Good practice guideline

The safe management of small service vessels used in the offshore wind industry

3rd edition

G+ Global Offshore Wind
Health & Safety
Organisation

In partnership with

energy institute

GOOD PRACTICE GUIDELINE

THE SAFE MANAGEMENT OF SMALL SERVICE VESSELS USED IN THE OFFSHORE WIND INDUSTRY

3rd edition

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FOREWORD

The G+ Global Offshore Wind Health and Safety Organisation (G+) comprises the world's largest offshore wind farm operators, who came together to form a group that places health and safety at the forefront of all offshore wind activity. The primary aim of the G+ is to create and deliver world class health and safety performance across all of its activities in the offshore wind industry. The G+ has partnered with the Energy Institute (EI) in order to develop good practice guidelines to improve health and safety performance. Through the sharing and analysis of incident data provided by G+ member companies, an evidence based understanding of the risks encountered during the construction and operational phases of a wind farm project has been developed. This information has been used to identify the higher risk activities in the offshore wind industry.

In 2013 the G+ commissioned the development of this good practice guideline: ***The safe management of small service vessels used in the offshore wind industry***, the 1st edition of which was published in 2014. The guideline drew upon existing standards and practices in the maritime industry and offshore oil and gas sector, while seeking to take account of and reflect the unique aspects of working in the offshore wind industry. It represented one of the first steps within the G+ to reduce the H&S risk in this sector of the industry. Following publication of the guideline, in 2016 the G+, after consultation with the industry, agreed to commission an update to the guideline to ensure that it remained fit for purpose and continued to be a useful source of information to industry which would assist in reducing the number of incidents resulting in injury to personnel.

In 2022 the G+, after consultation with the G+ members operating in the US, agreed to commission another revision to ensure that the language used in the guidance can be followed and applied globally. A US-specific section was developed (Annex D) to help with the implementation of the principles in the global guidance in the US region.

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This publication will be further reviewed from time to time. If users would like to send comments or suggestions for improvement to future editions of this publication please send them to:

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BP
Corio Generation
EDF Renewables
Equinor
Northland Power
Ocean Winds
Ørsted
RWE
Iberdrola
Siemens Gamesa
SSE
Vattenfall

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1 INTRODUCTION

1.1 SCOPE

This guideline addresses small service vessels, which for the purposes of this publication are defined as vessels less than 500 GT, operating in offshore wind farms under instructions from site management. It does not address the principal vessels undertaking major marine operations (see definitions in Annex E). Small service vessels include (but are not limited to):

- crew transfer vessels;
- guard vessels (sometimes referred to as scout vessels);
- stand-by vessels;
- survey vessels and other vessels used in the collection of data related to the construction or operation of an offshore wind farm;
- workboats;
- tugs and supply vessels, and
- construction support vessels.

The guideline does not address specific regulatory requirements for vessels certified to the IMO *International code of safety for high speed craft* (HSC Code) or to which the Flag Administration has applied provisions of the Special Purpose Ships (SPS) Code. These service vessels should be subject to special consideration. The guideline does not address additional operational requirements for wind farm installation vessels, jack-up barges or self-elevating platforms.

This guideline is intended to be applicable to all offshore wind farms globally. Guidance and information on regulatory frameworks for specific countries/regions are provided in Annex D.

Some requirements of this guideline assume the presence of a permanently staffed Marine Coordination function. This is most applicable to offshore wind farms in the construction phase, or larger/cluster operated offshore wind farms during the operations and maintenance (O&M) phase. However, the principles are broadly applicable to any offshore wind farm and are consistent with good practice for the management of marine operations in the offshore construction industry. Wind farms that do not have a permanently staffed Marine Coordination function should establish responsibilities and apply equivalent procedures that are appropriate for the scale and nature of their operation.

The guideline considers the management of service vessels to include the following:

- Functional roles and responsibilities for parties involved in the management of service vessels.
- Audit and inspection regimes for service vessels engaged by the wind farm.
- Operating procedures and guidance for the control and coordination of service vessel activities within the wind farm.
- Operating procedures for routine marine operations and vessel activities in the wind farm.
- Management of vessel traffic within the wind farm and in transit to, and from, the wind farm.

– Training and competence of service vessel marine crew, industrial personnel, passengers, and Marine Coordination personnel.
– Vessel safety equipment.

1.2 IMPLEMENTATION

This guideline represents the G+ interpretation of good practice, and is intended to be reflected in the management systems of the G+ member companies. It is also offered for use by other operators of offshore wind farms in defining their site operating procedures. Contractors and Vessel Operators engaged to undertake work or support marine operations within offshore wind farms are encouraged to reflect the recommendations of this guideline in their management systems and instructions.

For G+ members, deviations from requirements of the guideline should be justified for an individual site and circumstances.

The principle for acceptance of deviations is that the risk that the requirements are intended to mitigate has been reduced to a level as low as reasonably practicable (ALARP) by other safety measures or site-specific circumstances.

1.3 VERBAL FORMS

Verbal forms of special importance in this guideline are defined as follows:

– Should: indicates a recommendation that a certain course of action is preferred or particularly suited. Alternative courses of action are allowable where agreed between contracting parties but should be justified and documented.
– May: indicates guidance that a certain course of action is likely to be particularly suited to specific circumstances. Alternative courses of action may be followed when appropriate to the circumstances.

1.4 GUIDELINE STRUCTURE

This guideline is divided into two parts as follows:

– Part A: guidance for site management, capable of being audited onshore.
– Part B: guidance for vessel management, capable of being audited on the vessel.

PART A : SITE MANAGEMENT

2 OFFSHORE MANAGEMENT

2.1 ROLES AND RESPONSIBILITIES

The wind farm operator should establish the overarching policies for operation of the wind farm and appoint a Project Director or Site Manager. The Project Director/Site Manager is responsible for ensuring that the following generic functional roles for site management within an offshore wind farm are fulfilled in accordance with the wind farm operator's policy.

All responsibilities defined here should be assigned to one or more designated persons within site management. In general, responsibilities defined here may be delegated to subordinate managers or employees; however, where this is the case such delegation should be clearly documented and understood by all parties concerned. Where a Contractor has assumed responsibility for site management roles or responsibilities defined in this section and elsewhere in this guideline, site management should have a duty to oversee and verify the associated work of the Contractor.

2.1.1 Safety management

The site management should:

- Require that risk assessments/method statements (RA/MS) are performed for all marine operations within the wind farm, including routine operations, and for all marine operations outside the wind farm that are directly connected to operations regarding the wind farm.
- Develop and implement site safety procedures in accordance with wind farm operator policy.
- Develop a wind farm emergency response plan (ERP) and corresponding emergency response cooperation plan (ERCoP) in accordance with wind farm operator policy and Coastal Administration regulations (see section 4).
- Assist Contractors in the preparation of bridging documents between the Contractor's management system and the wind farm management system.
- Promote reporting of hazardous observations and near-misses.
- Ensure investigation of incidents, identification of lessons learned and implementation of corrective actions.
- Promote a just safety and reporting culture (see definitions in Annex E).
- Share safety information and lessons learned with Contractors and Vessel Operators.
- Invite participation of service vessel marine crews in toolbox talks.
- Organise and attend safety meetings.
- Conduct and evaluate emergency drills.
- Conduct periodic reviews of all site safety procedures, RA/MS, providing appropriate and sufficient notification of any updates to all concerned parties.

2.1.2 Marine management

The site management or marine management should:

- Develop and implement marine procedures in accordance with wind farm operator policy and the site safety procedures.
- Ensure legal compliance with consenting requirements.
- Conduct vessel suitability assessments and arrange for fit-for-purpose inspections for all service vessels.
- Assist Vessel Operators in the preparation of bridging documents between the Vessel Operator's management system and the wind farm management system.
- Provide for supervision of all marine operations in the wind farm.
- Develop and conduct marine exercise scenarios in support of the wind farm ERP.
- Prepare and maintain records of service vessel manifests containing details of personnel on board and work to be carried out within the wind farm in response to requests for access (RFA).
- Ensure that all personnel authorised to work in or visit the wind farm hold valid, appropriate and sufficient certification in accordance with statutory requirements and industry guidance.
- Liaise with local authorities, sea users and other maritime stakeholders to discuss:
  - site access requirements (where permitted or required by Coastal Administration);
  - recommended transit routes to and from the wind farm, and
  - sufficient notice of works in the wind farm that may impact such stakeholders.
- Review project work schedules to identify potential traffic or access conflicts.
- Manage and maintain weather forecasting services for the wind farm and meteorological measuring equipment within the site.

