TECHNICAL SHEETS FOR COORDINATION

HORIZONTAL RECOMMENDATION FOR USE SHEETS (RfUs) - STATUS ON APRIL 2014

Number CNB/M/ (1)	Revision (Rev)	Key words	Approved by Horizontal Committee of NBs (2) on	Endorsed by Machinery Working Group on
00.001	33	Key addresses	11/12/2012	
00.100	03	Recommendation for Use sheets (RfUs) - Content - Addressees	26/06/2013	22/11/2013
00.213	04	EC type-examination, safety relevant aspects	26/11/2009	09/04/2001
00.220	03	Guards	13/12/2011	23/04/2012
00.230	04	Low voltage, tests, report, declaration, electrical components	15/06/2010	30/12/2010
00.240	03	Internal arrangements, series production, quality assurance (generalization CNB/M/	26/11/2009	08/06/1998
00.250	06	Notified bodies, operational procedures, duties, certificates	26/11/2009	03/03/2000
00.251	06	EC type-examination of a modified Machinery	28/06/2012	17/01/2013
00.252	03	EC type-examination, series manufacture, internal checks	14/12/2010	23/05/2011
00.255	03	Performance Levels, categories, SILs, hardware fault tolerance	10/12/2013	15/04/2014
00.301	03	Component, manual handling	26/11/2009	08/06/1998
00.302	04	Machinery, Errors of fitting	26/11/2009	08/06/1998
00.502	06	EMC, Emissions, Immunity	15/06/2010	30/12/2010

^{(1):} CNB/M/xx.xxx RERev yy = Coordination of Notified Bodies/Machinery/Numbering of the RfUs R: Recommendation for Use E: English version Rev: Revision yy: index of the Revision

European Commission April 2014

^{(2):} NBs = Notified Bodies

CNB/M/00.001



CO-ORDINATION OF NOTIFIED BODIES Machinery Directive 2006/42/FC + Amendment

Revision 33

	RECOMMEN	To be approved by:	Language: E
Date of first stage: 01/03/2010 Origin: Technical Secretariat			Approved on:
Origin: Technical Secretariat			Approved on:
		□ Vertical Group☑ Horizontal Committee	11/12/2012
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Question related to:	Article:	EN/prEN:	Other:
Annex:	ESR (1):	Clause:	Other clause:
		CEN TC concerned:	
Key words: Key addresses		·	
Solution: The key addresses of the coordination	are given in the following pa	ages.	
The Key addresses of the coordination	are given in the following pa	ayes.	

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CNB/M/00.100 Revision 03

RECOMMENDATION FOR USE

Language: E

Date of first stage: 22/04/2013		To be approved by:	Approved on:
Origin: Horizontal Committee		✓ Vertical Group	
		To be endorsed by:	Endorsed on:
		☑ Machinery Working Gro	oup 22/11/2013
Question related to: Directive 2	2006/42/EC Article:	EN/prEN:	Other:
Annex:	ESR (1):	Clause:	Other clause:
		CEN TC concerned:	

Key words: Recommendation for Use sheets (RfUs) - Content - Addressees

Question:

What are the acceptable purposes/contents of the RfUs and who are the addressees of the RfUs?

Solution:

- 1) Before bringing a Recommendation for Use sheet to the attention of the Horizontal Committee and after to the Machinery Working Group of the European Commission, the writers of the RfUs must apply the following tests:
- 1.1) Does the Recommendation for Use sheet add value, i.e. does it provide additional information that is not available in the directive or the relevant harmonised standard?

The added values can be for example as follows:

- a) to support the interpretation of requirement(s) of standards and provide a solution;
- b) to provide a solution that supersedes a too generic requirement of a standard by providing an alternative solution for a specific application;
- c) to provide an additional solution besides those from the standard to meet the goal(s) of the MD in an alternative way. If the RfUs do not add value, the issues raised by the document should be included in the minutes of the meeting of the relevant Vertical Group but not presented as Recommendation for Use sheet.
- 1.2) Is the Recommendation for Use sheet of a horizontal nature, i.e. applicable to more than one Vertical Group? Such questions should be agreed and documented at Vertical Group level and passed to the chairman of the Horizontal Committee and the Technical Secretariat for agreement and submission as a horizontal document.
- 1.3) Are the wordings of the Recommendation for Use sheet clear and so that readers who have not attended the Vertical Group or Horizontal Committee meetings can easily understand the question and answer?
- 1.4) Are the RfUs consistent with the actual safety level to be applied (e.g. wording of directive, standard, decision of the Machinery Working Group, publication of the European Commission, etc)? It is not permissible to specify a level of safety below that described in the above documents. Where realization of an adequate safety level can be achieved by a solution not described in a harmonized standard, evidence shall be provided in a transparent and comprehensible way that the Vertical Group solution meets the requirements and is therefore acceptable. Such evidence should be sufficient to support the solution in the event of challenge from a Member State.

(1) Essential safety requirement

Note: According to point 6.6 of the Guide of the implementation of directives based on the New Approach and the Global Approach, the notified bodies apply as general guidance this recommendation for use.

1.5) If the level of safety specified in the applicable standard appears to be too low, or if an aspect of a standard that is doubtlessly wrong or seems to not fully meet the goal of the MD, the relevant interested parties (CEN/CENELEC TC, European Commission) shall be informed immediately.

Before decision is taken, the Vertical Group shall discuss the matter in order to reach a common agreement on how to proceed with the assessment of the conformity.

However, if the questions require an urgent solution the notified body who detected the possible deficiency(ies) or mistake(s) can start within the VG members a quick enquiry in order to collect answers within a reasonable period of time (less than 3 months).

If the question(s) are deemed to be of general interest, the Horizontal Committee shall also be informed.

The Member States and the European Commission are automatically informed through the minutes of the meetings of the Horizontal Committee.

2) The RfUs, "endorsed" by the Machinery Working Group shall be sent firstly by the Technical Secretariat (TS) to the NBs who are responsible for their implementation. The TS shall send the "endorsed" RfUs to the CEN/CENELEC TCs and to the European Commission in order to be uploaded in EUROPA Website.

The manufacturer of the machinery concerned has the ongoing responsibility of ensuring that he said machinery meets the corresponding state of the art (Annex IX point 9.2). State of the art is described in the harmonised standards; RfUs provide explanations and rules for implementing the clauses of the harmonised standards.

