



Training of Inspectors on work equipment safety inspections

Non-Binding Publication for EU Labour Inspectors

*Senior Labour inspectors' Committee
Sub-Working group on Training of inspectors
on work equipment safety inspections*

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*Employment,
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INTRODUCTION

Senior Labour Inspectors' Committee (SLIC) is a committee of the EU Commission's Directorate-General for Employment, Social Affairs and Inclusion. One representative from each EU Member State and one member from each EFTA Member State serve on SLIC. The representatives are members of the labour inspection services of these Member States. SLIC assists the EU Commission with the implementation of the EU's health and safety objectives on the labour market.

A working group (WG) known as SLIC WG MACHEx deals with the technical and administrative aspects of meeting health and safety objectives when working with machinery.

The Machex has established a Sub Working Group, called "**TRAINING OF INSPECTORS ON WORK EQUIPMENT SAFETY INSPECTIONS**".

The purpose of this group is to create common guidelines for training of labour inspectors on the use of work equipment including machinery.

This group was formed by representatives from Cyprus, Denmark, Greece, Italy (chair), Lithuania, Portugal, Spain, Sweden and The Netherlands.

1. LEGAL REQUIREMENTS

This framework programme of training is inspired and aimed to be coherent with the common principles of OSH inspection, as shaped by international labour norms and standards.

The convention No. 81, "*Convention concerning Labour Inspection in Industry and Commerce (1947)*" of International Labour Organisation (ILO), declares "*Labour inspectors shall be adequately trained for the performance of their duties*".

In addition, the Protocol of 1995 on the Labour Inspection Convention (P081), supposes "*The labour inspectorate shall be able to advise on the formulation of effective measures to minimize risks during training for potentially hazardous work and to participate in monitoring the implementation of such measures*".

Based on the Treaty on the Functioning of the European Union (TFEU), there are two types of directives: product directives and social directives.

The fundamental distinction is that the product directives, drawn up on the basis of art. 114 of the TFEU, are aimed primarily at manufacturers, who are responsible for placing safe products on the market; the social directives, drawn up on the basis of art. 153 of the TFEU, on the other hand, are addressed to employers and impose on them obligations aimed at guaranteeing the safety and health of workers in all aspects connected with work.

The purpose of the *product directives* is to ensure the functioning of the internal market in accordance with the relevant provisions of the Treaty.

Legislative measures for transposing those directives into national laws must be as close as possible to the text of the original directive, so that in all Member States the rules are the same and the products can truly circulate freely. Therefore, the product directives establish the Essential Health and Safety Requirements (ESR) to which the products must comply in order to be able to circulate freely on the European market and to adhere with the procedures for CE conformity marking.

The purpose of the *social directives* is to assure a homogeneous minimum level of protection and guarantee for all European citizens: their transposition into national laws is then a function of the national legislation on the matter and will fill the gaps in these Member States whose legislation is lacking. These directives are therefore transposed differently in each Member State.

2. GENERAL PERSPECTIVE ON WORK EQUIPMENT

The world of work and the workplace are undergoing profound changes due to the phenomena of globalization and digitalization, as well as the demographic development and the appearance of emerging risks. The new processes, plants and infrastructures introduced in the production systems during the digital transformation, posed a continuous challenge compared to the traditional tools used to guarantee the protection of safety at work.

The number of employees and especially the number of skilled workers is decreasing significantly, and the average age of employees is increasing meaningfully.

In this context, the psycho-physical conditions of workers are becoming more and more incisive both on the socio-economic and on the cultural side.

All this imposes the urgency to renew the prevention and protection strategies of workers' health and safety, from which it follows the obligation by the employer of the **scientific update** on the developments of the technique and on the discoveries about the risky aspects of the job. Knowledge and training on work equipment thus becomes an indispensable factor for implementing the principle of maximum technologically possible safety.

This knowledge must be possessed by all the figures involved in the protection of workers, starting from the workers themselves to employers and labour inspectors, in all workplaces, also in the context of "Fourth Industrial Revolution" and in the perspective based on collaborative technology at the service of workers' protection requests and, more generally, of the person.