The site management or marine management should establish a Marine Coordination function to oversee all marine operations in the wind farm, provide information to service vessel Masters and coordinate an emergency response to any incident within the wind farm (see section 3).

2.1.3 Control of work

Site management should:

- Oversee compliance with site safety procedures for marine operations under their direction.
- Manage RFAs arising from planned work activities within the wind farm in accordance with any permit to work system in effect.
- Verify that Contractor documentation is in order and that appropriate management system bridging documents to the wind farm management system are in place before work begins.
- Identify any risks or hazards posed to personnel or vessels during marine operations under their direction and ensure that resulting control measures or corrective actions are properly implemented.

2.1.4 Contractors

Contractors carrying out work within the wind farm should:

- Carry out their work in a safe manner and in accordance with site safety procedures.
- Familiarise themselves with the wind farm ERP.
- Report incidents, hazards and near-misses observed during their work.
- Maintain required certification for transit to and marine operations within the wind farm.
- Ensure that all stakeholders are familiar with the RA/MS for the work being carried out.
- Follow instructions from marine crew or Marine Coordination relating to marine operations.

2.2 SERVICE VESSEL SELECTION

To ensure vessels are appropriate to undertake their intended operations in a safe manner, a robust survey and inspection regime is required to ensure the vessel is fit-for-purpose throughout the life cycle of its operations. This should comprise:

- suitability assessment;
- International Marine Contractors Association (IMCA) marine inspection or other industry accepted inspection programs, and
- site verification.

Where possible, positive reporting should be encouraged when preparing vessel survey and audit reports. Positive reporting encourages the attending surveyor/inspector to provide additional comments which may not be specifically covered in the survey/audit form question sets. Additional comments should be included if they advance the report or provide clarification.

While the fit for purpose evaluation should consider the regulations to which the vessel is built, maintained and operated, the vessel selection guidance provided in this section is intended to be in addition to country or region-specific regulatory requirements (see Annex D).

2.2.1 Suitability assessment

Marine management is responsible for determining the suitability of a vessel to undertake an operation.

Before any vessel is approved for operation the marine management should conduct a suitability assessment to determine whether it is fit-for-purpose for the area of operation and activities to be undertaken. An example suitability assessment process is defined in the RenewableUK ***Vessel safety guide***. Alternative suitability assessment processes should define:

- scope of activities;
- site-specific information, and
- vessel requirements to meet these.

Marine management should maintain a register of all vessels for which suitability assessments have been carried out.

The suitability assessment may solely be a desktop exercise, or if deemed necessary, may be combined with an onsite survey/audit of the vessel undergoing assessment. Marine

management may also arrange an audit of the Vessel Operator's shoreside office to verify compliance with the Vessel Operator's management system.

Site management should verify the existence and implementation of the crew competence scheme (see section 7).

The suitability assessment should be completed prior to the chartering of a vessel and should be revisited, as required, upon changes to the scope of vessel activities, site-specific information, or vessel requirements.

Non-conformities and/or observations identified during the Suitability Assessment should be clearly documented and communicated to relevant personnel. As required, a corrective action plan should be agreed upon and relevant non-conformities should be satisfactorily addressed prior to acceptance of vessel charter.

2.2.2 IMCA marine inspection

All small service vessels operating, or intending to operate, within a wind farm should have been subject to a Marine Inspection for Small Workboats (eMISW), or other industry accepted inspected programmes, within the last 12 months following the International Marine Contractors Association (IMCA) ***M 189/S 004 Marine Inspection for small workboats***. This is reported in the eMISW template, which sets out a standard format for inspection of smaller workboats (i.e. 500 gross tonnage and/or less than 24m), and can be shared through the eCMID database.

Only Accredited Vessel Inspectors (AVI) can perform an eMISW. Positive reporting by the AVI should be encouraged to ensure a comprehensive report is produced. Additional comments/ narrative provided in eMSIW report are encouraged to be factual in naturale; subjective reporting (i.e. opinions) are not encouraged in the eMSIW reporting format.

Site management should request all eMISW inspections to be completed in the electronic online format and have access granted to the report by the vessel supplier to monitor report status and close out of identified deficiencies.

For vessels on long-term charter, the eMISW should be undertaken annually.

The eMISW relates primarily to the status and condition of the vessel. It does not contain pass/fail acceptance criteria and does not make any statement on the assesseded vessel's suitability for operations, but instead aims to provide an assessment of the operating status based on key area such as structural integrity, safety of personnel, and environmental protection. Therefore, the eMISW is not considered a suitability or fit for purpose survey/ inspection, but should supplement the suitability assessment and provide key input for the vessel selection process.

2.2.3 Site verification

The results of the suitability assessment and eMISW should be verified through an inspection completed on site by a competent person before a service vessel engages in marine operations at a wind farm. In conducting an initial site verification inspection, the competent person should as a minimum:

- Conduct spot-checks of any required statutory certificates and verify that they are in order.
- Confirm that any findings from previous surveys or MISW inspections have been appropriately addressed.

- Confirm that key assumptions from the suitability assessment regarding vessel facilities and vessel selection criteria are valid. Including any assumptions regarding the installation of project/charter specific 3rd party equipment.
- Audit the marine crew's familiarity with the vessel management system, including witnessing a service vessel emergency drill and confirmation that records of previous drills are being maintained,, which may include:
  - fire drill;
  - man-overboard drill;
  - main propulsion or steering failure drill;
  - collision or grounding drill;
  - marine pollution (oil spill) drill;
  - evacuation from an offshore structure drill, or
  - vessel evacuation and abandonment drill.

Where there is evidence to doubt the findings of the eMISW after a site verification inspection, site management should either:

- request a review of the competence assurance system used by the original eMISW Inspector;
- request a new eMISW inspection, or
- conduct a more detailed fit-for-purpose inspection, including the scope of the eMISW.

Issues with the quality of eMISW reports completed by an AVI should be reported to the accreditation body, the International Institute of Marine Surveying (IIMS).

In-operation verification should be established for service vessels with a charter period longer than six months to ensure that they remain fit-for-purpose. In-operation verification should be carried out to the scope of an initial site verification. In addition, in-operation verification should be revisited, along with the suitability assessment (see section 2.2.1), upon changes to the scope of vessel activities, site-specific information, or vessel requirements.

2.3 CONTROL OF WORK

2.3.1 Risk assessments and method statements

All marine operations should be carried out according to an approved method statement incorporating a recognised risk assessment methodology (RA/MS), clearly identifying safety controls and demonstrating that the risk level of the operation is acceptable and ALARP. The RA/MS should have been submitted to site management for review and comment.

Site management should establish risk acceptance criteria for marine operations within the wind farm and share these with Contractors and Vessel Operators. In general, the risk level of an operation may be considered ALARP when all risks are minimised as far as practicable after having assessed foreseen failure modes, consequences and possible risk control measures. ALARP should be used to minimise both the probability of a hazardous event and the possible consequences.

In general, any new RA/MS should be submitted to site management for review and comment two weeks in advance of the planned work start date. This time period may be reduced for modifications to existing RA/MS, or in exceptional circumstances for project critical activities, but should not remove the responsibility for thorough review by site management and timely notification to all parties concerned.

Site management should develop operating procedures to describe the required process and risk controls for repetitive marine operations carried out on a regular basis (e.g. transport of technicians). Such procedures should be subject to periodic RA/MS review by site management. A marine operation carried out under a routine operating procedure may be subject to additional risk assessment, whenever deemed necessary.

2.3.2 Planning

An RFA should be prepared for any work requiring marine operations, and should detail:

- The scope and location(s) of the marine operation to be carried out and the associated RA/MS or procedure.
- The vessel(s) intended to be used for the marine operation.
- Industrial personnel and passengers required, their function in the marine operation and their certification status.
- Project equipment required to undertake the marine operation.
- Any other project cargo associated with the operation.
- Whether any bulk or packaged dangerous goods are to be loaded onto the vessels, including those covered by the IMO International Maritime Dangerous Goods (IMDG) Code.

Site management should continuously review planned works in the wind farm and maintain a forecast of work to be carried out. Site management should invite Vessel Operator and Contractor representatives to participate in all planning and look-ahead meetings relevant to their operations. The minutes of planning and look-ahead meetings should be circulated to all Vessel Operators and Contractors working on the site, together with updated work schedules and any newly issued RFAs.

Any access conflicts identified at the work planning stage should be noted with the RFA and Marine Coordination informed (see section 3.7.1).