- 3) The fact of a standard being transferred to the ISO does not change either its status or the status of RfUs.
- 4) If a manufacturer applies a technical solution described in a Recommendation for Use (RfU) which deviates from the technical solution described in a harmonised C-standard, he must submit an example of the machinery either for the EC type-examination referred to in Annex IX or for the Full quality assurance referred to in Annex X because the machinery would not totally comply with the harmonised C-standard.



CNB/M/00.213 Revision 04 Language: E

RECOMMENDATION FOR USE

Date of first stage: 16/07/19	98		To be approved by:	Approved on:
Origin: Horizontal Committee	e - Generaliz	zation of CNB/M/11.018	☐ Vertical Group ☑ Horizontal Committee	
			To be endorsed by: ☑ Machinery Working Group	Endorsed on: 09/04/2001
Question related to: Dir. 200	06/42/EC	Article:	EN/prEN: EN ISO 13849-1:2008	Other:
Annex:		EHSR (1):	Normative clause:	Other clause:
			CEN TC concerned:	

Key words: EC type-examination, safety relevant aspects, omission of tests

Question: Within the framework of an EC type-examination account should be taken of all safety-relevant aspects (category, electrical insulation, environmental factors as vibration, EMC etc.). In which well-founded cases exceptions from this rule are admissible?

Solution:

In general a test can be omitted if a negative influence of performance and safety is not expected. Some examples may demonstrate how omissions can be justified:

- 1. For indoor applications tests with limited temperature ranges (o to 50°C) are admissible.
- 2. If the type tested is used in an indoor application and foreseen to be mounted in an enclosure of P-rate IP 54 the IP-rate test can be omitted.
- 3. In the case that safety-related controls consist only of electromechanical components EMC testing for immunity can be omitted.
- 4. If the type tested is foreseen to be used with an external converting equipment with fulfils the power supply voltage interruption requirements the supply voltage can be omitted.

All restrictions in the field of applications shall be mentioned in the EC type-examination certificate. However tests of safety relevant aspects cannot be omitted within framework of an EC type-examination, if cannot be ensured that all given requirements are fulfilled.

Adaptation procedure: FORMAL ADAPTATION IN CONFORMITY WITH DIRECTIVE 2006/42/EC



06/42/EC + Amendment Revision 03

RECOMMENDATION FOR USE

Language: E

CNB/M/00.220

Date of first stage: 17/05/2011		To be approved by:	Approved on:
Origin: Generalisation of CNB/M/01.005/R/E Woodworking machinery	Rev 03 from VG1	✓ Vertical Group ✓ Horizontal Committee	
		To be endorsed by:	
		☑ Machinery Working Group	23/04/2012
Question related to: Directive 2006/42/EC	Article:	EN/prEN:	Other:
Annex: I	ESR (1): 1.3.7 and 1.4	Clause:	Other clause:
		CEN TC concerned:	

Key words: Guards

Question:

Assuming a machine meets all essential safety requirements of the directive. The manufacturer of this machine adds for any reason an additional guard. Shall this additional guard meet all the requirements of the directive as defined for guards in clause 1.4?

Solution:

Yes

Any part of a machine regarded as a safety guard shall meet all the requirements of the directive as defined for guards in clause 1.4.

E.g.:

A manufacturer fits a fixed guard, which prevents access to a hazard area, with an interlocking not required by the directive or the relevant standards. The interlocking might be understood as a safe shut off of all hazard movements of machine parts behind the fixed guard and the user may omit turning the power switch. Both the fixed guard and the interlocking shall comply with the relevant requirements in annex I of the machinery directive.

(1) Essential safety requirement

Note: According to point 6.6 of the Guide of the implementation of directives based on the New Approach and the Global Approach, the notified bodies apply as general guidance this recommendation for use.



CO-ORDINATION OF NOTIFIED BODIES

CNB/M/00.230

MACHINERY	MACHINERY DIRECTIVE 20	006/42/EC + Amendment	Language: E
NOTIFIED BOOT	RECOMMENDAT	ION FOR USE	
Date of first stage: 06/06/199	7	To be approved by:	Approved on:
Origin: Horizontal Committee	e - generalization of CNB/M/11.022	☐ Vertical Group ☐ Horizontal Committee To be endorsed by:	
		✓ Machinery Working Group	30/12/2010
Question related to: Dir. 200	6/42/EC Article:	EN/prEN:	Other:
Annex: I	EHSR (1): 1.5.1	Clause:	Other clause:
		CEN TC concerned:	
Key words: Low voltage, test	s, report, declaration, electrical componen	nts	
EXAMPLES I. The list of components give 2. In all cases, the actual use component. 3. It should be checked whet	ocument that may be used by all Notified E en in the columns is non exhaustive and or e of the component has to be considered a her the declaration and/or certificate of cor requirements of the machinery directive for	nly meant as indication. and it has to be decided if it is used as a	a functional or as a safety

		COMPONENT IS USED AS:	
AVAILABLE COMPONENT	FUNCTIONAL COMPONENT	SAFETY RELATED	SAFETY COMPONENT (not
INFORMATION		COMPONENT	covered by Annex IV)
	Failure of the component does	Failure of the component causes	Failure leads to unacceptable
	not decrease the safety level	a limited decrease of safety	decrease of safety
Manufacturer's specifications	Y	N	N
No conformity mark and no			
reference to compliance with			
standards	V	\(\(\lambda \)	N.
Manufacturer's specifications with reference to a standard No	Y	Y(1)	N
conformity mark No declaration			
of Conformity			
Manufacturer's specifications	Υ	Υ	Υ
+Declaration of Conformity	·	·	·
Voluntary conformity marks	Y	Y	Y(2)
	EXAMPLES Plugs and	See below (A)	See below (B)
	sockets(3) Cables Push-buttons		
	Pilot lights		
	Switches/contactors/timers El.		
	Magnetic valves Temp. controls		
	Motor start capacitor		

In all cases it is assumed that components operate within their specified limits

- (1) if manufacturer states in writing that he has followed the standard
- (2) only if test report shows that the safety functions have been checked as well
- (3) strictly speaking plugs and sockets outlets for domestic use are not under the low voltage directive.
- (A): EXAMPLES Transformers. Temp. limiters. Position Switches without positive opening operation. Motor protectors. Overload protectors. Main power switches. Power supply units. Fuses
- (B): EXAMPLES: see Machinery Directive Annex V (Note: some of the safety components listed in Annex V are also listed in Annex IV)

Y= The notified body may accept the component with the information certificate provided

N= The notified body shall not accept the component as such other types of certificate or additional testing are needed



CNB/M/00.240 Revision 03 Language: E

RECOMMENDATION FOR USE

To be approved by: ☐ Vertical Group	Approved on:
☑ Horizontal Committee To be endorsed by:	26/11/2009 Endorsed on:
✓ Machinery Working Group	08/06/1998
EN/prEN:	Other:
Clause: CEN TC concerned:	Other clause:
☑ EN	To be endorsed by: Machinery Working Group N/prEN: ause:

Key words: Internal arrangements, series production, quality assurance

Question:

In the EC type-examination requested dossier what shall "the internal arrangements for maintaining the conformity of machines and safety components manufactured in series" contain? What are the acceptance criteria for the Notified Body?

