



BSI Standards Publication

Cranes — Offshore cranes

Part 3: Light offshore cranes

National foreword

This British Standard is the UK implementation of EN 13852-3:2021.

The UK participation in its preparation was entrusted to Technical Committee MHE/3/-/10, Marine cranes.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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European foreword

This document (EN 13852-3:2021) has been prepared by Technical Committee CEN/TC 147 “Cranes - safety”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA or ZB, which are integral parts of this document.

This document is one part of EN 13852. The parts are the following ones:

- *Part 1: General purpose offshore cranes;*
- *Part 2: Floating cranes;*
- *Part 3: Light offshore cranes.*

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is a type C standard as defined in EN ISO 12100.

This document has been prepared to provide one means for light offshore cranes to conform to the essential health and safety requirements of the Machinery Directive.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered and are indicated in the scope of this document (see Clause 1).

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

This document applies to light offshore cranes including their supporting pedestals and structures.

NOTE Supporting pedestal and structures such as columns and boom rests, are covered by this document to the extent where their main purpose is to support the crane.

This document is applicable to light offshore cranes, whose structures are made of steel, and fulfil all of the following characteristics:

- maximum rated capacity 15 tonnes or maximum static load moment 3 000 kNm;
- limitation for off-board lifting operation up to $H_s = 2,0$ m and wind speed 15 m/s (3 s gust);
- maximum number of working cycles class U_1 ($C \leq 3,15 \times 10^4$) according to EN 13001-1.

This document provides requirements for all significant hazards, hazardous situations and events relevant to light offshore cranes for lifting of goods and lifting of persons, when used as intended and under conditions foreseen by the risk assessment (see Clause 4).

This document is applicable to light offshore cranes, which are manufactured after the date of approval by CEN of this document.

This document is not applicable for:

- a) transportation, assembly, disabling, scrapping, installation or erecting of the crane;
- b) any item attached to the hook, such as loads, non-fixed load lifting attachments, lifting accessories, baskets, carriers and containers;
- c) lifting operations in ambient temperatures below -20 °C;
- d) lifting operations in ambient temperatures above 45 °C;
- e) lifting operations involving more than one crane;
- f) accidental loads as result of collisions, earthquakes, explosions, etc., which are not covered by exceptional loads defined in Table B.7;
- g) emergency personnel rescue operations (except training);
- h) subsea lifting operations;
- i) general purpose offshore cranes (covered by EN 13852-1), floating cranes and motion compensated cranes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 614-1:2006+A1:2009, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 614-2:2000+A1:2008, *Safety of machinery — Ergonomic design principles — Part 2: Interactions between the design of machinery and work tasks*

EN 795:2012, *Personal fall protection equipment — Anchor devices*

EN 842:1996+A1:2008, *Safety of machinery — Visual danger signals — General requirements, design and testing*

EN 894-1:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*

EN 894-2:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

EN 894-3:2000+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*

EN 1127-1:2019, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

EN 1837:2020, *Safety of machinery — Integral lighting of machines*

EN 10204:2004, *Metallic products — Types of inspection documents*

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EN 12385-1:2002+A1:2008, *Steel wire ropes — Safety — Part 1: General requirements*

EN 12385-2:2002+A1:2008, *Steel wire ropes — Safety — Part 2: Definitions, designation and classification*

EN 12385-3:2020, *Steel wire ropes — Safety — Part 3: Information for use and maintenance*

EN 12385-4:2002+A1:2008, *Steel wire ropes — Safety — Part 4: Stranded ropes for general lifting applications*

EN 12464-2:2014, *Light and lighting — Lighting of work places — Part 2: Outdoor work places*

EN 12644-1:2001+A1:2008, *Cranes — Information for use and testing — Part 1: Instructions*

EN 12644-2:2000+A1:2008, *Cranes — Information for use and testing — Part 2: Marking*

EN 13001-1:2015, *Cranes — General design — Part 1: General principles and requirements*

EN 13001-2:2014, *Crane safety — General design — Part 2: Load actions*

EN 13001-3-1:2012+A2:2018, *Cranes — General design — Part 3-1: Limit states and proof of competence of steel structure*

EN 13001-3-2:2014, *Cranes — General design — Part 3-2: Limit states and proof of competence of wire ropes in reeving systems*

EN 13001-3-3:2014, *Cranes — General design — Part 3-3: Limit states and proof of competence of wheel/rail contacts*

EN 13001-3-4:2018, *Cranes — General design — Part 3-4: Limit states and proof of competence of machinery bearings*

EN 13001-3-5:2016, *Cranes — General design — Part 3-5: Limit states and proof of competence of forged hooks*

EN 13001-3-6:2018, *Cranes — General design — Part 3-6: Limit states and proof of competence of machinery — Hydraulic cylinders*

EN 13135:2013+A1:2018, *Cranes — Safety — Design — Requirements for equipment*

EN 13557:2003+A2:2008, *Cranes — Controls and control stations*

EN 13586:2020, *Cranes — Access*

EN ISO 13732-1:2008, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)*

EN ISO 14118:2018, *Safety of machinery — Prevention of unexpected start-up (ISO 14118:2017)*

EN 14502-1:2010, *Cranes — Equipment for the lifting of persons — Part 1: Suspended baskets*

EN IEC 60079-0:2018, *Explosive atmospheres — Part 0: Equipment — General requirements (IEC 60079-0:2017)*

EN 60079-1:2014,¹ *Explosive atmospheres — Part 1: Equipment protection by flameproof enclosures “d” (IEC 60079-1:2014)*

EN 60079-2:2014, *Explosive atmospheres — Part 2: Equipment protection by pressurized enclosure “p” (IEC 60079-2:2014)*

EN 60079-5:2015, *Explosive atmospheres — Part 5: Equipment protection by powder filling “q” (IEC 60079-5:2015)*

EN 60079-6:2015, *Explosive atmospheres — Part 6: Equipment protection by liquid immersion “o” (IEC 60079-6:2015)*

EN 60079-7:2015,² *Explosive atmospheres — Part 7: Equipment protection by increased safety “e” (IEC 60079-7:2015)*

EN 60079-11:2012, *Explosive atmospheres — Part 11: Equipment protection by intrinsic safety “i” (IEC 60079-11:2011)*

¹ This document is impacted by EN 60079-1:2014/AC:2018-09.

