

Position Paper

PP Modernisation 2016-12-12

Brussels, 2016-12-12



Interpretation of the Machinery Directive (MD) 2006/42/EC regarding modernisation of metallurgical machinery/plant

Introduction

EUnited Metallurgy is a sector group of EUnited aisbl, Boulevard A. Reyers 80, 1030 Brussels (Belgium). Register Number BE 874.269.908.

EUnited Metallurgy is the voice of the European suppliers of plants, mechanical and electrical equipment, components, automation solutions and services for

- the processing of raw materials,
- iron-making and other reduction processes,
- steel and non-ferrous metal production,
- casting of steel and non-ferrous metals,
- rolling of flat and long products, metal processing and finishing.

EUnited Metallurgy welcomes policies, which favor the development and testing of industrial innovation in Europe. EUnited Metallurgy invests in European initiatives which spur the performance of metallurgical industries vis-à-vis more sustainable use and re-use of materials and energy.

Aim

This Position Paper aims at:

- providing concrete suggestions to establish a common understanding for a complementary, coherent and consistent interpretation of the MD regarding modernisation of metallurgical machinery/plant (in particular with regard to a minor or major change) and
- clarifying different points of understanding regarding the Declaration of Conformity of machinery (CE marking) or Declaration of Incorporation of partly completed machinery according to the MD as well as the manufacturer's scope of supply.

NOTE 1 Modernisation in this context covers retrofitting (e. g., replacement of obsolete parts including design modifications), upgrading, re-manufacturing, etc.

NOTE 2 Modernisation does not cover typical maintenance work such as replacement of spare and wear parts or machine components (i. e., no design modifications necessary)

In this context, EUnited Metallurgy calls regulators and customers to support the statements of this Position Paper.

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Background

Metallurgical machinery/plant (machinery/plant is understood as an "assembly of machinery" according to Machinery Directive 2006/42/EC) of our sector are subject to various European Directives.

In the first place the Machinery Directive applies. Based on the MD, sector-specific C-type standards have been developed in CEN/TC 322 "Equipment for making and shaping of metals – Safety requirements" (see Annex D).

Furthermore, the Pressure Equipment Directive, ATEX Directive and the Low-Voltage Directive are of particular interest.

Metallurgical machinery/plant (e. g., rolling mills) are typically operated for decades. But a permanent development of new equipment and technology in conjunction with new rules and regulations (such as quality, productivity, environment, health and safety) results in modernisation of such machinery to increase, e. g., the efficiency of the production.

In this context, the question of minor or major change always needs to be answered at a modernisation project. Especially regarding the MD, the consequences are often being controversially discussed.

The following statements are intended to clarify the state of affairs.

NOTE 3 For the purposes of this document, the terms and definitions given in EN ISO 12100 and in the harmonised standards of CEN/TC 322 (see Annex D) apply.

State of affairs – Our point of view!

a) Meaning of CE in general

The CE marking is a mandatory conformity marking for certain products sold within the European Economic Area (EEA) since 1995.

By affixing the CE marking to a product, the manufacturer declares on his sole responsibility that the product is in conformity with the essential requirements of the applicable Union harmonisation legislation providing for its affixing and that the relevant conformity assessment procedures have been fulfilled. Products bearing the CE marking are presumed to be in compliance with the applicable Union harmonisation legislation (presumption of conformity) and hence benefit from free circulation in the European Market.

The CE marking is accompanied by the EC Declaration of Conformity.

The CE marking is a symbol of free marketability in the EEA. According to the MD, it is necessary for products which are newly placed on the market. A product is placed on the market when it is made available for the first time on the Union market. The operation is reserved either for a manufacturer or an importer, i.e., the manufacturer and the importer are the only economic operators who place products on the market.

NOTE 4 For further information see 10.7. ANNEX 7 – FREQUENTLY ASKED QUESTIONS ON CE MARKING of The "Blue Guide" on the implementation of EU product rules, Ref. Ares(2015) 2977717 - 15/07/2015

b) Meaning of CE regarding modernisation

According a), the "value" of CE is overestimated, if it is understood as a safety marking.

There is no requirement for CE marking of metallurgical machinery/plant already placed on the market at a later point in time.

