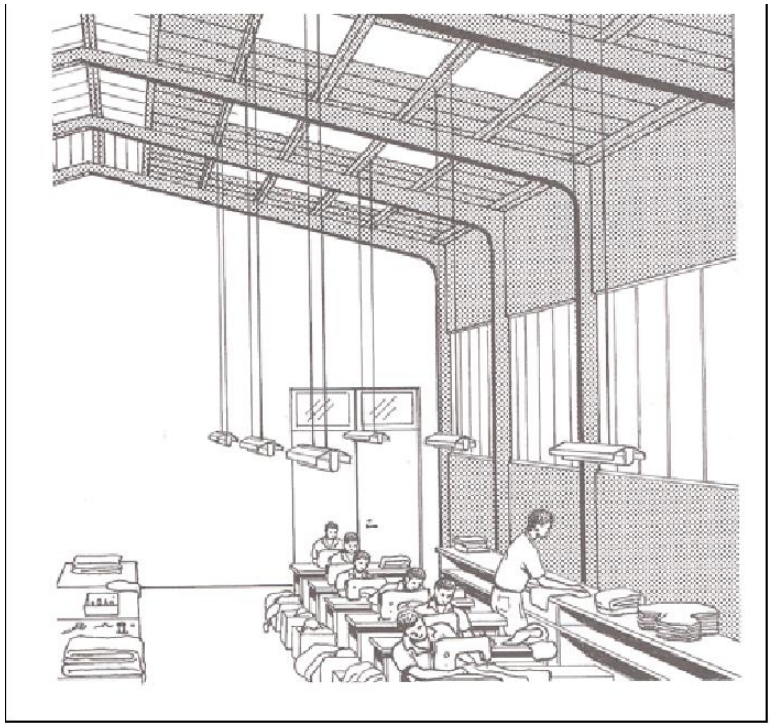
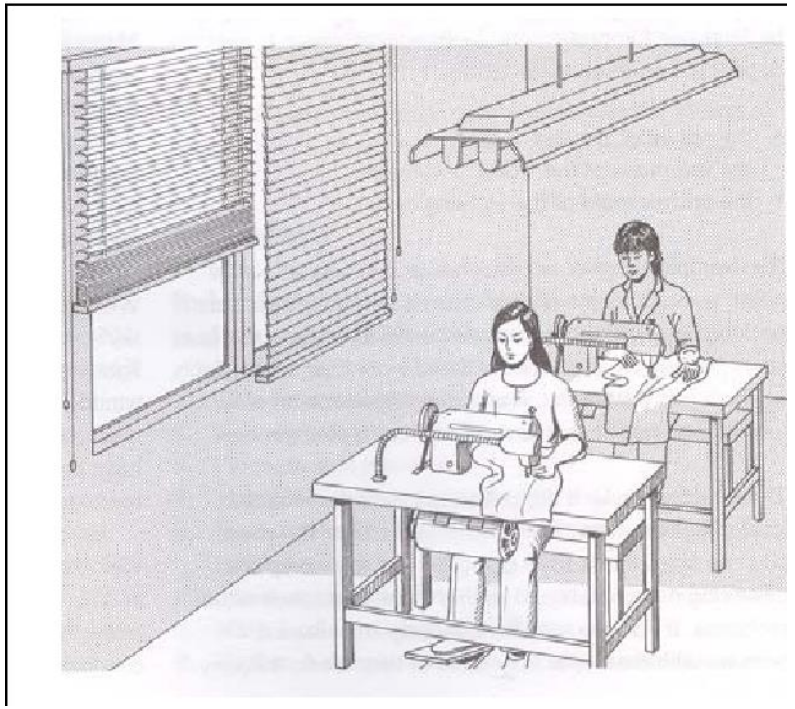


Figure 2: Use as much natural light as possible. Make sure that all windows, skylights etc., are clean

Clean windows will allow more natural lighting into the workplace. Blinds can be used to cut down direct sunlight and glare



Finding the best place for the light source

It may sound like common sense, but it is essential for the light to focus on the work at hand and not directly, or indirectly in the workers' eyes. The more detailed the task, the more light that is needed for the workers to carry out the job efficiently.

Figure 3: For close-up work it is essential to have localm lighting where the light shines directly on the task and not into the workers' eyes.

It is also essential that lights are positioned in the correct place so that workers do not have to adopt poor working postures to see the task at hand. It is also important to have adequate lighting near any potential hazards such as steps, ramps, etc., and outside the factory for security at night.

Avoiding glare

Although lighting levels may be adequate in the factory as a whole, glare from a direct light source or reflected off equipment or shiny surfaces can cause discomfort, eye strain and fatigue, all of which contribute to an increase in errors, and a reduction in quality and productivity. Glare has been described as “light in the wrong place” and comes in three different kinds:

Disability glare can dazzle and impede vision, and therefore may be a cause of accidents. It is the result of too much light entering the eye directly.

Discomfort glare is more common in work situations. It can cause discomfort, strain and fatigue, especially over long periods. It is caused by direct vision of a bright light source and background.

Reflected glare is bright light reflected by shiny surfaces into the field of vision.

Figure 4: Avoid direct light into the eyes – use a shade.

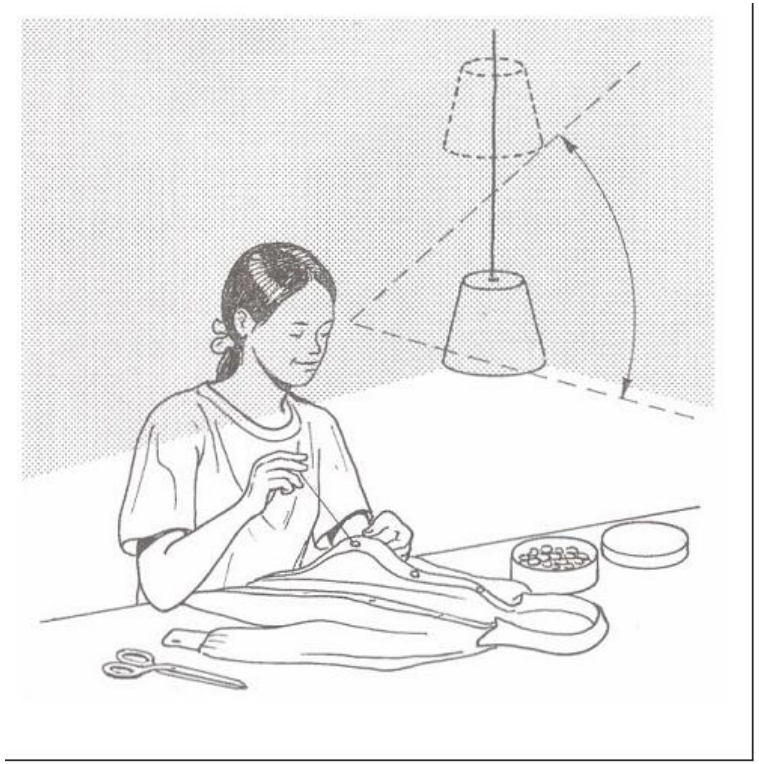


Figure 5: The correct positioning of lights avoids **discomfort glare** but care should be taken to avoid shadows on the working area. Look at the worker on the right – the light is almost behind her head so that she is working in her own shadow.

Figure 6: Avoid polished surfaces – use matt finishes or move the work position by 90 degrees to the right or left to stop **reflected glare**.

To reduce reflected glare

- change position of the light source and reduce its brightness;
- cover reflecting surfaces with opaque, non-glossy materials; and
- change the layout of the workstations.

How is light measured?

The level of light is measured in LUX using a light meter. The table gives an indication of some typical light levels.

Illuminance	Example
1 lux	Full moon overhead
50 lux	Family living room
80 lux	Hallway/toilet
100 lux	Very dark overcast day
400 lux	Sunrise or sunset on a clear day. Well lit office area
1000 lux	Overcast day, typical TV studio lighting
10,000-25000 lux	Full daylight (not direct sun)
32,000-130,000 lux	Direct sunlight

Table 1: Typical light levels measured in LUX

Are there any lighting standards?

Table 2 gives some typical examples of the minimum lighting intensities required for different occupations and types of work.

Activity	Typical Location	Average Illuminance (lux)	Minimum Illuminance (lux)
Movement of people, machines and vehicles.	Lorry park, corridors, circulation routes.	20	5
Movement of people, machines and vehicles in hazardous areas; rough work not requiring any perception of detail.	Construction site clearance, excavation and soil work, loading bays, bottling and canning plants.	50	20
Work requiring limited perception of detail.	Kitchens, factories assembling large components, potteries.	100	50
Work requiring perception of detail.	Offices, sheet metal work, book binding.	200	100
Work requiring perception of fine detail.	Drawing offices, factories assembling electronic components, textile production.	500	200

Table 2: Minimum and average lighting intensities required for different types of work

Figure 7: Good lighting reduces errors and improves productivity, whether it is for the factory a a whole or for individual workstations.