Solution:

Annex IX point 2. and Annex VII-A 1. b) require that the technical dossier contains the internal arrangements established to ensure that the conformity of machines and safety components manufactured in series meet the requirements of the Directive.

The notified body cannot require the manufacturer to present a quality manual conforming to the series EN ISO 9-000 standards (preferably 9001). If the firm has set up such a system it is enough to have a copy of the certificate. Otherwise, the notified body will satisfied with a commitment from the manufacturer to ensure the homogeneity of manufacturing together with a concise description of the means of control. The controlling may rest on:

- foreign bought parts, components,
- during production,
- final check before delivering the machines/safety components.
- check list for the final check
- external compliance

Adaptation procedure: FORMAL ADAPTATION IN CONFORMITY WITH DIRECTIVE 2006/42/EC

(1) Essential health and safety requirement

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NOTIFIED BOOK

CNB/M/00.250 Revision 06 Language: E

NOTIFIED BOOK	RECOMMENDATIO	ON FOR USE	
Date of first stage: 02/12/1999		To be approved by:	Approved on:
Origin: Horizontal Committee		☐ Vertical Group ☑ Horizontal Committee	26/11/2009
		To be endorsed by: ☑ Machinery Working Group	Endorsed on: 03/03/2000
Question related to: Directive 200	06/42/EC	EN/prEN:	Other:
Annex: XI ESF	R (1):	Clause:	
		CEN TC concerned:	
Key words: notified bodies, opera	tional procedures, duties, certificates:		

Question: What are the operational procedures and duties of a notified body once it has been requested to issue an EC type-examination certificate

Solution:

The rights and duties of a not ified body are de fined firstly by the Directive itself. Some u seful indications can be found in guides published by the European Commission, and especially the "Guide to application of the machinery directive – 2006/42/EC" Reference to these guides is sometimes made in this "Recommendation for Use". The main purpose of this document is to highlight some aspects which are specific to the activities of a notified body acting within the framework of the Machinery Directive.

Adaptation procedure: FORMAL ADAPTATION IN CONFORMITY WITH DIRECTIVE 2006/42/EC

(1) Essential safety requirement

Note: According to point 6.6 of the Guide of the implementation of directives based on the New Approach and the Global Approach, the notified bodies apply as general guidance this recommendation for use

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1. BASIC PRINCIPLES

As a starting point, it is felt important to confirm some principles

- It is not possible to carry-out an EC type examination for machinery not listed in annex IV. Howe ver, a notified b ody can carry out a voluntary examination for a machinery not listed in annex IV on request of an applicant or a manufacturer. In this case, the notified body shall not mention its European identification number on the voluntary examination-certificate¹
- A body doe s not need to be not ified for all machinery/safety components covered by Anne x IV². The notified bo dy must know which har monised standards apply to the machine e xamined and must know how to apply them. If the solutions proposed by the manufacturer differ from the requirements of the standards, the notified bod y shall make sure that the safety level of these solutions is not lower than the level recommended by the harmonised standards.
- The task of a notified body in t he field of Machinery is re stricted to an examination of conformity with the Machinery Directive.

The notified body, as per Article 14 of Directive 2006/42/EC, which is responsible for carrying out the EC type-examination procedure defined in Article 12 (3) (b) and Article 12 (4) (a) for a machine specified in Annex IV, is only required to carry out the operations defined in the above mentioned Article and in Annex IX.

In particular, where a machine or one of its components is subject to Community Directives other than the Directive 2006/42/EC, there is no require ment to check whether these of the Directives are being respected. In which case, the notified body must draw the attention of the contractor to his obligation to complete his technical file (also termed technical documentation or technical construction file) with reference to other Directives applicable to the machine.

In effect, the manufacturer must ensure that these other Dire ctives are being respected, and pursuant to Article 5 (4), the CE marking affixed by him or his authorised representative (artic le 5 (1) (f)) in accordance with article 16 means that the machine also conforms to the provisions of those Directives³.

If other Directives (low voltage, EMC, etc.) apply to the machin e or to some of its components, that is the manufacturer's problem (See also CNB/M/11.025/R/E). In other words, supplying an EC type-examination certificate does not necessarily mean that the machinery may carry the CE marking as it may not conform with the EMC Directive. However, the notified body should draw the attention of the manufacturer to the existence of other Directives which apply to his product.

Secondly, here are a few guidelines with regard to the essent ial requirements that the notified b ody must actually verify. This will be defined in more detail under paragraph 2.3.

- The notified bo dy must carry out a thorough examination of the risk assessment performed and document ed by the manufacturer.
- In certain cases the notified body takes into account data provided by the manufacturer (test reports, certificates, etc.). This will be discussed with more details in paragraph 2.2. hereafter.
- The notified body does not norm ally have to deal with certain crit eria such as, for instance testing vibrations in the case of motor vehicle lifts.

2. TYPICAL CONTENT OF AN EC TYPE-EXAMINATION

Based on the g eneral information defined above and the field inform ation provided by several Vertical Groups, a list def ining the "typical" content of an EC type-exami nation has been established for "simple" ma chines (without sophisticated electronic steering.....). The aim is to consolidate the practical conseque nces of the general principles as implemented t oday. Of course, every type of machine is specific. Some of the examinations are critical for certain machines and not relevant to others. For instance, the calculation of stability is not critical for a heavy press and can be very important for a lifting platform.

This list sets out the points that need to be take n into consideration in view of the specific nature of each type of machine. As we point out when presenting the list of documents to be supplied by the manufacturer, these points are sorted in logical rather than chronological order.

2.1. General

Contract (mutual obligations). Although a contract is not explic itly foreseen in the directive, this might be a good way to confirm mutual understanding of regulatory duties for both parties, for instance the duty of the applicant to inform the notified body which retains the technical file of all modification sof the approved type. (A nnex IX paragraph 6).

