



THE PILLAR OF THE SEA : JOINT ACTION OF THE EUROPEAN SOCIAL PARTNERS OF THE SEA-FISHING SECTOR

Pillar 3 : survey on the legislation in force regarding deck machinery, engine rooms and fishing gears

Machine safety on board fishing vessel

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INTRODUCTION

A study initially titled “study on the legislation in force regarding deck machinery, engine rooms and fishing gears”.

The study focuses on the safety of fixed machinery installed on board fishing vessels. On the basis of the definition of “machinery” given by Directive 2006/42/EC of 17/05/2006 - the Machinery Directive - targeting several types of machinery:

- deck machinery and lifting appliances / accessories,
- fish processing machines,
- engine room and workshop machines.

Two kinds of technical devices are specifically excluded from the scope of the study:

- fishing gears,
- propulsion devices ; the Machinery Directive considers propulsion engines to be part of the ship and, therefore, cannot be considered as machinery.

I. EUROPEAN MACHINERY DIRECTIVES

I.1. Machinery Directive 2006/42/EC

I.1.1. Structure of European Regulations

European machinery regulations address the issue of safety from two complementary angles: on the one hand, the design and marketing of machinery; on the other, the use of machinery. The former is primarily for manufacturers and distributors, while the latter is aimed at employers.

The design and marketing aspects only concern new machinery. They issue from European directives called "machinery" directives, which define and impose harmonized technical standards applicable throughout the European Union. The first of these is Directive 89/392/EEC on the approximation of the laws of the Member States relating to machinery. Dated 14/06/1989, it came into force on 31/12/1992. Since then, two other versions followed, in 1998 and in 2006. Another one is currently under preparation.

Directive 2006/42/EC of 17/05/2006 relating to machinery, currently in force, applies to the following products:

- machinery,
- interchangeable equipment,
- safety components,
- lifting accessories,
- chains, cables and slings,
- removable mechanical transmission devices,
- partly-completed machinery.

The term which interests us most directly, namely "machinery", is defined in its article 2. In the most common case, "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".

This definition refers to a very wide range of work equipment: stationary machines, portable machines, mobile machines (forklifts...), lifting devices...

From the directive, we will select three main requirements:

1. Machinery must be designed and built in such a way that its setup, use, adjustment and maintenance do not expose individuals to any risk of harm to their health or safety.
2. It is forbidden to sell (or rent, or lend) any new machinery that does not comply with the technical standards contained in the regulations or that has not been the subject of a certification procedure.
3. In order to certify that the machine complies with the relevant technical standards and has complied with the applicable conformity assessment procedures, the manufacturer must:
 - affix on it a CE marking in a visible, legible and indelible way,

- draw up and sign an EC declaration of conformity.

=> In the case of the Machinery Directive 2006/42/EC, we may speak of an “economic directive”. Although based on social concerns and worker safety, its aim is above all to define a Community standard applicable to all the machinery marketed in the EU territory in order to guarantee fair competition between the players in the EU market.

The aspect of use, in the meantime, concerns all machinery, regardless of the date of commissioning. It is governed by Directive 89/655/EEC, as amended by several other Directives, the last of which is Directive 2009/104/EC on the minimum health and safety requirements for the use of working equipment by workers at work.

=> In the case of Directive 2009/104/EC, we speak of a “social directive”; a directive whose aim, through obligations laid down for employers, is to ensure a high level of safety for workers who use machinery.

I.1.2. Spanish interpretation

A presentation titled (translated from Spanish): “Safety of fishing machinery and equipment”; dated 10/10/2015; drafted by the Marine Fisheries Working Group of the National Committee for Occupational Safety and Health.

This presentation covers both aspects: design on one side, and use on the other.

P.3 ; 2nd & 3rd § (translated from Spanish):

“The marketing standard for new machinery manufactured in the EU [...] is contained in the Machinery Directive 2006/42/EC, transposed into national law by RD 1644/2008 of 10/10/2008, which replaced the previous regulation as from 29/12/2009.

For machinery marketed or commissioned between 01/01/1995 and 29/12/2009, the former Machinery Directive 98/37/EC will continue to apply, transposed into national law by RD 1435/92 of 27/11/1992, modified by RD 56/95 of 20/01/1995”.

The authors note that Directive 2006/42/EC contains several exclusions, listed in paragraph 2 of Article 1.

P.4 (from the French version):

e. the following means of transport:

- means of transport by air, water and rail networks with the exclusion of machinery mounted on these means of transport;

The guide to application of the Directive states:

Machinery mounted on water-borne vessels ,such as, for example, floating cranes, drills, excavators and dredgers are not excluded from the scope of the Machinery Directive.

Comment

The guide to application of the Machinery Directive 2006/42/EC § 57 Means of transport by air, water and rail networks; p.53:

By virtue of the exclusion provided for in the fifth indent of Article 1 (2) (e), the machinery directive covers no kind of aircraft or means of transport by water. Vessels covered by Directive 94/25/EC on recreational craft, as amended by Directive 2003/44/EC, are excluded from the scope of the Machinery Directive. The

latter, therefore, does not apply to inboard or stern-driven engines that are considered as being a part of the craft.

However, the Machinery Directive is applicable to outboard engines, with the exception of the requirements that are specifically included in the Recreational Craft Directive relating to the owner's manual, the handling characteristics of the craft, the starting of outboard engines and exhaust and noise emission.

Machinery mounted on water-borne vessels, such as, for example, floating cranes, drills, excavators and dredgers are not excluded from the scope of the Machinery Directive.

PP.5&6 (from the French version) :

- f. Seagoing vessels and mobile offshore units and machinery installed on board such vessels and/or units;

The guide to application of the Directive states:

Seagoing vessels and mobile offshore units such as, for example, mobile drilling rigs and machinery installed on them are excluded from the scope of the Machinery Directive by Article 1, paragraph 2 (f), since they are subject to the conventions of the International Maritime Organization.

Machinery intended to be installed on fixed offshore platforms such as, for example, oil production rigs, and machinery which may be used on both fixed and mobile offshore units is also subject to the Machinery Directive.

Comment

Guide to application of the Machinery Directive 2006/42/EC § 58 Seagoing vessels and mobile offshore mobile units, including machinery installed on board such vessels and/or units; p.54:

Seagoing vessels and mobile offshore units such as mobile drilling units out at sea and machinery installed on them are excluded from the scope of the Machinery Directive by Article 1 (1). 2 (f), since they are subject to the conventions of the International Maritime Organization.

Certain equipment affected by this exclusion may also be covered by Directive 96/98/EC on marine equipment, as amended by Directive 2002/75/EC.

A mobile offshore unit is an offshore unit that is not intended to be located on the oil field permanently or for the long term, but is designed to be moved from location to location, whether or not it has a means of propulsion or of lowering legs to the sea floor.

However, floating units intended for production, such as, for example, FPSOs (Floating Production, Storage and Offloading installations - usually based on tanker designs) and FPPs (Floating Production Platforms - based on semi-submersible vessels) and the machinery installed on such units are not excluded from the scope of the Machinery Directive.

Machinery intended to be installed on fixed offshore platforms, such as, for example, oil production rigs, and machinery which may be used on both fixed and mobile offshore units is also subject to the Machinery Directive.

=> Where do the two exclusions under the Machinery Directive issue from, which affect the entire maritime sector including fishing? At least two lines of explanation are given in the guide to application of the Directive:

- the existence of IMO conventions covering ships and machinery installed on board. What are the IMO requirements for machinery safety? Which other conventions (e.g. SOLAS) have such requirements?
- the Marine Equipment Directive (MED) 96/98/EC of 20/12/1996, whose latest amendment

dates from the directive (EU) 2015-559 of 09/04/2015, and which covers certain work equipment.

The Spanish working group notes that the wording of the previous Machinery Directive 98/37/EC was largely the same, but that there were significant differences in its guide to application.

P.7 (English version):

Seagoing vessels and mobile offshore units together with equipment on board them are excluded since they are covered by the IMO Conventions. However, fixed offshore platforms and their equipment are covered by the directive, as are vessels which are not considered to be seagoing, i.e. those of less than 500 tonnes, those not designed to put out at sea and those intended for inland navigation on rivers, canals, lakes...

The boat as a mean of transport, including its propulsion system, is not covered by the directive, but the machinery used on board (cranes, capstan, etc.) is.

Comment

Guide to application of the Machinery Directive 98/37/CE § 95 p.29 :

"e) seagoing vessels and offshore mobile units are excluded, together with the equipment on board such vessels and units since they are covered by the IMO Conventions. However, fixed offshore platforms and their equipment are covered by the Directive as are vessels which are not intended to be seagoing, i.e. those of less than 500 tonnes, those not designed to put out at sea and those intended for inland navigation on rivers, canals, lakes, etc.). The boat as a means of transport, including its propulsion system, is not covered by the Directive, but the machinery commissioned on board (cranes, capstan, ...) is covered by the directive".

=> At the end of its reflection, the Spanish working group reached the conclusion that Directive 2006/42/EC does not seem applicable to the maritime fishing sector. Therefore, the group poses an interesting complementary question.