Simple rules for lighting

1. Make full use of daylight in the factory.
2. Choose appropriate visual backgrounds for walls, ceilings, etc.
3. Find the best place for the light source to avoid glare, etc.
4. Use the most appropriate lighting devices and fixtures.
5. Avoid shadows.
6. Ensure regular cleaning and maintenance of lights and windows.

AMBIENT TEMPERATURE MONITORING

Wellness is something that is not often considered in a traditional working environment, but employers don't realise that it poses a risk to their bottom line. While employees in warm spaces may be impaired on a functional level, those in overly air-conditioned rooms can be victim to airborne illness.

This not only impacts long-term health and well-being but also contributes to many sick days and a decrease in productivity. A reasonable temperature largely depends on the work activities and the environmental conditions of the workplace.

That said, navigating the optimal temperature for a working environment is easier said than done. Hygienists generally recommend that temperatures should be between 21 – 24 °C for summer and 24 – 26 °C for winter. But research undertaken in the Netherlands on building efficiency found that women generally are more comfortable if the temperature is closer to 25 °C – about 3 degrees warmer than men.

What does the law say?

Section 8 of the Occupational Health and Safety Act (Act 85 of 1993) stipulates that the employer must provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of its employees.

The same section stipulates that the employer is duty bound to establish, as far as is reasonably practicable, the hazards to health or safety of persons come with work which is performed. This includes risks associated with air conditioning systems. Risks associated with air conditioning should thus be identified and reduced as much as possible.

An efficient way to monitor work place temperature

The use of room temperature monitors or temperature data loggers are recommended. These devices will display the current room temperature so that adjustments can be made if necessary (with or without the use of an air conditioner).

One is also able to download a report indicating the either maximum and minimum temperatures for past periods or temperatures recorded at regular intervals.

Paired with this, employers can identify and control risk related to indoor air quality by:

- Air quality test reports
- Workplace inspections
- Investigating complaints from employees about the air quality

AIR POLLUTION SURVEILLANCE

Monitoring is an exercise to measure ambient air pollution levels in an area. The data will indicate the status of the quality of air we breathe. The data, over a long term, allows us to tease out patterns that help support air pollution control policy.

To thoroughly understand the broad range pollution level and its fluctuations. Measurements are taken using collection-analysis (manual analysis), concentration meters, continuous (automatic) analysers, and the other simple measuring equipment.

Volatile organic compound (VOC) sensors are available that are capable of detecting volatile chemicals and odorous pollutants. A common device for detecting particulate matter in the air is. Smoke is detected using two types of sensor: ionization detectors and photoelectric detectors.

HUMIDITY MONITORING

High humidity can have a range of effects on the workplace, not all of them pleasant! For one thing, high moisture levels can contribute to increased mould growth – mould spores aren't good news for humans, as they can cause stuffiness, eye and skin irritation, and even serious lung infections.

Therefore, safe humidity levels in office buildings are generally within the “safe zone” of 40 to 60 percent RH. This protects against overly low or high air moisture content.

A hygrometer will measure the humidity level in the air and will typically provide a %RH value, which means % relative humidity (100%RH being air that is saturated and cannot hold any more moisture).

There are three main measurements of humidity: relative, absolute and specific. Absolute humidity (units are grams of water vapor per cubic meter volume of air) is a measure of the actual amount of water vapor in the air, regardless of the air's temperature.

By maintaining humidity at around 50%rH, static build-up is eliminated and all these associated problems are avoided. Another advantage of maintaining the correct humidity in processing facilities is that it reduces airborne particles.

Use dehumidifiers and air conditioners, especially in hot, humid climates, to reduce moisture in the air, but be sure that the appliances themselves don't become sources of biological pollutants. Raise the temperature of cold surfaces where moisture condenses. Use insulation or storm windows.

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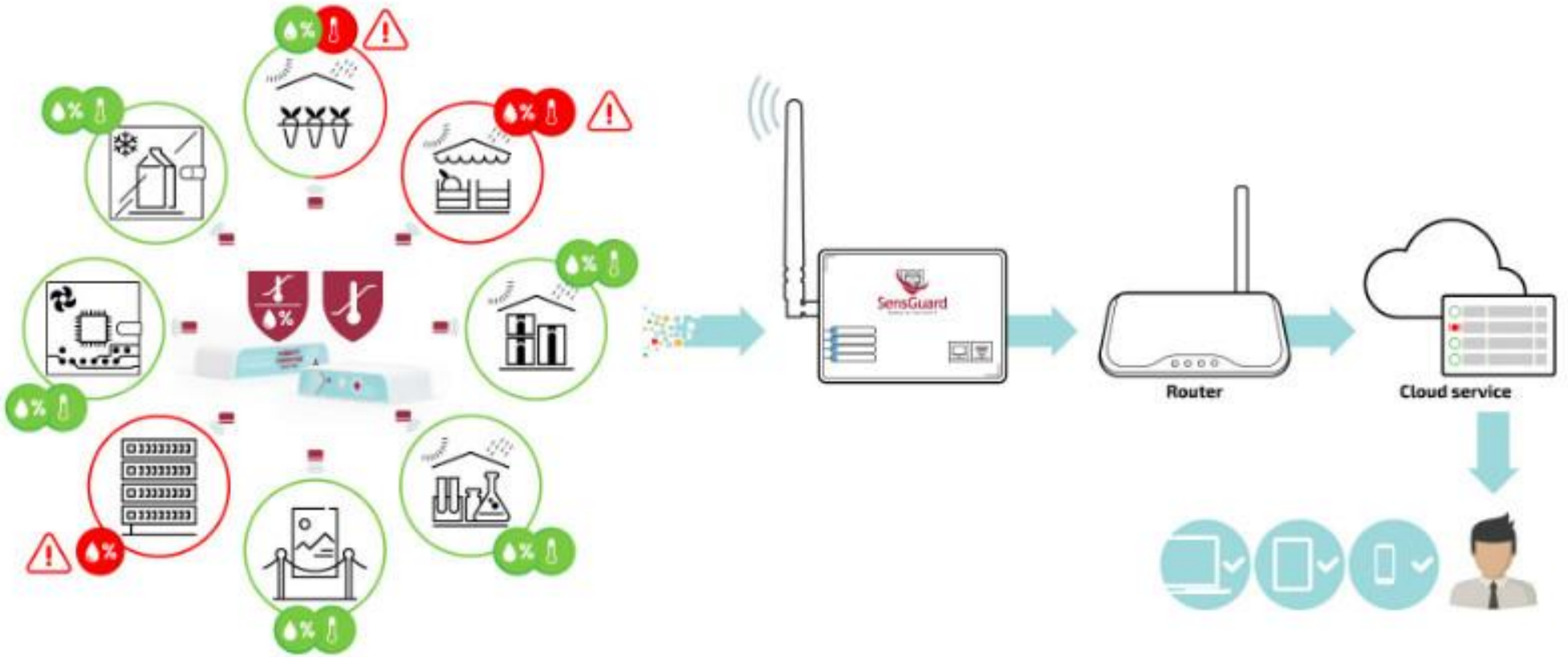

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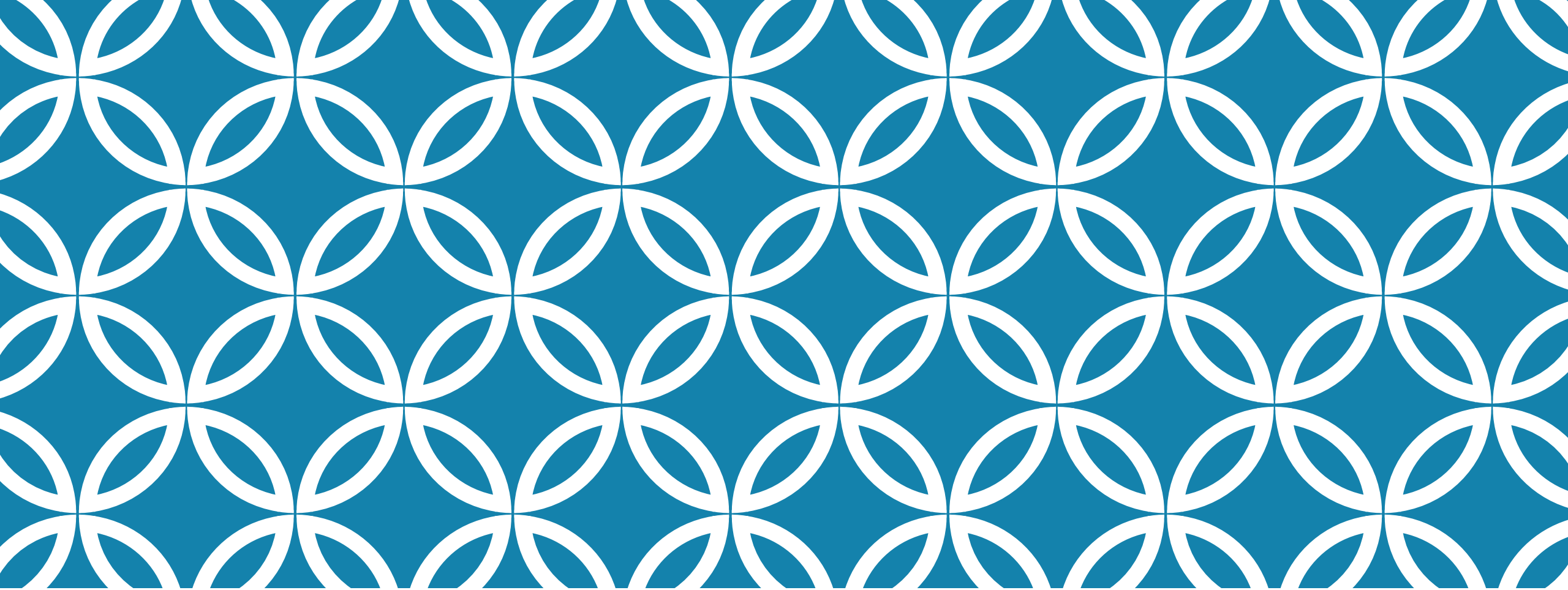


OCCUPATIONAL HEALTH AND SAFETY

Prof. Dr. Vural Emir KAFADAR

CHAPTER 5

WORK ACCIDENTS

What is a Workplace Accident?