¹ This is the text of CNB/M/00.105/R/E Rev 01 now replaced by this Recommendation for Use

² European Commission - Responses given by the services of the Commission after consultation of the committee set up by the Directive, to some questions relating to the implementation of the Directive - question 6 - June 97

³ Useful information on the directives that may apply in a complementary way to machinery can be found in § 89 of the "Guide to the application of the machinery directive 2006/42/EC"

- Acceptability of the request and completeness of the techn ical file as provided by the app licant (manufacturer, authorised representative....)
 - One of the issu es is related to the obligation for the manufacturer to include in its app lication a written declaration that the application has not been submitted to another notified body (Annex IX second parag raph, second bullet point). It has to be clear that the intention of this requirement is not to restrict the manufacturer from obtaining several quotations, but simply prevent the practice of going from one Notified Body to another until one will issue EC type approval. It is permissible for the Manufacturer to approach one or more Notified Bodies and invite them to issue a quotation for providing the necessary assessment services required by Annex IX of the Machiner y Directive 2006 /42/EC. The Notified Bodies that have been approached may require the manufacturer to supply relevant information to enable them to prepare the required quotation. This information may be submitted verbally or in written form as required by the Notified Body. Once the manufacturer has decided to select a single Notified Body to provide the necessary services that manufacturer shall be required to enter into an agreement (e.g. a contract) with that Notified Body. In that a greement the manufacturer declares that they have not entered into a contract with any other Notified Body to provide similar services for the same machine. The selected Notified Body will then request (if not already provided) the remaining information specified within clause 2 of Annex IX (see also 5.1. in this RfU)
- Verification by the body that the machine has been built to in conformity with the applicable essential requirements of the
 Directive and/or the applicable harmonised standards when the manufacturer has made reference to them.

2.2. Documents to be supplied by the manufacturer (and to be verified by the notified body)

In current practice it is important to point out that the technical file as described in Annex VII of the Directive has not always been completed when the manufacturer requests an EC type-examination. In many cases the technical file is modified during the course of the type e xamination itself: it is the notified body that r equests the add itional information a nd/or the necessary corrections in order to be able to issue a certificate of conformity for the machine.

In the final stage the technical file must contain a set of information that must be properly identified. It must be possible to link the plans, drawings, certificates, etc unequivocally to the machine or family of machines that is the subject of the EC type approval certificate.

- Drawings, stress/stability calculations (limited to critical components)
- Sufficient docu ments for valid ation of e lectric, hydraulic and pneumatic circuits. The docume nts can be circuit diagram s (including interfaces/connections), functional description of the circuit diagrams, component lists.....
- Manufacturer's declarations an d/or certificates ⁴ related to ot her Directives applicable to some safety/saf ety related components (EMC, Low Voltage, Pressure....).
 - See Section 3.1. hereafter for the acceptability of certificates.
 - The notified body should draw the attention of the manufacturer to the existence of other Directives which apply to his product.
- Other certificates, test reports (n oise, safety components.....). They may be included in the technical file. The acceptability of certificates/test reports is made under the responsibility of the notified body⁵ using a ranking of criteria defined as follows
 - Notification (a report established by a notified/competent body acting in the field of its notification/designation may not be rejected).
 - Accreditation (pay attention to the scope of accreditation)
 - Reputation (may be given consideration)
 - For parameters considered to be less critical, a test report of the manufacturer himself (for example on noise emission) can be taken into account by the notified body (see section 3.3. hereafter)
- Manufacturing procedures (when critical for safety aspects), internal measures for conformity of series production.
- The risk assessment carried out by the manufacturer and the safety measures applied, with indication of the residual risks.
- If all risks identified by the risk assessment of the manufacturer are described in the harmonised standard published in the Official Journal of the European Union the risk analysis may mention this as a result of this risk assessment process
- List of standards applied
- List of essential safety requirements applied (or, at least, list of the essential safety requirements which are not covered by the harmonised standards used by the manufacturer)...
- Instruction manual/safety related instruct ions (inten ded use, foreseeable misuse.

⁴ As applicable

⁵ The notified body decides which are the critical components and which are the acceptable certificates/test reports. A general requirement is that "Conformity assessments shall be carried out in a proportionate manner, avoiding unnecessary burdens for economic operators". (see Article 8 (10) of Regulation 765/2008/EC). It should also be clear the in so doing the notified bodies shall nevertheless respect the degree of rigour and the level of protection required for the compliance of the product with the provisions of the directive

Declarations of incorporation for included partly completed machinery and the relevant assembly instructions, if appropriate

2.3. Language required for the documents of machinery

The files and correspondence referring to the EC type-examination procedures shall be drawn up in an official language of the Member state where the notified body is established or in a language acceptable to it.

The instructions must be drafted in one or more Official Comm unity languages. The words "Original instructions" must appear on the language version(s) verified by the manufacturer or his authorised representative. (Machinery directive, Annex I, 1.7.4.1. (a).6

The notified body may require for carrying out an EC type-examination documents, including the technical file that are prepared in a language understood by the notified body. The notified body is not responsible to check translations of the manual instructions.

2.4. Inspections (tests, measurements, visual checks.....as applicable)

- Correspondence between the actual machine (safety component) and the machine as described in the technical file
- Validate (by analysis and, if necessary, by testing), the safety functions and categories of the safety-related control systems, in normal operation and in the case of faults, taking into account all operating modes of the machine.
- Protective devices, safeguarding method
- Warnings
- Conformity of markings
 - Marking as requested by Machinery Directive
 - Indications or marks which are presented in the file as a factor of conformity of components to certain critica I requirements of directives or European standards: el ectrical components (see CNB/M/00.230/ R/E), mechanical components (ropes,....), hydraulic components (pipes,....)
 - Identification of the manufacturer (also for components...)
- Overload test
- Mechanical resistance
- Measurement of critical properties (e.g. dimensions, temperatures, pressure, speed)
- Stopping time between the moment the protect ive device (emergency stop, light curtain...) is actuated and the moment the machine stops (if necessary)
- Checking of electrical, pneumatic, hydraulic equipment

2.5. Documents to be issued by the notified body

- Test/inspection report: no standardised presentation has been pr ovided but a full identification of all the components of the report is required in the spirit of the EN IS O 1 7000 and EN 45000 series. This report describes i.a. the examinations performed by the notified body, the certificates taken into ac count and the product examined (full identification, photo's, plans....). The element of the file provided by the manufacturer must be identified univocally. In case of dispute in the future, the report must make it possible to define as completely as possible the machine or the safety component submitted by the manufacturer.
- EC type approval certificate.