P.8 (translated from Spanish):

"If, as it seems, the machinery on board fishing vessels is excluded from the scope of the Machinery Directive, then what marketing standards apply to such machinery?"

To research further into this issue, they visited machinery manufacturers and shipyards.

Some replies were provided by the interviewees (translated from Spanish):

- Manufacturer no. 1; deck machinery: required to carry CE marking relevant to offshore vessels, never to fishing. The situation would be the same in all European countries. At the request of the shipowner, some machines may be certified by a classification society, particularly in the offshore sector,
- Manufacturer no. 2; deck machinery for longliners and purse seiners: has already prepared a file for an electric machine just in case... but does not affix the CE marking if not asked to do so,
- Manufacturer no. 3; forestry and marine cranes: the design of its marine cranes and structural calculations are based on the German standard DIN 15018.

Classifies its cranes according to their use and the sea conditions (ship-ship loading, ship-land loading, etc.).

Certifies its cranes according to the Machinery Directive; concerning the safety devices to be incorporated, it uses the standard of cranes for trucks; concerning structural calculations, the standard for marine cranes. If the customer requests it, cranes are certified according to the sea conditions; otherwise, the standard crane is intended for a calm sea, inside a river or a harbour.

Does not mount the cranes. Gives instructions to the worksite which is also responsible for the base as it is part of the ship's structure.

These marine cranes can be used for lifting people. This is allowed by the standard with a level of requirement lower than the standards of the land cranes.

Concerning crane operator training, he says there is nothing regulated at this time. Training at the request of the customer. He clarifies that it would be interesting to implement a crane-operator licence taking into account the crane's lifting capacity.

Comment

DIN 15018-1 ; 11/1984 ; annulled on 01/09/2012

DIN 15018-2 ; 11/1984 ; annulled on 01/09/2012

DIN 15018-3 ; 11/1984 ; still in force: lifting devices - Principles for steel structures – Stress analysis for mobile cranes <=> a text that would allow lifting people with the crane???

Regarding the training of crane operators, the same problem occurs in France. This aspect is not directly related to the Machinery Directive but illustrates the question of the applicability to the maritime sector of certain health and safety requirements. These requirements are not always convergent between general texts on the one hand (labour code/transport code) and maritime-specific texts on the other (e.g. regulations concerning vessel safety) <=> which one of them prevails? There are differing legal interpretations on this subject.

- Manufacturer no. 4; catch processing machinery: a company engaged in the design and manufacture of fish processing machines on board fishing vessels as well as at onshore factories. Designs prototypes and develops machinery according to customer needs. Certifies, in accordance with the requirements of the Directive, machinery that goes on land or on board vessels. In the design process, in the absence of standards specific to this type of machinery, applies general harmonized standards and relies on comparable machinery. Endeavours to introduce safety improvements in the design of their machinery; for example, the use of 24V for electrical machinery,
- Shipyard (construction of "large" units): most fishing vessels are classified and perform load tests on their equipment. With regard to deck machinery, it does not take into account the point of view of labour/manpower during construction and does not require any certification of these machines before installing them.

In the process of designing and building a vessel, they have a list of things that must be certified by a classification society; machinery is not in the list.

Comment

A priori, a situation similar to that of France (see chapter V. Classification Societies p.33).

I.1.3. French interpretation

Until recently, the most widespread French interpretation was the same as in Spain: the Machinery Directive 2006/42/EC does not apply to machinery installed on board vessels - including fishing vessels - in the light of the exclusions that it provides for.

This situation has changed quite significantly with the enactment on 04/01/2018 of the latest

version of Division 222 of the regulations concerning ship safety: "Design and operation of cargo vessels of less than 500 gross tonnage".

In Article 7.3.2.3 Machinery (p.199), this text provides that:

"Machinery is subject to the requirements for design and construction in order to be marketed in accordance with the provisions of article 5.6.3 of this Division".

Article 5.6.3.1 Machinery (p.156) provides:

"In accordance with Article 7.3.2 of this Division, no 'machinery' may be commissioned unless its use meets the purpose for which it was declared to be in conformity. This, however, is without prejudice to the establishment of specific conditions of use, provided that the machinery is not, therefore, modified in a manner not provided for.

In the application of Decree No. 2008-1156 of 7 November 2008, on work equipment and personal protective equipment [transposition of Directive 2006/42/EC into French law], machinery is subject to design and construction requirements in order for "machinery" to be marketed.

In order not to apply the provisions of Decree No. 2008-1156 referred to above, the operator:

- 1) justifies to what extent the machines concerned are specific and consequently require the use of other standards;
- 2) supports its request with a risk analysis demonstrating an equivalent level of safety:

The operator shall evaluate the risks to the machinery and, to this end, shall determine the essential health and safety requirements that apply to the machinery and for which requirements it must take action.

Any modification made to machinery in service must take into account the standards contained in the technical guide of November 18, 2014, relating to operations to modify machinery in service".

=> This evolution of the French regulations concerning ship safety elicits two questions. Has it been determined by a change of interpretation as to the applicability of the Machinery Directive to ships? If so, is it intended to be gradually extended to other categories of vessels?

=> Questions that were asked by the IMP, on the one hand to the Directorate General of Labour (DGT) and, on the other hand to the Directorate of Maritime Affairs - Maritime Security Sub-Directorate (DAM/SM)). This dossier is still under investigation at the DGT. However, there is a reply from the Department of Maritime Affairs, from which three points are highlighted:

- Decree No. 2008-1156 in force excludes machinery installed on vessels from CE marking, in accordance with the provisions of the Machinery Directive 2006/42/EC from which it is transposed,
- The latest wording of Division 222 does not require machinery to comply with the Machinery Directive but refers to the principles enumerated in this Directive, namely to achieve essential requirements for the protection of the health and safety of workers. It is not the same as imposing the strict application of that directive, that is to say, the CE marking of all machinery installed on board a vessel,
- The feedback from the authorities and field agents shows that the principle of excluding vessels from the scope of the Machinery Directive poses problems in approving equipment and, consequently, in defining the responsibilities associated with making equipment

available to the workers. As a result, a reflection is underway within the services of the DAM to determine the possible evolutions, including the scope of the Decree no. 2008-1156.

I.2. Directive 89/655/EEC as amended

Directive concerning the minimum safety and health requirements for the use of work equipment by workers at work.

This Directive is known as “use”, aimed at employers and from which we will highlight three of the main requirements:

1. Machinery commissioned or used in workplaces shall be equipped, installed, used, adjusted and maintained in such a way as to safeguard the health and safety of workers, including the cases in which such machinery is modified.
2. It is forbidden to commission or use any machinery that is not in compliance with the technical standards defined by the regulations, whether for new or second-hand machinery.

Comment

The technical standards covered by this requirement are as applicable to new machinery as of the Machinery Directive 89/392/EEC, which entered into force on 31/12/1992.

To make sure they meet this requirement, some employers have their new machinery tested for conformity. This “follow-up inspection” is performed by a certified body. If the tests are not positive, they may have recourse to the manufacturer and, where appropriate, proceed to cancel the sale within one year from the date of delivery.

3. The machines must be maintained in a state of conformity with the applicable design and construction technical standards throughout the commissioning.

The Directive also provides for two special cases:

- machinery commissioned before 31/12/1992,
- new machinery to which no other Community directive is applicable, or is only partially; e.g.: new machinery that does not fall within the scope of the Machinery Directive.

In such cases, the machinery must comply with the minimum requirements listed in the Annex. The latter are very general, but nevertheless effective. For example, we quote:

2.8. Where there is a risk of mechanical contact with moving parts of work equipment which could lead to accidents, those parts must be provided with guards or devices to prevent access to danger zones or to halt movements of dangerous parts before the danger zones are reached.

2.9. Areas and points for working on, or maintenance of, work equipment must be suitably lit in line with the operation to be carried out.

I.2.1. Spanish situation

A presentation titled (translated from Spanish): “Safety of fishing machinery and equipment”; dated 10/10/2015; prepared by the Marine Fisheries Working Group of the National Committee for Occupational Safety and Health.

P.15; 2nd § (translated from Spanish):

“In general, on all vessels, the use of work equipment on board shall comply with RD 1215/1997 (18/07/1997), which lays down the minimum safety and health requirements for the use of

work equipment by workers”.

RD 1215/1997, of July 18, which establishes the minimum health and safety regulations for the use of work equipment by workers. BOE n°188 07/08/1997.

Specifically, Directive 89/655/EEC, of November 30, modified by Directive 95/63/EC, of December 5, establishes the minimum safety and health requirements for the use of work equipment by workers at work. Through this Royal Decree [1215/1997], the aforementioned Directives are transposed into Spanish law.

=> Transposition of the amended Directive 89/655/EEC concerning the use of work equipment. The applicability to the maritime sector of the obligations of this directive raises three questions:

- how to enforce on shipowners CE-marked machinery on board their vessels, if, at the same time, the Machinery Directive is not applicable to these same machines?
- should it not simply be considered that machines installed on board ships are excluded from the scope of the Machinery Directive and, therefore, constitute one of the special cases provided for in Directive 89/655/EC and subject to the minimum safety and health requirements?
- in this case, is it necessary to consider that the responsibility for ship safety rests solely with the shipowner?