A CE marking for the complete machinery/plant in case of modernisation (of a single equipment) would require that the whole process of the MD be fulfilled, starting with design, calculations etc.

c) Requirements to the metallurgical machinery/plant to be modernised

It is assumed that the metallurgical machinery/plant complies at least with the national occupational health and safety requirements. This is under the responsibility of the user.

NOTE 5 The role and status of the "user" is described in detail in the "Guide to Application of the MD 2006/42/EC (2010)"

d) Definition of "machinery" according to the MD in relation to metallurgical machinery/plant

Metallurgical machinery/plant (e. g., steel converters, continuous casting machines, hot and cold flat rolling mills, foil rolling mills, strip processing lines, slitting lines, extrusion presses) have to be seen as "machinery" according to the MD.

It must be clear, that metallurgical machinery/plant is an assembly of various single machines (partly completed) according to the C-type standards of CEN/TC 322 (see Annex D). They function together as a whole and thus are to be seen as an assembly of partly completed machinery according to the MD. This assembly of machinery (e. g., a rolling mill plant or a strip processing line) is CE marked and does not require an individual CE marking for each single machine.

NOTE 6 The MD 2006/42/EC uses for such machinery the term "assemblies of machinery" in Article 2, Definitions, 4th indent of (a):

*For the purposes of this Directive, 'machinery' designates the products listed in Article 1(1) (a) to (f).
The following definitions shall apply:
(a) 'machinery' means:*

- an assembly, fitted with or intended to be fitted with a drive system other than directly applied human or animal effort, consisting of linked parts or components, at least one of which moves, and which are joined together for a specific application,*
- an assembly referred to in the first indent, missing only the components to connect it on site or to sources of energy and motion,*
- an assembly referred to in the first and second indents, ready to be installed and able to function as it stands only if mounted on a means of transport, or installed in a building or a structure,*
- **assemblies of machinery** referred to in the first, second and third indents or partly completed machinery referred to in point (g) which, in order to achieve the same end, are arranged and controlled so that they function as an integral whole,*

*(b) ...
...
(g) 'partly completed machinery' means an assembly which is almost machinery but which cannot in itself perform a specific application. A drive system is partly completed machinery. Partly completed machinery is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment, thereby forming machinery to which this Directive applies;*

Example:

A cold flat rolling mill (e. g., de-coiler, mill stand, re-coiler; see also EN 15094) is only functioning as integral whole and can only fulfill the intended use when considering the interaction between the product (e. g., metal strip), process and control system, and is therefore an assembly of machinery according to the MD (see Figure 1).

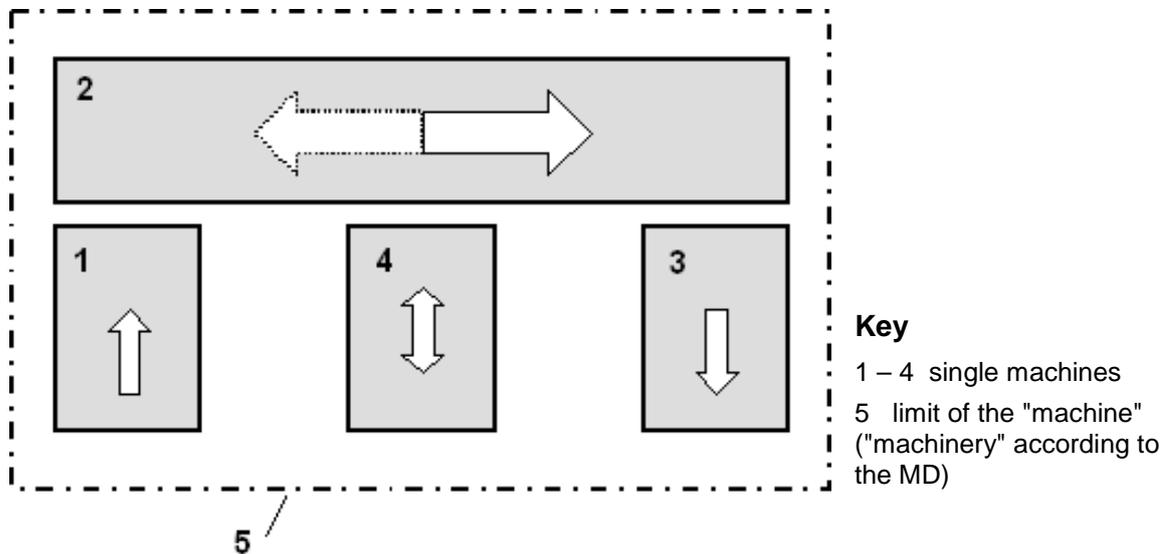


Figure 1 — Exemplary layout of a cold flat rolling mill (Source: EN 15094)