SUBCONTRACTING – ACCEPTABILITY OF CERTIFICATES, REPORTS AND DATA SUPPLIED BY THE MANUFACTURER

For such a wide-ranging Directive as the Machinery Directive, this is one of the most delicate points. It is important to ensure the credibility of the conformity assessment process. There are two important basic rules

- Where a notified body subcontracts specific tasks connected with conformity assessment or has recourse to a subsidiary, it shall
 ensure that the subcontractor or the subsidiary meets the relevant requirements set out in Annex XI of the directive and shall
 inform the notifying authority accordingly
- Notified bodies shall take full responsibility for the tasks performed by subcontractors or subsidiaries wherever these are established

⁶ This is the text of CNB/M/00.207/R/E Rev 03 amended to take the new requirement of the directive into account and now replaced by this Recommendation for Use

3.1. Electro-technical components subject to the low voltage and EMC Directives.

The conditions for subcontracting do not apply if the work concer ns a product that is shown to fulfil the requirements put on it according to the applicable Directive(s). An example of such a product is an electro-technical component that is within the scope of the EMC and the Low Voltage Directives. The conformity assessment procedures fore—seen for the component by the relevan—t Directives have to be accepted by a notified body in charge of the evaluation of a final product containing this component. This is true provided the administrative duties foreseen in the Directive for the manufac turer of the component are fulfilled (CE marking, declaration of conformity, instruction handbook etc...)

It is mandatory to follow the conformity a ssessment procedure's set out in these two Directives. There is the refore a trend to wards acceptance of the manufacturers' data. For components with a significant bearing on the safety of the machinery, the body will also obtain a declaration from the manufacturer or a voluntary conformity mark.

The guide concerning the Low Voltage Directive states that the notified body in the field of machinery will take into account the results of the conformity assessment procedures of the "Low Voltage" Directive which apply for the intrinsic electrical safety aspects of the electrical component of the machinery (conformity with point 1.5.1. of Annex I of the Machinery Directive). ⁷ It is also stated t hat direct examination by the notified b ody will apply, i.a. to all risks ari sing from the way in which the electrical components are incorporated into a machinery and ensure their proper functioning.

The notified body remains fully responsible for the appropriat eness of components and certificates. If the manufacturer defectively assembles components for which the required characteristics have not been documented/certified as far as the safe operation of the machinery is concerned, this gives rise to a fundamentally unacceptable situation whether or not the components carry the CE marking.

In terms of practice, two basic questions have been answered by the European Coordination of Notified Bodies. Both of the answers have been accepted by the Machinery Committee.

3.2. Components and safety components manufactured by specialised firms and included by the machinery manufacturer in his product.

Certain manufacturers are specialised in the ma nufacture of co mponents and safety component s of machinery. Such components are found in several types of differe nt machinery produced by man ufacturers throu ghout the world. Consequently, the machines will be submitted to various notified bodies. Although such components may have a significant bearing on the safety of machinery, it would seem exaggerated to carry out all of the tests required to demonstrate the reliability of the component all over again. Despite the fact that it is aimed specifically at presses, Recommendation for Use CNB/M /03.013/R/E gives some guide lines which can be applied to a ll types of machinery. Notified bodies may take into account certificates drawn up by other notified bodies for the same machines and/or by a laboratory/body which is accredited in a specific domain.

3.3. Parameters considered to be "less critical"

For parameters considered to be "less critical", the task of not ified bodies is essentially to verify the credibility of the data provided by the manufacturer

EC type-examination for all machines entering into the field of application of Annex IV must in clude verification of all the es sential requirements stated in Annex I and applicable to the machine. This includes the requirements which are recognised as not constituting the basis of this examination:

- either by checking that the requirements directly applied by the manufacturer are adhered to
- or by checking that the harmoni sed standards have been used corre ctly, as regards the essent ial requirements covered by the standards, when the manufacturer has made reference to them

Taking noise as an example, the essential requirement aimed at in point f of section 1.7.4 of Annex I: the not ified body must, in general, abide by the declaration of the manufacturer as stated in the instruction manual and should not:

- carry out the measurement again
- or require a certificate by a third party if the measurements and the equipment used comply with the relevant standards

At the meeting of 4 July 1993, the 89/392 Committee (currently 2006/42 Committee) stated that the role of the notified body should be limited to

- verifying that all measures have indeed been taken to ensure that noise has been reduced to the lowest possible level by
 isolating the transmission components for instance (Essential health and safety requirement 1.5.8.)
- verifying that the manufacturer has indeed indicated in the instruction manual both the noise level and the methods used to reach the result shown
 - asking for explanations from the manufacturer where the emission level is badly indicated or where the stated emission level is clearly at odds with reality. In this case, the notified body should carry out further measurements and, afterwards, refuse

⁷ European Commission - Guidelines on the application of Council Directive 2006/95/EC Electrical equipment designed for use within certain voltage limits) – Comment 30 – August 2007

the EC type-examination if the lack of compliance is confirmed. Systematic verification of the emission level is, however, not envisaged.

4. EC TYPE-EXAMINATION CERTIFICATE

As far as EC type-examination certificates are concerned, two issues have been dealt with by the European co-ordination of notified bodies

- A. Is it possible to put different variants of a machine on the same certificate?
- B. Is it possible to issue EC type-examination certificates for the same product to different applicants?

The answers are as follows

4.1.1 Procedure to be applied to the EC type-examination of variants of a mach ine or a safety component - Criteria to be taken into account for the certificate

The normal procedure is to put a family in one certificate. Howeve r, the notified body must verify if the range of products of the manufacturer presents a similar series of risks and/or technical solutions. If not, we are dealing with separate types which are covered by separate certificates. A machine or a safety component is considered as a variant of a referenced machine or safety component only if it differs on points which have no noticeable influence on the expected performances. The variants can correspond to differences relating in particular to dimensions, shape, nature of constituents materials, colour, assembly methods, manufacturing processes etc.

It is the responsibility of the Notified Body to evaluate for each individual case, if a given machine or safety component can effectively be considered as a variant. In case of doubt, it will carry out any check, measurement or test considered to be useful.

In every case and for each of the variants, the applicant will provide the Notified Body with a detailed description indicating the differences in comparison with the reference model and the number of samples of these variants required for complementary checks and tests.