Comment

As the situation is equal to that of France, these questions were also raised to the Directorate-General for Labour (DGT). For the moment, they have not received an answer in writing. However, from the discussions, the following position emerges: machinery on board fishing vessels could enter the field of “new machinery to which no other Community directive is applicable, or is only partially applicable”. In this case, they would be subject to the minimum safety and health requirements.

In order to confirm this position, checks must first be carried out, in particular on interactions with Directives 93/103/EC and 97/70/EC, which is aimed directly at fishing vessels.

Such a position could open the door to a process of “compliance”, comparable to that which was set up in France in the mid-1990s for land-based machinery commissioned before 31/12/1992.

P.15; 1st § (translated from Spanish):

“[...] New fishing vessels (from 23/11/1995) of 15 m in length and over, and existing fishing vessels of 18 m in length and over shall meet the following safety and health requirements provided for by RD 1216/1997 (18/07/1997) laying down the minimum safety and health provisions at work on board fishing vessels”.

RD 1216/1997, of July 18, laying down the minimum occupational safety and health requirements on board fishing vessels. BOE no.188 07/08/1997.

Specifically, Directive 93/103/EC, of 23 November, establishes the minimum health and safety requirements at work on board fishing vessels. Through this Royal Decree [1216/1997], the aforementioned Directive is transposed into Spanish law.

=> Transposition of the Fisheries Directive 93/103/EC of 23/11/1993 concerning the minimum requirements for safety and health at work on board fishing vessels (thirteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC). Detailed Directive in [chapter III.3. p.23](#).

On the impact of these regulations on machinery safety, the conclusion of the Spanish working group is negative.

P.16 (translated from Spanish):

“In the case of machinery installed on board and used for fishing operations, we often find that it is manufactured in accordance with very general (or non-existent) requirements and, therefore, has a lower level of safety than machinery installed on land [...].

The lack of detailed requirements for deck machinery in the regulations dealing with maritime safety and the lack of certainty as to the applicability of the Machinery Directive is a problem which has been reported by the Standing Commission for Maritime Accident and Incident Investigation (CIAIM), the INSHT and the Labour and Social Security Inspectorate (STBI) of the Ministry of Employment and Social Security (MEYSS), as well as Ministry of Labour and Social Security (MEYY), [...]”.

P.17 (translated from Spanish):

The Spanish regulations applicable to fishing activities include two other texts:

- RD 543/2007 of 27/04/2007 establishing safety and pollution prevention rules for fishing vessels less than 24 m in length,
- RD 1032/1999 of 18/06/1999 laying down the safety standards applicable to fishing vessels of 24 m in length and over, which aims above all to make the requirements of the Torremolinos Protocol mandatory in the European area to extend its scope to vessels longer than 24 m in length (L) and to increase, in certain respects, their requirements; amended by RD 1422/2002 of 27/12/2002 transposing Directive 2002/35/EC, which replaces Annex 1.

P.18 (translated from Spanish):

These two texts deal mainly with aspects related to vessel safety and set only very general requirements for the machines; no specific requirements for manufacturers, in particular, of deck equipment.

Comment

Directives 97/70/EC of 11/12/1997 and 2002/35/EC of 25/04/2002, of which RD 1032/1999 and 1422/2002 are the transpositions in Spain, are detailed in [chapter III.4. p.25](#).

I.2.2. Irish situation

On the advice of Bord Iascaigh Mhara, the Irish Seafood Development Agency, consultation of machinery safety regulations at the Health and Safety Authority website.

Fishing ; Legislation and Enforcement (copied from the website):

“The Irish Maritime Administration (IMA) and the Health and Safety Authority enforce the Irish legislation with regard to safety and health on board fishing vessels. In general the HSA enforce occupational health and safety legislation whilst the IMA enforce maritime safety legislation.

[...]

The specific occupational health and safety legislation enforced by the HSA and applicable to the fishing sector includes:

- The Safety, Health and Welfare at Work Act 2005

- The Safety, Health and Welfare at Work (General Applications) Regulations 2007
- The Safety, Health and Welfare at Work (Fishing Vessels) Regulations 1999”.

The Safety, Health and Welfare at Work (Fishing Vessels) Regulations 1999

This Regulation was adopted “for the purpose of giving effect to Council Directive 93/103/EC of 23 November 1993”.

=> Transposition of the Fisheries Directive 93/103/EC of 23/11/1993 concerning the minimum requirements for safety and health at work on board fishing vessels (thirteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC). Detailed Directive in [chapter III.3. p.23](#).

The Safety, Health and Welfare at Work Act 2005

The primary national legislation on safety, health and welfare at work. It applies to all workplaces, including fishing vessels. It establishes the rights/duties of employers/employees and sets out essential obligations such as the drafting of a safety statement, based on the assessment of occupational risks.

Part 2 – General Duties ; chapter 1 – General Duties of Employer ; section 8. A requirement that relates to the safety of machinery:

“(1) Every employer shall ensure, so far as is reasonably practicable, the safety, health and welfare at work of his or her employees.

(2) Without prejudice to the generality of subsection (1), the employer’s duty extends, in particular, to the following:

(c) as regards the place of work concerned, ensuring, so far as is reasonably practicable—

(iii) the design, provision and maintenance of plant and machinery or any other articles that are safe and without risk to health ; [...]”.

=> This requirement remains very general. No link has been identified with European directives on machinery safety.

The Safety, Health and Welfare at Work (General Applications) Regulations 2007

This Regulation covers many health and safety issues identified in workplaces, including the use of work equipment. As such, it constitutes the transposition into national law of the directive on “use of work equipment”.

Part 2 – Workplace and work equipment ; chapter 2 – Use of work equipment ; section 28 – Duties of employer, use of work equipment:

“An employer shall ensure that—

(a) any work equipment provided for use by employees at a place of work complies, as appropriate, with the provisions of any relevant enactment implementing any relevant Directive of the European Communities relating to work equipment with respect to safety and health, [...]”.

=> This requirement is linked to European regulations: Work equipment made available to

employees must comply with the requirements of the relevant European directives. But it does not address the “relevance” of Directive 2006/42/EC regarding machinery installed on board fishing vessels. Overall, this aspect remains unclear, as in Spain and France.

I.2.3. The Danish situation

In Denmark, the question of the safety of machinery on board fishing vessels is dealt with in its “Technical regulation on occupational health in ships”; chapter VI -technical aids (machines, scaffolding, etc.); part A - use of equipment on board ships; dated 01/07/2004.

A part of the Danish legislation is clearly based on the amended Directive 89/655/EEC:

“The provisions have been drafted on the basis of Council Directive 89/655/EEC, as amended by Directive 95/63/EC and Directive 2001/45/EC”.

It provides in Article 5:

“Machines and safety components that are taken into use from 01/01/2003 shall comply with the health and safety requirements that apply to CE-marked machines and safety components. They shall be designed and arranged so that they are in accordance with the provision in force on machines procured within the European Union.

Machines and safety components taken into use after 01/01/2003 by ships outside the European Union shall be of a similar nature.

Machines and safety components that have been taken into use before 01/01/2003 shall comply with the requirement of annex 1 on the design, manufacture, equipment and user instruction of machines and other technical aids.

Other technical aids shall also comply with the requirement on annex 1”.

=> In Denmark, since 01/01/2003, all machinery commissioned on board ships - including fishing vessels - must meet the design requirements of the Machinery Directive [98/37/EC at the time, 2006/42/EC today]. *A priori*, this does not mean that they must bear the CE marking; but they must be designed and constructed in accordance with the rules in force for machinery marketed in the EU.

=> Machinery commissioned before 01/01/2003 is subject to detailed requirements in an annex; which requirements are also applicable to “technical aids” other than machinery.

II. EUROPEAN DIRECTIVES ON MARINE EQUIPMENT

II.1. Directive 2014/90/EU

Directive 2014/90/EU of 23 July 2014, on marine equipment and repealing Directive 96/98/EC. This Directive is known as “MED” for “marine equipment directive”.

A directive whose objective is clearly defined in Article 1:

“The objective of this Directive is to enhance safety at sea and to prevent marine pollution through the uniform application of the relevant international instruments relating to marine equipment to be placed on board EU ships, and to ensure the free movement of such equipment within the Union”.

Comment

The aim of the MED is to harmonize the rules applicable to so-called “marine” equipment. It recognizes that:

- *there are international conventions that require flag State compliance checks for equipment installed on board ships with certain requirements,*
- *such requirements issue from performance and testing standards developed by IMO and international/European standardization bodies,*
- *these international instruments, however, leave too much discretion to flag administrations, and,*
- *such discretion is likely to cause differences in the levels of product safety, which may jeopardise the proper functioning of the internal market.*

=> Although based on the concern for maritime safety, the MED is first and foremost an “economic” directive, that is to say, a directive aimed at avoiding a situation capable of causing distortions of competition; able to challenge the conditions of fair competition. In this sense, its justification - as well as its mode of operation - is very close to the directives relating to other work equipment (machinery, PPE).