2.3.3 Weather procedures

Site management should establish procedures to limit operations within the wind farm in adverse weather conditions. The procedures should include limiting weather criteria where applicable. These criteria should include, as appropriate:

- significant and maximum wave and swell heights;
- wind speeds and direction;
- peak and mean wave periods;
- current strengths and direction and tidal ranges, and
- thunderstorms and lightning.

Limiting criteria should be specific to the individual operation and within the safe working limits of the specific vessel and any of its associated equipment. Vessel-specific limiting criteria should consider the behaviour and motions of a service vessel in varying environmental and load conditions and adhere to the operating limits transcribed within its operators' manual or class documentation. This should be agreed by site management together with the Vessel Operator and the Master.

The limiting criteria for any marine operation should be stated on the RA/MS (and any

routine operating procedures) covering the operation. Limiting criteria specific to service vessels should be clearly communicated to the Master, marine crew, industrial personnel and passengers and Marine Coordination.

Site management may also define marginal criteria for all operations being undertaken in the wind farm. Marginal criteria should be lower than corresponding limiting criteria. Monitoring current and forecast weather conditions with reference to the limiting and marginal weather criteria is part of the responsibility of Marine Coordination (see 3.6.2).

Service vessel limiting criteria should be supported by measured behaviours or theoretical predictions wherever these are available.

Note: The Master has the overriding authority to halt any marine operation when judged necessary for the safety of life, environment and the vessel, before limiting criteria are reached.

2.4 INDUSTRIAL PERSONNEL AND PASSENGERS

2.4.1 General requirements

In this guideline, personnel who are on-board the vessel are categorised as:

– Marine crew (including the Master), who operate the vessel.
– Industrial personnel, including contractors and technicians, who are transported or accommodated for offshore industrial activities, such as construction or maintenance work on the wind farm.
– Passengers, including representatives of the site management, Vessel Operator and other parties, who are visiting the vessel or the wind farm.

Guidelines for the marine crew are given in section 7. Guidelines for other personnel, i.e. industrial personnel and passengers, are as follows:

- Site management should establish a certification matrix which defines the certification requirements for all industrial personnel and passengers on-board the service vessel, according to their access requirements within the wind farm and the work to be undertaken. The matrix should meet the minimum requirements in Table 1. Additional certificates should be included for work activity-specific training or as otherwise required by Coastal Administration regulations.
- All industrial personnel and passengers should maintain valid certification as required by the matrix, as appropriate to their access requirements. The validities in Table 1 should apply wherever they are less than that stated on the certificate.
- In addition to valid certification, all industrial personnel and passengers should be provided with a site induction in accordance with the wind farm operator's policy (See section 8.2.1).

Table 1: Crew, industrial personnel and passenger certification requirements

Certificate	Crew (not accessing WTG)	Industrial personnel	Passengers[1]
First aid	STCW Basic Safety Training	GWO Basic safety	Exemption by site management on a case-by-case basis
Sea survival	STCW Basic Safety Training	GWO Basic safety	
Fire awareness	STCW Basic Safety Training	GWO Basic safety	
Marine transfer	Company-specific	GWO Basic safety	
Working at height	Company-specific	GWO Basic safety	
Manual handling	Company-specific	GWO Basic safety	
Lifting operations	Slinger/banksman training	Slinger/banksman training	
Medical	Flag State certified medical (e.g. ENG 1 in UK)	Coastal Administration medical certificate	
Notes: See 2.4.2 for application processes and restrictions.			

Marine Coordination should maintain a database of all personnel authorised to transit to or undertake work within the wind farm, which should include:

– person's name, profession and company;
– copies of all required certificates including dates of validity;
– type of access granted (full or vessel);
– additional restrictions on transfer and/or work activities;
– any medication or health problems, and
– up-to-date next of kin information.

This information should be provided to site management for review in advance of the transit to the wind farm. All industrial personnel and passengers should be issued with a unique ID number in the database and a photocard bearing this number and the person's name, profession and company.

The database should comply with applicable data protection laws.

The photocard should clearly indicate the type of access granted and any restrictions on the methods of transfer or type of work that may be undertaken.

The database and photocards should be integrated with a personnel tracking system linked to the wind farm's offshore management system (OMS) to enable Marine Coordination to account for the location of all industrial personnel and passengers.

2.4.2 Exemptions

In exceptional circumstances, passengers may be embarked as visitors without holding the required

certificates. Application for such exemptions should be submitted to the site management for approval not less than 24 hours in advance of scheduled vessel departure and Marine Coordination informed of the outcome. The application should include a statement of medical fitness from the applicant or the applicant's employer unless in possession of a valid medical certificate.

Such exemptions should be considered on a case-by-case basis and should be limited to validity not greater than one week. Visitors should ordinarily be permitted only a single application and if future site access is required should obtain the necessary certification.

Temporary photocards should be issued to visitors and clearly marked to distinguish them from industrial personnel. Visitors should wear these photocards at all times.

Visitors should be escorted at all times by a designated site representative. The site representative should have no other duties assigned when fulfilling an escort role. This representative is responsible for providing additional instruction in:

– site safety procedures, and
– the use of lifesaving appliances and personal protective equipment.

A single designated site representative may escort no more than five visitors.

Visitors should only undertake transfer to wind farm structures or vessel-to-vessel transfer in exceptional circumstances. Visitor transfers should be subject to satisfactory risk assessment of the transfer method including any additional safety measures or operational limits. Visitors who are to undertake transfers should be escorted by two designated site representatives (one is to transfer ahead of the visitor and assist the transfer from the structure).

Exemptions may also be granted for crew changes transferring to or from other service vessels operating in the wind farm, provided that the transferees hold valid Basic Safety certification in compliance with IMO ***Seafarers' training, certification and watchkeeping (STCW) Code*** and seafarer medical certificates. The method of transfer should be subject to risk assessment (see 8.4.4 for vessel-to-vessel transfer requirements) and the transferees should be either:

– directly supervised by two designated site representatives, or
– provided training and induction as appropriate to the transfer method and approved by site management.

Vessel Operator representatives are also exempted from normal passenger certification requirements, provided that they hold valid STCW sea survival certification.

2.4.3 Personal protective equipment (PPE)

Subject to risk assessment and site requirements, all industrial personnel and passengers should wear the PPE listed in Table 2 and receive suitable training in its use. PPE should be inspected for damage, correct fit and confirmed as within test or service dates (as applicable) before use.

Industrial personnel and passengers should wear clothing appropriate to the activities to be carried out. Work wear should include high visibility and reflective clothing.

Standards other to those listed in Table 2 may provide an equivalent level of safety and be acceptable, or required, depending on country/region of operation. Refer to relevant Annex for country/region specific requirements.

Table 2: Recommended PPE requirements for industrial personnel and passengers

Description	Additional information	Usage requirement
Safety footwear	ISO 20345 *Personal protective equipment. Safety footwear*: minimum toe cap and protrusion protection sole; ankle high	At all times
Safety helmet	EN 397 *Industrial safety helmets*: chinstrap required; or EN 12492 *Mountaineering equipment. Helmets for mountaineers. Safety requirements and test methods*/ EN 14052 *High performance industrial helmets*; headlight for night operations	Open decks within the wind farm limits. Also during lifting operations/ working under risk of falling objects
Safety harness	EN 361 *Personal protective equipment against falls from a height. Full body harnesses*	Prior to and during a transfer
Safety belt and lanyard	EN 358 *Personal protective equipment for work positioning and prevention of falls from a height. Belts for work positioning and restraint and work positioning lanyards*	Prior to and during a transfer
Fall arrest lanyards	EN 354 *Personal fall protection equipment. Lanyards*/EN 355 *Personal protective equipment against falls from a height. Energy absorbers*, with energy absorber	Prior to and during a climbing transfer
Safety spectacles/ goggles	EN 166 *Personal eye protection. Specifications*, compatible with safety helmet	When risk assessment identifies potential exposure to chemical, splash, dust, gas or molten metal hazards
Gloves	ISO 21420 *Protective gloves. General requirements and test methods*/EN 388 *Protective gloves against mechanical risks*	When risk assessment identifies potential exposure to abrasion, blade cut, tear or puncture hazards

Table 2: Recommended PPE requirements for industrial personnel and passengers (continued)

Description	Additional information	Usage requirement
Lifejackets and immersion suits		
Lifejacket	EN ISO 12402-2 *Personal flotation devices. Lifejackets, performance level 275* *Safety requirements*; fitted with crotch strap	Open decks, prior to and during a transfer. To be kept readily accessible at all other times
Personal Locator Beacon (PLB)	Automatic common transmission type for the site	Integral to lifejacket, function check before boarding vessel
Immersion suit	SOLAS approved constant wear immersion suit (CE) air tight seals, well fitting, compatible with lifejacket or designed with integrated buoyancy, reflective and visible	When a need is identified by a risk assessment[2]

Notes:
1. Also to comply with Coastal Administration aviation standards for sites making use of helicopter access.
2. Factors to be considered should include: prevailing sea state, water temperature, visibility, lighting and certification status of the personnel.