4.1.2. Is it possible to issue EC type-examination certificates for the same product to different applicants?

It is possible to issue other EC type-examination certificates for the same product which has an existing EC type-examination certificate provided the following rules are observed:

- The request shall be made to the notified body which issued the original EC type-examination certificate giving all relevant
 information to ensure the product is the same. The new applicant must obtain official authorisation from the owner of the original
 certificate, a copy of which must accompany the request.
- The new applicant shall be considered as a manufacturer and shall conform with the requirements of Annex IX, in particular point 6 (duty to inform the notified body about any modification made or planned on the type of machinery approved).
- To eliminate ambiguities between the original certificate and the new one, the references of the product must not be the same, the information for use and trade documents must accordingly be changed. The notified body has the responsibility to verify the new documents and to confirm the product is the same as the one originally approved.
- The new EC type-examination certificate should be issued by the same notified body as the original certificate ensuring full traceability of each document.

In this matter, the legislation on intellectual property and the patent and trade mark laws have to be observed.

5. ORGANISATIONAL PROCEDURES

Four subjects have been broached in this context:

- How to ensure that the manufacturer does not attempt to resubmit a file that has already been rejected elsewhere
- How to harmonise the practical interpretation of the Directive when the product does not comply with an harmonised standard
- What to do when it is discovered that the application of a standard poses a problem
- How long should one retain files that relate to an EC type-examination?
- 5.1. How can it be assured that the manufacturer has not presented the same file to two or even several notified bodies? How can it be assured that the manufacturer does not re-submit a file having been the subject of a previous EC type-examination certificate refusal decision?

This question is in relation with the paragraph 2 from Annex IX of the Directive. The answer not a pplicable for the quotation process (see 2.1. of this RFU).

The manufacturer will be asked to confirm (an example of a confirmation form is attached) that he has not submitted the same file to another notified body and that the model presented for examination or a very similar one has not been the subject of any previous EC-type certificate refusal decision.

For the future, an information system is considered to be useful. The Commission should be asked by the Horizontal Committee whether the Directive provides a legal basis for establishment of such a system.

The aim of the confirmation Form is to make the manufacture aware of his(her) responsibilities.

" A body which refuses to issue an EC type-exa mination certificate shall so inform the other notified bodies. ..." The problem is that this information must be given very quickly to all othe r competent notified bodies (for example by FAX). If this is so, all notified bodies know what are the rejected machines. But this supposes that the lise to feuropean notified bodies is always up to date and sent in time to all notified bodies.

Confirm	nation form (example)
	In the name of
	(name of the company)
the	undersignedcertifies
	(name of the undersigned)
	- That the following Machinery or Safety Component for Machinery:
	(type of the M achinery or Saf ety Component according to Annex IV of MD 98/37/EC (previously 89/392 /EEC amended)
	(identification of the product including designation of series or type, serial number and year of construction) whose manufacturing technical file is enclosed herewith, with the view of being granted an EC type-examination certificate, has not been subject of a previous EC type-examination certificate refusal decision
	- That no request of a similar nat ure concerning the same model has been submitted to any other Notified Body for the granting of EC type-examination certificates.
Done	atDate
(signa	ture) (position of the undersigned) (seal)

Note: "A manuf acturer cannot set notified bod ies in competit ion with each oth er on technical questions by requesting an EC type - examination certificate from several notified bodies in the hope that at least one of them will issue such a certificate. However, this does not prohibit competition on the grounds of cost. A manufacturer located in one Member State may se lect a body notified by another Member State"8

5.2. How to harmonise the practical interpretation of the Directive when the product does not comply with an harmonised standard

If everyone interprets the Directive in his own way, it would be nothing short of miraculous if all of the solu tions found were intercompatible. In the event of flagrant divergences, there is always a risk that the safeguard clause would raise it shead, which is not the desired objective.

The harmonised standards and the data sheets of the European co-ordination of notified bodies make it possible gradually to set a level acceptable to all parties in volved (public aut horities, manuf acturers, etc.). Providing an o perational sum mary of this "technic al jurisprudence" applicable within the framework of the EC type-examination is one of the tasks of notified bodies.

One of the first questions raised during the mee ting of the not ified bodies was related to this to pic. The question was "Are there any methods or procedures available for testing the a chievement of adequate safety if the product is not in accordance with the har monised standard? What and how can it be done? The notified body cannot always wait for the next meeting of the ver tical group or horiz ontal committee to discuss the problem9".

The answer is based on common sense and personal contacts. We have no official regulation for the time being other than ESR's, but we can rely on:

- experience of some notified body ("ringing round")
- completing a technical sheet "proposal for enquiry"
- informative report and discussion in the vertical group
- compliance with national specifications/standards.

5.3. What action should be taken if deficiencies and/or mistakes in standards are detected?

Question concerning possible deficiencies and/or mistakes in standards shall be brought to the attention of relevant CEN/CENELEC Technical Committees for possible solution.

Before decision is taken, the Vertical Group shall discuss the matter in order to reach a common agreement on how to proceed with the testing.

However, if the questions require an urgent solution the notified body who detected the possible deficiency(ies) or mistake(s) can start within the VG members a quick enquiry (by fax) in order to collect answers within a reasonable period of time (10 days).

If the question(s) are deemed to be of general interest, the Horizontal Committee shall also be informed.

The Member States are automatically informed through the minutes of the meeting of the Horizontal Committee.

5.4. For how long must the EC type-examination files be stored by the notified body?

Directive 98/37/EC did not give explicit limitation to the notified bodies concerning the retention of the EC type-examination files.

In order to ensure some degree of coherence with respect to Annex V paragraph 4 b of directive 98/37/EC, the notified bodies were advised to keep the file for fifteen years after the last intervention of the notified body.