The "Fourth Industrial Revolution" is leading to automated and interconnected industrial production. Digitalisation and the use of new technologies such as automation, robotics and artificial intelligence, nanotechnologies, pose opportunities and challenges both for the world of work and labour inspectors.

2.1 Work equipment

The employer assesses the probability that a given incidental event will occur, identifies the prevention and protection measures to be taken to protect the health and safety of workers, puts them in place and organizes actions to monitor the effectiveness of these measures and plans the phase of risk assessment review.

To do that, the employer also takes into account the different nature of the dangers in the life stages of the equipment, the limits in the use and operation, all the foreseeable uses by different people by gender, age, labour force, dominant employment, or physical abilities, as well as the different level of training, experience or ability of the users.

The inspector must be able to understand if the employer has taken into account all the aspects indicated above, therefore the inspector must have knowledge of how to determine whether the risk assessment that has been carried out by the employer is correct, not only in reference to the use of the equipment itself, but also with regard to ergonomics and the consequent emerging risks, such as psychosocial risks, risks related to musculoskeletal disorders, etc.

In the case of EC marked equipment, part of the risk assessment has already been carried out before the equipment was placed on the market by the manufacturer who, with the declaration of conformity, guarantees compliance with all essential safety requirements and therefore with specific provisions laws and regulations transposing the EU product directives.

On the other hand, the employer has a wider obligation than just assessing the risk inherent to the use of a machinery and its operation. The technical standard makes it clear that it is not within the scope of the standard itself to identify additional safety measures compared to those contemplated in the design phase to be adopted by the user/employer, since the work organization, the conditions and the usage situations cannot be controlled by the designer.

For this reason, the employer must take due account not only of the risks inherent to the use of the equipment, but also of the environment in which the equipment will be placed and the risks already present in it and those due to other pre-existing equipment, or otherwise interfering. That one, therefore, is another aspect that the

inspector must take into consideration, verifying that the employer fulfills all his obligations, including that of ensuring that the contextual conditions are such as not to compromise the safety of workers.

In the event that the work equipment is built in the absence of legislative provisions transposing the EU product directives or made available to workers prior to the issue of legislative and regulatory provisions transposing the EU product directives, the employers must comply with the general safety requirements.

In conclusion, the labour inspector must be able to identify exactly the cases that fall within the aforesaid directives, in addition to the rules for implementing them in the member state of origin.

Furthermore, if machines don't comply with the provisions of the EU directives and meet the requirements indicated therein, the labor inspector will report the alleged non-conformities to the national market surveillance body.

2.2 Work equipment and workplaces

In order to reduce the number of injuries and occupational diseases associated with the use of work equipment, it is important to use them correctly, keeping in account their compliance and the suitability of the work environment in which they are located. The concept of safety applied to **work equipment** is the result of the interaction between technical factors relevant to the equipment and human factors associated to the end users.

Work equipment should present only residual risks. It is useful to specify that the "acceptable risk" cannot always be expressed with an absolute value, since it varies with the surrounding conditions (workplace, type of processing, current regulations, etc.).

Work equipment includes an acceptable risk when:

- it has intrinsic safety technical characteristics;
- it is installed and used in a suitable work environment;
- the worker uses work equipment in the respect of the procedures of the employer, that includes manufacturer guidelines.