3 MARINE COORDINATION

3.1 ROLES AND RESPONSIBILITIES

The site management should establish a Marine Coordination function to oversee all marine operations in the wind farm, provide information to service vessel Masters and coordinate an emergency response to any incident within the wind farm.

For individual or smaller near-shore O&M sites, site management may establish equivalent, proportional mitigation of marine risks in site procedures in place of a Marine Coordination function. This decision should be based on an individual assessment of the site.

Marine Coordination should:

- Have the overriding authority to prohibit marine operations within the wind farm with reference to agreed operational limits or on the advice of service vessel Masters and Contractors.
- Monitor and track all service vessels engaged in marine operations in the wind farm.
- Monitor the locations of all technicians and project crew in the wind farm.
- Maintain communication with all vessels engaged in marine operations in the wind farm.
- Coordinate marine operations within the wind farm to minimise access conflicts and vessel traffic hazards (see 3.7.1).
- Ensure that movements do not infringe restricted zones and structures to which access is permitted (see 3.7.2).
- Monitor weather conditions within the wind farm and distribute weather forecast updates to all vessels in the wind farm or directly connected to operations regarding the wind farm (see 3.6.2).
- Provide navigational advisory support to vessels transiting to the wind farm and engaged in marine operations within it.
- Maintain a database of all personnel authorised to transit to or undertake work within the wind farm (see 2.4.1).
- Coordinate any emergency response to any incident within the wind farm in co-operation with the relevant Coastguard or equivalent Coastal Administration authorities.

3.2 FACILITIES

The site management should assign a location for the exclusive use of Marine Coordination as a control room, or Marine Coordination Centre (MCC). The control room may be located onshore or offshore. It should be equipped with appropriate communications and monitoring equipment to undertake the task, and should be provided with dedicated network bandwidth sufficient to handle all workload and communication requirements.

MCC should be equipped with communications and monitoring equipment appropriate to to the complexity and geographic position of the site, but as a minimum should include:

- two telephone lines (including dedicated emergency number);
- duty mobile telephone;
- e-mail;
- VHF, TETRA or other site voice communication base station;
- means of monitoring marine VHF;
- means of transmitting and receiving by any other form of radio communications in use by service vessels and Contractors in the wind farm;
- Automatic Identification System (AIS) monitoring;
- CCTV monitoring (if installed in the wind farm);
- site-specific weather forecasting service;
- live environmental monitoring to determine:
  - wind conditions;
  - tide conditions;
  - sea state;
- status board(s)/display screens in a prominent location, and
- copies of site and vessel ERPs.

For far-shore projects additional Marine Coordination facilities and communication equipment may be required (see 3.7.6).

Marine Coordination should be provided with an integrated OMS with vessel tracking and recording to assist communication and monitoring activities. All service vessels operating on the wind farm should be provided with a tracking unit linked to the OMS that should account for industrial personnel and passengers on board or transferred to a wind farm structure.

A standardised means of communication between service vessels and Contractors should be in place. The preferred means of communication should be radio, with an independent second means of communication available. If mobile telephones are used as a secondary means of communication, the contact details for all Contractor work teams and service vessels should be circulated to all service vessels and Contractors working in the wind farm.

Redundant or uninterruptible power supplies should be available to the control room to ensure continued communication and monitoring in the event of a power outage.

Marine Coordination should, in consultation with relevant authorities and regulators, pre-define radio channels for use by service vessels and Contractors, taking into consideration other local users and any restrictions or requirements imposed by local authorities.

3.3 WATCH ORGANISATION

The site management should provide Marine Coordination with sufficient staff to ensure that there are sufficient competent marine coordinators in the control room whenever marine operations are being undertaken in the wind farm. At all times that the control room is staffed, one marine coordinator should be designated as the marine coordinator in charge of the watch. Deputy or relief marine coordinator(s) should be assigned and available to assist or relieve the duty marine coordinator(s) at any time.

When relieving a marine coordinator of the charge of the watch, the relieving coordinator should arrive a minimum of 15 minutes prior to starting the watch to conduct a proper takeover as follows:

- The incoming coordinator should review the status board and the takeover log.
- The outgoing coordinator should brief the incoming coordinator on:
  - marine operations:
    - completed during the preceding watch;
    - currently taking place, and
    - planned for the following watch.
  - current and forecast weather conditions, and
  - current service vessel movements/positions.
- The outgoing and incoming coordinators should systematically go through the takeover log together.
- The outgoing marine coordinator should ask whether the incoming coordinator is satisfied with the takeover and has any further questions.
- Once any issues or questions are resolved to the satisfaction of both the outgoing and incoming coordinator, the charge of the watch may be transferred and this recorded in the takeover log.

The marine coordinator in charge of the watch should remain in the control room where practicable. To accommodate comfort breaks, there should be a method for the marine coordinator to communicate with vessels at all times.

3.4 COMPETENCE

No marine coordinator should be permitted to hold the watch independently until assessed as competent by an experienced and competent marine coordinator or the site management. Such assessment should include on-the-job training in the use of Marine Coordination equipment and validation of the following:

- Understanding of relevant national and international regulations for maritime safety and protection of the marine environment.
- Knowledge of and ability to use navigational charts and nautical publications.
- Understanding of the content and application of the International convention on the international regulations for preventing collisions at sea (COLREGs).
- Knowledge of aids to navigation.
- Understanding of shipboard navigational equipment and electronic means of navigation.
- Ability to use and understand IMO Standard Marine Communication Phrases.
- Basic understanding of relevant vessel types, vessel stability, propulsion and bridge procedures.
- Understanding of the requirements of the IMO International maritime dangerous goods (IMDG) Code.
- Knowledge of the wind farm ERP and ERCoP.
- Ability to apply the ERP and ERCoP in simulated emergency situations.
- Knowledge of local nautical topography, hydrographic and meteorological characteristics.

– Knowledge of the characteristics of weather systems, reporting procedures and recording systems.
– Ability to interpret and apply the meteorological information available.
– Understanding of construction process and potential construction vessel operations; including possible corrective campaigns during operation and maintenance.

The site management should arrange training for marine coordinators as required to develop and maintain the competence requirements. Annual assessments should be conducted to verify appropriate competence and identify the need for any additional training.

Marine coordinators should be provided with, and maintain certification for, any radio operator licence training required by the Coastal Administration.

Marine coordinators should maintain a Competence Log to record:

– training courses received;
– on-the-job training;
– training for Marine Coordination watchkeeping, and
– the results of annual assessments including top-up or follow-on training requirements.

Endorsement for independent watchkeeping should be valid for a single wind farm site.

3.5 WORK PLANNING

3.5.1 Scheduling

Marine Coordination and Vessel Operators should exchange information at the start of a contract so that they understand each other's expectations and constraints affecting the scheduling of work. Good communication may enable schedules to be refined so that the requirements of both parties can be met.

Work should be scheduled so that it can be completed without breaching hours of work regulations, including allowing for start-up and shut-down and refuelling procedures (see 7.3.1). Staggering the scheduled hours of different vessels may allow flexibility to deal with unexpected demands towards the end of the working day.

Marine Coordination should monitor service vessel assignments and port logistics to ensure that unreasonable demands are not placed on service vessel marine crew and that hours of rest regulations are complied with.

3.5.2 Vessel manifest

No vessel should undertake a transit to, or undertake work of any kind within, the wind farm unless it has been issued with a manifest or granted permission by Marine Coordination. A manifest should only be issued following a satisfactory review of an RFA to undertake marine operations.

Marine Coordination should review the RFA, and in consultation with site management:

– Confirm that the vessel has been deemed suitable by the pre-charter inspections conducted on the vessel. A record of this acceptance should be available to the MC along with any expiry dates associated with the inspections;

- identify any potential hazards posed to the vessel by project cargo or equipment;
- if dangerous goods (DG) are to be carried, verify the vessel maintains appropriate certification (see following) and notify the Vessel Operator and flag/Coastal Administration authorities as required, and
- identify any access conflicts with other marine operations (see 3.7.1).