Common European regulation is needed in order to:

- *enforce safety equipment on board EU-flag vessels in accordance with the requirements; all the more necessary because market surveillance is difficult given the global nature of shipbuilding and ship repairs,*
- *enforce on such equipment performance and testing standards, as well as a procedure to check compliance with such standards,*
- *define a specific marking attesting to such conformity: the “ship’s-wheel” marking; simply a CE marking specific to marine equipment.*

The first MED is Directive 96/98/EC. Due to the need to make significant changes, it was replaced by 2014/90/EU.

“Marine equipment” is equipment that falls within the scope of Directive 2014/90/EU, in accordance with Article 3 thereof:

“This Directive shall apply to equipment placed or to be placed on board an EU ship and for which the approval of the flag State administration is required by the international instruments, regardless of whether the ship is situated in the Union at the time when it is fitted with the equipment”.

Finally, the international instruments mentioned correspond to the updated versions of three major IMO international conventions:

- the 1972 Convention on the International Regulations for Preventing Collisions at Sea (Colreg),
- the International Convention for the Prevention of Pollution from Ships, 1973 (Marpol),
- the 1974 International Convention for the Safety of Life at Sea (SOLAS).

Comment

Marine equipment is therefore all the equipment that the Colreg, Marpol and SOLAS conventions enforce on board vessels and control by the flag-state administration. They are listed and grouped in Directive (EU) 2015/559 as described in [chapter II.2](#). below.

Attention, the MED applies to “Union vessels” defined as vessels flying the flag of a Member State and falling within the scope of the international conventions Colreg, Marpol and SOLAS.

The main requirements for marine equipment are detailed in Article 4:

“1. Marine equipment placed on board an EU vessel [...] shall meet the design, construction and performance requirements of the international instruments as applicable at the time when that equipment is placed on board.

2. Compliance of marine equipment with the requirements referred to in paragraph 1 shall be demonstrated solely in accordance with the testing standards and by means of the conformity assessment procedures referred to in Article 15”.

These requirements are applicable from 18/09/2016.

Comment

The “design, construction and performance requirements of the international instruments” correspond to the manufacturing and testing standards which are also listed in Directive (EU) 2015/559 described in [chapter II.2](#). below.

The conformity assessment procedures set out in Article 15 are detailed in an annex. They are five:

1. module B: EC type-examination,
2. module D: conformity to type on the based on quality assurance of the production process,
3. module E: conformity to type based on product quality assurance,
4. module F: conformity to type based on product verification,
5. module G: conformity based on unit verification.

Two cases are provided:

“(a) whenever the EC type-examination (module B) is provided, prior to marketing, all marine equipment is subject to:

- quality assurance of production (module D); or
- product quality assurance (module E); or
- product verification (module F);

b) in the case where marine equipment is produced on a single-piece basis or in small quantities and not in series or mass, the conformity assessment procedure may consist of an EC unit verification (module G)”.

II.2. Directive (EU) 2015/559

Directive (EU) 2015/559 of 9 April 2015 amending Council Directive 96/98/EC concerning marine equipment.

This directive supplements MED 2014/90/EU. It is mainly composed of Annexes A.1 and A.2, respectively titled:

- A.1 – Equipment for which detailed test standards already exist in international instruments,
- A.2 – Equipment for which no detailed test standards exist in international instruments,

These are two annexes that contain tables relating to categories of equipment. These tables with 6 columns whose titles may change according to the international convention of reference:

1. No.,
2. Item designation,
3. Regulation SOLAS 74, as amended, where “type approval” is required, or Marpol 73/78 regulation, as amended, where “type approval” is required, or COLREG 72 regulation, where “type approval” is required,
4. Regulation SOLAS 74, as amended, and applicable IMO Resolutions and Circulars, or Regulation SOLAS 74, as amended, and applicable IMO Resolutions and Circulars and ITU Recommendations where appropriate, or applicable Marpol 73/78 regulations as amended, and applicable IMO Resolutions and Circulars, or applicable COLREG 72 Regulations and applicable IMO Resolutions and Circulars,
5. Testing standards. In most cases, standards from IMO Resolution or Circulars, but also many standards such as EN, ISO, IEC (International Electrotechnical Commission, Geneva) or ETSI (European Telecommunications Standards Institute, Sophia Antipolis),
6. Modules for conformity assessment. With reference to MED 2014/90/EU, a definition of applicable conformity control procedures. E.g. : B+D, B+F, G...

Categories of equipment treated in Annex A.1:

1. life-saving equipment; such as:
 - lifebuoys,
 - lifejackets,
 - immersion suits,
 - flares,
 - line-throwing appliances,
 - liferafts...
2. marine pollution prevention; such as:
 - sewage systems,
 - shipboard incinerators...
3. fire protection equipment; such as:

- primary decks covering,
 - portable extinguishers,
 - firefighting equipment,
 - SCBAs,
 - fire doors,
 - draperies, curtains and other suspended textile materials and films,
 - bedding components,
 - automatic sprinkler systems,
 - emergency escape breathing devices (EEBD)...
4. navigation equipment,
 - compass,
 - gyro compass,
 - GPS equipment,
 - rudder angle indicator,
 - ECDIS,
 - radar equipment,
 - pilot ladder...
 5. radio communication equipment,
 6. equipment required under COLREG 72,
 7. bulk carrier safety equipment,
 8. equipment under SOLAS Chapter II.1. Construction – Structure, subdivision and stability, machinery and electrical installations

Annex A.2 is structured in the same way; compared to Annex A.1 it deals with only a very small number of equipment types.

=> A careful reading of the listed equipment identified only very few items that could be considered machinery:

- A.1/1.11. Line-throwing appliances (to be checked),
- A.1/1.21. Launching appliances using falls (davits)
- A.1/1.23. Launching appliances for free-fall lifeboats,
- A.1/1.24. Liferaft launching appliances (davits),
- A.1/1.25. Fast rescue boat launching appliances (davits),
- A.1/1.41. Winches for survival craft and rescue boats [...],
- A.1/2.7. Shipboard incinerators (to be checked),
- A.2/1.3. Float-free launching appliances for survival craft (to be checked).

=> The international conventions of the IMO and MED are the two main reasons given for not applying the Machinery Directive 2006/42/EC to ships and machinery installed on board.

=> Regarding MED, and therefore all equipment subject to approval by the flag-State administration under the SOLAS, Colreg and Marpol Conventions, this explanation seems a little mild given the very limited kinds of equipment that could actually fall under the definition of machinery.

=> The connection weakens as it is not even certain that the international conventions Colreg, Marpol and SOLAS apply to all vessels and to fishing vessels in particular...

III. OTHER EUROPEAN DIRECTIVES

III.1. Directive 89/391/EEC

Directive 89/391/EEC of 12/06/1989 concerning the implementation of measures to encourage improvements in the safety and health of workers at work.

A major directive on the prevention of occupational risks. Entry into force in the Member States by 31/12/1992 at the latest.

A very broad scope defined in Article 2:

“1. This Directive shall apply to all sectors of activity, both public and private (industrial, agricultural, commercial, administrative, service, educational, cultural, leisure, etc.)”.

Several essential requirements for employers:

Article 5

General provision

“1. The employer shall have a duty to ensure the safety and health of workers in every aspect related to the work.”

Article 6

General requirements for employers

“1. Within the context of his responsibilities, the employer shall take the measures necessary for the safety and health protection of workers, including prevention of occupational risks and provision of information and training, as well as provision of the necessary organization and means [...].

2. The employer shall implement the measures referred to in the first subparagraph of paragraph 1 on the basis of the following **general principles of prevention** [...].

3. [...] the employer shall, taking into account the nature of the activities of the enterprise and/or establishment:

a) **evaluate the risks to the safety and health of workers**, inter alia in the choice of work equipment, the chemical substances or preparations used, and the fitting-out of workplaces.

Subsequent to this evaluation and as necessary, the preventive measures and the working and production methods implemented by the employer must:

- **assure an improvement in the level of protection afforded to workers with regard to safety and health,**

- be integrated into all the activities of the undertaking and/or establishment and at all hierarchical levels [...].”.

=> Several fundamental aspects of the prevention of occupational hazards - and therefore of the prevention of machinery risk - are applicable to fishing vessels by virtue of this directive.

=>However, in relation to this particular risk, such aspects remain too general and, consequently, not very effective.

Article 16 of Directive 89/391/EEC provides for the adoption of specific directives which will

make it possible to set more precise obligations with regard to risks or targeted activities listed in the Annex:

- work places,
- work equipment,
- personal protective equipment,
- work with visual display units,
- handling of heavy loads involving risk of back injury,
- temporary or mobile work sites,
- fisheries and agriculture.

The relationship between Directive 89/391/EEC and the resulting specific directives is specified in Article 16:

“3. The provisions of this Directive shall apply in full to all the areas covered by the individual Directives, without prejudice to more stringent and/or specific provisions contained in these individual Directives”.