² This document is impacted by EN 60079-7:2015/A1:2018.

EN 60079-14:2014, *Explosive atmospheres — Part 14: Electrical installations design, selection and erection (IEC 60079-14:2013)*

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EN 60079-25:2010,⁴ *Explosive atmospheres — Part 25: Intrinsically safe electrical systems (IEC 60079-25:2010)*

EN 60204-32:2008, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines (IEC 60204-32:2008)*

EN IEC 61000-6-2:2019, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments (IEC 61000-6-2:2016)*

EN IEC 61000-6-4:2019, *Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments (IEC 61000-6-4:2018)*

EN ISO 898-1:2013, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread (ISO 898-1:2013)*

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 3834-1:2005, *Quality requirements for fusion welding of metallic materials — Part 1: Criteria for the selection of the appropriate level of quality requirements (ISO 3834-1:2005)*

EN ISO 3834-2:2005, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements (ISO 3834-2:2005)*

EN ISO 3834-3:2005, *Quality requirements for fusion welding of metallic materials — Part 3: Standard quality requirements (ISO 3834-3:2005)*

EN ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

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EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 7731:2008, *Ergonomics — Danger signals for public and work areas — Auditory danger signals (ISO 7731:2003)*

³ This document is impacted by EN 60079-18:2010/A1:2017 and EN 60079-18:2010/AC:2018-09.

⁴ This document is impacted by EN 60079-25:2010/AC:2013.

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

EN ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2019)*

EN ISO 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

EN ISO 15614-1:2017, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2017, Corrected version 2017-10-01)*

EN ISO 15614-11:2002, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 11: Electron and laser beam welding (ISO 15614-11:2002)*

EN ISO 15614-12:2014, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 12: Spot, seam and projection welding (ISO 15614-12:2014)*

EN ISO 15614-13:2012, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 13: Upset (resistance butt) and flash welding (ISO 15614-13:2012)*

EN ISO 19353:2019, *Safety of machinery — Fire prevention and fire protection (ISO 19353:2019)*

EN ISO 80079-36:2016, *Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements (ISO 80079-36:2016)*

EN ISO 80079-37:2016, *Explosive atmospheres — Part 37: Non-electrical equipment for explosive atmospheres — Non-electrical type of protection constructional safety “c”, control of ignition sources “b”, liquid immersion “k” (ISO 80079-37:2016)*

EN 60529:1991,⁵ *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

EN 61310-2:2008, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking (IEC 61310-2:2007)*

⁵ As impacted by EN60529:1991/AC:2006-12, EN60529:1991/A1:2000, EN60529:1991/A2:2013 and EN60529:1991/A2:2013/AC:2019-02.

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ISO 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 3864-2:2016, *Graphical symbols — Safety colours and safety signs — Part 2: Design principles for product safety labels*

ISO 3864-3:2012, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*

ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

ISO 5817:2014, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 7010:2019, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 9927-1:2013, *Cranes — Inspections — Part 1: General*

ISO 12478-1:1997, *Cranes — Maintenance manual — Part 1: General*

ISO 12480-1:1997, *Cranes — Safe use — Part 1: General*

ISO 12482:2014, *Cranes — Monitoring for crane design working period*

EN ISO 12944-1:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 1: General introduction (ISO 12944-1:2017)*

EN ISO 12944-2:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 2: Classification of environments (ISO 12944-2:2017)*

EN ISO 12944-3:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 3: Design considerations (ISO 12944-3:2017)*

EN ISO 12944-4:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 4: Types of surface and surface preparation (ISO 12944-4:2017)*

EN ISO 12944-5:2019, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 5: Protective paint systems (ISO 12944-5:2019)*

EN ISO 12944-6:2018, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 6: Laboratory performance test methods (ISO 12944-6:2018)*

EN ISO 12944-7:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 7: Execution and supervision of paint work (ISO 12944-7:2017)*

EN ISO 12944-8:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 8: Development of specifications for new work and maintenance (ISO 12944-8:2017)*

EN ISO 12944-9:2018, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 9: Protective paint systems and laboratory performance test methods for offshore and related structures (ISO 12944-9:2018)*

ISO 17635:2016, *Non-destructive testing of welds — General rules for metallic materials*

ISO 20332:2016, *Cranes — Proof of competence of steel structures*

ISO 23815-1:2007, *Cranes — Maintenance — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions in EN ISO 12100 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following locations:

- IEC Electropedia: available at <http://www.electropedia.org>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

actual hook load

total static weight of the load including any equipment placed between the load and the hook

3.2

automatic overload protection system

AOPS

system that automatically safeguards and protects the crane during overload in off-board lifts by allowing the hook to be pulled away from the crane, without causing significant damage to the crane

3.3

component

single part or assembly of parts of a crane, which is subjected to load effects

Note 1 to entry: Examples of components are wire ropes, pendant bars, rope sheaves, axles, gears, couplings, brakes, hoists, hydraulic cylinders, shafts, shackles, swivels and pins.

3.4

primary component

component (usually in the main load path) which is essential for the mechanical and structural integrity of the crane

Note 1 to entry: Examples of primary components are boom section, slewing bearing, hoist rope and hook.

3.5

secondary component

component that is not a primary component

Note 1 to entry: Examples of secondary components are walkways and their supports.

