


NEBOSH
National Diploma
in Occupational
Health and Safety

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NEBOSH
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Health and Safety

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Unit C
Workplace and
Work Equipment
Safety


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Element C6

Work equipment
(workplace machinery)

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Work equipment (workplace machinery)

Learning outcomes

- C6.1 Describe the principles of safety integration and the considerations required in a general workplace machinery risk assessment
- C6.2 Describe, with examples, the principal generic mechanical and non-mechanical hazards of general workplace machinery
- C6.3 Describe protective devices found on general workplace machinery
- C6.4 Explain the principles of control associated with the maintenance of general workplace machinery
- C6.5 Describe the requirements for information and warnings on general workplace machinery

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Work equipment (workplace machinery)

Learning outcomes (continued)

C6.6 Explain the key safety characteristics of general workplace machinery control systems

C6.7 Explain the analysis, assessment and improvement of system failures and system reliability with the use of calculations

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Work equipment (workplace machinery)

Contents

C6.1 Safety integration and machinery risk assessment

C6.2 Generic hazards

C6.3 Protective devices


C6.4 Maintenance

C6.5 Information and warnings

C6.6 Machinery control systems

C6.7 Systems failures and system reliability

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Work equipment (workplace machinery)

Contents

C6.1 Safety integration and machinery risk assessment

C6.2 Generic hazards

C6.3 Protective devices


C6.4 Maintenance

C6.5 Information and warnings

C6.6 Machinery control systems

C6.7 Systems failures and system reliability

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Work equipment (workplace machinery)

Safety integration and machinery risk assessment

- The principles of safety integration from the Supply of Machinery (Safety) Regulations (SMSR) 2008
- Factors to be considered when assessing risk
- Purpose of CE marking and the relevance of the CE mark
- Conformity assessments and the use of harmonised standards

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Work equipment (workplace machinery)

Safety integration and machinery risk assessment

The principles of safety integration from the SMSR 2008

- The Supply of Machinery (Safety) Regulations (SMSR) 2008 set out requirements to ensure that machinery is designed and constructed taking account of essential health and safety requirements (EHSRs)
- The term 'machinery' incorporates machinery; interchangeable equipment; safety components; lifting accessories; chains, ropes, and webbing; removable transmission devices and partly completed machinery
- The requirement applies to situations where machinery is manufactured for supply to another organisation and when a user manufactures their own machinery

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Work equipment (workplace machinery)

Safety integration and machinery risk assessment

The principles of safety integration from the SMSR 2008

Machinery must be designed and constructed to be fit for purpose and to eliminate or reduce risks throughout the lifetime of the machinery

- Schedule 2, Part 1 of SMSR 2008, first principle of safety integration, requires that machinery be designed and constructed so that it is fitted for its function and can be operated, adjusted and maintained without putting persons at risk when the operations are carried out under foreseen conditions and taking account of reasonably foreseeable misuse

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment

The principles of safety integration from the SMSR 2008
 The principles must be applied in order to eliminate or reduce risks as far as possible; take necessary protective measures where risk cannot be eliminated; and inform users of any residual risks

- Schedule 2, Part 1 of SMSR 2008, second principle of safety integration, requires the responsible person to apply specified principles of good practice when selecting the most appropriate methods to prevent risk and satisfy the essential health and safety requirements

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment

The principles of safety integration from the SMSR 2008
 When designing and constructing machinery and when drafting the instructions: use and foreseeable misuse must be considered

- Schedule 2, Part 1 of SMSR 2008, third principle of safety integration, establishes a duty to not rely on the specification of intended use for the machine when designing, constructing and drafting instructions

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment

The principles of safety integration from the SMSR 2008
 Take account of operator constraints due to necessary or foreseeable use of personal protective equipment

- Schedule 2, Part 1 of SMSR 2008, fourth principle of safety integration, requires the design and construction of the machinery must take account of constraints to which the operator is subject as a result of foreseeable use of personal protective equipment

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment

The principles of safety integration from the SMSR 2008
 Machinery must be supplied with all the essentials to enable it to be adjusted, maintained and used safely

- Schedule 2, Part 1 of SMSR 2008, fifth principle of safety integration, requires that supply must ensure that all essential special equipment or accessories are provided to ensure machinery can be adjusted, maintained and used safely

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment

Factors to be considered when assessing risk

- Persons at risk
- Severity of possible injury
- Probability of injury
 - Technical/procedural/behavioural factors
- Need for access
- Duration of exposure
- Reliability of safeguards
- Operating procedures and personnel

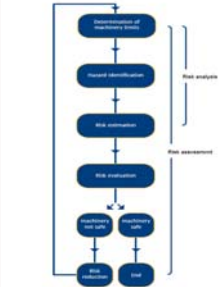
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Work equipment (workplace machinery)
Safety integration and machinery risk assessment

