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Torben Jespen

Risk Assessments and Safe Machinery

Ensuring Compliance with the EU
Directives

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Torben Jespen
Koege
Denmark

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Preface

Besides chemicals, major industrial (process) accidents and construction works, there is hardly a more important specific occupational safety and health subject than the achievement of safety in the use of machinery.

Safety in the use of machinery necessitates an effort in two different areas:

First of all at the *manufacturer's* place in order to ensure the design and construction of adequately safe machinery (taking the intended use into consideration) being placed on the market accompanied by safety relevant information, and second at the *user's* place in order to ensure a controlled and risk-minimized use of the equipment under the responsibility of the employer.

Many countries have approved legislation and published guidelines, including standards, which promote the achievement of the safe use of machinery in the framework of surveillance by competent authorities and assistance from expert institutions, including Notified Bodies (third-party institutions).

Regarding efforts on regional levels, it is evident to set focus on the European Union (EU) who has approved product specific legislation on machinery, harmonizing the safety related requirements to be met by the manufacturers (Machinery directive 2006/42, former Directive 98/37 and Directive 89/392). EU has also approved minimum requirements to be met by employers concerning the use of machinery at work (Use of work equipment directive 2009/104—codified version of directive 89/655 as amended—being a daughter-directive of the Framework directive 89/391 on health and safety at work).

As mentioned above, the achievement of safety in the use of machinery starts at the manufacturer place at the design and construction stage before the machinery is placed on the market, which is the principal subject of this publication—based on the EU Machinery directive 2006/42.

Through the *ILO code of practice* “Safety and health in the use of machinery”, published in 2013, the principles and approach of the European legislation will be spread out as a global strategy—in particular, based on the machinery risk assessment as the key issue for reaching the demanded level of health and safety.

The ILO publication is of course also dealing with the responsibility of employers, and again the risk assessment and risk reduction processes (at the workplace) come into focus. Such workplace machinery risk assessment will in general require appropriate contributions from manufacturers, for example through the accompanying instructions, about possible hazards, implemented protective measures and any residual risks, and recommendations for additional protective measures to be implemented by the user.

As a conclusion, you could emphasize that in future, the design of safe machinery and the communication by the manufacturer of associated risk assessment aspect for the safe use of machinery are going to be the key elements—as ever before—in the endeavour of avoiding any risk at the use of machinery.

It is worth mentioning that ILO (the International Labour Organization), having its headquarters in Geneva, Switzerland, is the only tripartite UN agency, where workers and employers together have an equal voice with governments in its deliberations. The ILO code of practice on the safe use of machinery was drawn up at a meeting in late 2011 by a group of 24 experts appointed after consultation of the governments, the Employers' group and the Workers' group of the governing body.

Finally, the author wishes to express his gratitude for the many helpful and inspiring discussions and comments received from colleagues at work, especially Mr. Sigfred K. Nielsen (Bachelor of Science in Mechanical Engineering) who was always ready to study and comment on any draft material prepared by me.

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Torben Jespen

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Chapter 1

Introduction

Although it is primarily the EU Machinery directive 2006/42 and risk assessments that are put into focus here, you can for some part consider the present informative guide as a general introduction to the European Product regulation and how to comply with its essential requirements.

When you have become familiar with the principles behind and the structure of the Machinery legislation you will be in a much better position to comply with EU Product legislation in general.

In order to facilitate the achievement of an appropriate degree of familiarity with the EU Product regulation, especially concerning the Machinery directive, Chap. 2 and subchapters are dedicated to a brief introduction to relevant EU legislation, standards, responsibilities, producer liability and language requirements.

Chapter 3 and subchapters go into details with the Machinery directive and its Essential Health and Safety Requirements (EHSR), which must be met in order to be in compliance with the Directive. This is a prerequisite for placing machinery (as defined by the Directive) on the EU market and/or putting machinery into service. The legal requirements directed towards what is called “Partly completed machinery” are also discussed.

Concerning the EU (European Union) market, this is here equivalent to the EEA (European Economic Area) market, which is composed of the EU countries supplemented by Iceland, Liechtenstein and Norway.

The Machinery directive aims primarily to ensure the free circulation of machinery on the EU market and to ensure a high level of protection of the health and safety of users and other exposed persons.