3.6

crane stiffness

value representing the rigidity of the crane in terms of a vertical force applied at the hook divided by the resulting vertical deflection at the hook

3.7**dynamic coefficient** ϕ_{2n}

ratio between the maximum dynamic load at the hook and the actual hook load for any given configuration or operating condition

3.8**emergency operation system****EOS**

back-up system for limited operation of the crane, if the normal system of operation is out-of-service

3.9**folding**

motion to fold or unfold a knuckle boom assembly

3.10**light offshore crane**

smaller, low class working cycle, offshore crane for sporadic use and long inactive periods without attendance or maintenance

3.11**hazardous area**

area in which an explosive gas atmosphere is present or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of the equipment

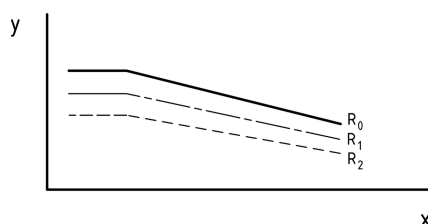
3.12**hoisting**

moving the hook in vertical direction

3.13**load chart**

diagram or table showing the rated capacity relative to the radius, configuration, environmental conditions, out of plane influences and type of operation

Note 1 to entry: An example is given in Figure 1 showing rated capacity for off-board lifts to and from the deck of supply vessels.

**Key**

X radius

Y rated capacity

R_0 rated capacity for on-board lifts

R_1 rated capacity for off-board lifts in significant wave height $H_s = 1$ m

R_2 rated capacity for off-board lifts in significant wave height $H_s = 2$ m

Figure 1 — Load chart

3.14

luffing

motion where the boom is raised or lowered

3.15

emergency load lowering

ELL

system activated by the crane operator, to lower the load down to the load supporting deck to avoid hazardous situations

3.16

off-board lift

lifting operation between the offshore installation and a floating unit or the sea surface

3.17

offlead load

horizontal load at the boom tip caused by a radial displacement of the hook

3.18

offshore crane

crane mounted on an offshore installation and used for on-board and off-board lifts

3.19

offshore installation

structure supported by the seabed or floating unit, exposed to an offshore marine environment

3.20

on-board lift

lifting operation within the physical boundaries of the offshore installation where the crane is installed

3.21

overload

condition where the actual hook load exceeds the rated capacity for on-board lift

3.22

lifting of persons

lifting operation where persons are moved by the crane from one location to another using equipment attached to the crane hook

3.23

radius

horizontal distance between the crane vertical axis of slewing and a vertical line through the hook when there is no offlead or sidelead

3.24

rated capacity

R_0 , R_n or R_p

maximum actual hook load that the crane is designed to lift for a given operational condition (e.g. lifting mode, reeving arrangement, radius, significant wave height, wind, heel/trim)

Note 1 to entry: Rated capacity R_0 refers to on-board lifts, R_n refers to off-board lift and R_p refers to lifting of persons. Rated capacity corresponds to hoist load as defined in EN 13001-2 and Safe Working Load (SWL) as used by ILO conventions.

3.25**rated capacity limiter****RCL**

device or system that automatically safeguards and protects the crane against overload during on-board lifts and lifting of persons

3.26**sidelead load**

horizontal load at the boom tip caused by the tangential displacement of the hook

3.27**failure load**

calculated overload at the hook that causes the most probable first loss of the load carrying capacity of a primary component

Note 1 to entry: Examples of failure loads:

- a) result in components exceeding their yield strength, e.g. by forming partly plastic cross-sections;
- b) result in components exceeding their ultimate tensile strength or minimum breaking loads, e.g. wire ropes;
- c) result in immediate buckling of any component;
- d) cause mechanical components to fail to fulfil their primary function, e.g. torque transmitting components.

3.28**significant wave height** **H_s**

average height of the highest one third of the individual wave heights in a shortterm constant state of sea, typically 3 h

3.29**slewing**

motion where the crane is rotating about its vertical axis

3.30**telescoping**

motion where the boom is extended or retracted

3.31**travelling**

motion where the wire rope suspension for the hook is moved along the boom

3.32**davit type offshore crane**

light offshore crane with a maximum rated capacity up to 2 tonne and a fixed working radius up to 7 m

3.33**emergency shutdown****ESD**

safety system on an offshore installation which limits or prevents abnormal events to develop into a major accident

3.34**significant damage**

state of loading that represents 80 % of the failure load

3.35**user**

organization (owner, operator, buyer) which owns and utilizes the crane

4 List of significant hazards

Table 1 contains all the significant hazards, hazardous situations and events, as far as they are dealt with by this document, identified as significant for this type of machinery, and which require action to eliminate or reduce the risk.

The significant hazards are based upon EN ISO 12100. Also shown are the sub clause references to the safety requirements and/or protective measures in this document.

A risk assessment of each light offshore crane design shall be carried out by the manufacturer to check that the hazards identified Table 1 and any other relevant hazards not identified in Table 1 are dealt with. Any significant hazards identified as a result of the risk assessment in addition to the generic hazards as given in Table 1, shall be taken into consideration.