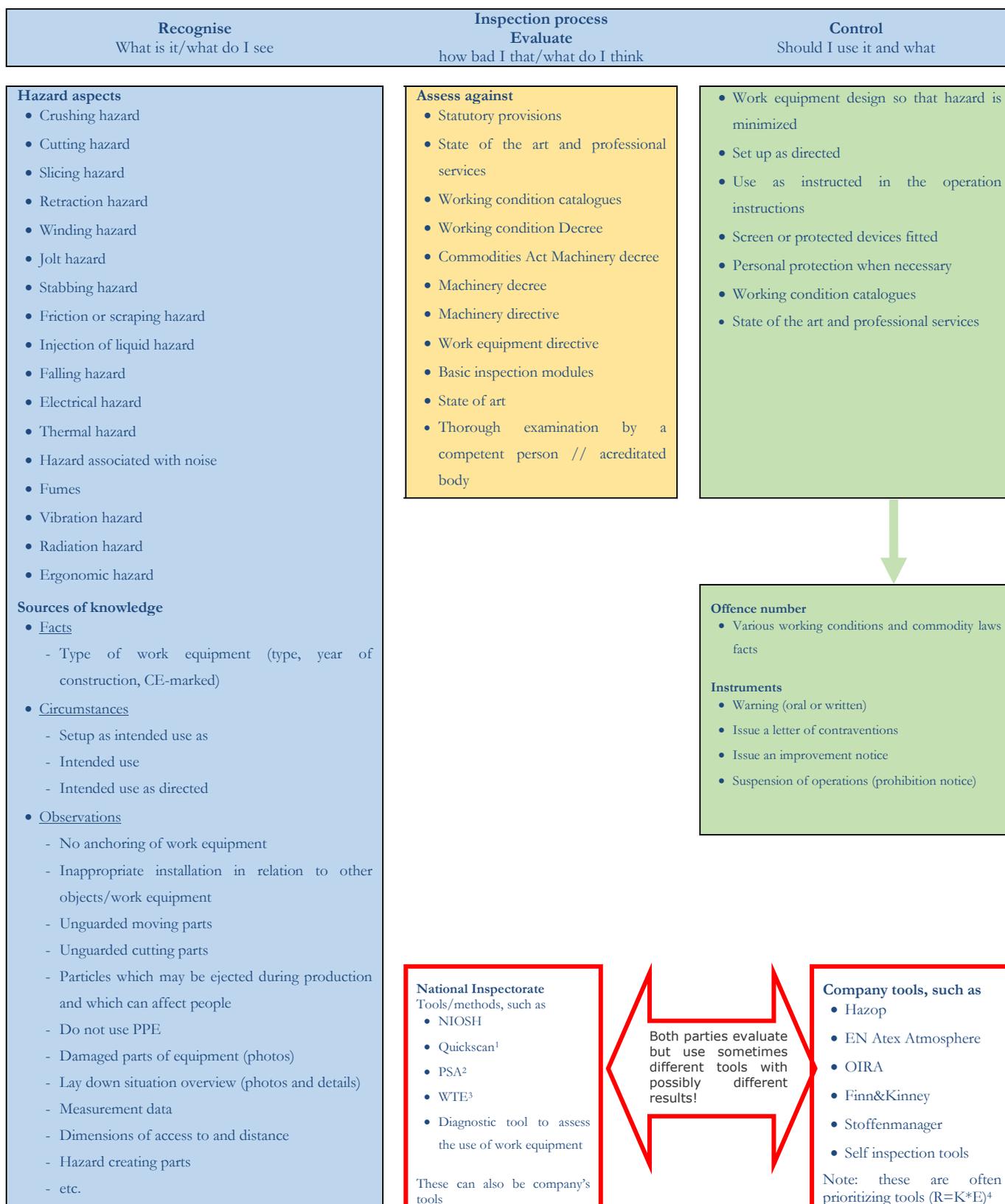
When only one of those conditions is lacking, the equipment cannot be considered suitable, potentially giving rise to risk situations that exceed the acceptability threshold.

The employer must ensure not only that the work equipment is correctly used by the workers, but that the technical characteristics are guaranteed in the lifetime of the equipment through maintenance planned.

2.3 Hazard assessment in relation to work equipment

The following diagram represents the inspection process:

1. recognizing risks;
2. evaluating risks;
3. controlling risks.



¹ QuickScan: This is a tool to quickly assess a lifting situation in terms of physical load.

² PSA: This is a tool to assess whether there is a psychosocial work-related burden.

³ WTE: Working Time Evaluator, a spreadsheet to easily assess whether there is a violation of the Working Time Act.