Twenty individual directives have been identified and are listed below. Two - in bold type - are directly related to the topic of this report:

1. Directive 89/654/EEC of 30/11/1989 concerning the minimum safety and health requirements for workplaces (first individual directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
2. **Directive 89/655/EEC of 30/11/1989 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16 (1) Directive 89/391/EEC); replaced by Directive 2009/104/EC of 16/09/09**
3. Directive 89/656/EEC of 30/11/1989 concerning the minimum safety and health requirements for the use by workers of personal protective equipment at the workplace (third individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
4. Directive 90/269/EEC of 29/05/90 concerning the minimum safety and health requirements for the manual handling of loads where there is a risk particularly of back injury to workers (fourth individual Directive within the meaning of the Article 16 (1) of Directive 89/391/EEC)
5. Directive 90/270/EEC of 29/05/1990 concerning the minimum safety and health requirements for work with display screen equipment (fifth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
6. Directive 90/394/EEC of 28/06/1990 concerning the protection of workers from the risks related to exposure to carcinogens at work (sixth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC); replaced by Directive 2004/37/EC of 29/04/2004
7. Directive 2000/54/EC of 18/09/2000 concerning the protection of workers against the risks related to exposure to biological agents at work (seventh individual Directive within the meaning of Article 16 (1) of Directive 89 / 391 / EEC)
8. Directive 92/57/EEC of 24/06/1992 concerning the minimum safety and health requirements at temporary or mobile construction sites (eighth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
9. Directive 92/58/EEC of 24/06/1992 concerning the minimum requirements for the provision

of safety and/or health signs at work (ninth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)

10. Directive 92/85/EEC of 19/10/1992 concerning the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding (tenth individual Directive within the meaning of Article 16 (1) of Directive 89/391 / EEC)
11. Directive 92/91/EEC of 03/11/1992 concerning the minimum requirements for improving the safety and health protection of workers in the mineral-extracting industries through drilling (eleventh individual Directive within the meaning of Article 16 (1)) of Directive 89/391/EEC)
12. Directive 92/104/EEC of 03/12/1992 concerning the minimum requirements for improving the safety and health protection of workers in surface and underground mineral-extracting industries (twelfth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
13. **Directive 93/103/EC of 23/11/1993 concerning the minimum safety and health requirements for work on board fishing vessels (thirteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)**
14. Directive 98/24/EC of 07/04/1998 concerning the protection of the health and safety of workers from the risks related to chemical agents at work (fourteenth individual Directive within the meaning of Article 16 paragraph 1 of Directive 89/391/EEC)
15. Directive 1999/92/EC of 16/12/1999 concerning the minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (fifteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
16. Directive 2002/44/EC of 25/06/02 concerning the minimum safety and health requirements regarding the exposure of workers to the risks arising from physical agents (vibration) (sixteenth individual Directive within the meaning of Article 16) paragraph 1 of Directive 89/391 / EEC)
17. Directive 2003/10/EC of 06/02/03 concerning the minimum safety and health requirements regarding the exposure of workers to the risks arising from physical agents (noise) (seventeenth individual Directive within the meaning of the Article 16 (1) of Directive 89/391/EEC)
18. Directive 2004/40/EC of 29/04/04 concerning the minimum safety and health requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) (eighteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
19. Directive 2006/25/EC of 05/04/2006 concerning the minimum safety and health requirements regarding the exposure of workers to the risks arising from physical agents (artificial optical radiation) (nineteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)
20. Directive 2013/35/EU of 26/06/2013 concerning the minimum safety and health requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) (twentieth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC) and repealing Directive 2004/40/EC

III.2. Directive 92/29/EEC

Directive 92/29/EEC of 31 March 1992 on the minimum safety and health requirements for improved medical treatment on board vessels.

This Directive lays down the requirements for:

- medical supplies, sick-bay or a doctor on board vessels,
- medical training of seafarers
- long-distance consultation

Requirements applicable by 31/12/2014 at the latest. They are of no interest regarding the issue of machinery safety.

III.3. Directive 93/103/EC

Directive 93/103/EC of 23 November 1993 concerning the minimum safety and health requirements for work on board fishing vessels (thirteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC).

This Directive lays down the minimum safety and health requirements for new fishing vessels, and existing fishing vessels (two sets of separate requirements, which appear to be fairly equivalent and are grouped together in its Annexes I and II).

For new fishing vessels - any fishing vessel with a length between perpendiculars of 15 metres or over and whose construction started after 23/11/1995 - these requirements are applicable at the latest from 23/11/1995.

For existing fishing vessels - any fishing vessel with a length between perpendiculars of 18 metres or over and which is not a new fishing vessel - these requirements shall apply not later than seven years after 23/11 / 1995 (23/11/2002).

In addition, the Directive provides for training and information for workers.

The minimum safety and health requirements detailed in Annexes I and II address the following topics:

1. Seaworthiness and stability
2. Mechanical and electrical installation
 - 2.1. The electrical installation must be designed and constructed so as not to present any danger and to ensure:
 - protection for the crew and vessel from electrical hazards, [...].
 - 2.6. All equipment used in hoisting should be tested and examined at regular intervals.
 - 2.7. All parts of hauling gear, hoisting gear and related equipment should be maintained in good repair and working order.
 - 2.8. Where refrigeration plants and compressed air systems are installed they should be well maintained and examined at regular intervals.
 - 2.9. Cooking and domestic appliances using heavy gases should be used only in well-ventilated spaces and care should be taken to avoid any dangerous accumulation of gas.
Cylinders containing flammable and other dangerous gases should be clearly marked as to their contents and stowed on open decks.
All valves, pressure regulators and pipes leading from the cylinders should be protected

against damage.

3. Radio installation
4. Emergency routes and exits
5. Fire detection and fire fighting
6. Ventilation of enclosed workplaces
7. Temperature of working areas
8. Natural and artificial lighting of workplaces
9. Decks, bulkheads and deckheads
10. Doors
11. Traffic routes - Danger areas
12. Layout of workstations

12.3. The controls for the hauling gear must be installed in an area sufficiently large to enable operators to work unhindered.

The hauling gear must also have appropriate safety devices for emergencies, including emergency stop facilities.

12.4. The hauling gear operator must have an adequate view of the hauling gear and the workers at work.

If the hauling gear is controlled from the bridge, the operator should also have a clear view of the workers at work, either directly or via any other suitable medium.

12.7. Contact with bare ropes and warps and with moving parts of the equipment must be minimized by installing protective devices.

13. Living quarters
14. Sanitary facilities
15. First aid
16. Accommodation ladders and gangways
17. Noise

=> In this directive, there are safety requirements for machinery; in limited numbers, however. Requirements that may be elicited:

- design:
 - item 2; electrical installation,
 - item 12; emergency stop device on the hoisting gear,
- utilisation :
 - item 2; checks and maintenance of hauling and lifting equipment.

=> Though only applicable to part of the European fishing fleet:

- fishing vessels with a length between perpendiculars of 15 metres or over, built after 23/11/1995,
- fishing vessels with a length between perpendiculars of 18 metres or over, built before that date.

III.4. Directive 97/70/EC

Directive 97/70/EC of 11 December 1997 setting up a harmonised safety regime for fishing vessels of 24 meters in length and over; amended by Directive 2002/35/EC of 25/04/2002.

This Directive enforces the terms of the Torremolinos Protocol (1993) on all Community vessels of 24 m in length and over; where many chapters of the Protocol apply only to vessels of 45 m in length and over, creating a discrepancy for vessels of 24 to 45 m and distorting competition.

The purpose of the Directive is recalled in Article 1:

"[...] is to lay down safety standards for seagoing fishing vessels of 24 metres in length and over, both new, and existing, in so far as the Annex to the Torremolinos Protocol applies to the latter, and:

- flying the flag of a Member State and are registered in the Community, or
- operating in the internal waters or territorial sea of a Member State, or
- landing their catch in a port of a Member State.

[...]

This Directive is without prejudice to Council Directive 89/391/EEC of 12 June 1989 [...] and of its individual Directives, and in particular Council Directive 93/103/EC of 23 November 1993, concerning the minimum health and safety requirements for work on board fishing vessels [...]"

=> New fishing vessels are vessels whose building or major conversion contract has been placed after 01/01/1999.

=> The provisions applicable to existing vessels are concentrated in Chapters VII to X of the Annex to the Protocol.

=> Directives 89/381/EEC and 93/103/EC take precedence over Directive 97/70/EC.

The requirements relating to the safety of fishing vessels are described in Article 3:

"Member States shall assure that the provisions of the Annex to the Torremolinos Protocol are applied to the fishing vessels concerned flying their flag unless otherwise provided for in Annex I to this Directive.

Unless provided otherwise in this Directive, existing fishing vessels shall comply with the relevant requirements of the Annex to the Torremolinos Protocol not later than 1 July 1999".

Directive 2002/35/EC replaces Annex I to Directive 97/70/EC with a new wording which harmonises the interpretation of certain provisions of the Torremolinos Protocol Annex and which is enforceable for fishing vessels constructed on or after 01/01/2003.

As the minimum ratification requirements have never been met, the Torremolinos Protocol has been amended by the Cape Town Agreement of 2012 to facilitate its ratification. As indicated in a Council Decision of 17 February 2014 authorizing the Member States to sign or ratify the Cape Town Agreement of 2012[...] (2014/195/EU), this change had no impact on the application of Directive 97/70/EC and the Annex to the Torremolinos Protocol within the European Union.