Table 1 — List of significant hazards, hazardous situations, hazardous events, their relation to the Essential Requirements of the Machinery Directive 2006/42/EC, and associated requirements in this document

Group	Significant hazard in accordance with EN ISO 12100:2010, Table B.1	Directive 2006/42/EC, Annex I	Associated requirements in this document
1	Mechanical hazards		
1.1	Due to machine parts or workpieces, e.g. — by potential energy (falling objects, height from the ground, gravity)	1.3.3 Risks due to falling or ejected objects	5.2.8, 5.4.1, 5.7.12, 5.8, 5.9
	— by kinetic energy (acceleration, deceleration, moving/rotating elements)	1.3.7 Risks related to moving parts	5.2.8, 5.7.9.2, 5.8, 5.9
	— by mechanical strength (break-up)	1.1.3 Materials and products 1.3.2 Risk of break-up during operation	5.2, 5.4, 5.8, 5.9
1.2	by stored energy, e.g.: — elastic elements (springs)	1.3.9 Risks of uncontrolled movements 1.5.3 Energy supply other than electricity 1.6.3 Isolation of energy sources	5.1.4, 5.4.8, 5.4.9
1.3	Crushing	1.3 Protection against mechanical hazards	5.7.9.2

Group	Significant hazard in accordance with EN ISO 12100:2010, Table B.1	Directive 2006/42/EC, Annex I	Associated requirements in this document
1.4	Shearing	1.3 Protection against mechanical hazards	5.7.9.2
1.5	Cutting or severing	1.3.4 Risks due to surfaces, edges or angles	5.7.1, 5.7.9
1.6	Entanglement	1.3 Protection against mechanical hazards	5.7.1, 5.7.9
1.7	Drawing-in or trapping	1.3 Protection against mechanical hazards	5.7.1, 5.7.9
1.8	Impact	1.3 Protection against mechanical hazards	5.7.1, 5.7.9
1.9	Stabbing or puncture	1.3 Protection against mechanical hazards	5.7.1, 5.7.9
1.10	Friction or abrasion	1.3.4 Risks due to surfaces, edges or angles	5.7.1, 5.7.9
1.11	Injection	1.3.2 Risk of break-up during operation	5.7.1, 5.7.9
1.12	Slipping, tripping and falling	1.5.15 Risk of slipping, tripping or falling	5.7.5
1.13	Instability	1.1.5 Design of machinery to facilitate its handling 1.3.1 Risk of loss of stability	5.1.3
2	Electrical hazards		
2.1	Touching live parts	1.5.1 Electricity supply 1.6.3 Isolation of energy sources	5.3.1
2.2	Parts which have become live under fault conditions	1.5.1 Electricity supply	5.3.1
2.3	Not enough distance to live parts under high voltage	1.5.1 Electricity supply 1.6.3 Isolation of energy sources	5.3.1
2.4	Electrostatic phenomena	1.5.2 Static electricity	5.3.1
2.5	Electromagnetic phenomena	1.2.1 Safety and reliability of control systems	5.3.2.6
2.7	Short-circuit	1.5.1 Electricity supply	5.3.1
2.8	Overload	1.5.1 Electricity supply	5.1.4
2.9	Thermal radiation	1.5.1 Electricity supply	5.1.4

Group	Significant hazard in accordance with EN ISO 12100:2010, Table B.1	Directive 2006/42/EC, Annex I	Associated requirements in this document
3	Thermal hazards		
3.1	Burn, scald	1.5.5 Extreme temperatures 1.5.6 Fire 1.5.7 Explosion	5.7.10
4	Noise hazards		
4.1	Permanent hearing loss, tinnitus	1.5.8 Noise	5.7.8 6.2.4
6	Radiation hazards		
6.2	Radio frequency electromagnetic radiation	1.5.10 Radiation 1.5.11 External radiation	5.3.2.6
7	Material/ substance hazards		
7.1	Hazards from contact with inhalation of harmful fluids, gases, mists, fumes and dusts	1.1.3 Materials and products 1.5.13 Emissions of hazardous materials and substances 1.6.5 Cleaning of internal parts	5.7.1
7.2	Fire	1.5.6 Fire	5.6.5
7.3	Explosion	1.5.7 Explosion	5.3.4, 5.6.5
8	Ergonomic hazards		
8.1	Unhealthy postures or excessive effort	1.1.5 Design of machinery to facilitate its handling 1.1.6 Ergonomics	5.7.13.3, 5.7.1
8.3	Insufficient means for evacuation/emergency exit	1.1.7 Operating positions	5.7.5
8.4	Inadequate local lighting	1.1.4 Lighting	5.7.7
8.5	Design or location of indicators and visual displays units	1.7.1 Information and warnings on the machinery	5.5.1, 5.7.2
8.6	Design, location or identification of control devices	1.2.2 Control devices	5.7.3

Group	Significant hazard in accordance with EN ISO 12100:2010, Table B.1	Directive 2006/42/EC, Annex I	Associated requirements in this document
8.9	Human error during operation	1.1.6 Ergonomics 1.2.1 Safety and reliability of control systems Control devices 1.2.5 Selection of control or operating modes 1.5.4 Errors of fitting information	5.7.1, 5.7.2, 5.7.3, 5.7.4
9	Hazards associated with the environment in which the machine is used		
9.1	Lightning	1.5.16 Lightning	5.3.1
9.2	Moisture	1.1.3 Material and products 1.2.1 Safety and reliability of control systems 1.1.7 Operating positions	5.1.3, 5.3.1.4, 5.3.1.5
9.4	Snow, water, wind, temperature	1.1.3 Material and products 1.2.1 Safety and reliability of control systems 1.1.7 Operating positions	5.1.1, 5.1.2, 5.1.3, 5.2.8, 5.3.1, 5.3.2
10	Combination of hazards		
10.1	Failure/disorder of the control system and control circuits	1.2.1 Safety and reliability of control systems 1.2.3 Starting 1.2.4 Stopping 1.2.5 Selection of control or operating modes 1.6.3 Isolation of energy sources	5.3.1.8, 5.3.2, 5.6.4
10.2	Restoration of energy supply after an interruption	1.2.3 Starting 1.2.6 Failure of the power supply	5.3.2, 5.3.1.8
10.3	Software error	1.2.1 Safety and reliability of control systems	5.3.2.3
10.4	Failure of the power supply	1.2.6 Failure of the power supply	5.3.1.8