A workplace accident is an unexpected event that results in physical or mental harm, such as injuries, illnesses, and even fatalities while performing work-related activities. This can happen on the premises of the workplace or outside of it.

What are the Main Reasons Leading to Workplace Accidents?

Workplace accidents can happen for a variety of reasons, such as negligence, inadequate implementation of safety measures, human error, equipment malfunction, or hazardous working conditions. Recognizing that workplace accidents can occur in any industry or work environment, including offices, factories, construction sites, transportation, healthcare facilities, and other places where people work is crucial. Some factors that can contribute to workplace accidents include:

Lack of Training

Insufficient training greatly contributes to workplace accidents. Employees not well-versed in safety protocols, handling equipment, or hazardous substances may inadvertently jeopardize their and others' safety. To prevent this, organizations must offer thorough training programs to their staff on potential hazards, safe practices, and emergency procedures.

Inadequate Safety Equipment

One of the main reasons for workplace accidents is the failure to provide the necessary safety equipment and gear. Employees working in sectors like construction, manufacturing, or healthcare must have suitable personal protective equipment to reduce the risk of potential hazards. This equipment comprises helmets, gloves, protective eyewear, ear protectors, and specialized gear for specific tasks.

Insufficient Maintenance and Unsafe Infrastructure

Neglecting the maintenance of machinery, equipment, and infrastructure can pose a serious threat to employee safety. Faulty equipment, wiring, slippery floors, and poorly maintained walkways increase the risk of accidents. Regular inspections, maintenance programs, and timely repairs are necessary for maintaining a safe working environment.

Fatigue and Stress

Fatigue and excessive stress can affect an employee's focus, reaction time, and decision-making abilities, leading to accidents. Long working hours, insufficient breaks, and high-pressure work environments increase levels of fatigue and stress. Implementing policies that prioritize work-life balance, encourage breaks, and support stress management techniques can significantly reduce the risk of accidents.

Lack of Communication and Coordination

Poor communication and coordination between employees and different departments can result in accidents. Miscommunication about safety procedures, work processes, or sudden changes can cause misunderstandings and hazardous situations. To enhance safety awareness and prevent accidents, it is crucial to establish transparent communication channels, hold frequent safety meetings, and encourage an open dialogue culture.

Human Error

Despite having stringent safety protocols, workplace accidents still occur due to human error. Mistakes in judgment and distractions can result in serious consequences. Promoting a culture of accountability, providing necessary training, and implementing error-prevention techniques can minimize the occurrence of human errors.

Hazardous Substances and Equipment

When dealing with hazardous substances like chemicals, gases, or radioactive materials, the risks involved are inherent. If proper handling, storage, and disposal protocols are not followed, it can result in chemical spills, toxic exposures, or fires. Employers must educate their employees on the potential dangers, provide adequate safety measures, and ensure that regulatory standards are met.

What Qualifies as Workplace Accidents?

The Social Insurance and General Health Insurance Law No. 5510 (In Turkish) in Türkiye defines workplace accidents to safeguard the safety and social security rights of employees. As per the law, workplace accidents refer to any unwanted incidents that happen under particular circumstances and are related to a person's work or workplace. The following situations are categorized as workplace accidents under the law:

When the insured person is present at their workplace,

When the work is being carried out by the employer,

During the times when an insured person, who has an employment contract, is sent to a place other than their workplace by the employer and is not performing their primary job during that time,

During the times when an insured, breastfeeding woman who has an employment contract, is given time according to labor regulations to breastfeed her child,

During the commute to and from the place of work using a vehicle provided by the employer,

If the insured person is self-employed and working independently, for events related to the work they are conducting.

Who is Eligible for Occupational Accident Insurance?

As per the regulations of Law No. 5510 concerning Social Insurance and General Health Insurance, the following individuals are covered by occupational accident insurance:

Employees who have an employment contract (4/a)

Self-employed individuals, village and neighborhood heads (4/b)

Employees working in Penal Institutions and Detention Centers

Apprentice candidates, apprentices, and interns

Disabled veterans and recipients of Disability Pension under the scope of the first paragraph of Article 4 (a) and (b) of the Law

Participants in Turkish Employment Agency training programs

Turkish employees sent to work abroad by employers undertaking work in countries without a social security agreement

Intern students

Insured individuals working temporarily under an employment contract in agricultural and forestry jobs

Insured individuals working in domestic services under the conditions specified in Article 9 Exhibit.

What to Do After a Workplace Accident?

In the event of a workplace accident, both employers and employees must take specific steps. Here are the necessary actions to be taken after a workplace accident:

Emergency response teams or trained personnel should administer first aid; if unavailable, the injured employee must be taken to a healthcare facility.

An accident report (record) must be created, which should include statements and signatures of any witnesses.

Authorities, such as the Police or Gendarmerie, must be notified of the accident if it occurred within their jurisdiction.

The accident must be reported to the relevant social security institution within 3 (three) business days from the date of the accident.

How to Prepare a Workplace Accident Report?

A workplace accident report is an official document that employers are required to maintain following workplace accidents. This document is essential in case legal proceedings arise due to the accident, as it serves as evidence. To create an accurate workplace accident report, the following essential elements should be included:

Identification of the Injured Party: The report should contain comprehensive information about the injured employee, such as their department, job responsibilities within the department, and date of employment.

Description of the Incident: The report should start with a description of the incident. The description should include the date, time, location, the specific area of the workplace where the accident occurred, and a summary of what happened.

Details of the Accident: The report should provide details about how the accident occurred, whether medical intervention was required, and a list of the tools and equipment involved. The report should also include information about the condition of the environment where the accident took place, lighting conditions, working conditions, and any other significant factors.

Injured or Affected Parties: In case any other individuals were harmed or affected by the workplace incident, it is important to mention their names, job titles, start dates, and the severity of their injuries. If there was any loss of limbs or appendages, it should also be specified. Furthermore, if needed, please provide details about the first aid that was given and any precautions that were taken.

Witness Statements: When filling out a workplace accident report, it's important to include the names, job titles, and contact information of anyone who witnessed the incident. It's also beneficial to gather statements from these witnesses to gain a better understanding of how the accident occurred. These statements can be significant evidence during the investigation process.

How to Report a Workplace Accident?

If there is an accident in the workplace, it is important to inform the Social Security Institution (SGK) (In Turkish) by either writing a letter or submitting an electronic notification. However, electronic notifications are only possible for those who are covered under 4A insurance, which includes employees working under an employer. If you are eligible, you can submit an electronic notification through the e-Devlet portal by using the user code and e-declaration password provided by the Social Security Institution. Simply fill out the workplace accident form (In Turkish) in the system and the process will be complete. If you do not have an e-declaration password or are not covered by 4A insurance, such as foreign employees, you will need to fill out the necessary forms and submit them directly to the Social Security Institution.

The Period for Reporting a Workplace Accident

If a workplace accident occurs, it must be reported to the Social Security Institution (SSI) within 3 business days. This 3-day period is calculated from the day after the accident. For example, if an accident happens on Monday, the report must be submitted by Thursday at midnight.

When calculating this period, it is important to note that Sundays and official holidays are not included. Additionally, according to the Labor Law, Saturdays are considered business days for employees but not for official procedures. Since reporting a workplace accident is an official procedure, Saturdays are not counted. For instance, if an accident occurs on a Friday, the report must be submitted by Wednesday at the latest.

The Penalty for Not Reporting a Workplace Accident

The consequences of not reporting a workplace accident differ depending on the number of employees present and the hazard class of the workplace. As per the Occupational Health and Safety Law No. 6331, the penalties for neglecting to report a workplace accident in 2023 are outlined below:

Hazard Class	Workplaces with Less Than 10 Employees	Workplaces with 10-49 Employees	Workplaces with 50 or More Employees
Low Hazard	15,529.00 TRY	15.529,00 TRY	23.293,00 TRY
Medium Hazard	19.411,00 TRY	23.293,00 TRY	31.058,00 TRY
High Hazard	23.293,00 TRY	31.058,00 TRY	46.587,00 TRY

What are the Rights of an Employee After a Workplace Accident?