The appropriate certification for carriage of DG, unless the DG are in limited quantities, consists of a statutory 'Document of Compliance' for the carriage of DG. In addition, the range of goods and different DG classes should be such that the necessary segregation may be maintained in accordance with the IMDG Code.

Marine Coordination should issue the vessel(s) undertaking marine operations with a manifest prior to sailing. This should be issued as early as possible before the vessel sails. The following items should be considered for inclusion in the manifest:

- Names of marine crew assigned to the vessel and their position on board.
- Names of industrial personnel and passengers on board, their function in the marine operation and their certification status.
- Project equipment required to undertake the marine operation.
- Any cargo that may significantly affect the stability or seakeeping of the vessel.
- Any equipment or cargo containing hazardous materials or packaged DG.
- Any other project cargo associated with the operation.
- The destination of the industrial personnel, passengers and cargo (if relevant).

Where packaged DG are to be carried, the RFA and manifest should include the following details for each DG:

- UN number;
- proper shipping name;
- packing group;
- quantity;
- destination (if relevant);
- Material Safety Data Sheets (MSDS), and
- IMO declaration of DG according to IMDG.

3.6 PROVISION OF INFORMATION

3.6.1 Vessel traffic information

Marine Coordination should provide traffic information services to all vessels carrying out marine operations on behalf of the wind farm. This should include:

- Providing information on restricted zones (see 3.7.2).
- Monitoring of the status of navigational hazards and aids to navigation and advising all vessel Masters as appropriate.
- Monitoring the status of marine operations within the wind farm and advising Masters accordingly.

– Monitoring the location of personnel within the wind farm.
– Providing current and forecast environmental conditions to Masters.

Marine Coordination may require other service vessels such as the guard vessel (if in use) to perform a monitoring role and relay coordination to vessels outside of the range of Marine Coordination.

For vessels undertaking transits from more distant ports not in regular use by the wind farm, Marine Coordination and the Master should agree what part of the voyage should be supported by vessel traffic information.

3.6.2 Weather forecast

In addition to a general description of the weather situation and the predicted development, the weather forecast should, as relevant, include:

– wind speed and direction;
– waves and swell, significant and maximum height, mean or peak period and direction;
– rain, snow, lightning, ice etc.;
– tide variations and/or storm surge;
– visibility;
– air and water temperature, and
– barometric pressure.

Forecast conditions should be provided at a maximum interval of 12 hours for the next 48 hours. In addition, an outlook for at least the following 48 hours should be included.

The forecast should clearly define forecasted parameters, e.g. average time and height for wind or characteristic wave periods.

If undertaking a major marine operation, site management should consider contracting an additional, independent weather forecast source for the duration of the operation.

The latest forecast should be readily available to Marine Coordination, be provided to all service vessel Masters and Contractors undertaking major marine operations and be available on request to all Contractors and Vessel Operators.

Marine Coordination should monitor current and forecast weather conditions with reference to the limiting and marginal weather criteria (see 2.3.3) and inform service vessels and personnel engaged in marine operations if the criteria are forecast to be exceeded during the operation.

3.6.3 Master's handbook

Marine Coordination should develop and maintain an advisory document for the use of all service vessel Masters. This document should include details of:

– Site safety procedures and process relevant to marine operations.
– Reporting and notification requirements to Marine Coordination.
– Wind farm structures, layout and markings, including current schedule of installation works during the construction phase.

– Port requirements and reporting procedures.
– Information regarding other sea users and vessel traffic patterns in the area.
– Any agreed routes or template passage plans for transiting to the wind farm.

An example layout and suggested content of the Master's Handbook is given in Annex B.

The layout of wind farm structures should also be available in an electronic format compatible with electronic chart systems in use by service vessels.

3.7 CONTROL OF WORK

3.7.1 Access conflict

An access conflict is a situation where activities within the wind farm pose a potential hazard to other work being carried out, such as:

– overlap of restricted zones;
– a need for a service vessel to enter a restricted zone;
– existing work on a wind farm structure;
– work schedule clashes, and
– failure consequences from hazardous activities.

In the event of an access conflict, Marine Coordination should inform the originators of the affected RFAs. Marine Coordination, site management, the originators of the affected RFAs and affected Contractors and Vessel Operators should agree any special measures necessary to ensure the safety of the operations. Such measures may include, as appropriate:

– modifications to work schedules;
– communication routines and reporting requirements (contact details/radio channels for all affected parties are to be documented with the RFA), or
– restrictions on activities that may pose a hazard to the work, personnel or assets of any affected party.

In any case, all persons undertaking work and affected service vessel Masters should be informed of the access conflict and any special measures agreed.

Access conflicts involving a major marine operation should be considered for a more detailed simultaneous operations (SIMOPS) process. For further information see IMCA M 203 *Guidance on simultaneous operations (SIMOPS)*.

3.7.2 Restricted zones

Restricted zones of a minimum radius of 50 m should be established around all structures within the wind farm. Large Dynamic Positioning (DP) vessels require a 500 m radius restricted zone, which moves with the vessel. This includes service operation vessels (SOVs), accommodation vessels and construction vessels engaged in major marine operations (see 3.8.1). See figure 1 for examples of restricted zones.

Restricted zones should be defined by and enforced by Marine Coordination in cooperation

with the Contractors conducting the work and/or the Master(s) of the principal vessels.

Overlapping restricted zones should be considered access conflicts and addressed as specified in Section 3.7.1.

These restrictions should apply to all wind farm traffic, regardless of whether a statutory safety zone is in place that should apply to non-wind farm traffic in addition. Wind farm defined restricted zones should be contiguous with any statutory safety zones in force.

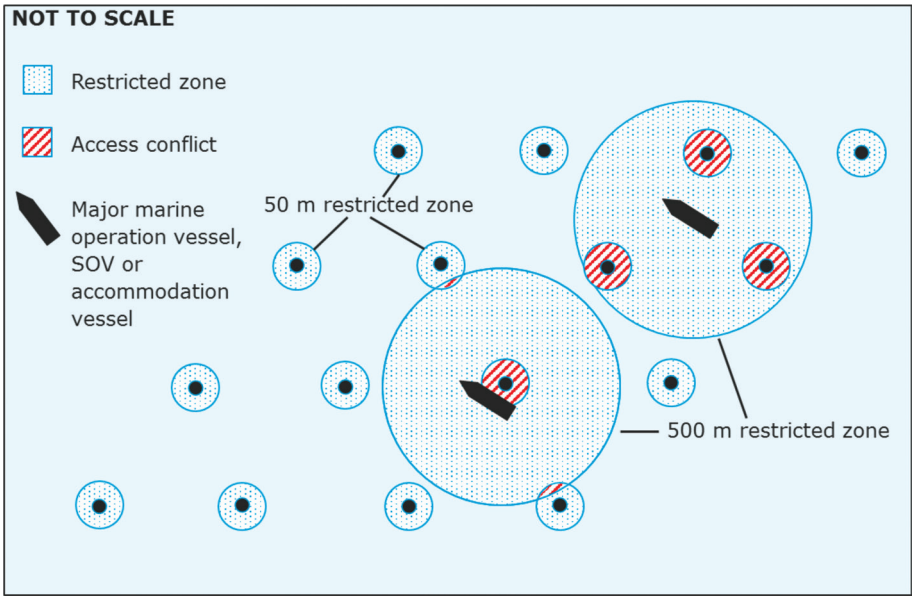

Figure 1: Examples of restricted zones

In defining restricted zones within the wind farm, Marine Coordination should consider the following:

- location and status of anchors and anchor lines;
- operating mode of DP vessels;
- presence of divers;
- bubble curtains in use;
- lifting operations, and
- hot work/smoking restrictions.

3.7.3 Thunderstorms

If thunder is reported within the windfarm, Marine Coordination should notify all service vessels and impose the following restrictions:

- no personnel are to be transferred to any wind farm structure, and
- service vessels free to manoeuvre should remain clear of wind farm structures.

If lightning is observed at a distance, personnel already on a wind farm structure may be recovered to a service vessel; however, this should only be undertaken when sufficient time

is available to safely evacuate.

3.7.4 Additional safety controls

Marine Coordination may at any time impose restrictions on navigation or marine operations permitted to be undertaken for service vessels operating in the wind farm, including:

– transit speed restrictions;
– more restrictive limiting weather criteria, and
– additional restricted zones.

All service vessel Masters should be notified of such restrictions at the time of their entry into force and again at the time they cease to apply.