⁴ R=K*E is consequence x probability of the occurrence of an unpleasant / undesirable event.

2.4 The quality of risk assessment related to the use of work equipment

Labour inspectors, in order to monitor health and safety in the workplace, should have in-depth expertise for the individual risk classes, as well as complete and general knowledge of the risk assessment.

In that case, labour inspectors must have skills and knowledge in relation to the risks associated with work equipment and their use also in order to verify the quality of the risk assessment carried out by the employer.

In fact, one of the inspectors' tasks, in addition to making sure that the employer has assessed all the risks including the risks associated with the use of work equipment, is to verify the correctness of the assessment.

In the following pages, we will try to focus on some aspects whose knowledge will allow labour inspectors to express a correct examination of the risk assessment with regard to work equipment.

2.4.1 Process of risk assessment

A correct risk assessment must be carried out in close correlation with the tasks performed daily by the workers and must concern all the work equipment present in the company.

It must be updated whenever the work equipment undergoes changes or are replaced.

This requires careful observation of certain aspects such as:

- organization of work involving the use of particular equipment;
- type of work equipment used;
- their positioning in the premises and possible interference;
- human-machine interaction;
- characteristics and physical abilities of the operator;
- ergonomic features of the equipment;
- vibrations and noise and fumes produced by them;
- the environmental conditions related to lighting, the microclimatic conditions of the work environment;

- the psychosocial implications related to the type of work and their repetitiveness.

As generally happens in risk assessment, work equipment should also follow the following scheme (figure 1):



Figure 1. Steps of risk assessment

2.4.2 How can the inspector identify the risks related to work equipment

The employer guarantees the safety and health of workers in all aspects related to work. That fact translates into the obligation to evaluate all the risks related to work environment, and therefore also those ones related to work equipment.

So the employer evaluates the risks connected with the work equipment, their use, the correct use in operation, the maintenance, the adaptation and the improvement, besides their eventual disposal. In order to ensure the complete assessment of the risks, the life cycle of the equipment (design, construction, placing it on the market, operating phase, any adjustments, improvements, maintenance, decommissioning, disposal, etc.) cannot be ignored.

It is, therefore, essential that the labour inspector, in addition to knowing the contents of the national implementation directives and standards, understands the concepts set out in them.

It is useful to note that the EC declaration of conformity is issued following the verification by the notifying bodies. They verify that all the measures envisaged by the standards have been adopted for a specific machine before placing on the market. In order for this to happen, an assessment of the risks relating to the machine itself must be carried out on the machine, that means that it must be checked during the design and construction phases. The more dangerous the activity to be carried out using the machine, the more important it is to have an EC declaration of conformity.

For those machines that do not have EC declaration of conformity, it is the employer's obligation to check compliance with the aforementioned requirements and to take responsibility when choosing it for use. In this regard, the labour inspector must be able to recognize if a machine is equipped with a declaration of conformity, that is, if it has the EC marking, or if it has not. The Inspectors must also examine whether the employer has assessed all the health and safety risks for the workers when choosing the equipment.

In particular, the fact that a punctual risk assessment is a preparatory process to the declaration of conformity, is comforting with respect to the safety management of work equipment which also includes machines. Thus, when the machine has the CE marking, it can be believed that at least the risks associated with the safety requirements have been eliminated by the manufacturer at the design stage or the assembly of the machine. In the event that the equipment is not equipped with a declaration of conformity, the employer must also conduct a risk assessment of the machine and take responsibility for its use.

While the manufacturer evaluates the risks inherent to the machinery for the purpose of the declaration of conformity, the employer, on the basis of the residual risks present in the machinery, assesses the risks associated with the use of it.

When the equipment is actually used, the worker also exposes himself to further risks related to:

- his/her person;
- the work environment;
- possible interactions and interferences with the operation of other work equipment and processes, with other workers, etc.;

which concern:

- the ergonomics;

- the repetitiveness of the working actions, the consequent possible musculoskeletal disorders;
- the so-called emerging risks connected with the technological innovations of the various sectors, etc.