The 2006/42/EC directive now states that the manufacturer and the notified body shall retain a copy of the certificate, of the techn ical file and of all the relevant documents for a period of 15 years from the date of the issue of the certificate (Annex IX, 9.3. third paragraph)

⁸ J-P Van Gheluwe - Community legislation on machinery - Comments on Directive 98/37/EC - Section 822 - 1999 Edition

⁹ This is the text of CNB/M/00.204/R/E Rev 01 now replaced by this Recommendation for Use



CNB/M/00.251 Revision 06

RECOMMENDATION FOR USE

Language: E

NOTIFIED BOS			
Date of first stage: 09/11/2010		To be approved by:	Approved on:
Origin: Horizontal Committee		□ Vertical Group □ Horizontal Committee	
		To be endorsed by: ☑ Machinery Working Group	Endorsed on: 17/01/2013
Question related to: Directive 2006/42/EC	Article: 12.3 b), 12.4 a)	EN/prEN:	Other:
Annex: IX	ESR (1):	Clause:	Other clause:
		CEN TC concerned:	
Key words: EC type-examination of a modif	ied Machinery		
Question:			

How must a Notified Body (NB2) deal with an application of an assessment of conformity (EC type-examination) for a modified machinery while the base machinery was assessed by a Notified Body (NB1) who is different from NB2 and who delivered an EC type-examination certificate to the base machinery?

Solution:

The manufacturer has to address the NB1 when he makes changes to a machine (see Machinery Directive); NB1 will assess what impact the intended modifications may have on the validity of the EC type-examination certificate he issued. If NB1 reaches the conclusion that machinery, when subject to the envisaged modifications, will no longer be covered by the original EC type-examination certificate, he will inform the manufacturer about his conclusion.

If the manufacturer decides to go ahead and implement the envisaged changes, he must change the type and he has to make a new application in order to assess conformity with essential health and safety requirements of the Machinery directive. Such application may in this case be made to other NB2 that the manufacturer chooses. NB2 is responsible for the whole new type and it's up to the NB2 to accept technical files, certificates (e.g. for type approved Annex IV safety components) and /or test reports.

(1) Essential safety requirement



CNB/M/00.252 Revision 03

RECOMMENDATION FOR USE

Language: E

Date of first stage: 05/06/2009			To be approved by:	Approved on:
Origin: Generalisation of CNB/M/11.048/R/E Safety components	Rev 01 from VG11	I	Vertical Group Horizontal Committee	
		V	To be endorsed by: Machinery Working Group	Endorsed on: 23/05/2011
Question related to: Directive 2006/42/EC	Article:	EN	l/prEN:	Other:
Annex: IX	ESR (1):	Cla	ause:	Other clause:
		CE	N TC concerned:	

Key words: EC type-examination, series manufacture, internal checks

Question:

Article 12 lists as one possible procedure for assessing the conformity in its point 3 (b) the following:

"The EC type-examination procedure provided for in Annex IX, plus the internal checks on the manufacture of machinery provided for in Annex VIII, point 3."

Does a Notified Body carrying out an EC type-examination also have to assess these internal checks, i.e. all measures necessary in order that the manufacturing process ensures compliance of the manufactured machinery with the technical file?

Solution

Reminder: "EC type-examination is the procedure whereby a notified body ascertains and certifies that a representative model of machinery referred to in Annex IV (hereafter named the type) satisfies the provisions of this Directive."

No, the type-examination procedure described in Annex IX does not include the "assessment of conformity with internal checks on the manufacture of machinery" (Annex VIII).

According to Annex VII, point 1 b) "for series manufacture, the internal measures that will be implemented to ensure that the machinery remains in conformity with the provisions of this Directive" are part of the technical file.

Part of work of a Notified Body in performing an EC type-examination is to examine the technical file (see Annex IX, point 3.1). Therefore in case of series manufacture of a machine the Notified Body has to check also the measures foreseen by the manufacturer. The Notified Body has to check whether such measures exist and whether they seem appropriate, but does not have to perform production surveillance.

(1) Essential safety requirement



CNB/M/00.255 Revision 03

NO THE BOTH	RECOMMENDAT	Language: E	
Date of first stage: 07/06/2013		To be approved by:	Approved on:
Origin:		☐ Vertical Group	
Question related to: Directiv	ve 2006/42/EC Article:	✓ Machinery Working Gr EN/prEN:	Other:
		·	
Annex: I	ESR (1): 1.2.1	Clause:	Other clause:
		CEN TC concerned:	
Key words: Performance Le	evels, categories, SILs, hardware fault tolera	ance	
with PL d with structure cwith SIL 2 with a hardwar	ategory 3 as described in ISO 13849-1:200 re fault tolerance of 1 with a proof test interaction a control system complying with SIL 3 with	06, or erval of not less than 20 years, as o	
Solution:			
No.			
The probability of a danger	ous failure, expressed either in PL or in SIL	is one requirement.	
The structure of the safety-requirement.	related parts of the control system, express	sed in categories or in hardware fa	ult tolerance, is another
Both requirements have to	be fulfilled independently.		

(1) Essential safety requirement
Note: According to point 6.6 of the Guide of the implementation of directives based on the New Approach and the Global Approach, the notified bodies apply as general guidance this recommendation for use.

ORLAN CO-ORDINATIO
Non
MACHINERY
NOTIFIED BODY

CNB/M/00.301 Revision 03 Language: E

RECOMMENDATION FOR USE

O/IFIED 8-			
Date of first stage: 12/05/1997		To be approved by:	Approved on:
Origin: Horizontal Committee		☐ Vertical Group ☐ Horizontal Committee	
		To be endorsed by: ☑ Machinery Working Group	Endorsed on: 08/06/1998
Question related to: Dir. 2006/42/EC	Article:	EN/prEN: EN 1005-2: 2003/A1 :2008	Other:
Annex:	EHSR (1):	Clause:	Other clause:
		CEN TC concerned:	
Key words: Component, manual handli	ng		
Question: What criteria should be take	n into account when evaluating if a c	omponent can be transported by har	nd?

Solution:

The principal criteria to be taken into consideration are :

- . the mass of the component
- by component we mean all components used during the maintenance
- . the dimensions of the component.

The maximum permitted mass per person is worked out according to the maximum distance between lifting and laying, as per the following table, and under no circumstances can exceed 25 Kg (in accordance with Directive 90/269/EEC, see also EN 1005-2:2003/A1:2008 safety of machinery. Human safety performance Part 2: Manual handling of machinery and component parts of machinery). Otherwise, standardised gripping devices which can be used in conjunction with slings, hooks, lifting rings or more simply cut holes must be foreseen for handling, and the instruction handbook should give all the necessary instructions.

Regardless of their weight, machine components which are more hazardous due to sharp areas, bulky shapes, slippery lubricated surfaces, etc. must be fitted with appropriate devices to ease handling.

Adaptation procedure: FORMAL ADAPTATION IN CONFORMITY WITH DIRECTIVE 2006/42/EC

(1) Essential health and safety requirement

Where the mass of a component to be handled is not obvious, (a strengthened, heat insulating guard for example), an indication regarding its sturdiness must be affixed to the guard itself.