NOTE 7 1, 2, 3, and 4 of Figure 1 are single machines according to EN 15094 – within the meaning of the MD named as "partly completed machinery" ("*...arranged and controlled so that they function as an integral whole*", see NOTE 6)

e) Minor or major change?

The decision whether a major or minor change occurs

- 1) shall be determined by a risk evaluation according to the flowchart of Annex A, in conjunction with a risk assessment according to EN ISO 12100.
- 2) is always related to the machinery (e. g., rolling mill plant, strip processing line)

NOTE 8 In general, an improvement of the protection level, e. g. by a new safety control, guard, light barrier etc. results not in a major change and does not require a (new) CE marking.

The flowchart (see Annex A) can be applied by the manufacturer and the user. It must be clearly stated, that the focus of the manufacturer is only directed to the planned modernisation (i. e., to his scope of supply).

On the other hand, the user is focused on the whole plant, because normally multiple modernisations are running in parallel and could overlap in their effects.

f) Responsibility

- 1) The supplier, i. e., the "manufacturer" according to the MD, is responsible for the risk assessment for the scope of supply only, including the interfaces to other machines or areas.
- 2) The decision if the changes are major or minor is the sole responsibility of the user of the machinery or a party nominated by him, because only the user has an overview of the current status of the assembly of machinery.

3) The relevant information of 1) and 2) shall be mutually communicated.

NOTE 9 The MD 2006/42/EU defines the term "manufacturer" in Article 2, Definitions, item (i):

(i) 'manufacturer' means any natural or legal person who designs and/or manufactures machinery or partly completed machinery covered by this Directive and is responsible for the conformity of the machinery or the partly completed machinery with this Directive with a view to its being placed on the market, under his own name or trademark or for his own use. In the absence of a manufacturer as defined above, any natural or legal person who places on the market or puts into service machinery or partly completed machinery covered by this Directive shall be considered a manufacturer;

g) Minor change

If a modernisation has either no influence on the current protection level or even increases the protection level of the machinery, a new Declaration of Conformity and CE marking is not required, regardless of if the machinery is already CE marked or not.

h) Major change

The machinery shall be considered as "new" according to the MD and therefore needs a new Declaration of Conformity and CE marking and an updated Information-for-Use manual (e. g., operating instructions).

NOTE 10 The party responsible for CE marking should consider that for machines without CE marking the effort to prepare the required documentation according to the MD could be economically not reasonable, e. g., due to missing or obsolete documents/drawings.

i) Partly completed machinery

Regarding partly completed machinery (placed on the market according to the MD) the requirement of the MD 2006/42/EU, Annex II B "Declaration", item 6

*"a statement that the partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of this Directive, **where appropriate**;"*

- 1) is not applicable in case of a minor change,
- 2) is applicable in case of a major change including a new Declaration of Conformity and CE mark by the responsible party (together with all the resultant requirements according to the MD).

NOTE 11 Machine components (e.g., bearings, hydraulic cylinders, expanding mandrel) must not be classified as partly completed machinery