Any decision to impose such restrictions should consider the following:

– whether the wind farm is experiencing restricted visibility;
– prevailing and forecast weather conditions;
– any major marine operations taking place within the wind farm;
– non-wind farm vessel traffic observed or known to be operating in the area, and
– known or observed navigational hazards.

3.7.5 Non-wind farm traffic

Marine Coordination should be familiar with the Coastal Administration regulatoryframework governing access to the wind farm, in addition to the details of all agreements reached with local authorities, sea users and other maritime stakeholders relating to access to the wind farm by non-wind farm traffic.

Any service vessel observing a vessel not engaged on the business of the wind farm within the wind farm limits should immediately inform Marine Coordination and continue to monitor the location of the vessel.

Marine Coordination should request a guard vessel or other available service vessel to attempt to establish contact with such vessels by radio or other means and inform them of:

– any statutory safety or exclusion zones applying to the wind farm;
– current traffic levels and marine operations taking place within the wind farm;
– hazards to navigation, and
– anchoring restrictions and hazards.

If the observed vessel enters the wind farm limits, Marine Coordination should advise all service vessels of the vessel's position, course and speed at intervals of not more than 15 minutes until the vessel has cleared the wind farm limits.

If the observed vessel is restricted in its ability to manoeuvre, Marine Coordination should consider assigning a service vessel to provide close escort until the vessel has cleared the wind farm limits. Marine Coordination may also request support from relevant authorities (e.g. CGOC for tug assistance/salvage).

Marine Coordination should report any observed infringements of statutory safety zones or

other Coastal Administration navigational restrictions to the appropriate local authorities.

3.7.6 Far offshore projects

Wind farms that are far offshore involve very different issues to the near-shore projects that are assumed in other parts of this guideline. Instead of daily transits from shore, far-shore projects may make use of SOVs, which are able to remain offshore for long periods. The operation of SOVs is outside the scope of this guideline, but the following addresses the use of small service vessels supporting SOVs and other far-shore operations or 24-hour offshore operations.

For far-shore projects, site management and Marine Coordination should identify the critical issues and develop plans and procedures to address them. The issues may include:

– MCCs may combine one onshore with one offshore on an SOV.
– Service vessels may be beyond VHF range from the onshore MCC requiring specialised communications equipment such as MF/HF radio.
– Communications blackspots may arise, with impact on the ERP.
– Multiple SIMOPS may occur, with different vessels working on different tasks.
– Vessel-to-vessel transfers may occur between CTVs, SOVs and accommodation vessels (see 8.4.4).
– Vessels may be idle offshore for long periods, requiring offshore mooring.
– Vessel maintenance is difficult to schedule in 24-hour operations.
– The possible need for offshore bunkering (see 8.4.1).

For far-shore projects involving long idle periods, when the small service vessels are crewed but not working, such as while waiting for weather, it may be desirable to shut down engines for maintenance. Site management should consider pre-laying mooring buoys during the construction of far-shore projects, to avoid the need to tie-off to turbines.

4 EMERGENCY PREPAREDNESS

4.1 EMERGENCY RESPONSE PLAN (ERP)

The site management should develop and maintain a site ERP for incidents within the wind farm or while transiting to or from the wind farm. The ERP should be developed taking into account foreseeable worst case incidents.

The ERP should establish:

- the emergency response organisation that will respond to an incident;
- the process for activation of the emergency response organisation;
- the process for escalating the emergency response according to incident severity;
- the priorities of emergency response within the wind farm, and
- definitions and classification of incidents for the wind farm.

ERP procedures should define:

- specific responsibilities of response personnel;
- initial actions for response personnel;
- follow-on or ongoing actions required, and
- post-incident actions and reporting.

The ERP should contain specific procedures to be followed in response to incidents within the wind farm, including but not limited to:

- evacuation from a turbine;
- evacuation from a substation or other structure;
- fire on a permanently attended installation;
- severe weather events (incl. hurricanes, typhoons, winter storms);
- thunder/lightning warning;
- helicopter rescue;
- marine pollution from a wind farm installation;
- marine incidents in the vicinity of the wind farm such as drifting vessels, and
- marine incidents involving service vessel(s):
  - man overboard;
  - fire/explosion;
  - collision;
  - grounding;
  - loss of propulsion, steering or position keeping, and
  - marine pollution.

Marine pollution incident procedures should address, but not be limited to, pollution by oil and incidents involving DGs.

Stranding of personnel on an offshore structure (e.g. due to weather conditions) should not be considered an emergency under the ERP. Site management should ensure that all personnel and installations within the wind farm are appropriately equipped and

prepared for the event of becoming stranded until recovery is possible by normal means of access.

Summaries of ERP procedures should be made available in a readily accessible format for all relevant parties in the wind farm. An example format is given in Annex C. This format should, where appropriate, distinguish between 'initial' and 'follow-on' actions required by all relevant parties. 'Considerations' for further and/or supporting actions may be included where their presence is judged to be beneficial.

A 24-hour company internal reporting line to a crisis management team should be in place.

Further guidance on an ERP is available in *G+ Integrated Offshore Emergency Response (G+ IOER) - Good practice guidelines for offshore renewable energy developments.* In all cases, the ERP should take account of local requirements and legislation.

4.2 NATIONAL RESPONSE PLANS

The requirements for each offshore wind farm are dependent on national requirements of individual Coastal Administrations. Refer to *G+ IOER - Good practice guidelines for offshore renewable energy developments for further guidance*.

4.3 EMERGENCY RESPONSE IMPLEMENTATION

Site management should ensure that all wind farm personnel, Contractors and service vessel Masters are familiar with the appropriate procedures in the ERP and coordination with local and national authorities. The ERP should include bridging documents to Contractor and Vessel Operator management systems, where applicable.

The ERP should include a schedule for periodic site incident drills involving Marine Coordination, service vessels and Contractors. Additionally, at least once a year a drill should be arranged in consultation with local authorities to also involve other relevant stakeholders.

PART B : VESSEL MANAGEMENT

5 VESSEL DESIGN AND EQUIPMENT

5.1 DESIGN AND CONSTRUCTION STANDARDS

The regulatory frameworks governing design and construction of small service vessels in different North Sea countries, as well as the United States of America (US), are summarised in Annex D. At present, most small service vessels are designed to operate up to maximum sea states and distance from land, as required by either Flag Administration regulations, Classification Society requirements or High-Speed Craft (HSC) Code. These requirements are part of the design, build and certification process regulated by the Flag Administration and the Classification Society. The operational requirements covering crew numbers and competence, passenger safety requirements, hours of operation, range from Safe Haven (see definition in Annex D - Table D.4) and companies' safety management systems are part of the certification process which the Vessel Operator should comply with to ensure their vessels maintain certification under a particular Flag Administration.

All these requirements and associated certification may be audited by a charterer before taking a vessel on hire. Example requirements for CTV design and construction are included in Annex A.

5.2 SAFETY EQUIPMENT

5.2.1 Navigation equipment

Notwithstanding equipment required by the Flag Administration or Classification Society, all service vessels should be fitted with the following equipment:

- a gyro or satellite compass;
- a fixed magnetic compass;
- speed and distance measuring device capable of measuring speed through water;
- two radars with plotting/automatic radar plotting aid (ARPA) function, including at least one X-band radar;
- a satellite-based navigation system, with alarms for loss of fix;
- a depth sounding device;
- rudder angle indicator (or direction of steering thrust);
- electronic chart display (see next paragraph), and
- Class A AIS.

Paper charts may be used as a primary means of navigation, but where practicable the primary means of navigation should be a certified Electronic Chart Display and Information System (ECDIS) (as defined in IMO Resolution A.817(19)). The Master and crew should be appropriately trained in the use of ECDIS according to STCW.

All electronic and paper charts should be kept updated according to a documented schedule.

5.2.2 Communication equipment

The vessel should be fitted with radio communications equipment appropriate to the Global Maritime Distress and Safety System (GMDSS) Sea Area of operation and meeting the requirements of the Flag Administration or Classification Society. A GMDSS shore-based maintenance agreement should be available on board.

The vessel should be provided with two independent means of communicating with contractors working within the wind farm. The preferred means of communication should be UHF/TETRA. Mobile telephone is acceptable as a backup if coverage is assessed to be sufficient. Otherwise satellite phone/communications should be used as a backup. If mobile telephones are used as a means of communication, the contact details for all Contractor work teams and service vessels should be circulated to all service vessels and Contractors working in the wind farm.