The notified body should ensure that the instruction handbook gives all the details pertinent to the handling of these components. The mass of components exceeding 25 Kg must be mentioned in the instruction handbook.

MASS (m) (kg)	MAXIMUM DISTANCE BETWEEN LIFTING AND LAYING (m)	
	HORIZONTAL DIRECTION	VERTICAL DIRECTION
0 <m<=15< td=""><td>1,2</td><td>1</td></m<=15<>	1,2	1
10 <m<=20< td=""><td>1</td><td>0,8</td></m<=20<>	1	0,8
15 <m<=25< td=""><td>0,8</td><td>0,6</td></m<=25<>	0,8	0,6

STEPH CO-ORDINATIO
No. No.
MACHINERY %
NOTIFIED BODY

CNB/M/00.302 Revision 04 Language: E

RECOMMENDATION FOR USE

Date of first stage: 30/09/1996		To be approved by:	Approved on:
Origin: Horizontal Committee		☐ Vertical Group ☑ Horizontal Committee	26/11/2009
		To be endorsed by: ☑ Machinery Working Group	Endorsed on: 08/06/1998
Question related to: Dir. 2006/42/E	EC Article:	EN/prEN:	Other:
Annex: I	EHSR (1): 1.5.4	Clause:	Other clause:
		CEN TC concerned:	
Key words: Machinery Errors of fi	tting	·	·

Question:

How can the prevention of errors of fitting components making up machinery or errors of connection likely to leaf to a risk be ensured? What criteria should be retained to ensure that the instructions of the manufacturer prevent errors of fitting or connection?

Solution: Ensure that in the documentation:

1°) in the case of pre-fitting

- the "pre-fitting" of items or couplings has already been carried out by the manufacturer. In these circumstances the handbook must provide the information necessary for any possible dismounting operation as well as on the risks likely to result from an error of fitting where there is the possibility of interchangeability...

2°) without pre-fitting

- the items or couplings are fitted with polarizing slots in the case where "pre-fitting" has not previously been carried out. These devices should be strong enough not to break or deform if incorrect fitting is attempted.
- the items or couplings must be identified by means of markings or distinctive colours when 'pre-fitting' and fitting of polarizing slots are not feasible. These markings must be affixed directly on the items and/or on their housing. If a direction of movement is required this should be indicated on the items and/or on their housing. The handbook must provide information regarding the risks likely to result from an error of fitting.

In all circumstances the handbook must explain the fitting and dismounting phases, and the cautions must de drafted clearly. Ensure by means of inspection that:

- the pre-fitting is in conformity with the documentation
- the polarising slots are efficient,
- the markings are adequate

Adaptation procedure: FORMAL ADAPTATION IN CONFORMITY WITH DIRECTIVE 2006/42/FC

(1) Essential health and safety requirement

Note: According to point 6.6 of the Guide of the implementation of directives based on the New Approach and the Global Approach, the notified bodies apply as general guidance this recommendation for use.



CNB/M/00.502 Revision 06 Language: E

ONFIED BOY	RECOMMENDATION FOR USE			
Date of first stage: 05/02/1999		To be approved by:	Approved on:	
Origin: Horizontal Committe	ee		☐ Vertical Group ☐ Horizontal Committee	
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Question related to: Dir. 20	06/42/EC	Article:	EN/prEN:	Other:
Annex: I		EHSR (1): 1.5.10 and 1.5.11	Clause:	Other clause:
			CEN TC concerned:	
Key words: EMC, Emission	s, Immunity.			
Question: How to take acco	ount of electr	omagnetic effects in the context of	f the machinery directive?	

Solution:

Generally speaking, the machinery directive and the EMC directive are complementary (see the European Commission's compatibility guide mentioned below). Neither of the directives can be considered specific, given the different nature of the essential requirements defined by the two directives (radiation and employee safety for the machinery directive and electromagnetic compatibility for the EMC directive).

This being said, it should be borne in mind that there are two aspects to the problem:

- Emissions (not causing interference in the environment): this point is raised in paragraph 1.5.10 of Annex I of the machinery directive (risks due to radiation). It has two facets:
 - induced effects on the performance of machinery and equipment: : this aspect is covered by the EMC directive;
 - the physiological effects on human beings: this aspect is adequately covered by, among others, the IRPA (1) and NRPB (2) guides. For conventional machines, there is normally no risk in this field.

The analysis of these risks by the manufacturer is compulsory.

- Immunity (not being influenced by electromagnetic interference): this point is raised in paragraph 1.5.11 of Annex I of the machinery directive (risks due to external radiation). Electromagnetic interference also constitutes an external influence under paragraph 1.2.1. The manufacturer must ensure that the interference does not create a dangerous situation. According to the directive, there must not be:
 - the machinery must not start unexpectedly;
 - the parameters of the machinery must not change in an uncontrolled way, where such change may lead to hazardous
 - the machinery must not be prevented from stopping if the stop command has already been given;
 - no moving part of the machinery or piece held by the machinery must fall or be ejected;
 - automatic or manual stopping of the moving parts, whatever they may be, must be unimpeded;
 - the protective devices must remain fully effective or give a stop command.

It is also clear that interference must not cause the machine to make sudden random movements.

(1) Essential health and safety requirement

Note: According to point 6.6 of the Guide of the implementation of directives based on the New Approach and the Global Approach, the notified bodies apply as general guidance this recommendation for use.

The manufacturer and any notified body which may be involved in the conformity assessment process must ensure that these rather particular aspects are properly dealt with. We should bear in mind that effects of interference on the machine are covered specifically by the EMC directive and not the machinery directive. The following are possible approaches:

- · reports drawn up by competent EMC bodies;
- declarations of conformity to the EMC directive for components, apparatus, systems forming part of the machine;
- analysis of the electrical circuit to determine whether the electromagnetic interference is likely to create a dangerous situation. The designer may have decided to guarantee immunity by using electromechanical devices which are not vulnerable to interference. In this case of complex control circuits, the manufacturer must make a risk analysis to evaluate the effect of faults. This analysis is to be included in the technical file.

It is often impossible to verify by testing whether a large machine is immune. In this case, the immunity of the electronic control systems and safety components is to be checked.

- (1) = International Radiation Protection Association PO Box 662 - 5600 Ar - Eindhoven - Netherlands
- (2) = National Radiological Protection Board Chilton - Didcot - Oxon - United Kingdom