Following a work accident, the insured employee and their relatives are entitled to certain rights as specified by the law. These rights are granted based on the employee's health status after the incident. The rights include:

Temporary Incapacity Benefit

If an employee receives a medical certificate from the hospital due to a workplace accident, they are entitled to receive a temporary incapacity benefit for the duration of their medical leave. This allowance is paid from the first day of their medical leave.

Survivor's Pension (Allowance)

If an employee passes away due to a workplace accident, their eligible family members will receive monthly survivor's pensions. Even if the employee only worked for one day, they will still qualify.

The amount of the monthly pension is calculated by taking 70% of the employee's average earnings reported to the Social Security Institution (SSI) for the last three months.

Permanent Incapacity Benefit

To receive a permanent incapacity benefit, an employee's health condition is evaluated to determine if they have suffered a loss of at least 10% of their earning capacity in their profession as a result of a workplace accident. This evaluation necessitates a medical report from a health board.

Funeral Benefit

If an employee passes away due to a workplace accident, a funeral benefit is offered to cover the expenses. This benefit is given to the employee's spouse, children (if there is no spouse), or parents (if there is no spouse or children). In case the funeral ceremony is arranged by other individuals or organizations, the payment can also be made to them.

Marriage Benefit

If a parent passes away due to a workplace accident and their daughter is receiving a survivor's pension but gets married and as a result, her pension is discontinued, a one-time marriage benefit is provided. The amount of this benefit is equal to the income or pension amount for two years at the time of marriage. Daughters who receive the marriage benefit will no longer receive income or pensions starting from the payment period following the date of their marriage.

What is Workplace Accident Compensation?

Workplace accident compensation refers to the compensation that an employee, or their family in case of injury or fatality, may be entitled to receive following a workplace accident. This compensation typically results from a workplace accident compensation claim filed by the injured employee or their relatives, due to the employment relationship with the employer.

How Workplace Accident Compensation is Calculated?

Calculating compensation for a workplace accident is a complicated process that relies on various factors, including the nature of the case, the circumstances of the accident, and the employee's post-accident condition.

Workplace accident compensation claims can generally be categorized into three main types: economic compensation, non-economic compensation, and survivor benefits in the event of a fatality. Numerous factors play a significant role in determining the outcome of a workplace accident compensation claim:

The employee's monthly salary or earnings at the time of the accident

The degree of fault assigned to both the employee and the employer (comparative negligence)

The extent of the employee's injuries or disabilities resulting from the accident.

Official records and reports related to the workplace and the accident

In the event of an employee’s fatality, factors such as the employee's age, the financial dependency of family members (spouse, children), and their living conditions become crucial in determining survivor benefits.

These benefits aim to compensate for the loss experienced due to the employee's demise.

How Long is the Term of Litigation of a Workplace Accident Compensation Lawsuit? (Statute of Limitations)

The time limit for filing a compensation lawsuit for a workplace accident, known as the statute of limitations, is 10 years from the date the workplace accident occurred. There is no distinction in terms of the statute of limitations between cases involving injuries (disability) or fatalities resulting from workplace accidents.

Compulsory mediation is not a requirement for workplace accident-related material and moral compensation lawsuits, as well as related declaratory, recourse lawsuits, and vitilitigations. Therefore, an injured employee can file a lawsuit in Labor Courts without going through mediation.

Example Cases Considered Workplace Accidents

1- If an insured employee who works at a law firm falls and breaks their leg while visiting coworkers or collecting personal belongings at the workplace during their annual paid leave, the incident should be considered a workplace accident due to the continued legal relationship with the workplace and the active employment contract, even when on leave.

2- If an insured employee who is using a company vehicle has an accident while delivering a personal cargo for the employer to a cargo branch, following the employer's instructions, this accident should be considered a workplace accident. Because the accident took place while the insured employee was not performing their primary duties and had been sent to a different location by their employer.

3- If a female insured employee gets injured due to being mugged by thieves while leaving the workplace to breastfeed her baby and go home, the incident is considered a workplace accident. Because the employee was exercising her rights related to maternity leave as per the law No. 4857.

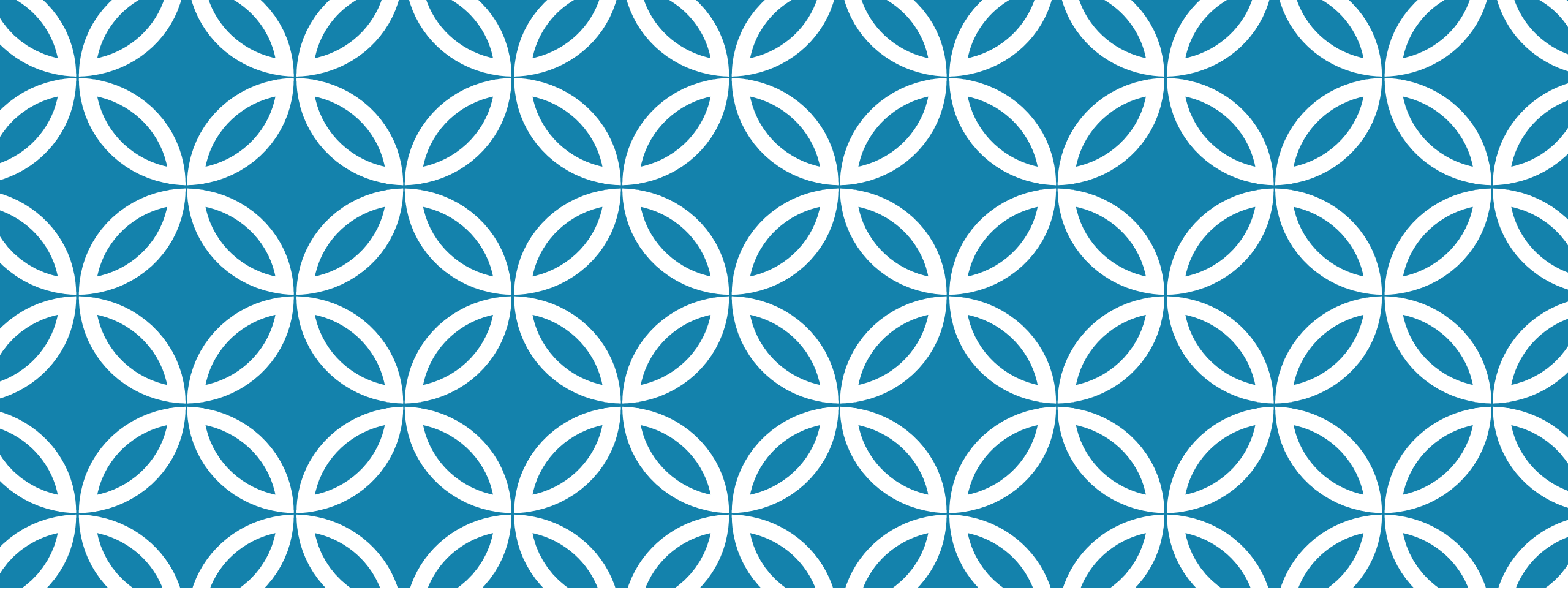
Example Cases Not Considered Workplace Accidents

1- If an insured employee who commutes to work by metrobus gets injured due to losing balance during transit, this accident is not considered a workplace accident. Because the employee is not using a vehicle provided by the employer for commuting purposes.

2- If an insured employee who works in the field for a telecommunications company to install modems gets injured due to hot water being spilled on them while having tea in a tea garden nearby after completing their work at the office, this accident is not considered a workplace accident.

END OF CHAPTER 5

Reference: https://www.cottgroup.com/en/blog/work-life/item/understanding-work-accidents-definition-and-examples



OCCUPATIONAL HEALTH AND SAFETY

Prof. Dr. Vural Emir KAFADAR

CHAPTER 6

WORKPLACE HAZARDS

What are Workplace Hazards?

Workplace hazards are the sources of potential harm or damage to someone or something in any work environment. It can be material or any activity that has the likelihood to cause injuries under specific conditions. It should be eliminated as soon as they are identified to prevent workplace incidents or fatalities.

Workplace hazards can be overlooked since the business is not aware of them. Identifying workplace safety issues can help prevent the likelihood of workplace incidents, accidents, or near-misses. OSHA identifies the 6 most common hazards in the workplace as follows:

1. Safety

A safety hazard is the most common type of hazard that is always present in a construction site. It includes unsafe working conditions that can cause injury, illness, or death. Here are the basic examples safety hazards in the workplace:

Spills on floors or tripping hazards such as blocked aisles or cords running across the floor;

Working from heights including ladders, scaffolds, roofs, or any raised work area;

Unguarded machinery and moving machinery parts; guards removed or moving parts that a worker can accidentally touch;

Electrical hazards like frayed cords, missing ground pins, improper wiring;

Confined spaces; and

Equipment and machinery-related hazards (lockout tagout, boiler safety, forklifts, hand, and power tools, etc.)

2. Biological

Biological hazards associated with working with animals, people, or infectious plant materials. Most at-risk workers include those who work in schools, daycare facilities, colleges and universities, hospitals, laboratories, emergency response, nursing homes, and outdoor occupations. Here are the types of biological hazards workers may be exposed to:

blood and other body fluids;

fungi/mold;

bacteria and viruses;

insect bites; and

animal and bird droppings.