The assessment of these risks must take into account as the dangerous events linked to the use of the work equipment (for example ergonomic risks), to the work context and to any interference with other equipment and processing.

Consequently, the approach to evaluate the risk related to work equipment must be twofold: risks inherent to the equipment and risks relating to how to use it throughout its entire life cycle (installation, preparation, start-up, operation, cleaning, maintenance, dismantling).

During the inspection, the inspector could proceed, in the first place, to examine the equipment from the perspective of the directive, then examine it during its operation and finally, check the related documentation. In this way, the correctness of the assessment of the equipment's own risks can be evaluated. In a second moment, the correctness of the way of using the equipment can be assessed, by establishing the correctness of the risk assessment carried out by the employer with respect to the actual use of the work equipment in the workplace.

In order to carry out the assessment of the risks related to the methods of use of the work equipment, it is necessary to observe how the workers operate on it, in the various work phases (operation, maintenance, cleaning, etc.). By observing the operating methods, the associated risks which can be reduced are identified, either by changing the operating methods themselves, or by providing specific precautions for risk control. In these cases, there are generally operational precautions rather than technical interventions on the equipment.

2.4.3 Evaluating and prioritising risks

Once the risks have been identified, they should be sorted in order of importance so as to establish the intervention times.

Some questions to consider are:

- how often are workers exposed to the risk?
- how many workers are exposed?
- do employers as well as workers have knowledge of suitable work positions and work movements, and of how to use technical aids?

Aggravating factors are always evaluated in the global risk assessment. Some of those factors that aggravate the risks related to the use of work equipment are:

- work that requires the use of high physical strength, precision or speed of movement;
- work at height;
- parts or handles of equipment, or work tools, heavy and difficult to grasp;
- frequent unforeseen interruptions over which the worker has no control;
- weak social relationships and social support in the workplace;
- absence of incentives that reward the performance of special processes for the quantity and quality of the product.

2.4.4 Deciding on preventive and protective measures and taking action

Following the risk assessment, the employer should draw up an action plan and insert the timing of implementation of these actions in a time schedule, also foreseeing deadlines.

It is essential to communicate the results of the assessment to all workers and to ensure the commitment of all those involved. Measures to prevent or reduce the risks related to the use of work equipment are generally necessary at different levels of the organization.

Some of the interventions implemented by the employer to prevent and manage the risks are:

- rotation of jobs or modification of tasks (e.g. to avoid routine and reduce the pressure of time);
- allow sufficient time for workers to carry out their duties;
- minimize physical risks such as inadequate lighting, noise and vibrations;
- ergonomic design of shift programs if shift work cannot be avoided;
- allow workers to take part in decisions that concern them;
- provide information and support to workers;
- allow workers to file complaints and give them due consideration;
- modification of the physical characteristics of the work equipment or of the design of the work process (first, by tackling collective physical measures);
- adapt the work equipment to the skills and resources of each worker;
- provide workers with knowledge and instructions on suitable ways of working and on the correct use of work equipment;
- give feedback and reward workers who follow good practices in the use of work equipment.

2.4.5 Monitoring and reviewing

The employer should continuously evaluate and update what actions to be taken in order to reduce or eliminate risks related to work equipment. Once those actions undertaken, he/she should check if they have proven effective and where they have not been, adopt improvements.

Furthermore, the employer must organize the workplaces, the workstations, including those where the use of fixed or mobile, static or mechanical equipment is foreseen, so that workers can, for example:

- perform their work activities by assuming postures and making ergonomically correct movements;
- move safely both during processing and outside shifts, to reach different points inside the workplace;
- avoid space-time interference both between processing and between equipment;
- organize work to prevent workers from being exposed to psychosocial risks.

In addition to these specific aspects, the labour inspector should check whether the employer applies a holistic approach to the actions to be taken in order to implement prevention and protection measures. He/she should focus on the aspects indicated above with reference to the measures relating to particular work stations, to ensure that unwanted effects do not occur, as well as on the operators, also on other work stations, along a production line or in a flow of production.