The annex to the Torremolinos protocol contains ten chapters:

- I. General provisions,
- II. Construction, water tightness and equipment,

Regulation 15 - Anchorage and mooring equipment

“Anchor equipment designed for quick and safe operation shall be provided, which shall consist of anchoring equipment, anchor chains or wire ropes, stoppers and a windlass or other arrangements for dropping and hoisting the anchor and for holding the vessel at anchor in all foreseeable service conditions. Vessels shall also be provided with adequate mooring equipment for safe mooring in all operating conditions. Anchor and mooring equipment shall be to the satisfaction of the Administration.”,

- III. Stability and associated seaworthiness,
- IV. Machinery and electrical installations and periodically unattended machinery spaces,

Regulation 3 - General Provisions

“Main propulsion, control, steam pipe, fuel oil, compressed air, electrical and refrigeration systems ; auxiliary machinery ; boilers and other pressure vessels ; piping and pumping arrangements ; steering equipment and gears, shafts and couplings for power transmission shall be designed, constructed, tested, installed and serviced to the satisfaction of the Administration. This machinery and equipment, as well as lifting gear, winches, fish handling and fish processing equipment, shall be protected so as to reduce to a minimum any danger to persons on board. Special attention shall be paid to moving parts, hot surfaces and other dangers.”,

Comment

Throughout the Torremolinos Protocol, the above requirement regarding “this machinery and equipment as well as lifting gear, winches and fish handling and processing equipment” appears to be the only one related to machine safety.

Regulation 4 - Machinery

"All gears, shafts and couplings for power transmission to machinery essential for the propulsion and safety of the vessel or the safety of persons on board shall be designed and constructed to withstand the maximum service they may be subject to in any operating condition. Due regard must be given to the type of engines that drive or are a part of them."

V. Fire protection, fire detection, fire extinction and firefighting,

Regulation 35 - Fire pumps

Comment

This equipment does not seem to be covered by the MED. Only number requirements and ability to extinguish a fire. There is nothing related to the design or use of a device that is considered machinery,

VI. Protection of the crew

Comment

General protection measures and rules concerning deck openings; bulwarks, handrails and guardrails; stairs and ladders... but there is nothing about the machinery installed on board.

VII. Machinery and life-saving devices,

Regulation 32 – Life-saving appliances and arrangements

Comment

This equipment is covered by the MED.

VIII. Emergency instructions, muster list and exercises,

IX. Radio communications

X. Equipment and requirements on board for navigation

=> Overall, this regulation concerns vessel safety especially. It contains requirements for some machinery, but mainly focused on its reliability: equipment to anchor safely, fire pumps capable of discharging a minimum amount of water...

=> There is almost no requirement for machinery safety, except very general and ineffective requirements in Chapter IV - Regulation 3.

=> In the end, in terms of machinery safety, Directive 97/70/EC (focused on vessels) is less interesting than Directive 93/103/EC (focused on work). Indeed, the latter covers a larger range of fishing vessels (new vessels > 15 m built from 23/11/1995 or existing vessels > 18 m) and sets more specific requirements.

IV. OTHER INTERNATIONAL TEXTS

IV.1. MLC 2006

Maritime Labour Convention; 2006 (ILO); entered into force on 20/08/2013.

The scope is defined in Article II:

“4. Except as expressly provided otherwise, this Convention applies to all ships, whether publicly or privately owned, ordinarily engaged in commercial activities, other than ships engaged in fishing or similar pursuits and ships of traditional build such as dhows and junks [...]”.

=> This Convention explicitly excludes fishing from its scope. It also provides, under restrictive conditions, the possibility of excluding ships of less than 200 gross tonnage not engaged in international voyages.

The regulations and the code of the Convention address the following topics: minimum age, medical certificate, training and qualification, recruitment and placement, seafarers' employment agreements, wages, hours of work and rest, entitlement to leave, repatriation, compensation, manning levels, employment and career, accommodation and food, medical care, social security.

Regulation 4.3 - Health and Safety Protection and Accident Prevention:

“3. Each Member shall adopt laws and regulations and other measures addressing the matters specified in the Code, taking into account relevant international instruments, and set standards for occupational safety and health protection and accident prevention for ships that fly its flag”.

Standard A4.3 - Health and safety protection and accident prevention:

“ 1. The laws and regulations and other measures to be adopted in accordance with Regulation 4.3, paragraph 3, shall include the following subjects:

a) the adoption and effective implementation and promotion of occupational safety and health policies and programmed on ships that fly the Member's flag, including risk evaluation as well as training and instruction of seafarers;

b) reasonable precautions to prevent occupational accidents, injuries and diseases on board ship, including measures to reduce and prevent the risk of exposure to harmful levels of ambient factors and chemicals as well as the risk of injury or disease that may arise from the use of equipment and machinery on board ships [...]”.

=> This Convention enforces the requirement to adopt measures to evaluate occupational hazards, obviously applicable to machinery safety, and to prevent accidents resulting from the use of machinery. This targeting is also found in Guideline B4.3.1 - Provisions on occupational accidents, injuries and diseases:

“2. The competent authority should ensure that the national guidelines for the management of occupational safety and health address the following matters, in particular:

c) machinery [...]”.

=> This Convention addresses the issue of machinery safety, indirectly (occupational risk evaluation) or directly. But it only sets general requirements applicable to the signatory States;

nothing really practical and effective.

IV.2. ILO Convention 188

Convention concerning work in the fishing sector; 2007; it entered into force on 16/11/2017 for 10 of the 12 countries that have ratified it (Estonia, France and Lithuania for the EU).

This Convention is applicable to all fishermen and fishing vessels engaged in commercial fishing operations. However, some articles are only intended for fishing vessels >24 m. In such cases: "Any Member after consultation, may extend, in whole or in part, to fishers working on smaller vessels the protection provided in this Convention for fishers working on vessels of 24 metres in length and over".

The structure of this Convention has great similarities with the MLC 2006. Many common themes: minimum age, medical examination, crew and rest period, fisher's employment agreement, repatriation, recruitment and placement, payment, accommodation and food, medical care, social security.

Articles 31 to 33 deal with occupational health and safety and the prevention of accidents at work. They do not directly target machinery safety. Indirectly though, there are two interesting aspects:

Article 31

"Each Member shall adopt laws, regulations or other measures concerning:

a) the prevention of occupational accidents, occupational diseases and work-related risks on board fishing vessels, including risk evaluation and management, training and onboard instruction of fishers [...]"

Article 32 (for vessels >24 m)

"3. Fishing vessel owners shall:

c) ensure that fishers are sufficiently and reasonably familiarized with equipment and its methods of operation, including relevant safety measures, prior to using the equipment or participating in the operations concerned".

Comment

English version

Article 31

Each Member shall adopt laws, regulations or other measures concerning :

(a) the prevention of occupational accidents, occupational diseases and work-related risks on board fishing vessels, including risk evaluation and management, training and on-board instruction of fishers ;

Article 32 (for vessels > 24 m)

3. Fishing vessel owners shall:

(c) ensure that fishers are sufficiently and reasonably familiarized with equipment and its methods of operation, including relevant safety measures, prior to using the equipment or participating in the operations concerned.

=> This Convention provides for the requirement to assess occupational risks, obviously applicable to machinery safety, and the requirement to train the users of work equipment.

IV.3. ILO Recommendation 199

Recommendation concerning the work in the fishing sector; 2007.

A non-binding text that also addresses topics such as the protection of young persons, medical examination, competency and training, record of service, payment, accommodation and food, social security...

It contains a chapter on “safety and health at work” with several sub-chapters:

- research, dissemination of information and consultation,
- occupational safety and health management system,
- risk evaluation...

The closest thing to machinery safety is the sub-chapter entitled “Technical Specifications” and worded as follows:

47. Members should address the following, to the extent practicable and as appropriate to the conditions in the fishing sector:

- (e) machinery safety, including guarding of machinery;
- (j) lifting gear;
- (k) anchoring and mooring equipment;

=> This text invites to examine the questions of machinery safety; but which, once again, does not set or propose any truly practical and effective measures.

IV.4. Voluntary FAO/ILO/IMO Guidelines

<http://www.fao.org/docrep/007/x9656f/x9656f04.htm> (accessed 09/10/2018)

The three UN organizations, FAO, ILO and IMO, work together to develop and disseminate safety regulations for fishers and fishing vessels. These regulations are not binding, but may, in turn, have an educational purpose or be intended for those responsible for defining national regulations.

Two products issued from this cooperation.

- Compendium of safety rules for fishers and fishing vessels

Compendium of safety rules in two parts:

- part A “Practical safety and hygiene guidelines for employers and crews”
- part B “Provisions for safety and health requirements for the construction and equipment of fishing vessels”

Its application is limited to fishing vessels of 24 meters in length and over, excluding recreational fishing vessels and fish processing vessels.

It is currently under revision. It was therefore not possible to obtain it.

- Optional guidelines for the design, construction and equipment of small fishing vessels

Optional guidelines for the design, construction and equipment of vessels between 12 m and 24 m in length.