The vessel should be fitted or provided with any additional equipment necessary to ensure compatibility with wind farm communications infrastructure and communication.

Additional emergency hand-held VHF radios should be available on board.

The vessel should be equipped to connect to the internet via mobile data network, wireless Local Area Network (LAN) etc., as available at the site, to facilitate safety related communication, e.g. transfer manifests, weather forecasts, email communication etc. Further requirements for internet connection and availability to passengers on board may be specified.

The vessel should have a designated email address and a suitable mobile and/or satellite telephone.

5.2.3 Lifesaving appliances

Lifesaving appliances should comply with the IMO *International Life-saving Appliance (LSA) Code*, or as appropriate, applicable Flag regulations, and the EU *Marine Equipment Directive (MED)*. Lifesaving appliances should carry respectively SOLAS approval and MED mark of conformity (known as the 'wheelmark') and Flag state approval numbers as applicable.

A vessel-specific LSA manual should be available.

The vessel should carry life raft capacity of 200 % of the maximum allowed number of persons on board. It should be possible to launch a minimum capacity of 100 % from either side of the vessel. If all life rafts can be launched to either side or over the stern, the total capacity, minus any one life raft, may be reduced to 100 %. Manual release of life rafts should be possible from deck level without climbing deck structures.

Notwithstanding equipment required by the Flag Administration or Classification Society, all service vessels should also be fitted with the following lifesaving appliances:

- Approved life jackets for the maximum number of persons on board plus 10 %.
- Immersion suits for the maximum number of crew and for all industrial personnel and passengers on board when proceeding to sea.
- At least two life buoys, one on each side of the vessel, one with min. 18 m line and one with light.
- A man overboard (MOB) recovery arrangement to allow an unconscious person to be recovered from the water, appropriate for operation by the marine crew.
- Emergency pyrotechnical signal equipment.
- Search and Rescue Transponder (SART).

- Emergency Position Indicating Radio Beacon (EPIRB).
- All CTVs are to be fitted with seatbelts. The style of the belt should be a lap belt, as a minimum.

5.2.4 Fire safety equipment

Notwithstanding equipment required by the Flag Administration or Classification Society (where applicable), all service vessels should be fitted with the following fire safety equipment:

- A power-driven fire pump that is independent of main machinery failures.
- At least two fire hydrants and hoses with nozzles, sufficient to fight fire in any compartment on board.
- An automatic fire detection and alarm system for machinery spaces with indication at the vessel's control station.
- An approved fixed fire extinguishing system in all machinery compartments, available for deployment from outside the compartments.
- Sufficient portable fire extinguishers including at least one on each deck, one in each accommodation area and one at the entrance to each machinery space.
- Fire blankets in accordance with the safety plan, including at least one fire blanket in the accommodation.

All firefighting equipment should be maintained as per legal requirements and ready for immediate use.

Fire prevention measures should comply with relevant Flag Administration or Classification Society (where applicable) requirements.

5.2.5 Other safety equipment

Notwithstanding equipment required by the Flag Administration or Classification Society (where applicable), all service vessels should be fitted with the following additional safety equipment:

- An updated supply of medicine and medical equipment, in accordance with the Flag State and charterer's requirements.
- An automated external defibrillator (marine crew to be provided with appropriate training).
- A means of monitoring and tracking signals from the Personal Locator Beacon (PLB) system in use on the wind farm, unless provided for by navigation equipment.
- At least one permanently mounted searchlight and one battery-powered portable searchlight (to protect against power failure).
- A spine board and stretcher for casualty evacuation (to be provided by site management together with appropriate training and induction for marine crew).
- Displayed emergency posters/muster lists, clearly showing the responsibilities of crew, industrial personnel and passengers.

Additional requirements for safety equipment are included in Annex A.

5.2.6 Personal protective equipment (PPE)

Subject to Vessel Operator's occupational risk assessments and site requirements, all marine crew members should wear the PPE listed in Table 3.

Standards other than those listed in Table 3 may provide an equivalent level of safety and be acceptable, or required, depending on country/region of operation. Refer to relevant Annex for country/region specific requirements

Table 3: Recommended PPE requirements for marine crew

Description	Additional information	Usage requirement
Safety footwear	EN ISO 20345 ***Personal protective equipment. Safety footwear***, minimum toe cap and protrusion protection sole, ankle high	At all times
Safety helmet	EN 397 ***Industrial safety helmets***, chinstrap required; or EN 12492 ***Mountaineering equipment. Helmets for mountaineers. Safety requirements and test methods***/ EN 14052 ***High performance industrial helmets***; headlight for night operations	Open decks within the wind farm limits. Also during lifting operations/working under risk of falling objects
Fall arrest systems[1]	EN 354 *Personal fall protection equipment* – Lanyards/ EN 355 *Personal protective equipment against falls from a height* - Energy absorbers/ EN 358 *Personal protective equipment for work positioning and prevention of falls from a height*. Belts for work positioning and restraint and work positioning lanyards, two lanyards required/ EN 361 *Personal protective equipment against falls from a height.* Full body harnesses/ EN362 *Personal protective equipment against falls from a height.* Connectors	Open decks in exposed locations (e.g. transfer area, in way of open bulwark doors, working outboard from guard rails) or with risk of falling from height
Safety spectacles/ goggles	EN 166 ***Personal eye protection. Specifications*** compatible with safety helmet	When risk assessment identifies potential exposure to chemical, splash, dust, gas or molten metal hazards
Gloves	ISO 21420 ***Protective gloves. General requirements and test methods***	When risk assessment identifies potential exposure to abrasion, blade cut, tear or puncture hazards
Lifejackets and immersion suits		

Lifejacket	EN ISO 12402- 2 *Personal flotation devices. Lifejackets, performance level 275. Safety requirements*; fitted with crotch strap	Open decks, to be kept readily accessible at all other times
Personal Locator Beacon (PLB)	Automatic common transmission type for the site	Function check before boarding vessel
Immersion suit	SOLAS approved constant wear immersion suit (CE) airtight seals, well fitting, compatible with lifejacket or designed with integrated buoyancy, reflective and visible	When a need is identified by a risk assessment
Notes: 1. Appropriate for use with fastening points.		

6 VESSEL MANAGEMENT

6.1 ROLES AND RESPONSIBILITIES

6.1.1 Vessel Operators

Vessel Operators should:

- Ensure all vessels provided for marine operations are fit-for-purpose, in compliance with Flag Administration and Coastal Administration regulatory requirements and maintained in good condition.
- Cooperate in the planning and execution of inspections and surveys as required.
- Ensure that all marine crew are competent, appropriately trained and maintain the required certification.
- Maintain a vessel management system and establish appropriate bridging documents to the wind farm management system (including the ERP).
- Comply with and work with the site management in planning and conducting marine operations.

6.1.2 Service Vessel Master

The Master of the service vessel has the overriding authority in relation to the operation and navigation of the vessel, the responsibility to make decisions with respect to safety and pollution prevention, including calling off operations if conditions are unsafe, and requesting the Vessel Operator's assistance as may be necessary.

The Master should:

- Understand, follow and enforce site safety procedures and marine procedures.
- Maintain the vessel in a condition to safely engage in marine operations within the wind farm.
- Account for all industrial personnel and passengers manifested to the vessel throughout the marine operation.
- Maintain communication with Marine Coordination and other vessels within the wind farm.
- Report any defect or failure which may render the vessel unsafe or not fit-for-purpose to the Vessel Operator and the site management.
- Report any incidents, accidents, near-misses and observations according to the vessel's SMS and the Charterers' procedures.
- Observe instructions and restrictions to navigation within the wind farm issued by Marine Coordination.
- Act proactively as a safety ambassador, promoting a positive and proactive safety culture among crew, industrial personnel and passengers on board.
- Ensure that the vessel operates in compliance with the Vessel Operator's management system (see 6.2) and the marine operations guidance (see section 8).
- Ensure that all crew members are adequately rested and fit for duty (see 7.3).
- Ensure that toolbox talks are carried out before any work is commenced.

– Conduct incident drills in support of the site ERP (Section 4) and vessel emergency procedures (Section 9).
– Produce a daily report on operation and performance of the vessel in accordance with Charterers' requirements.