Group	Significant hazard in accordance with EN ISO 12100:2010, Table B.1	Directive 2006/42/EC, Annex I	Associated requirements in this document
12	Hazards due to: assembly and installation setting cleaning fault-finding maintenance		
12.1	Maintenance	1.6.1 Machinery maintenance	5.7.13.4
12.2	Insufficient means of access during use, setting and maintenance	1.6.2 Access to operating positions and servicing points	5.7.13.1
12.3	Cleaning inside the machine	1.6.4 Operator intervention	5.7.13.4
12.4	Being trapped in a machine	1.5.14 Risk of being trapped in a machine	5.7.5
17	Hazards linked to work position (including driving station) on the machine		
17.1	Fall of persons during access to or at/from the work position	3.4.5 Means of access 3.4.7 Transmission of power between self-propelled machinery (or tractor) and recipient machinery	5.7.5
17.2	Fire (lack of extinguishing means)	3.5.2 Fire	5.6.5
17.3	Mechanical hazards at the work position, such as: contact with the wheels rollover and overturning slipping during access fall of objects, penetration by objects contact of persons with machine parts or tools (pedestrian controlled machines)	3.2.1 Driving position 3.4.3 Roll-over and tip-over 3.4.5 Means of access 3.4.4 Falling objects 3.3.4 Movement of pedestrian-controlled machinery	5.7.9, 5.7.12
17.4	Insufficient visibility from the work position	3.2.1 Driving position	5.3.2.9

Group	Significant hazard in accordance with EN ISO 12100:2010, Table B.1	Directive 2006/42/EC, Annex I	Associated requirements in this document
18	Hazards due to the control system		
18.1	Inadequate location of manual controls	3.3.1 Control devices 3.4.5 Means of access	5.3.2.7
18.2	Inadequate design of manual controls and their mode of operation	3.3.1 Control devices 3.3.3 Travelling function	5.3.2.8
19	Hazards due to the power source and the transmission of power		
19.1	Engine and batteries	3.4.2 Moving transmission parts 3.5.1 Batteries	5.1.4
19.2	Transmission of power between machines	3.4.7 Transmission of power between self-propelled machinery (or tractor) and recipient machinery	5.3.1, 5.4.1, 5.4.8, 5.4.9
21	Hazards due to insufficient instruction for the driver/operator		
21.1	Insufficient instruction for the driver/operator	3.6 Information and Indications	5.5.1, 5.7.2
22	Mechanical hazards caused by load falls, collisions, machine tipping		
22.1	Lack of stability	4.1.2.1 Risks due to lack of stability	5.2.1, 5.2.2
22.2	Uncontrolled loading, overloading, overturning moments exceeded	4.2.2 Loading control 4.3.3 Lifting machinery 4.4.2 Lifting machinery	5.2.3, 5.2.4, 5.2.5, 5.2.6, 5.2.7, 5.5.2.7, 5.6.2
22.3	Uncontrolled amplitude of movements	4.1.2.6 a) Control of movements 4.2.1 Control of movements	5.5.2, 5.6
22.4	Unexpected/unintended movement of loads	4.1.2.6 c) Control of movements	5.5.2, 5.6
22.5	Inadequate holding devices/accessories	4.1.2.6 e) Control of movements 4.4.1 Lifting accessories	5.4.4, 5.4.5, 5.4.8.3
22.9	Insufficient mechanical strength of parts	4.1.2.3 Mechanical strength	5.4.1, 5.4.2, 5.4.3
22.10	Inadequate design of pulleys and drums	4.1.2.4 Pulleys, drums, wheels, ropes and chains	5.4.1

Group	Significant hazard in accordance with EN ISO 12100:2010, Table B.1	Directive 2006/42/EC, Annex I	Associated requirements in this document
22.11	Inadequate selection of chains, ropes, lifting and accessories and their inadequate integration into the machine	Pulleys, drums, wheels, ropes and chains Lifting accessories and their components Chains, ropes and webbing Lifting accessories	5.4.4, 5.4.5
22.12	Lowering of the load under the control of friction brake	4.1.2.6 d) Control of movements	5.6.3
22.13	Abnormal conditions of assembly/use/maintenance	Lifting accessories d) Lifting machinery 4.4.2 e) Lifting machinery	5.7.13.4
23	Hazards linked to driver/operator position		
23.1	Insufficient visibility from driver position	4.1.2.7 Movements of loads during handling 4.4.2 c) Lifting machinery	5.3.2.9
<i>Supplementary, for machinery presenting particular hazards due to the lifting of persons</i>			
27	Mechanical hazards		
27.1	Due to: inadequate mechanical strength inadequate working coefficients failing of loading control	6.1.1 Mechanical strength 6.1.2 Loading control for machinery moved by power other than human strength	5.1.6, 5.2.4, 5.10, 7.2.5 5.3.2, 5.10.8
27.2	Failing of controls in person carrier (function, priority)	6.2 Control devices	5.1.6, 5.2.4, 5.3.2, 5.10.3, 5.10.4, 5.10.5, 5.10.6, 5.10.7, 7.2.5
27.3	Overspeed of person carrier	6.3.1 Risks due to movements of the carrier 6.4.1 Risks to persons in or on the carrier	5.1.6, 5.2.4, 5.3.2, 5.10.3, 5.10.4, 5.10.5 5.1.6, 5.2.4, 5.3.2, 5.10.3, 5.10.4, 5.10.5, 5.10.6, 7.2.5
27.4	Falling of persons from person carrier	6.3.2 Risk of persons falling from the carrier 6.4.1 Risks to persons in or on the carrier 6.3.3 Risk of objects falling on the carrier	5.10.7, 7.2.5 7.2.5 7.2.5
<i>Hazards not be by eliminated or reduced by inherently safe design measures or safeguarding and/or complementary protective measures</i>			
—	—	1.7 Information	7.2.5

5 Safety requirements and/or protective measures

5.1 General

5.1.1 Design

Light offshore cranes shall comply with the safety requirements and protective measures of Clause 5. Any relevant hazards, which are not dealt with by this document, shall be assessed and mitigated in accordance with EN ISO 12100:2010.