Chapter 4 - Machinery and electrical installations

Comment

The designation for "machinery" is ambiguous. Indeed, does it refer only to propulsion machinery, to machinery in the engine room, or to all the machinery installed on board ships?

Part A – General provisions

4.1.1 Machinery and electrical installations should be designed, constructed and installed in accordance with good engineering practice, applying, where applicable, the requirements of the Competent Authority or rules of recognized classification societies, or other equivalent standards as appropriate. Equipment should be installed, protected and maintained as not to constitute a danger to persons and vessel.

4.1.7 Moving external parts of engines and mechanical and electrical equipment should be suitably protected to prevent injury to attendant personnel.

Part B – Machinery Installations

4.2.1 Bars used on flywheels to turn machinery over by hand should be so constructed as to facilitate easy withdrawal from the flywheel recess if the engine should recoil. Hand cranks for engines should be designed to be thrown out instantly when the engine starts.

Chapter 6 - Protection of the crew

Comment

This chapter includes many recommendations related to machinery safety. It is impossible to copy them all. A few examples follow.

6.7 – Deck machinery, tackle and lifting gear

6.7.1 All elements of a fishing gear system, including warping heads, winches, warps, wires, tackle, nets, etc., should be designed, arranged and installed to provide safe and convenient operation [...].

6.7.9 Moving parts of winches, line and net hauling equipment and of warp and chain leads which may present a hazard should be, as far as practicable, adequately guarded and fenced.

6.7.10 Controls of winches, line and net hauling equipment should be so placed that winch operators have ample room for their unimpeded operation and have as unobstructed a view as possible of the working area [...].

6.7.11 The arrangement of the safety devices should also ensure that an emergency stop would be activated if a person is pulled towards a winch or other hauling equipment.

6.7.15 [...] Where practicable, winches with wire storage drums should be fitted to avoid the need of using warping heads.

6.11 – Fish processing equipment

6.11.5 Where several conveyors are working in one line, emergency switches should be provided at intervals of not more than 3 m for stopping all conveyors working in the line. Where

the length of the conveyors is 10 m or more, sound or light signals should be provided for giving warning when the conveyor starts.

6.11.8 Moving parts of machinery and other equipment, as well as gear wheels which could constitute a hazard, should be fitted with appropriate protective devices.

=> These Directives deal specifically with machinery safety. Clearly, the most effective international text identified in this area; with two limits: it is not binding and it is only for fishing vessels of 12 to 24 m. Nonetheless, it constitutes an excellent reference for all categories of fishing vessels.

V. CLASSIFICATION SOCIETIES

A telephone interview with a representative of a classification society (BV).

In France, vessels <24 m are exempt from classification. In this case, the classification societies intervene only for so-called "statutory" missions, that is to say to meet additional requirements of the flag State. In France, for example, to issue a register for lifting equipment, control of a refrigeration system...

On the other hand, it is mandatory for vessels >24 m to be classified. In this case, the classification societies apply all their regulations for a given category of ship. For fishing vessels, the NR467 - Rules for the Classification of Steel Ships; part D - Service Notations; chapter 15 - Fishing vessels (hull and stability, machinery, electrical installation, fire protection...).

At the shipowner's request, the classification society may also issue additional class notations, such as the COMF-NOISE or COMF-VIB classes for vessels which comply with the noise or vibration exposure limits laid down in the Regulation; ALP or ALM classes for lifting appliances used in ports or at sea...

Obviously, the regulation of a classification society is essentially concerned with ship safety. It is also interested in the robustness and reliability of some of the equipment, especially the machinery or lifting appliances. On the other hand, it hardly or not at all addresses the issues of use of work equipment.

In this respect, some elements have nevertheless been identified.

NR467 – Rules for the Classification of Steel Ships ; part C – Machinery, Electricity, Automation and Fire Protection ; chapter 1 – Machinery ; section 1 – General Requirements :

3 Arrangement and installation on board

3.4 Safety devices on moving parts

3.4.1 Suitable protective devices on access restrictions are to be provided in way of moving parts (flywheels, couplings, etc.) in order to avoid accidental contact of personnel with moving parts.

This requirement is identical in the NR566 – Hull arrangement, stability and systems for ships less than 500 GT ; chapter 2 – Machinery ; section 1 – General Requirements and Application.

NR526 – Rules for the Certification of Lifting Appliances onboard Ships and Offshore Units ; chapter 2 – Design assessment ; section 8 – Control and Safety Systems:

1 General

1.2 Safety principles

1.2.1 Lifting appliances are to be designed so that any damage to pump, motor, monitoring system, electrical or hydraulic fluid supply will not cause the load to drop or the appliance to be out of control and thus endanger the life of operators or of the personnel onboard.

1.2.2 In particular, cranes are to be fitted with automatic devices to maintain them in position in the case of electrical power failure or rupture of any hydraulic fluid pipe under pressure. In such a case means shall be provided to lower the load at controlled speed.

2 Control devices

2.1 General

2.1.1 Control devices are generally to be provided with automatic transfer to neutral position (dead man's control) which automatically actuates the braking device. Efficient means should be provided to lock the control device in this position.

3 Safety devices

3.1 Emergency stop

3.1.1 An emergency stop device is to be provided at each control station of powered lifting appliances or apparatus to stop their motions, in case of emergency, in cutting off the power-supply. This device are to be so designed and located as to prevent its being actuated inadvertently.

3.5.1 All machinery dangerous parts (engines, gears, chain and bet gearing) are to be effectively guarded, unless they are in such a position or of such a construction as to be as safe as they would be if effectively guarded.

=> The Classification Society offers an interesting reference system for the design, assembly and use of lifting equipment (cranes, derricks and winches used for lifting).

=> In this case, is there any risk of clashing with the requirements issuing from another frame of reference; e.g.: the Machinery Regulation?

VI. REGULATIONS CONCERNING SHIP SAFETY

French regulation that aggregates the requirements of international instruments (IMO and ILO conventions, European directives), to which national requirements are added that are considered relevant by the administration of Maritime Affairs.

This regulation, as the name implies, deals mainly with ship safety and navigation issues. It also addresses occupational health and safety issues on board ships.

VI.1. Division 214

Division 214 – Protection of Workers / Lifting Devices; OJFR edition of 06/01/2017.

Chapter 214-2 – Protection of Workers

Article 214-2.03 – Means of access to lifting equipment

“1.1. The means of access to the cabin or other parts of the hoist, when necessary for the operation of the machinery or for its maintenance, must be safe [...]”.

Article 214-2.09 – Use of lifting appliances

“1. All lifting appliances and mobile accessories, whether collective or not, must be used correctly and safely. In particular, they must not be loaded statically beyond their working load limit (WLL), except in the case of tests performed legally and under the direction of a competent person.

2. It is forbidden to use a hoist to intentionally exert an oblique pull on the hoist, in particular, to drag a load, if the hoist has not been designed specifically for such purpose”.

Chapter 214-3 – Lifting devices

Article 214-3.01 – Design

Article 214-3.02 – Construction

Article 214-3.03 – Safety devices

Article 214-3.04 – Testing of mobile accessories before mounting on board

Article 214-3.05 – Testing of wires and ropes before mounting on board

Article 214-3.06 – Overall tests before commissioning

Article 214-3.07 – Marking

Article 214-3.08 – Post-commissioning examinations and inspections

Article 214-3.09 – Register of lifting appliances and ship handling equipment

Chapter 214-4 – Provisions applicable to ships; Article 214-4.01 - Fishing vessels

1. Vessels with a reference length equal to or over 24 metres.

“1.1. The provisions of this article shall apply to specific equipment mainly used in fishing operations such as winches, gantry cranes, booms, etc. Other lifting appliances, used in particular for the handling of fishery products, are covered by other articles of this division, except article 214-4.02”.

2. Vessels with a reference length below 24 metres.

"2.1. The relevant provisions of Chapter 214-3 apply only to mechanization installations for fish holds.

The relevant provisions of Chapter 214-2 apply to vessels of 15 metres in length and over. However, the authority responsible for studying the plans and documents of the ship may apply them to vessels of lesser length whenever possible".

=> A fairly complete regulation, but practically only addressed to lifting devices. The text appears to be a national specificity; it resembles the reference system identified in the regulation of a classification society for the same kind of machinery.

=> Fishing vessels are exempted from many requirements; especially when their length is <24 m.

VI.2. Division 227

Division 227 – Fishing vessels less than 12 metres in length; OJFR edition of 28/12/2017.

Chapter 227-3 – Propulsion installations; Article 227-3.01 - General Provisions:

"3. Arrangement of the compartment:

The accessibility to the various components whose handling is essential during routine driving and maintenance operations must be studied to facilitate the work and deemed to be satisfactory and safe for the personnel, particularly as regards the risks of contact with hot spots or with moving parts.

If it is possible to start the propulsion engine from the wheelhouse, a device must be installed to prevent starting in case of intervention in the engine compartment".

Chapter 227-6 – Navigation safety; Article 227-6.08 - Handling fishing gear:

"The fishing winch is designed to ensure the traction of the fishing gear, the dragline drums being immobilized by the brakes and not engaged.