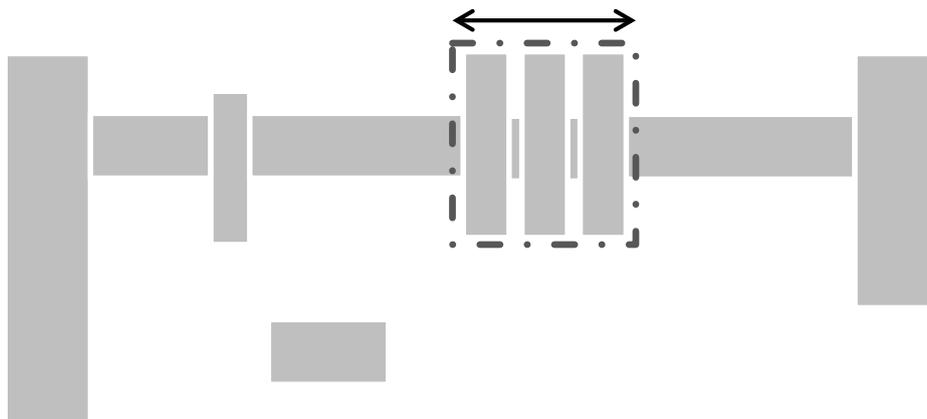
j) Scope of supply

1) Scope of supply of a new plant (CE marked) and associated interfaces

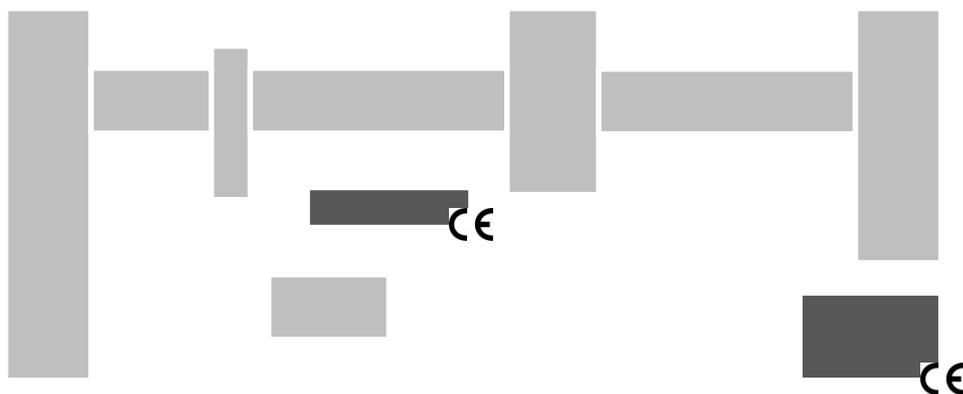


2) Scope of supply of a modernisation of an "old" plant (CE marked or not) and associated interfaces.

If the scope of supply can be classified as partly completed machinery, a Declaration of Incorporation is required and the interfaces must be considered and communicated



3) Scope of supply: New CE-marked machines (■) without safety-related interfaces to the existing machinery



Conclusion

A permanent development of new equipment and technology in conjunction with new requirements results in modernisation of metallurgical machinery/plant.

In this context questions regarding minor or major changes and scope of supply are of importance for the discussion between the supplier, i. e., manufacturer of metallurgical machinery/plant, and the user.