3. TRAINING ON RISKS RELATED TO WORK EQUIPMENT

3.1 The aim of the training

In order to make labour inspection more effective and efficient, it is very important to guarantee an appropriate training of inspectors to improve the quality of inspection so that the inspectorate can respond to its dual role of prevention and protection.

First of all, inspectors should receive general training that will lead them to understand of national laws, which derive from European legislation on safety in the use of work equipment. For this purpose, it is essential to know the contents of the social and product directives.

To be able to carry out an inspection on work equipment and to promote the development of technical and scientific skills, it's necessary to have a level of knowledge in Occupational Health & Safety.

The trainees, at the end of the action, should be able to understand the main work equipment, to identify the associated risk factors, to establish the main preventive measures, to recognise the applicable legislation and to develop the appropriate inspective gesture.

The training should include a theoretical and a practical part.

The theoretical part will focus specifically on the job or function of each worker, should cover theoretical and practical aspects, adapt to the evolution of risks and the appearance of new ones, to be repeated periodically, if necessary.

The practical part enables the worker to use and/or carry out specific activities with a specific work equipment that requires a particular knowledge of it.

It is recommended that newly hired inspectors be led by a senior or more experienced inspector, especially in preparation and during the inspection.

For purely indicative purposes, the following paragraph provides some indications on a possible training program for inspectors in the field of work equipment.

The following draft represents a program to be adapted by each Member State on the basis of its own peculiarities and on the frequency and type of fatal and non-fatal injuries that most frequently occur in their own country.

3.2 Training program

Module 1 (1/2 day)	Characterization of risks associated with machines and the machinery directive
	The European and national regulatory framework
	The Machinery Directive
	Essential health and safety requirements
	Mechanical hazards and others
	Concepts of machine safety (EN ISO 12100)
	Inspect intervention in the field of control of compliance of the application of the machinery directive
Module 2 (1/2 day)	The work equipment directive (I)
	The European and national regulatory framework
	The general minimum safety requirements applicable to work equipment
	Rules for the use of work equipment for temporary work at heights: Stairs, Scaffolding, Ropes
	Solving practical cases
Module 3 (1/2 day)	The work equipment directive (II)
	Rules for the use of work equipment and minimum safety and health requirements associated with: Suspended platforms for the lifting of workers; Load lifting; Mobile machinery (including tractors)
	Exceptional use of equipment for lifting of workers
	Training and information of operators
	Solving practical cases
Module 4 (1/2 day)	To promote the improvement of safety during the use of work equipment in use through organizational measures. Labour inspection approach
	Verification of the requirements of machinery and work equipment by a competent person
	Verifications and tests
	Labour inspection approach
Module 5 (1 day)	Training and practical demonstration of production processes with machines in the sectors of
	Wood Processing/Metal Processing
	Civil Construction
	Lifting platforms for people
	Forklift Telescopic Forklift

Module 1

In the module 1, the European and national machinery regulations are illustrated in order to fully understand the definition of the machine and the scope of the rules.

The machinery must comply with the essential safety requirements in order to ensure that it is safe. Those requirements should be applied with discernment, taking into account the state of the art at the time of construction and the technical and economic requirements.

The labor inspector must be able to identify the dangers, the risks and the associated protective measures implemented on the machines. For example, the correct choice of protective device for a particular machine must be made on the basis of the risk assessment for that machine. When choosing an appropriate protective device for a particular type of machinery or hazardous area, it must be clear that fixed guards are simple and must be used if the access of an operator to the hazardous area is not required during normal use of the machinery. As the frequency of access increases (e.g during maintenance work), this inevitably should lead to the fixed guard not being put back. This calls for the application of an alternative protective measure such as a movable blocking guard or a non-contact protective device.