Biological Hazard Examples

While various workplaces and industries deal with different biohazards, there are common ones that pose major threats to the health and safety of the workers. Looking at each in detail, here are 10 biological hazard examples that your workers might be exposed to.

1. Human blood and blood products

Bodily fluids, tissues that contain blood, serum, plasma, and other blood components in liquid or semi-liquid form are examples of biological hazards.

2. Animal waste

Any animal body part or the beddings of infected animals are also considered as biological hazards.

3. Human bodily matter

Direct contact with biological hazards such as human bodily matter in the workplace—blood, saliva, urine, and mucus—is highly risky most especially to healthcare workers.

4. Microbiological waste

Usually found in laboratories, this waste may contain concentrated forms of infectious products, such as blood or bodily fluids that have infectious pathogens, specimen cultures, and viruses.

5. Pathological waste

This covers any human body part, tissue, or organ that may have been taken out during surgical procedures.

6. Sharps waste

Belonging to the larger group of infectious waste, this type of biological hazard pertains to syringes, sharp tools, and broken glass that are at risk of pathogenic cross-contamination and piercing through human skin protection.

7. Molds and yeasts

These are found in nature, needed for the breakdown of plant debris. Such microorganisms can enter a building directly or their spores can be carried in by the air. For some people, inhalation of the molds, fragments of the molds, or spores can lead to serious health problems or worsen certain health conditions.

8. Organic material

Workers may also be exposed to rubbish, waste water and sewerage, plant materials, and organic dust.

9. Airborne pathogens

Pathogenic microbes, which are small enough to be discharged from an infected person, are easily transmitted through sneezing, coughing, and direct or close contact.

10. Stinging insects

As these can be found throughout various geographic regions, stinging insects are especially dangerous to outdoor workers. Such insects include bees, wasps, hornets, and non-venomous and venomous spiders.

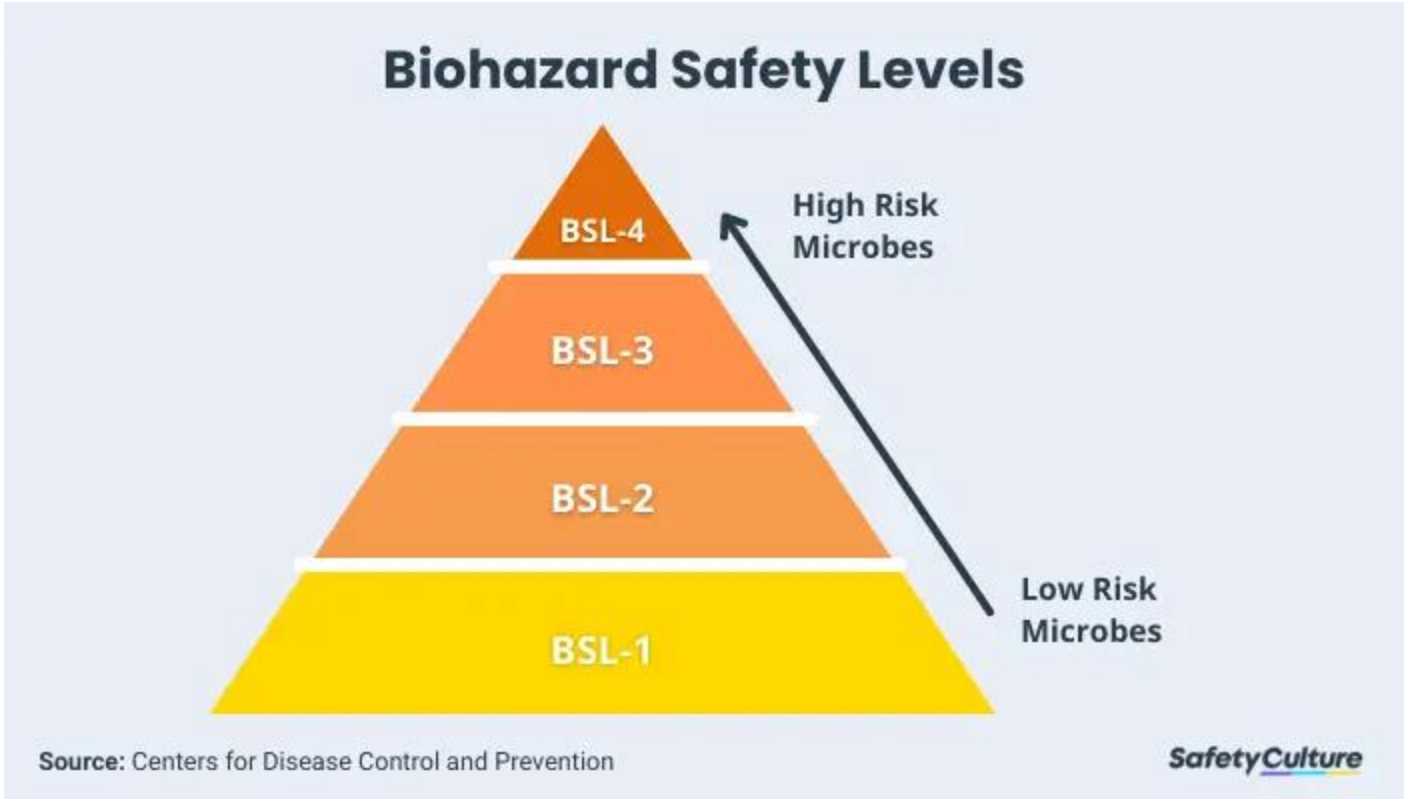
Biohazard Safety Levels

Biohazard Level 1: Often pertains to agents that include viruses and bacteria, this biosafety level requires minimal precaution, such as wearing face masks and maintaining no close contact. The biological hazard examples in the first level include E.coli and other non-infectious bacteria.

Biohazard Level 2: Usually causing severe diseases to humans, the second level classifies agents that can be transmitted through direct contact with infected materials. HIV and hepatitis B are some biological hazard examples that pose moderate risks to humans.

Biohazard Level 3: Mainly through respiratory transmission, pathogens that are highly likely to become airborne can cause serious or lethal diseases to humans. Mycobacterium tuberculosis, the bacteria that causes tuberculosis, is an example of a level-3 biohazard.

4: Biohazard Level Extremely dangerous pathogens that expose humans to life-threatening diseases, the fourth and last level requires workers to utilize maximum protection and containment. Some biological hazard examples are the Ebola virus and the Lassa virus.


Biohazard Safety Levels
BSL-4
BSL-3
BSL-2
BSL-1
High Risk Microbes
Low Risk Microbes
Source: Centers for Disease Control and Prevention
SafetyCulture

3. Chemical

Chemical hazards are present when a worker is exposed to any chemical preparation in the workplace in any form (solid, liquid, or gas). Chemicals can be safer to others, but to some sensitive workers, even the most common solutions can cause illness, skin irritation, or breathing problems. Workers should be aware of the following examples chemical hazards in the workplace.

Liquids like cleaning products, paints, acids, solvents – especially if chemicals are in an unlabeled container;

Vapors and fumes that come from welding or exposure to solvents;

Gases like acetylene, propane, carbon monoxide, and helium;

Flammable materials like gasoline, solvents, and explosive chemicals; and

Pesticides.

4. Ergonomic

Ergonomic hazards occur when the type of work, body positions, and working conditions put a strain on the body. They are the hardest to spot since you don't always immediately notice the strain on the body and the harm that these hazards pose. Short-term exposure may result in "sore muscles" the next day or in the days following exposure while long-term exposure can result in serious long-term illnesses. Ergonomic hazards include the following:

Improperly adjusted workstations and chairs;

Frequent lifting;

Poor posture;

Awkward movements, especially if they are repetitive;

Repeating the same movements over and over;

Having to frequently use too much force; and

Vibration.

How is Ergonomics Related to Safety?

When the principles of ergonomics are applied in the context of workplace safety, the concept of ergonomic safety is born. Ergonomics safety ensures that the products, methods, and environment that a worker uses are appropriate to fit the worker's job requirements and personal capabilities.

Why is Ergonomics Important in Workplace Safety?

Ergonomic disorders are the fastest-growing category of work-related illness. According to the most recent statistics from the U.S. Bureau of Labor Statistics, they account for 56-63 percent of illnesses reported to OSHA. Further, around two million work-related musculoskeletal disorders (MSDs) also occur yearly in the United States alone.

Many of these are caused by ergonomic work-related injuries like carpal tunnel syndrome alone, tendinitis, rotator cuff injuries, muscle strains, and low back injuries due to risk factors like high task repetition, forceful exertions, and repetitive awkward postures.

What are the Benefits of Ergonomics?

The implementation of ergonomics safety as part of the workplace safety program helps ensure that employees' capabilities and physical limitations are matched with the right tools and working spaces to ensure comfortable and safe working conditions for them. The benefits of an ergonomics safety program can not only make an impact on the lives of employees, but it can also make a difference in the overall efficiency of the entire organization.