Light offshore cranes shall be designed for sporadic intensive use and long inactive periods without attendance and maintenance.

The selection of a suitable set of crane standards for a given application is given in Annex A (informative).

5.1.2 Exchange of information

All relevant information regarding the interface arrangements, planned use and operating environment of the light offshore crane should be exchanged between the manufacturer and the user as recommended in ISO 9374-1 and ISO 9374-4 as relevant.

The information to be exchanged when specifying the technical requirements should include but need not be limited to:

- a) crane type, configuration, typical geometry and load chart for all modes;
- b) intended location of the offshore installation, lay out, environmental conditions;
- c) installation type, including inclinations and motions, if applicable;
- d) crane location, foundation, boom rest if applicable, external lighting and view from control position(s);
- e) service life, classification and operational limitations of the crane;
- f) interface connections such as communications, access, electrical, instruments, utilities, pedestal, boom rests;
- g) ambient temperature range for the operation of the crane;
- h) area classification including installation ignition source control philosophy and local heat or radiation sources, if applicable;
- i) characteristics of items attached to the hook, such as loads, non-fixed load lifting attachments, lifting accessories, baskets, carriers and containers.

The light offshore crane manufacturer should assist the offshore installation designer to optimize the crane selection, crane location and specify interface with the installation layout.

Any significant hazard arising from the interface between the crane and the installation, and which is within the scope of supply, ref. Clause 1, shall be addressed in the risk assessment, ref. Clause 4.

An example of a data sheet for the exchange of information is given in Annex L (informative).

5.1.3 Offshore marine environment

Light offshore cranes including their structure, machinery and equipment shall be designed suitable and reliable for operation in an offshore marine environment and to resist the environmental influences for the area of operation of the installation according to Annex C (normative).

5.1.4 Power supply

The main power supply, power transmission and power control elements of the light offshore crane shall be such that the full power demands of any loading and speed combinations associated with the various motions are compatible with the required operations at the maximum applicable load that the crane is designed for, such that:

- a) a diesel engine shall not stall, overspeed or fall below its nominal speed;
- b) an electric motor shall not stall, overspeed or overheat;
- c) any batteries shall not be overloaded or overheat;
- d) a hydraulic power pack shall not stop/stall or overheat;
- e) external power supplies shall not be overloaded or overheat.

The available power shall be sufficient for simultaneous operation of:

- 1) minimum required hoisting velocity at maximum rated capacity and 50 % luffing, telescoping, travelling or folding speed, or
- 2) minimum required hoisting velocity at maximum rated capacity and 50 % slewing speed.

Hoisting motions shall always have first priority, but no other motion shall stop fully if operated simultaneously.

For davit cranes, the available power shall be sufficient to achieve minimum required hoisting velocity at maximum rated capacity.

5.1.5 Hazardous area

Cranes installed in or exposed to hazardous areas shall comply with Annex K (normative).

5.1.6 High risk application

For high risk applications, the requirements of EN 13135:2013+A1:2018, 5.9 and EN 13001-2:2014, 4.3.2 apply.

NOTE Examples of typical high-risk applications:

- lifting of loads (or booms) over pressurized or critical equipment;
- lifting of loads that may represent severe consequences if dropped or damaged, e.g. explosives, flammables, dangerous substances or pressurized equipment;
- lifting of persons.

For the lifting of persons and application of risk coefficient, see 5.10 in this document.

5.2 Strength and stability

5.2.1 General principles and requirements

Light offshore cranes and their supporting pedestals, boom rests and other structures shall conform to the general principles and requirements for strength, stability and fatigue in EN 13001-1:2015 and subsequent parts as applicable (e.g. EN 13001-2:2014, EN 13001-3-1:2012+A2:2018).

Relevant natural frequencies of the crane structure shall be considered and any effects of resonance shall be limited. Relevant oscillation data coming from the offshore installation shall be taken into account.

NOTE For structures of slender or very high strength steel design, where nonlinear relations exist between loads and stresses and where significant deformations can be expected, reference is made to EN 13001-3-1:2012+A2:2018, 8.1.

5.2.2 Service classification

5.2.2.1 Service life

Light offshore cranes shall be designed for a service life of 20 years unless otherwise agreed between the manufacturer and the user.

5.2.2.2 Classification

The light offshore crane as a whole and its mechanisms shall be classified in accordance with EN 13001-1:2015 and EN 13001-2:2014 based on the information provided according to 5.1.2. The classification for the crane as a whole shall not exceed the limitations stated in the scope of this document.

5.2.2.3 Replacement and overhaul

Mechanisms and components requiring replacement and overhaul during the service life of the light offshore crane shall be specified with intervals for replacement and overhauls; Time Between Replacement (TBR) or Time Between Overhaul (TBO).

5.2.3 Loads and load combinations

5.2.3.1 General

Load cases shall be established and calculated for each lifting mode and reeving configuration that the light offshore crane is designed for in accordance with EN 13001-2:2014.

In addition, the environmental loads and load actions due to inclinations and motions of the installation which the crane is mounted on shall be taken into consideration in accordance with Annex C (normative).

The load combination table is shown in B.3.3.

5.2.3.2 In-service loads for on-board lifts

The basic load combinations for the load calculation shall be established in accordance with EN 13001-2:2014 and the requirements given in Annex B (normative).