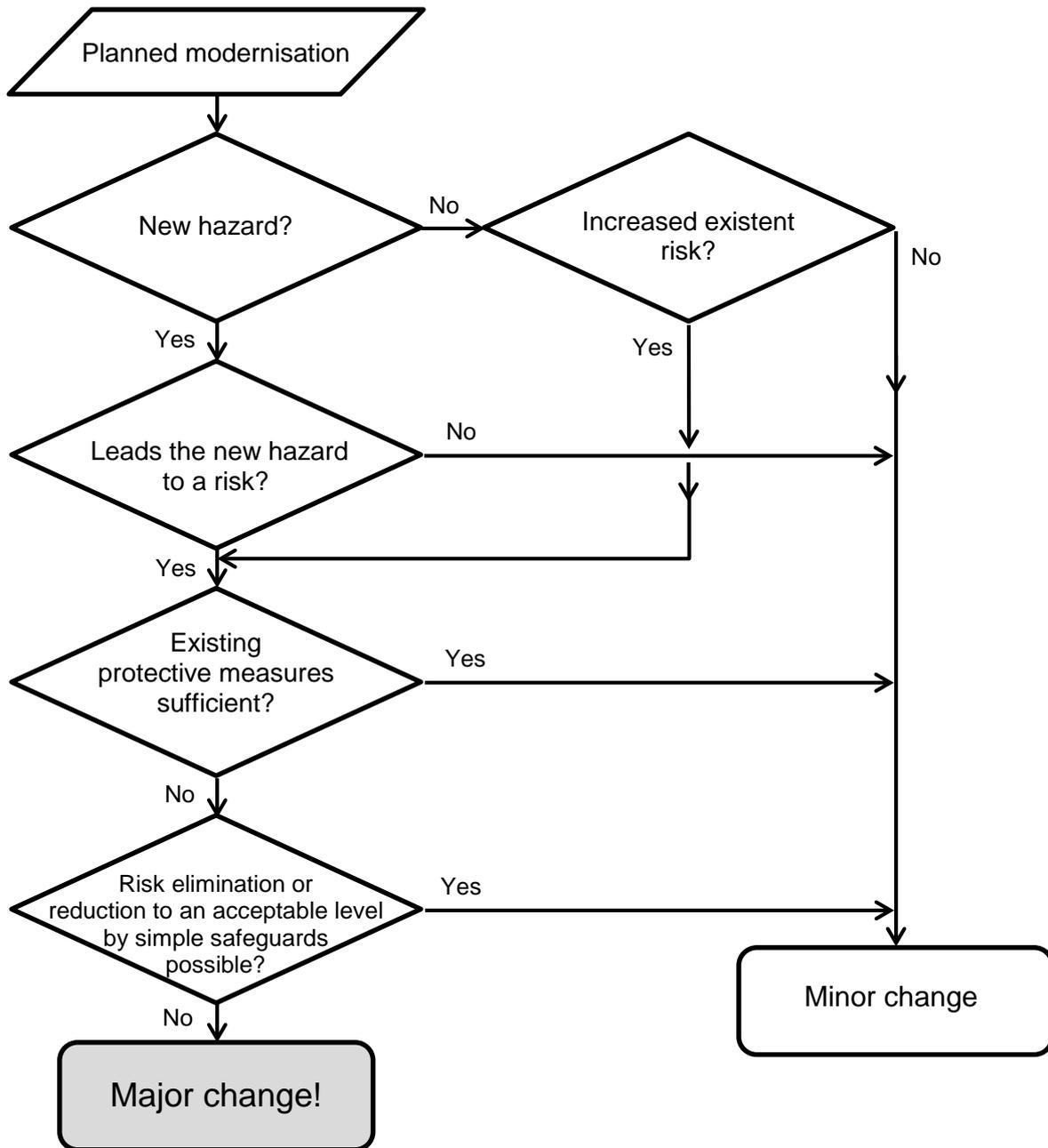
This Position Paper points out, that

- **metallurgical machinery/plant has to be seen as "machinery" according to the MD;**
- **there is no requirement for CE marking of metallurgical machinery/plant already placed on the market;**
- **it is the responsibility of the user that the metallurgical machinery/plant complies at least with the national occupational health and safety requirements;**
- **it is the responsibility of the user to determine the extent of the modernisation which could result in a minor or major change;**
- **the supplier is responsible for the scope of supply (incl. interfaces) only;**
- **minor changes do not require a Declaration of Conformity and CE marking according to the MD;**
- **major changes lead to a "new machine" according to the MD with all the resultant requirements.**

Annex A

User's guide for risk evaluation regarding the machine to be modernised

Based on practical experience, the most modernisation projects are resulting in a minor change. Examples of modernisations are given in Annex B.



NOTE A1 The flowchart is based on an interpretation paper (in German) published by the German Federal Ministry of Labour and Social Affairs (BMAS) on the subject of "Major change of machines"

NOTE A2 Up to now, there is no official definition of "simple safeguards". We assume, that it ranges from light barrier to safety PLC – "simple" depends on the current technological status of the machinery/plant

NOTE A3 In any case it is the user's obligation to comply over the lifetime of the machinery/plant with the national occupational health and safety requirements, e. g., Germany: Betriebssicherheitsverordnung; Austria: Arbeitsmittelverordnung; Italy: DLgs 81/08

Annex B

Examples of modernisations

The examples are based on real cases and consider specific boundary conditions. In any case, an individual risk assessment by the user is required!