The objectives to be attained find expression in the list of mandatory EHSR stated in Annex I to the Directive.

All of these EHSR, which put together “cover” all the possible hazards that may be associated with machinery, are generally only to be taken into consideration when the hazard behind the requirement is of relevance for the machinery in question. And the extent of the required EHSR fulfilment is to be determined by the assessed risk and “the state of the art” concerning this requirement.

This leads to the conclusion that the **machinery safety risk assessment** is the key aspect concerning Machinery directive compliance. The main subjects of Chap. 3 and subchapters are therefore Machinery risk assessment. This is supplemented by a closer look on the EHSR, some comments on subjects as Functional safety, Fire and explosion risks, and the standards, which can be used in order to obtain a presumption of being in compliance with the Directive (concerning the EHSR covered by the standard). Section 3.7 tells you a little about the parallel workplace EU legislation concerning machinery (which is for the employer to comply with, as the user of machinery).

Chapter 4 and subchapters set focus on some aspect related to some of the EHSR: Guards, access possibilities, safety signs, noise emissions from machinery, emergency stop and hazardous substances used or produced by machinery including the SDS (Safety Data Sheet) requirements for these chemical agents.

Risk assessment, including hazard identification and risk reduction methodologies, is not only a very important subject concerning safe machinery, but of general importance for assemblies of machinery, plant departments and plants. In order to become more familiar with this subject, Chap. 5 contains a more general introduction to the **aspects of Risk assessment**.

Finally, Chap. 6 contains some basic knowledge about fires and explosion, which can be of value when considering and assessing the hazard/risk in relation to some of the EHSR.

This guide does not contain many references to interesting and relevant publications. More legislative information—and updates—can easily be found at the European Commission website <http://ec.europa.eu/enterprise/sectors/mechanical/machinery>, and when you need supplementary information on specific topics, you should go to the Internet and search for relevant updated information including references to related important publications.

1.1 Disclaimer

The purpose of this guide is to provide general guidance on issues arising out of the EU Product legislation—especially the Machinery directive with its EHSR—that is to be applied according to sound risk assessments.

The author has endeavoured to ensure the accuracy of the guidelines. But legislative issues are subject to change, and the interpretation may differ over time and between experts, and this guide cannot be exhaustive in its coverage of all the aspects. The same goes for some of the more technical and scientific subjects that are closely connected to this legislation.

Anyhow, the guide intends to reflect the interpretations and recommendations regarded as valid at the time it was published. But supplementary information may be needed depending on the circumstances, and it must therefore be emphasised that this text is intended to guide you in the right direction but it cannot be relied

upon as a guarantee for being in compliance with the EU legislation or for not failing when a specific decision has to be taken.

In the end, being in compliance with EU legislation concerning a specific product is first of all the responsibility of the product manufacturer and implies the accomplishment of a sound specific risk assessment for which he may need to be supported by professional advice procured from outside the company.

Chapter 2

EU Legislation

2.1 EU Legislation

2.1.1 Introduction

A few words about EU legislation is appropriate in order to establish a certain framework for the subjects dealt with in this guideline, which sets focus on fulfilling Machinery Directive requirements—especially the proper carrying through of risk assessments.

The basic or primary EU legislation—only to be shortly mentioned here—is composed of the Treaties on the European Union, introduced by the Treaty of Rome in 1957 and revised through the years by several Treaties—last time in 2007 by the Treaty of Lisbon. The Treaties define e.g. the decision-making process for more specific EU legislation and the possibilities for the adoption of such secondary legislation.

Secondary legislation (i.e. Directives and Regulations) must have legal base in Articles of the applicable Treaty.

Regulations are EU legislation which is directly applicable and binding in all EU Member States without the need for any national implementing legislation. This direct applicability of the EU legislation ensures a more transparent and uniform legislation in EU. For example, the general EU legislation on chemicals is based on the REACH Regulation 1907/2006, and the classification and labeling of chemicals on the CLP Regulation 1272/2008.

Directives are EU legislation which binds the Member States as to—what could be called—the objectives to be achieved within a certain time-limit while leaving the national authorities the choice of form and means to be used. Directives have to be implemented in national legislation in accordance with the procedures of the individual Member States.