Here are some of the most notable benefits of ergonomic safety in the workplace:

Helps reduce costs

Helps prevent other incidents and injuries

Improves overall productivity

Helps foster employee engagement and satisfaction

How to Improve Ergonomics: 10 Principles

1. Joints must be in a neutral position

In the neutral position the muscles and ligaments, which span the joints, are stretched to the least possible extent

2. Keep work close to the body

If the work is too far from the body, the arms will be outstretched and the trunk bent over forwards

3. Avoid bending forward

The further the trunk of the upper body is bent forward, the harder it is for the muscles and ligaments of the back to maintain the upper body in balance.

4. A twisted trunk strains the back

Twisted postures of the trunk cause undesirable stress to the spine.

5. Alternate posture as well as movements

No posture or movement should be maintained for a long period of time.

Prolonged postures and repetitive movements are tiring.

6. Avoid excessive reaches

It is necessary to limit the extent of forward and sideways reaches to avoid having to bend over or twist the trunk

7. Avoid carrying out tasks above shoulder level

The hands and elbows should be well below shoulder level

when carrying out a task

8. Limit the weight of a load that is lifted

Be guided on weight limits

9. Avoid carrying loads with one hand

When only one hand is used to carry a load, the body is subject to mechanical

10. Use mechanical aids

Many lifting accessories are available to help lift and move loads

5. Work Organization

Work organization hazards are stressors that cause psychosocial hazards such as tension, anxiety, or strain to workers. These can be experienced in short term (stress) or long term (strain) that is associated with workplace issues such as workload, lack of control and/or respect, etc. Here are work organization hazards examples:

Workload demands;

Workplace violence;

Intensity and/or pace;

Respect (or lack of);

Flexibility/Control or say about things;

Social support/relations; and

Sexual harassment.

6. Physical

Physical hazards are factors within the environment that can harm the body without necessarily touching it. Examples of physical Hazards include the following:

Radiation: including ionizing, non-ionizing (EMF's, microwaves, radio waves, etc.);

Prolonged exposure to sunlight/ultraviolet rays;

Temperature extremes – hot and cold; and

Constant loud noise (which can be a harmful hazard if not well-managed or mitigated).

Employers, managers, and safety officials can reduce common workplace hazards by establishing adequate safety protocols, hazard identification procedures, and conducting regular hazard assessments.

One of the most affected part of the body when it comes to hazards are our hands. In some cases, it is also mostly responsible for triggering hazards in the workplace. Hand safety should be observed by people in the workplace to avoid injuries and accidents.

What is Hazard Identification?

Hazard identification is a risk assessment practice that aims to identify and record safety risks and work hazards to ensure the safety of workers and personnel. Hazard identification is usually done:

when new processes, equipment, and/or machinery are introduced into the standard workflow;

before each shift;

in the performance of work;

during formal or informal inspections; and

after incidents occur.

Benefits

It is the employer's responsibility to inform, educate, and train their employees about workplace hazards. It is paramount to ensure a safe and healthy environment not just for employees but for clients as well. Early detection of hazards and implementing safety practices will help the business in achieving its goals. It would also help:

prevent numerous work-related injuries and illnesses;

improve compliance with laws and regulations;

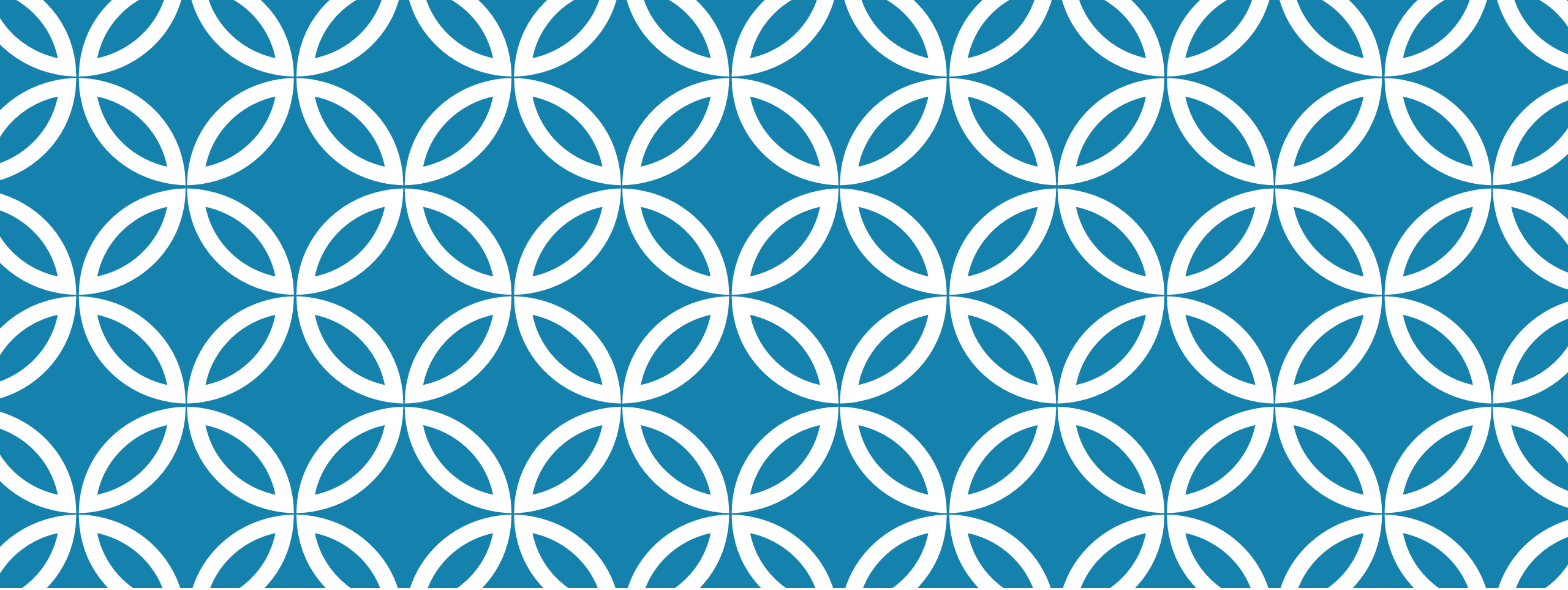
reduce costly repairs and unexpected damages;

improve employee engagement, productivity, and efficiency; and

boost overall business operations.

END OF CHAPTER 6

Reference: https://safetyculture.com/topics/workplace-hazards/



OCCUPATIONAL HEALTH AND SAFETY

Prof. Dr. Vural Emir KAFADAR

CHAPTER 7

HEALTH AND SAFETY SIGNS

Health and safety signs are used if there is a significant risk that cannot be avoided or controlled in any other way, or can provide information to supplement another form of control measure.

Why should we use health and safety signs?

Health and safety signs should be provided and maintained in circumstances where there is a significant risk to health and safety that has not been removed or controlled by other methods.

This is only appropriate where the use of a sign can further reduce the risk. If the residual risk is not significant, there may be no need to provide a sign.

Five main types of sign

1. Prohibition

Prohibition sign

Use - A sign prohibiting behavior likely to increase or cause danger.

Features - Circular shape, white background with black pictogram/text, red circle with diagonal line over pictogram

Example - No access for unauthorized persons

2. Warning

Warning sign

Use – A sign giving warning of a hazard or danger

Features – Triangular shape, yellow background with black pictogram/text, black edging

Example – Caution wet floor

3. Mandatory

Mandatory sign

Use – A sign prescribing specific behaviour

Features – Circular shape, blue background with white pictogram/text

Example – Respiratory protection must be worn

4. Safe condition

Safe condition sign

Use – A sign giving information on emergency exits, first aid, or rescue facilities

Features – Rectangular or square shape, green background with white pictogram/text

Example – Fire exit

5. Firefighting

Fire fighting sign

Use – A sign giving information on fire fighting equipment and fire alarm activation points

Features – Rectangular or square shape, red background with white pictogram/text

Example – Fire alarm call point

Specialist signs and signals

Other than the main types of signs, there are additional signals or specialist signs that can be used.

Illuminated sign

A transparent or translucent sign which is illuminated to give the appearance of a luminous surface. These signs can be used in the event visibility or mains lighting is impaired and critical safety information is still required to be seen (e.g. fire exit).

Acoustic signal

A sound signal which is transmitted without the use of a human or artificial voice (e.g. a fire alarm).

Verbal communication

A predetermined spoken message communicated by a human or artificial voice (e.g. public address system).

Hand signal

A movement or position of the arms or hands giving a recognised signal and guiding people who are carrying out manoeuvres which are a hazard or danger to people (e.g. vehicle banksman).

Warning light

A visual signal which gives warning to a hazard or emergency situation, usually in conjunction with an acoustic signal (e.g. flashing lights with a fire alarm in a hearing protection zone).

Exit instructions

A instruction on how to operate a fire exit or other final building exit (e.g. ‘push bar to open’).

Factors to consider

It is important that safety signs and signals are used effectively to ensure the message they convey is clear and concise.

Impact

The aim is for minimal signage for maximum impact. If too many signs are placed together, there is a danger of confusion or important information being overlooked. This is referred to as ‘sign blind’.