Planned modernisation	New hazard?		Increased existent risk?		Leads the new hazard to a risk?		Existing protective measures sufficient?		Elimination by simple safeguards possible?		Conclusion
	No	Yes	NA ¹⁾	Yes	No	Yes	No	Yes	No		
1) Plant/line in general Replacement of a coiler drive and gear box for higher torque to roll harder or thicker material	No	Yes	NA ¹⁾	Yes	NA ¹⁾	Yes	NA ¹⁾	Yes	NA ¹⁾	Yes	Due to higher torque (and higher power at same speed), there are no new risks, but existing risks like impact of breaking material (in case of thicker and harder material) are increased. However, the existing protective devices are sufficient (i. e., safety measures against impact of breaking material have been checked) and operators cannot enter the dangerous area. → Minor change related to the plant/line
2) Cold rolling mill plant Integration of a seam cutting shear in the exit of the mill	Yes	NA ¹⁾	Yes	Yes	No	No	Yes	Yes	Yes	Yes	There are new risks in the rolling mill related to the shear: For example: clamping or cutting fingers during maintenance and cleaning the rolling mill. These risks however can be eliminated by simple safeguarding measures in the area of installation of the shear, the automation/electrical control of the shear can be easily integrated in the existing Safety-PLC of the mill. → Minor change related to the cold rolling mill plant
3) Foil rolling mill plant Installation of a new (additional) double-coiler											For the new, additional coiler as per state of the art protective fences are required with access-doors that are safely locked during operation. For feeding of material a safely limited speed is required not only for the new coiler but also for the rolling mill, which is linked with the coiler by the material.
3 a)	Yes	NA ¹⁾	Yes	Yes	No	No	No	No	No	No	The existing automation includes no facilities for controlled access to dangerous areas and the drive system is not capable to ensure safely limited speed. In this example the risk elimination to an acceptable level is also not possible with simple safeguarding measures. → Major change related to the foil rolling mill
3 b)	Yes	NA ¹⁾	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA ¹⁾	The existing automation includes facilities for controlled access to dangerous areas and the drive system is capable to ensure safely limited speed or the automation system is upgraded with such functions. → Minor change related to the foil rolling mill

¹⁾ NA: Not applicable

Annex B

(continued)

Planned modernisation	New hazard?					Conclusion
	Increased existent risk?		Leads the new hazard to a risk?			
	Existing protective measures sufficient?			Elimination by simple safeguards possible?		
4) Mill stand Electrical spindle roll load will be replaced by hydraulic roll load cylinder	Yes	NA ¹⁾	Yes	No	Yes	Due to the hydraulic, a new fire hazard occurs. But a fire hazard is already an existing risk of the mill stand. Due to this: → Minor change related to the mill stand and the rolling mill plant NOTE to entry: Simple safety measures are, e. g. providing an oil tray or protection plates. In contrast, a fire extinguishing system is not a simple measure.
5) Strip processing line An existing strip processing line will be supplemented with a phosphating section	Yes	NA ¹⁾	Yes	No	No	New hazard: Use of carcinogenic substance. Safety Measures: Exhaust system, additional waste removal system → Major change related to the processing line
6) Rolling mill plant Additional inspection stand will be supplemented close to the coil handling section	Yes	NA ¹⁾	Yes	No	Yes	"Weak-linked" equipment with own PLC, new independent safety area, minor adaption of the coil handling section. → Minor change related to rolling mill plant, but new weak-linked equipment ("machinery") with CE marking.
7) Plant/line in general Main drive will be equipped with new three-phase alternating current drives instead of DC drives (in addition: new frequency converter instead of DC supply control)	No	No	NA ¹⁾	NA ¹⁾	NA ¹⁾	No new hazards. → Minor change related to the new equipment and the plant/line NOTE to entry: The new equipment like DC drives and frequency converter are covered by the Low-Voltage Directive 2014/35/EU
8) Plant/line in general Exchange or replacement of the whole or part of the drive system consisting of motors, electrical cabinets etc. (e. g., upgrade from DC drives to three-phase alternating current drives)						NOTE to entry: The new equipment like DC drives and frequency converter are covered by the Low-Voltage Directive 2014/35/EU

Annex B (continued)