Moreover, information on the inspection techniques to be adopted is provided in order to verify the compliance of the machines with the European directive. Generally, any processing requires a worker who interacts with a machine for longer or shorter times: the operator will work in safe conditions if the working distance from the machine is sufficient and if contact with the operator is prevented from the hazardous areas of the device. The machine is safer in relation to the technical equipment designed to prevent any contact. All the parts of the machines that can generate a possible dangerous condition must be protected, both during normal operation and in the event of a fault.

Obviously, it is not possible to guarantee that a machine will be safe if it is used by a non-expert worker, or is used for operations and processes for which it was not built, or is still used in a way that does not comply with the manufacturer's instructions, or is operated under insufficient maintenance conditions; in all these cases, the probability of accidents occurring increases.

Module 2

In this module the European and national regulations on work equipment are illustrated, including the minimum safety requirements of work equipment with a particular focus on some work equipment. Then, it will be highlighted:

- limitations on the use and/or maintenance of work equipment that present a specific risk for certain workers;
- the need to take ergonomic principles into account;

Finally, it is useful to present practical cases relating to work equipment.

Module 3

This module introduces the obligations inherent to use of work equipment and the concept of exceptional use of equipment for lifting of workers, by referring to the indications, if any, declined in own Member States.

Therefore, inspectors have to know the difference between adaptation and modification of a work equipment:

Adaptation of a work equipment

- under conditions provided by the manufacturer (for examples attach an interchangeable device, mount snow chains on the tyres);
- under conditions not provided by the manufacturer;

Modification of a work equipment

- modifications made to an "old" device –prior to 1995- (not subject to CE marking), in order to adapt it exclusively to the current legislation;
- modifications carried out in an "old" equipment for productive purposes;
- modifications to equipment with CE marking.

Contraindicated or prohibited uses and unforeseen uses.

In addition, all work equipment must be used by operators who have taken adequate training course in order to avoid hazards or risks during their use.

Finally, practical cases will be presented both of non-compliant use of work equipment and of accidents occurring with the use of the same.

Module 4:

This module focuses on the inspection techniques that the labour inspector must adopt in the various situations he/she encounters conformity of the machines, use of the equipment by trained worker, etc.

Furthermore, Labour inspectors receive training on how to get prepared for an inspection, according to national laws and practices.

After training, inspectors should be able to:

- distinguish the different types of equipment;
- use the database or any other source to collect information on the employer to be inspected;
- use the legislation relating to the type of inspection;
- use any available technical equipment;
- how to do the investigation of occupational accidents and diseases inherent to use of work equipment;
- draw up a report, fill in a form correctly.
-

Module 5

The aim of this module is to show the inspector the production processes in order to deepen the knowledge, the procedures and the ways in which any malfunctions and anomalies are resolved.

A series of processes have been proposed which can be adapted by each Member State according to the frequency and seriousness of accidents.

REFERENCES

- *Directive 2006/42/ec of the european parliament and of the council of 17 May 2006, on machinery, and amending Directive 95/16/EC (recast).*
- *Directive 2009/104/EC of the european parliament and of the council of 16 September 2009, concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC).*
- *Guide for assessing the quality of risk assessments and risk management measures with regard to prevention of psychosocial risks, non-binding publication for EU SLIC Working Group: New and Emerging Risks (EMEX). Adopted on October 8th 2018.*
- *Guide for assessing the quality of risk assessments and risk management measures with regard to prevention of MSDs, non-binding publication for EU SLIC Working Group: New and Emerging Risks (EMEX). Adopted on October 8th 2018.*
- Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025 (EU-OSHA 2018).
- “*Use of work equipment, Provisions issued by the Swedish Work Environment Authority*”.
https://www.av.se/globalassets/filer/publikationer/foreskrifter/engelska/us_e-of-work-equipment-provisions-afs2006-4.pdf; last consultation on March 24th 2020.
- EC Information Card: Machine safety, general by Ministerie van Sociale Zaken en Werkgelegenheid.

Links

- <https://osha.europa.eu/en/developments-ict-and-digitalisation-work>
- <https://www.inail.it/cs/internet/attivita/prevenzione-e-sicurezza/conoscere-il-rischio/attrezzature-di-lavoro.html>