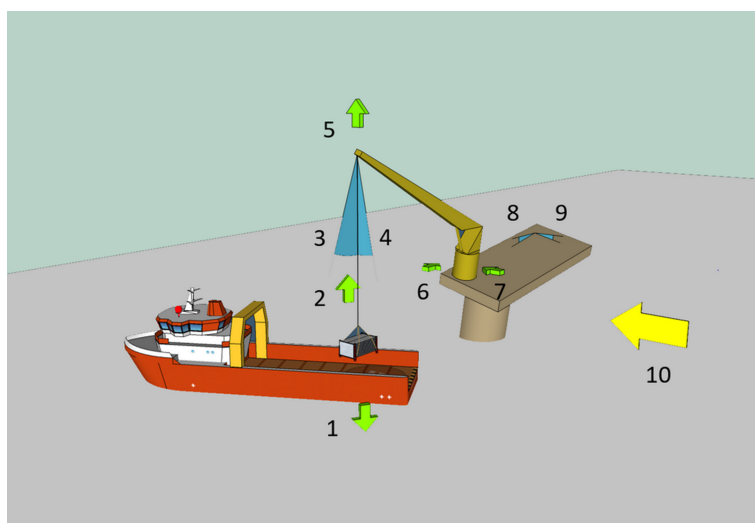
In the absence of a rated capacity for on-board lifts, R_0 shall be taken as the maximum rated capacity for off-board lifts.

5.2.3.3 In-service loads off-board lifts

The in-service loads shall include as applicable:

- dead weight, see Annex B (normative);
- hoist load, see Annex B (normative);
- loads due to hoisting velocity, see Annex B (normative);
- loads due to boom tip velocity from installation motion, see Annex B (normative);
- loads due to load supporting deck velocity, see Annex B (normative);
- loads due to sidelead and offlead, see Annex C (normative);
- loads due to installation trim and heel, see Annex C (normative);
- wind loads, see Annex C (normative);
- loads due to installation accelerations, see Annex C (normative).

In-service loads and motions for off-board lifts are illustrated in Figure 2.



Key

1	deck velocity	5	boom tip velocity	9	installation heel
2	hoisting velocity	6	installation surge	10	wind
3	offlead	7	installation sway		
4	sidelead	8	installation trim		

Figure 2 — Off-board lifts

5.2.3.4 Determination of dynamic coefficients

The dynamic coefficients Φ_2 , Φ_{2min} and Φ_{2C} shall be calculated in accordance with Annex B (normative). Other dynamic coefficients shall be calculated in accordance with EN 13001-2:2014 as applicable.

5.2.3.5 Out-of-service loads

The light offshore crane including boom rest and any tie downs if provided, shall withstand the out-of-service loads resulting from the environmental influences as stated in Annex C (normative).

5.2.3.6 Loads due to maintenance

Loads due to maintenance shall be calculated using the applicable load combinations in Annex B (normative).

5.2.4 Load actions

Load actions shall be calculated in accordance with EN 13001-2:2014 for each service condition and load combination.

The load combinations shall be based on the determination of factors given in Annex B (normative) and the environmental influences as given in Annex C (normative).

If the light offshore crane is designed for high risk applications, a risk coefficient γ_n as defined in EN 13001-2:2014 shall be used.

5.2.5 Limit states and proof of competence

5.2.5.1 Steel structures

Limit states and proof of competence of steel structures shall be in accordance with EN 13001-3-1:2012+A2:2018.

5.2.5.2 Wire ropes in reeving systems

Limit states and proof of competence of wire ropes in reeving systems shall be in accordance with EN 13001-3-2:2014, with due consideration to the factors in Annex B (normative) and the risk coefficients in 5.2.4 and 5.10 in this document.

5.2.5.3 Wheel/rail contacts

Limit states and proof of competence of wheel/rail contacts shall be in accordance with EN 13001-3-3:2014.

5.2.5.4 Machinery

Limit states and proof of competence of machinery shall be in accordance with EN 13001-3-4:2018.

Limit states and proof of competence of machinery such as components and mechanisms shall also be in accordance with EN 13135:2013+A1:2018.

5.2.5.5 Forged hooks

Limit states and proof of competence of forged hooks shall be in accordance with EN 13001-3-5:2016.

5.2.6 Failure mode analysis

A failure mode analysis shall be carried out in accordance with Annex D (normative).

5.2.7 Load charts

5.2.7.1 General

Load charts shall be calculated for a realistic set of environmental conditions (as agreed between the user and the manufacturer) for each lifting mode and reeving configuration based on the limit state and proof of competence of the light offshore crane as a whole.

5.2.7.2 Operational limitations

The load charts shall state the in-service operational limitations of the light offshore crane, based on limit states and proof of competence, performance and any limitations as set by the safety systems.

5.2.7.3 Information

The load charts shall be included in the instruction for use and permanently displayed at the control station.

The information from the load chart shall be programmed into the rated capacity indicator as described in 5.5.1.2.

5.2.8 Materials

5.2.8.1 General

Materials for structural members, bolted and pinned connections shall be in accordance with EN 13001-3-1:2012+A2:2018 which provides a preferred selection of materials.

Selection of materials shall be made upon the following criteria:

- a) strength and ductility at the specified ambient temperature range;
- b) resistance to brittle fracture at the ambient temperature range;
- c) resistance to fatigue loads;
- d) consistency and reliability of material properties;
- e) suitability for fabrication processes
- f) resistance to corrosion.

5.2.8.2 Impact toughness

The sum of the impact toughness parameter Σq_i , ref. EN 13001-3-1:2012+A2:2018, 4.2.2 and Table 4, shall not be taken less than 9.

5.2.8.3 Hydrogen embrittlement

Primary components shall be considered for susceptibility to hydrogen embrittlement due to the corrosive offshore environment.

NOTE A method for the determination of the susceptibility to hydrogen embrittlement/cracking is provided in EN ISO 17642-1, EN ISO 17642-2 and EN ISO 17642-3.

5.2.8.4 Machinery components

Materials for machinery components shall be in accordance with EN 13135:2013+A1:2018 and EN 13001-3-4:2018 for bearings.

5.2.8.5 Forged hooks

Material for forged hooks shall be in accordance with EN 13001-3-5:2016.

5.2.8.6 Slewing bearings

Materials for slewing bearings and slewing bearing fasteners shall be impact toughness tested at to an average minimum value of 42 J at -20°C .