The design and assembly of the controls of the fishing winches shall be such as to permit the instantaneous removal from the vessel driving position of the tension of the draglines in the event of tripping. For this purpose, the brake activating system is hydraulic or offers equal control possibilities".

=> This division specifically addresses fishing vessels <12 m. It has nothing, or almost nothing, about machinery safety. Among the requirements identified, one concerns propulsion that is excluded from the field of machinery; the other ultimately refers to a ship safety problem.

VI.3. Division 226

Division 226 – Fishing vessels of 12 metres in length or over and less than 24 meters in length; OJFR edition of 28/12/2017.

Chapter 2 – Construction, water tightness, stability; Title 3 – Protection of the Crew:

Article 226-2.24 – Fishing gear

"1. Fishing gear is designed in accordance with the relevant requirements of Division 214.

2. The control devices for fishing gear shall be arranged and designed to minimize the risk of

errors during the operation of such equipment.

3. Emergency stop devices shall be provided to the satisfaction of the competent Authority”.

Article 226-2.25 – Arrangement of workstations

“2. The controls for the hauling gear must be installed in an area sufficiently large to enable operators to work unhindered.

The hauling gear must also have appropriate safety devices for emergencies, including emergency stop facilities.

3. The hauling gear operator must have an adequate view of the hauling gear and the workers at work.

If the hauling gear is controlled from the bridge, the operator should also have a clear view of the workers at work, either directly or via any other suitable medium”.

=> This division specifically addresses fishing vessels from 12 to 24 m. There are interesting requirements for machinery safety; those of article 226-2.24 appear to be purely French; those of Article 226-2.25 issue from the transposition of Directive 93/103/EC of 23/11/1993, Annex I, paragraph 12.

VI.4. Division 228

Division 228 – Fishing vessels of 24 metres in length and over; OJFR edition of 28/12/2017.

Chapter 228-2 – Construction, Water tightness and Equipment:

Article 228-2.15 – Anchoring and mooring gear

“Anchoring gear shall be designed in such a way that it can be put into operation quickly and safely, and shall include anchoring equipment, anchor chains or wire ropes, stoppers and a windlass or other arrangements dropping and hoisting the anchor and for holding the vessel at anchor in all foreseeable service conditions. Vessels shall also be provided with adequate mooring equipment for safe mooring in all operating conditions. Anchoring and mooring equipment must comply with the rules prescribed by a recognized organization”.

Article 228-2.19 – Fishing gear

“1. Fishing gear is designed in accordance with the relevant requirements of Division 214.

2. Control devices for fishing gear shall be arranged and designed to minimize the risk of error during the operation of such equipment.

3. Emergency stop devices shall be provided to the satisfaction of the competent authority”.

Article 228-2.20 - Arrangement of workstations

“2. The controls for the hauling gear must be installed in an area sufficiently large to enable operators to work unhindered.

The hauling gear must also have appropriate safety devices for emergencies, including emergency stop facilities.

3. The hauling gear operator must have an adequate view of the hauling gear and the workers at work.

If the hauling gear is controlled from the bridge, the operator should also have a clear view of the workers at work, either directly or via any other suitable medium”.

=> This Division specifically addresses fishing vessels >24 m. It corresponds to a transposition of the amended Directive 97/70/EC, that is to say, of the Torremolinos Protocol Annex, with identifiable national additions in italics. As in Division 226, the latter issue in part from Directive 93/103/EC of 23/11/1993.

VII. CONCLUSIONS AND RECOMMENDATIONS

VII.1. Various regulatory instruments

In the area of machinery safety, the regulatory instruments applicable to the maritime sector, and to fishing in particular, are marked by a great diversity. Indeed, there are references in:

- international texts (IMO, EU ...) vs national texts,
- texts applicable to all sectors of activity vs texts specific to the maritime sector,
- texts more directed towards ship safety vs texts relating to safety at work,
- texts with general security requirements vs texts with requirements focusing on machinery safety,
- binding texts vs motivational texts.

=> This great diversity creates fuzziness as to what is actually applicable to ships at the European level; in particular with regard to the two Directives on the safety of machinery/work equipment, which are Directives 2006/42/EC and 89/655/EEC as amended.

VII.2. "Pitfalls"

At the international level (IMO, EU ...), the texts specific to the maritime sector show two limits regarding machinery risk.

First, their requirements are often applicable only to defined categories of vessels, including size and age categories:

- Directive 93/103/EC :
 - vessels >15 m built after 23/11/1995, or
 - existing vessels >18 m,
- Directive 97/70/EC :
 - vessels >24 m built after 01/01/1999, or
 - vessels >24 m existing for certain chapters,
- MLC 2006; not applicable to fishing vessels,
- FAO/ILO/IMO voluntary guidelines:
 - fishing vessels from 12 to 24 m
 - "for the design, construction and equipment of fishing vessels" <=> new vessels.

=> These texts ignore the "real" small vessels, that is to say <12 m. A paradoxical situation with regard to the structuring of certain European fishing fleets. In France, in 2018, the fishing fleet comprised 6,458 vessels; 5,556 <12 m, that is 86%.

=> These texts are mainly addressed to new vessels. Often, existing vessels are subject to fewer regulations, or less stringent regulations. Here again, a paradoxical situation with regard to the structuring of certain European fishing fleets. In France, in 2018, 3,817 fishing vessels were built until 1995, that is 59% of the fleet.

=> Finally, in 2018, the number of fishing vessels registered in France and subject to Directive 93/103/EC is 502, that is only 7.8% of the fleet (224 vessels >15 m built after 1995 + 278 vessels >18 m)...

Secondly, whether they are ship-based or work-oriented, their requirements concerning machinery safety issues are generally limited, both in number and level; with the exception of the voluntary FAO/ILO/IMO guidelines for the design, construction and equipment of fishing vessels which appear to be an interesting basis for reflection.

VII.3. National “adaptations”

The fuzziness and pitfalls have led to national “adaptations” that may be:

- radical; as in Denmark, where a specific regulation enforces, on board ships, machinery with a level of safety equivalent to that of CE-marked machinery,
- more moderate; as in France, where the international regulations are arranged in such a way as to enforce additional obligations concerning machinery, particularly for lifting appliances and fishing gear.

VII.4. Recommendations

In fact, there are plenty of possible options available to the European social partners to contribute to their discussions and without predicting what is relevant or even possible at the EU level.

Three options and a bias: taking action at the level of European regulation.

1. Taking advantage of the current redrafting of the Machinery Directive to clarify the status of machinery installed on board ships.

It is understood that propulsion or equipment subject to the MED may be excluded. This seems much less obvious for a pump, a winch, a crane or a filleting machine...

=> This is the most effective option in machinery safety as it covers a wide spectrum of machinery and all ranges of vessels, including fishing vessels. However, it has a limit: it addresses new machinery. What about existing machinery?

2. Clarifying the status of machinery installed on board vessels in relation to the amended Directive 89/655/EEC (2009/104/EC).

This option may complement the previous one, but it can also work on its own.

Machinery on board ships could fall under the scope of machinery to which “no other Community directive is applicable or is only partially applicable”. Therefore, if they were made available after 31/12/1992, they are subject to the minimum requirements laid down in Annex I to the Directive.

=> This option is not as effective as the first one because it concerns only a part of the machinery pool and it allows to apply only “minimal” requirements. It remains interesting for two reasons:

- although minimal, such requirements are essential for the prevention of mechanical hazards related to the use of machinery. They constitute a basic frame of reference which, articulated with a good approach to risk evaluation, should make it possible to eliminate many dangerous situations,
- it paves the way for a process of compliance of machinery commissioned after 1992, on the model of the one that existed on land between 01/01/1993 and 31/12/1996 for the same machinery.

=> However, it poses a practical problem. How do we make fishing professionals aware that they are now subject to this obligation? That - maybe - they have a period for compliance...?

3. Acting on the wording of Directive 93/103/EC

Directive 93/103/EC of 23 November 1993 is a European directive specific to fishing vessels. It is also an individual directive issuing from the Framework Directive 89/391/EEC to promote the improvement of health and safety at work.

Many of the individual directives issuing from Directive 89/391/EEC have been redrafted, once or even twice; though not Directive 93/103/EC which is now 25 years old...

This option is an alternative to the previous one, as Directive 89/655/EEC is itself an individual Directive issued from Directive 89/391/EEC.

Contributing to the redrafting of this directive with a twofold aim:

- placing a stronger emphasis on workplace safety issues in general, and machinery safety in particular; wherever appropriate, drawing on the voluntary guidelines proposed by FAO/ILO/IMO,
- including all fishing vessels within its scope, including vessels <12 m and existing vessels regardless of their age.

=> This option is ultimately more interesting than the previous one. Indeed, it allows to start from scratch, and anything can be envisaged: new machinery conforming to CE marking standards; some slightly improved minimum requirements for existing machinery...



THE PILLAR OF THE SEA: JOINT ACTION OF THE EUROPEAN SOCIAL PARTNERS OF THE SEA-FISHING SECTOR

Pillar 3: survey on the legislation in force regarding deck machinery, engine rooms and fishing gears

Machine safety on board fishing vessels

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