Combinations

In some cases, more than one type of safety sign or signal may be necessary (e.g. warning light on a forklift truck as well as hand signals from a banksman).

Temporarily impaired senses

If the hearing or sight of any employee is impaired, for example by wearing PPE, additional measures should be taken to ensure that employees can see or hear the sign or signal (e.g. increasing the volume).

Long-term impaired senses

If the hearing or sight of any employee is impaired long-term or permanently, then a combination of measures may be required if the risk is significant (e.g. for emergency procedures).

Target audience

The sign should be the appropriate size and siting for the target audience (e.g. signs aimed at a delivery driver should be large enough and at the correct height to see from the seat of their vehicle).

Changes of direction

If signage is giving instruction when entering a new area or changing direction on a walkway, the signage should be positioned so that it is clearly visible before entering the new area or changing direction.

Language barriers

Staff, students and visitors on UCL campus may not have English as a first language. Health and safety signs are universal, so ensuring that any signs used are within the parameters of the five main types of sign, they should be easily understood by everyone on campus. Avoid using too much text or complex instructions on signs.

Aesthetics

To be pleasing on the eye, signs should line up with windows and doors and other building features. For example, the top of the sign can be aligned with the top of the window or bottom of the sign with the bottom of the window.

Consistency

Signage is most effective when it is consistent. Use of the same colours, warning symbols, company branding etc. all makes for a consistent look and ensures the message is clear. If new signs are being put in place, all old, weary, redundant signage should be removed to make the new signage effective.

Safety sign maintenance

All safety signs must be properly maintained so that they are capable of performing the function for which they are intended. This can range from the routine cleaning of signboards to regular checks of illuminated signs and testing of acoustic signals to see that they work properly.

All safety signs should maintain their features under power failure – either from emergency lighting or phosphorescent material – unless the hazard itself is eliminated by the power failure.

Fire Signs

Fire safety is imperative in any workplace; make sure staff and visitors know the fire exists, muster points and protocol in case of fire.

First Aid Signs

In any work environment it's crucial to have easy access to medical supplies and a first aid kit. This is especially important for high risk workplaces – with moving machinery, hazardous substances or livestock.

Mandatory Signs

In health and safety colour signs, blue signage often denotes a mandatory safety aspect, and lets people know that they must comply for their own health and safety.


Masks must be worn when working here


Safety helmets are provided for your safety and must be worn


Keep locked


High visibility jackets must be worn beyond this point

Hazard Signs

Hazard signs are absolutely crucial if you have dangerous or hazardous substances, animals or machinery.


Danger
Highly flammable


Danger
Noise area


Warning
Freezing conditions


Harmful


Danger
Electric fence


Danger
Falling objects


Caution
Chemical spraying
in progress


Hazardous
substances

Emergency Escape Signs

Display emergency escape signs throughout your place of business to make sure everyone is safe and well informed in case of an emergency.

PPE – Personal Protective Equipment Signs

Shop popular PPE signs. In certain work areas it is important to wear protective clothing to make sure you're kept safe. Make sure everyone onsite knows where it is mandatory to wear PPE – and what PPE to wear in what areas – with PPE health and safety signs.

Smoking Signs

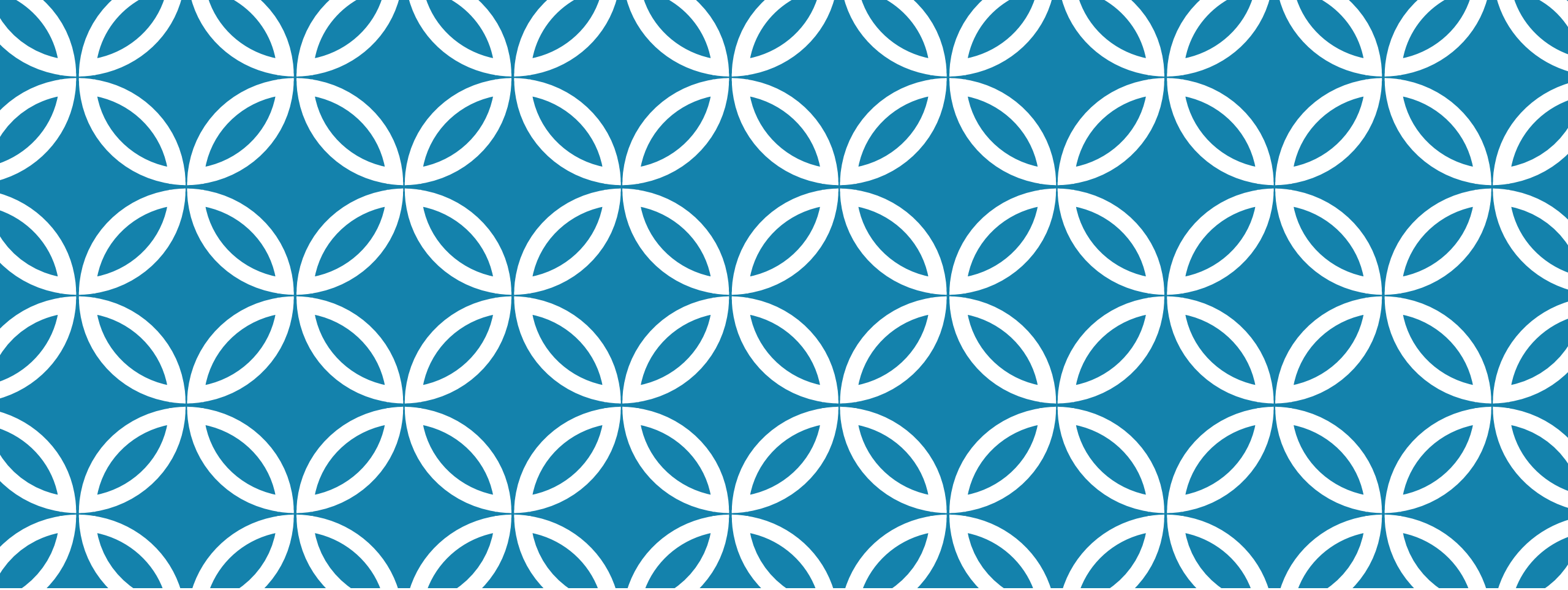
Smoking is not permitted in any workplace, enclosed space or public transport, according to law.

Construction Signs

Make sure your construction site safety is paramount by displaying clear, recognisable construction signs. We offer a large range, including ‘no entry’ signs, contractor sign in posters and mandatory safety clothing signage. Whether you need a hard hat sign or a protective footwear sign

END OF CHAPTER 7

Reference: https://www.ucl.ac.uk/safety-services/policies/2023/nov/health-and-safety-signs
https://healthandsafetysigns.co.uk/



OCCUPATIONAL HEALTH AND SAFETY

Prof. Dr. Vural Emir KAFADAR

CHAPTER 8

EMERGENCY MANAGEMENT AND FIRST AID

What is First Aid?

First aid refers to medical attention that is usually administered immediately after the injury occurs and at the location where it occurred. It often consists of a one-time, short-term treatment and requires little technology or training to administer.

First aid can include cleaning minor cuts, scrapes, or scratches; treating a minor burn; applying bandages and dressings; the use of non-prescription medicine; draining blisters; removing debris from the eyes; massage; and drinking fluids to relieve heat stress.

OSHA's revised recordkeeping rule, which went into effect January 1, 2002, does not require first aid cases to be documented. For example: A worker goes to the first-aid room and has a dressing applied to a minor cut by a registered nurse. Although the registered nurse is a health care professional, the employer does not have to report the accident because the worker simply received first aid. The selected references below provide more information on first aid.

Employer duties

Employers must:

Provide and maintain first aid supplies and services.

Assess the risks in the workplace that workers are likely to encounter and make sure that there are adequate first aid supplies and services.

Review the workplace first aid risk assessment at least annually, or more frequently if work conditions change.

Make sure that all supplies required are kept clean and dry, and are checked regularly for expiry. Any supplies must be replaced on or before their expiry.

Post a sign in a visible place in the workplace indicating:

The location of first aid kits in the workplace; and

The name and phone number of the workplace first aider(s) in the workplace.

Make sure that every worker knows the name of the workplace first aider(s) and their phone number, as well as the location of first aid kits in the workplace if posting a sign is not practical.

Designate one or more workers to act as workplace first aiders and maintain a record who is a designated workplace first aider.

Make sure that each worker designated as a workplace first aider holds a valid first aid certificate that is of the type or level required.

Make sure that any vehicle or boat used to transport workers to and from the workplace is equipped with an Intermediate First Aid Kit. The size of the First Aid Kit will be determined by the number of seats the vehicle or boat has and the requirements of the CSA Standard Z1220-17 First Aid Kits for the Workplace.

Keep all written first aid records for three (3) years after the date of injury.

Workplace First Aid Assessment

A workplace first aid risk assessment is a process used to determine the risk level which will determine what first aid services, first aid kits, and supplies are required. The assessment must be conducted by a competent person in consultation with the occupational health and safety committee, safety representative, or workers. [OHS General Regs., S. 9.3 (3)]

The risk assessment [OHS General Regs., S. 9.3 (3)-(4)] must include:

Identification of any hazards that may result in a work-related injury or illness.