Slewing bearing properties such as chemical composition, mechanical properties, heat treatment, hardening specification and surface finish shall be specified.

Fasteners for slewing bearings shall be subjected to visual and magnetic particle inspection according to EN ISO 898-1, at least 48 h after completion of the quenching and tempering process. Fasteners shall have rolled threads and be supplied in the black condition, be well greased and sealed against corrosion. Rolling of threads shall be made after heat treatment. If plated, the treatment shall be such as to preclude hydrogen embrittlement.

5.3 Electrical systems

5.3.1 General

5.3.1.1 Electrical equipment

Electrical equipment shall conform to EN 60204-32:2008.

5.3.1.2 Electrotechnical equipment

Electrotechnical equipment shall conform to EN 13135:2013+A1:2018.

5.3.1.3 Thermal influences

Local thermal effects, such as the thermal influence of flares, etc., shall be taken into account when selecting and locating components of the electrical system for the light offshore crane.

5.3.1.4 Enclosures

Enclosures shall conform to EN 60529:1991⁶ and Annex K (normative), as applicable.

5.3.1.5 Ingress protection

Ingress protection of electrotechnical equipment according to EN 60529:1991⁷ shall as minimum be as follows:

- outdoor, naturally ventilated areas and wash down areas: IP 56;
- dry indoor areas: IP 20;
- remote console sender unit: IP 55;
- other areas: IP 44.

5.3.1.6 Cable entries

Cable entries to electrotechnical enclosures and equipment shall be compatible with the applicable ingress protection.

⁶ As impacted by EN60529:1991/AC:2006-12, EN60529:1991/A1:2000, EN60529:1991/A2:2013 and EN60529:1991/A2:2013/AC:2019-02.

⁷ As impacted by EN60529:1991/AC:2006-12, EN60529:1991/A1:2000, EN60529:1991/A2:2013 and EN60529:1991/A2:2013/AC:2019-02.

5.3.1.7 Protective earthing

For each incoming electrical supply, a terminal shall be provided for connection of the hoisting machine to the external protective earthing system or to the external protective conductor in accordance with the provisions of EN 60204-32:2008.

5.3.1.8 Protection by automatic disconnection of supply

The light offshore crane and personnel shall be protected by automatic disconnection of the supply in case of a fault in accordance with EN 60204-32:2008, 6.3.

5.3.2 Controls

5.3.2.1 General

Controls shall conform to the requirements of EN 13557:2003+A2:2008 and EN 60204-32:2008. Controls shall prevent unexpected start up in accordance with EN ISO 14118:2018.

Controls shall be designed or protected so that the desired effect can only occur by an intentional operation.

This can for example be achieved by combinations of the following:

- recessing the actuator (lever, pushbuttons);
- mechanical interlock of the neutral position of the control lever;
- use of a set of actuators requiring sequential or simultaneous actions;
- surrounding the control levers on a panel by a guard rail;
- locating the actuator where it is unlikely to be accidentally knocked;
- manually enabling switch for the controls at the control station.

5.3.2.2 Safeguarding

Means of controls shall be provided for the operator to control the movement of the hook and other parts of the light offshore crane during all operations.

The control system shall be such that no single fault/failure or common cause failure shall result in an uncontrolled movement of the load, parts of the light offshore crane or the entire crane.

In all modes, in-service and out-of-service, the control system, shall automatically return to a safe state to avoid hazardous situations and damage to the crane, if any failure occurs in the control system.

NOTE A safe state is normally considered to include full stop of all motions, except for the hoist motion in the offboard lift mode, when the AOPS has been activated.

5.3.2.3 Safety functions

Safety functions of control systems shall conform to the required performance level in accordance with EN ISO 13849-1:2015 and Annex H (normative).

5.3.2.4 Mode selector

A mode selector that enable or disable consoles, controls, safety functions or limit movements shall be arranged if the light offshore crane has different control positions or modes of operation, such as:

- on-board lift mode;
- off-board lift mode;
- mode for lifting of persons, if applicable;
- other modes, if applicable.

The mode selection between on-board and off-board lift mode shall be automatic. For the mode for lifting of persons, the mode selection shall be manual and lockable.

Only one control console and one mode shall be active at the time.

Reference is made to Annex G (normative).

5.3.2.5 Control performance

The direction of movement of the control levers shall be consistent with the light offshore crane motion. Controls for crane movements shall return to the neutral/off position when released.

The controls of the main motions (hoisting, slewing, luffing, travelling, folding and telescoping) shall provide predictable smooth response proportional to the position of the control levers and with insignificant hysteresis and a defined neutral position.

Controls for hoist drives shall be class HD4 in accordance with EN 13001-2:2014. Davit type cranes may alternatively use class HD1 for hoist control.

5.3.2.6 Sensitivity

Electromagnetic compatibility for light offshore cranes shall comply with EN IEC 61000-6-2:2019 and EN IEC 61000-6-4:2019.

The control system shall be such that interference fields, Electromagnetic Compatibility (EMC) of equipment, e.g. radio and telecommunications, electrical or electronic transmission of the signals do not cause unintended movements or other hazardous conditions.

5.3.2.7 Control instrumentation

The control instrumentation shall be in accordance with Annex E (normative).

5.3.2.8 Remote consoles

Remote consoles shall have an unambiguous means of showing the relationship between control operation and physical movement of the light offshore crane.

The cable for wired remote consoles shall be suitable for the operation according to EN 60204-32:2008, 13.4.2 and 13.4.3. It shall be of sufficient length for the operator to oversee the working area of the crane.

Wireless controls shall not transmit whilst the means to prevent unauthorized use are active and activation of the transmitter is not to initiate crane movement. Operating commands for crane movement shall cease when the crane activation switch is de-energised. Means are to be incorporated to automatically stop all crane movements in case of transmission failure or disturbance within a pre-determined time.