Factors to be considered when assessing risk

Risk assessment




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    graph TD
        A[Identification of hazards] --> B[Hazard identification]
        B --> C[Risk identification]
        C --> D[Risk evaluation]
        D --> E[Risk control]
        E --> F[Residual risk]
        F --> G[Risk assessment]
        
        subgraph Risk_analysis [Risk analysis]
            A
            B
            C
        end
        
        subgraph Risk_assessment [Risk assessment]
            D
            E
            F
            G
        end
    
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
Source: Rockwell Automation




Work equipment (workplace machinery)
Safety integration and machinery risk assessment
Purpose of CE marking and the relevance of the CE mark
Declaration of CE marking

- Provide a visible declaration by the manufacturer, or their authorised representative, that the machinery is in conformity with the applicable requirements set out in European Community harmonisation legislation relating to machinery, being the Machinery Directive 2006/42/EC and in the UK the SMSR 2008
- Machinery bearing the CE mark will be taken as meeting the requirements and thereby entitled to free circulation throughout the European Economic Area, provided that it does in fact satisfy those requirements
- "CE Marking" is now used in all EU official documents
- "CE Mark" is also in use, but it is NOT the official term

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment
Purpose of CE marking and the relevance of the CE mark
Declaration of CE marking
 CE Mark



Source: Department of Business Innovation and Skills


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Work equipment (workplace machinery)
Safety integration and machinery risk assessment
Purpose of CE marking and the relevance of the CE mark
Selection and integration of work equipment in the workplace

- Selection of work equipment
 - The Provision and Use of Work Equipment Regulations (PUWER) 1998, Regulation 10 - Conformity with community requirements, places a duty on the employer to ensure that work equipment, including machinery, conforms to UK legislation that gives effect to EU Directives
- Integration of work equipment
 - Work equipment obtained by an employer may be integrated with other work equipment to form an assembly of machines, for example, a packing machine combined with a labelling machine

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment
Conformity assessments and the use of harmonised standards
Essential health and safety requirements for machinery

- Various product Directives are produced by the European Community to define and control the standards of products manufactured for use within the European Community.
- They do this by setting out 'Essential Health and Safety Requirements' (EHSR)
- The essential health and safety requirements of machinery are set out in Annex 1 of the EU Machinery Directive 2006/42/EC and are listed in Schedule 2 of the SMSR 2008


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Work equipment (workplace machinery)
Safety integration and machinery risk assessment
Conformity assessments and the use of harmonised standards
Essential health and safety requirements for machinery
Responsible person under SMSR 2008

- The manufacturer of the machinery
- The manufacturer's appointed representative in the community
- The person who first supplies the relevant machinery


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Safety integration and machinery risk assessment
Conformity assessments and the use of harmonised standards
Essential health and safety requirements for machinery
Machinery under SMSR 2008

- These include circular saws (single or multi-blade), band saws and other sawing machinery, spindle moulding machinery, presses (including press-brakes), cartridge operated and other such dangerous machinery that requires special consideration when designing, building and applying the CE mark

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment
Conformity assessments and the use of harmonised standards

Conformity assessments

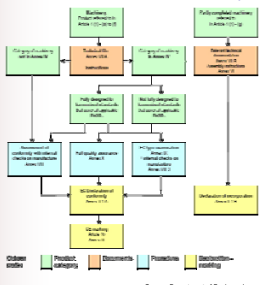
- There are three methods of conformity assessment under the SMSR 2008
- With the choice of method available to the responsible person being dependent, for the most part, on whether the machinery in question falls within Schedule 2, Part 4 of SMSR 2008, which reflects Annex 4 of the EU Machinery Directive 2006/42/EC

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment
Conformity assessments and the use of harmonised standards

Procedures for conformity



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Source: Department of Business Innovation and Skills.




Work equipment (workplace machinery)
Safety integration and machinery risk assessment
Conformity assessments and the use of harmonised standards

Conformity assessments

Procedure 1 - Assessment of conformity with internal checks on manufacture (self assessment) - Part 8 of Schedule 2 of SMSR 2008 (Annex VIII)

- A responsible person, applying the general principles and having regard to standards, undertakes a risk assessment against the essential health and safety requirements (EHSRs), produces a technical file having applied the necessary internal checks, produces a Declaration of Conformity and affixes the CE marking to the product, thus declaring compliance to the SMSR 2008

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Safety integration and machinery risk assessment
Conformity assessments and the use of harmonised standards

Conformity assessments

Procedure 2 - European Community (EC) type-examination (declaration of type approval) - Part 9 of Schedule 2 of SMSR 2008 (Annex IX)


- Details of the manufacturer, or representative in the European Community, and place of manufacture
- A written declaration that the application has not been submitted to another notified body
- A technical file
- A representative example of the machine or a statement of where it may be examined

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Work equipment (workplace machinery)
Safety integration and machinery risk assessment
Conformity assessments and the use of harmonised standards

Overview procedure for the machinery directive



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Source: Rockwell Automation.



Part only of the complete
 Element C6 PowerPoint
 Presentation

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