An assessment of the type of injury and illness, as well as the potential severity and likelihood that may occur.

The assessment must include:

Workplace characteristics;

Number of workers per shift;

Industry sector trends;

Past workplace first aid incidents;

Trained workplace first aider locations and proximity in the workplace;

Availability and accessibility of emergency medical services;

Work patterns, shift work and other organizational considerations (including unplanned leave of workplace first aiders);

Transportation methods for injured or ill persons; and

Any special needs of workers (such as workers with disabilities or known medical conditions)

Identification of first aid supplies and services to respond to the types of injury or illness that may occur in the workplace.

If an officer determines that the workplace first aid risk assessment is not adequate based on the specific workplace risks, the officer may specify additional first aid supplies or services to be provided by the employer.

If the work conducted at the workplace is not considered low-risk work, or it is a combination of low –risk work and work that is not considered low-risk work, the employer must ensure that the workplace first aider holds a valid first aid certificate as required by the number of workers in the workplace and are available on shift.

Number of Workers	First Aid Certificate Requirement
Between 1-19 workers regularly employed workers on one shift	At least one workplace first aider must be available with a valid Emergency First Aid Certificate.
Between 20-99 workers regularly employed on one shift	At least one workplace first aider must be available with a valid Standard First Aid Certificate.
100 or more workers regularly employed on one shift	At least one workplace first aider must be available with a valid Advanced First Aid Certificate.

Treatment of Injury or Illness

A worker who is injured at the workplace must use the first aid supplies and services provided as needed and without delay. [OHS General Regs., S. 9.4] They must also report the injury to the employer or supervisor as soon as possible after the injury.

If a workplace first aider administers first aid to a worker, the workplace first aider must:

Prepare a written record that includes:

the name of the injured worker,

the date, time, and description of the injury,

the date, time, and description of first aid treatment administered,

a description of the incident that caused the injury,

the name of the workplace first aider, and

the name of the person that the worker reporter the injury to.

Provide the written record to the employer of the injured worker.

All written records of first aid reports must be kept for three (3) years after the date of injury.

First Aid Kits

A first aid kit is a container containing the supplies required by this part. The classification of the first aid kit and any additional supplies required will be determined by the employer after the workplace first aid risk assessment. After the assessment, the higher risk level must be used when determining the appropriate workplace first aid kit.

All first aid kits must meet the requirements in the regulations by March 6, 2022.

First aid kits classification:

Type	Description	Size
Type 1	Personal First Aid Kit	One Size
Type 2	Basic First Aid Kit	Small
		Medium
		Large
Type 3	Intermediate First Aid Kit	Small
		Medium
		Large

These first aid kits may be used in different combinations across the workplace to be readily accessible to all workers as long as it meets the workplace requirements. In workplaces with more than 100 workers, the first aid kits must be proportionally distributed in the workplace.

The minimum contents of the first aid kits can be increased to account for any specific workplace hazards, risks, or conditions.

First Aid Rooms

A first aid room is a room at a workplace that is used exclusively for the purpose of administering first aid. If there are more than 100 workers regularly employed on any shift at the workplace, and if the work conducted at the workplace is work other than low risk work, a first aid room must be provided.

The first aid room must:

Have adequate lighting, ventilation, and heating;

Be kept clean and in a sanitary condition;

Be big enough to accommodate a stretcher;

Have emergency telephone numbers posted;

Only be used to administer first aid;

Be accessible by workers during their shift; and

Be equipped with:

A telephone or other means of communication;

Instructions on how and where to access a first aider;

A permanently installed sink with hot and cold running water;

A bed or cot with a moisture protected mattress and two pillows;

A treatment chair with armrests;

A flashlight;

A wash basin;

A nail brush;

Paper towels;

Hand soap;

Disposable paper cups;

A kidney basin; and

A large Type 3 Intermediate First Aid Kit.

First aid in the workplace

All workplaces must provide first aid equipment, facilities and in some circumstances, trained first aiders.

First aid is the immediate treatment or care given to someone suffering from an injury or illness until further advanced care is accessed or the individual recovers.

The aim of first aid is to:

preserve life

prevent illness or injury from becoming worse

relieve pain, if possible

promote recovery

protect the unconscious.

First aid can reduce the severity of an injury or illness and in extreme cases, could mean the difference between life and death.

Businesses (or PCBU)'s responsibility

Every workplace has a legal responsibility for ensuring adequate first aid provisions.

A ‘person conducting a business or undertaking’ (PCBU) is a broad term used throughout work health and safety legislation to describe all forms of modern working arrangements, which we commonly refer to as businesses.

If you are a Person Conducting a Business or Undertaking at a workplace you must ensure:

first aid equipment is provided for the workplace

each worker at the workplace has access to the first aid equipment

access to facilities for the administration of first aid are provided

an adequate number of workers are trained to provide first aid at the workplace or

workers have access to other persons who have been trained to provide first aid treatment.

Where multiple businesses are involved in the same work activities or share a workplace, first aiders and / or first aid facilities may be shared.

The PCBU should consult with workers about what equipment and facilities are needed to administer first aid at the workplace and inform workers about the first aid supplies and equipment that are available.

Worker's responsibility

Workers must take reasonable care of their own health and safety and other people's health and safety at the workplace.

Workers must comply with reasonable health and safety policies and procedures they have been provided. For example, workers would be expected to comply with the procedures for first aid and for reporting injuries and illnesses.

Determining your first aid needs

To meet your duty as a PCBU, you should consult with your workers when determining your first aid needs. This duty to consult is based on the understanding that worker input and participation improves decision-making about health and safety matters.

The WHS legislation requires that a PCBU making decisions about their first aid requirements must consider:

the nature of the work being carried out at the workplace

the nature of the hazards at the workplace

the size and location of the workplace

the number and type of workers and other persons at the workplace.

It is important to consider the requirements of your workplace and your workers when determining your first aid needs. For example, workers in factory environments exposed to multiple hazards such as; unguarded machinery, biological, chemical, temperature extremes, working at heights, and electrical risks are at greater risk of sustaining an injury requiring immediate first aid treatment.

How many first aiders does your workplace need?

The number of first aiders / first aid officers required for a workplace may be determined by the type and nature of the workplace, such as whether the workplace would be considered low-risk or high-risk.

Workplace risk level	Type of workplace	Ratio of first aiders to workers
Low risk	Retail shops, offices, libraries or art galleries	1:50
High risk	Factories, motor vehicle workshops or forestry operations	1:25
Remote high risk	All night convenient store and service station workers, long distance freight transport drivers	1:10

In addition to these ratios, consideration should be given to other factors that may affect the need for extra first aiders, such as:

the arrangement of work (multiple shifts or overtime)
seasonal work (sudden increase in the number of workers)
large numbers of other persons present (schools, shopping centres, childcare centres) or
workplaces that have unique hazards (fitness centres, amusement rides).

First aid procedures

First aid procedures should provide workers with a clear understanding of the first aid facilities at their workplace and consider a worker's language skills and reading ability. These procedures may include:

instruction and training on first aid arrangements

how to report injuries and illnesses at the workplace

the communication equipment and systems to be used when first aid is required, especially for remote and isolated workers

who is responsible for the first aid kits and facilities and how often they should be checked and maintained

precautions to avoid exposure to blood and body substances and contaminated material

access to debriefing or counselling services to support first aiders and workers after a serious workplace incident

record keeping of first aid treatment given

Access to trained first aiders

Access to qualified first aiders and first aid treatment at the workplace should be easy for all workers to reach immediately, or as close to this as practical. First aiders should be easy to identify and locate, particularly if they move around the workplace during their shift.

Appropriate qualifications of first aiders

In order to be a first aider, the person should hold a nationally recognised qualification issued by a Registered Training Organisation (RTO) for the nationally endorsed first aid unit/s of competency which give them the skills to administer first aid. First aiders should be provided with appropriate training for the level of risk (likelihood of serious injury or illness) identified at the workplace.

First aiders should attend training on a regular basis to refresh their first aid knowledge and skills. Refresher training in Cardiopulmonary Resuscitation (CPR) should be carried out annually and first aid qualifications should be renewed every three years.

First aid kits

All workers must be able to access a first aid kit. This will require at least one first aid kit to be provided at their workplace.

In the event of a serious injury or illness, quick access to the first aid kit is vital. The kit should be kept in an accessible location and /or close to areas where there is a higher risk of injury or illness.

The first aid kit should provide basic equipment for administering first aid. The kit should include items to treat cuts, scratches, punctures, grazes, splinters, muscular sprains and strains, minor burns, amputations and or / major bleeding wounds, broken bones, eye injuries and shock.

Extra equipment may be needed in remote workplaces, for example for serious burns, breathing difficulties or allergic reactions.

First aid kits can be any size, shape or type to suit your workplace. Each kit however, should be large enough to contain the necessary items, be immediately identifiable, contain a list of contents for that kit and be made of material that will protect the contents from dust, moisture and contamination.

END OF CHAPTER 8

Reference: https://www.osha.gov/sites/default/files/publications/OSHA3317first-aid.pdf