Planned modernisation	New hazard?					Conclusion
	Increased existent risk?		Leads the new hazard to a risk?		Elimination by simple safeguards possible?	
8 a) No increase of power and speed	No	No	NA ¹⁾	NA ¹⁾	NA ¹⁾	→ Minor change related to the new equipment and the plant/line
8 b) Increased power and/or speed, etc	Yes	NA ¹⁾	Yes	Yes	NA ¹⁾	New hazards due to increased power of the drives. → Minor change related to the new equipment and the plant/line if the mechanical equipment is able to withstand the additional loads. → Major change related to the new equipment and the plant/line if the mechanical equipment is <u>not</u> able to withstand the additional loads.
9) Pickling line Renewal of pickling tanks incl. piping	No	No	NA ¹⁾	NA ¹⁾	NA ¹⁾	No new hazards. → Minor change related to the pickling line.
10) Steel converter plant Installation of a new sub-lance (vertical)	Yes	NA ¹⁾	No	NA ¹⁾	NA ¹⁾	No increased risk. All safety measures are covered by the already existing blowing-lance → Minor change related to the steel converter plant, because of the existing safety measures
11) Steel converter plant Installation of a new sub-lance (horizontal)	Yes	NA ¹⁾	Yes	No	No	Installation of a new (complete) machine with CE marking. Additional safety measures have to be considered. Safeguards could be seen as "simple safeguards" (e. g., hold-to-run functionality for the sub-lance movement) → Minor change related to the steel converter plant
12) Eccentric-press Hard- and software upgrade of electrical control, e. g., from conventional control like Siemens® S5 or EUMUCO to Siemens® S7	No	No	NA ¹⁾	NA ¹⁾	NA ¹⁾	The upgraded electronic control has a higher safety standard (improvement) and the extension also allows the integration of further relevant safety assemblies. Depending to the current state of the safety equipment a further risk reduction may be achieved through additional integrated safety components. → Minor change

¹⁾ NA: Not applicable

Annex C

Meaning of terms in four languages

English	Deutsch	Français	Italiano
Hazard ¹⁾	Gefährdung	phenomene dangereux	Pericolo
Risk ¹⁾	Risiko	risque	Rischio
Risk assessment ¹⁾	Risikobeurteilung	Appréciation du risque	Valutazione del rischio
Risk evaluation ¹⁾	Risikobewertung	Évaluation du risque	Ponderazione del rischio
Protective measure ¹⁾	Schutzmaßnahme	Mesure de prévention	Misura di protezione
Protective device ¹⁾	Nicht trennende Schutzeinrichtung	Dispositif de protection	Dispositivo di protezione
Safeguard ¹⁾	Schutzeinrichtung	Moyen de protection	Mezzo di protezione
Safeguarding ¹⁾	Technische Schutzmaßnahmen	Protection	Protezione
Plant ²⁾ (assembly of machinery)	Anlage / Fertigungslinie (Gesamtheit von Maschinen)	installation / ligne de production (ensemble de machines)	Linea di produzione (assieme di macchine)
Simple safeguards	Einfache Schutz- einrichtungen	Simple dispositifs de protection	Protezione semplice

¹⁾ according to EN ISO 12100

²⁾ branch-related terms are, e. g., rolling mill (plant), strip processing line, pickling line or slitting line

Annex D

List of harmonised C-type standards developed in CEN/TC 322, Equipment for making and shaping of metals – Safety requirements

- **WG 1 "Steel production"**
 - Secondary Steelmaking EN 14677 [2008]
 - Electric Arc Furnaces EN 14681 [2006+A1:2010] ¹⁾
 - Continuous Casting Machines EN 14753 [2008]
 - Steel Converter EN 16774 [2016]

- **WG 3 "Rolling Mills"**
 - Long Products Rolling Mills EN 15949 [2012]
 - Tube Rolling & Forming Mills EN 13675 [2004+A1:2010]
 - Hot Flat Rolling Mills EN 15093 [2009]
 - Cold Flat Rolling Mills EN 15094 [2009]
 - *Finishing Line Equipment* *Draft proposal under preparation*

- **WG 4 "Strip Processing Lines"**
 - Strip Processing Lines EN 15061 [2007+A1:2008]

- **WG 5 "Extruding / Forging Presses"**
 - Extrusion Presses EN 14656 [2006+A1:2010]
 - Hydraulically Powered Hot Forging Presses EN 14673 [2006+A1:2010]

The above mentioned EN-Standards are published in the EU Official Journal. The application of these C-type standards leads to the presumption of conformity with the MD.

It is recommended to consider these standards in case of modernisation, if applicable.

¹⁾ EN 14681 is going to be replaced by ISO 13578 and will be published in Europe as "EN ISO 13578"