6.2 VESSEL MANAGEMENT SYSTEMS

6.2.1 Safety management system

The Vessel Operator should maintain a safety management system (SMS) in accordance with the principles of IMO *International safety management (ISM) Code*, including:

– A safety and environmental protection policy.
– Instructions and procedures to ensure safe operation of the vessel and protection of the environment in compliance with relevant international, Flag Administration and Coastal Administration requirements.
– Defined levels of authority, responsibilities and lines of communication between and amongst shore Vessel Operator personnel and service vessel marine crew.
– Procedures for reporting incidents, near misses, hazards and non-conformities with the vessel or wind farm management system.
– Emergency preparedness and response procedures, including an auditable plan of monthly drills.
– Procedures for internal audits and management reviews.
– A preventive maintenance system (PMS), which provides a structured approach to identify and address potential issues before they lead to equipment failures or operational disruptions. This includes, planned activities, inspections, and maintenance tasks performed on a regular basis to ensure the vessel's systems and equipment are in optimal working condition.

The vessel SMS should comply with the HSE management system for the individual site. The charterers and Vessel Operators should establish and agree bridging documents to the site management system prior to the service vessel being engaged in work in the wind farm. These documents should be subject to review and approval by the site management.

6.2.2 Environmental protection

Vessel Operators should provide a spill response plan for any oil or chemical spills. Spills of oil or chemicals in quantities deemed reportable under applicable legislation should be notified to the Charterers immediately with a follow-up incident report. Sufficient oil spill kit should be available on all vessels.

For vessels undertaking oil transfer to structures in the wind farm, the Vessel Operator should establish procedures for these transfers and agree these with the site management, vessel regulators and local authorities as appropriate. These procedures should include a service vessel-specific Ship Oil Pollution Emergency Plan (SOPEP) Manual, approved by the Flag Administration where required by the vessel's size.

The vessel management system should include a Garbage Management Plan describing the arrangements for the collection and disposal of garbage to reception facilities ashore.

The vessel management system should describe the arrangements for the overboard discharge and the retention of sewage and grey water in compliance with local restrictions on discharge in the area(s) of operation.

6.2.3 Healthy working environment

The vessel management system should include requirements for the cleaning of food preparation areas and training of any marine crew members involved in the preparation of food for personnel on board.

The vessel management system should describe any disinfection arrangements for potable water facilities and the arrangements for testing and inspection of fresh water systems for the presence of legionella bacteria. Test intervals should be no more than six months.

Although typically only applicable to vessel 500 gross tonnage or over, the Maritime Labour Convention (MLC), Regulation 3, may be used as guidance in relation to food preparation, supply of water and sanitation. Additional example requirements for health protection are the example requirements for CTVs provided in Annex A.

7 MARINE CREW

7.1 NUMBER OF CREW

The number of crew should be at least according to the 'Minimum Safe Manning Certificate' of the Flag Administration and of adequate number for completion of vessel scope of work when giving consideration to fatigue and ability to effectively respond to an emergency at sea. The number of crew should never be less than two, and the crew carried should not impinge on the passenger numbers.

7.2 COMPETENCE

7.2.1 Certification of competence

All marine crew should be STCW qualified according to the vessel's safe manning document. Original certificates of competence should be kept on board. Appropriate licenses and endorsements for their position for the flag state may be applicable in lieu of STCW. See applicable country annex for further guidance.

All marine crew should hold a valid deck or engine department STCW certificate of competency (CoC) or certificate of proficiency for the size of vessel, main propulsion machinery and service restrictions. Competence requirements for the Master are given in 7.2.2. The mate/ deck hand should, as a minimum, be qualified as a navigational watch rating, according to STCW Regulation II/4. All marine crew should hold a valid seafarer's medical certificate.

A certificate of equivalent competency (CeC) may be granted by a Flag Administration if the applicant holds a CoC from an Administration whose standards of competency and training are considered equal to those of the Flag Administration. The process for application of a CeC will be defined by the Flag Administration.

No person should be employed as a member of the marine crew and assigned emergency duties on the muster list unless they have been assessed as competent by the Vessel Operator and hold necessary certification for work in this capacity.

All persons in charge of a navigational watch or assigned duties as part of a navigational watch should have documented competence in the use of navigational equipment and received training appropriate to the type of equipment and their duties.

If no member of the marine crew is required to hold an engine department CoC by the Flag Administration then at least one crew member should hold a certificate of attendance for a Flag Administration approved engine course, certificate of proficiency in motor operation or equivalent evidence of competence.

One member of the marine crew should have demonstrated sufficient vessel handling skills and familiarisation with vessel controls to manoeuvre the vessel in the event of the Master being incapacitated.

7.2.2 Master's competence

The Master of a service vessel should hold an STCW CoC/CeC issued by the Flag Administration under the provisions of STCW Regulation II/2 or II/3. In the UK, Master certification for less than 200 GT with STCW endorsement is acceptable. Commercially endorsed RYA/MCA Yacht Master is not acceptable.

The Master and crew should also receive suitable and sufficient training in first aid at sea.

Assessment of competence should include demonstration of:

- vessel handling in varying conditions;
- manoeuvring in restricted areas and berthing;
- appreciation of limiting parameters of the vessel;
- measures to ensure the stability and watertight integrity of the vessel;
- sound knowledge of the propulsion system;
- familiarity with all bridge navigation and communication equipment;
- familiarity with vessel controls and back-up control arrangements;
- procedures for the carriage of dangerous goods on the vessel;
- safe approach to wind farm structures to undertake transfer, and
- safe transfer of personnel and cargo.

A new Master should be trained by an appointed and experienced training Master and complete a familiarisation test.

7.2.3 Competence scheme

The Vessel Operator should maintain a competence scheme to assess and document the competence of marine crew. The elements comprising the scheme should be reviewed by the Vessel Operator at frequent intervals and aligned to a recognised competence framework (such as IMCA C 017 ***Guidance on competence assurance and assessments: marine roles for small workboats***). The scheme should be supplemented by external training and certification as appropriate. Required elements should include, as appropriate to their role:

- Basic sea survival training
- STCW Basic Safety (certificated courses):
  - basic first aid,
  - personal survival techniques, and
  - basic fire fighting.
- vessel handling and navigation;
- keeping a proper lookout;
- medical care (certificated course);
- radio operation;
- RADAR;
- bridge team management;
- stability;
- ECDIS;

- closed loop communication;
- English language skills;
- sufficient training according to IMDG;
- induction/training on onboard cranes;
- slinger or banksman (certificated course), and
- marine transfer.

The competence scheme should include monitoring of certificate/competence element validity by the Vessel Operator.

7.2.4 Competence log

All marine crew members should maintain a competence log that should record:

- personal and company details;
- certificates held and training courses completed, and
- summary of sea service record including:
  - vessel particulars;
  - operating areas;
  - validating references;
  - site and vessel familiarisation periods, and
  - competence assessments.

Persons undertaking the role of competence assessors should have appropriate demonstrable competence, in line with IMCA *Guidance for competence assessment*.

The competence log should be made available for review by the site management upon request. Site management should review the competence logs for newly joining crew members assigned duties for the operation of the vessel (i.e. not required for crew members undertaking training or familiarisation).

7.2.5 Site induction

All marine crew should receive a site induction in accordance with the wind farm operator's policy. This should include familiarisation with the Masters' handbook and demonstration of site personnel transfer procedures. Satisfactory understanding of the induction should be assessed by a designated site representative or the vessel Master.

7.2.6 Vessel familiarisation for marine crew

All marine crew should be sufficiently trained in ship board operations prior to service on board the vessel. The Vessel Operator should apply a crew training and familiarisation programme for new crew members. Such training should include:

- Requirements for assisting the Master if incapacitated.
- Communication with other persons on board on elementary safety matters and understanding of safety information symbols, signs and alarm signals, particularly for:
  - a person falling overboard;
  - detection of fire or smoke, and
  - fire, abandon ship or general alarms.

- Immediate actions required in the event of an emergency.
- Location and use of lifesaving appliances.
- Identification of muster stations and emergency escape routes.
- Provision of medical treatment in the event of an accident or other medical emergency before seeking further assistance.
- Location and operation of all firefighting equipment and systems.
- Location and operation of emergency equipment including:
  - emergency generator (if fitted);
  - emergency fire pump, and
  - remote stops and shut-off valves.
- Closing and opening of any fire screen, weather-tight or watertight doors (other than hull openings).
- The vessel's SMS, including:
  - vessel procedures;
  - preventive maintenance system (PMS), and
  - incident reporting.

Marine crew having received familiarisation training should have their competence assessed by the Master or other representative of the Vessel Operator and such assessments should be documented in the competence log.

Vessel familiarisation for industrial personnel and passengers is covered in 8.2.1.

7.3 FITNESS FOR DUTY

7.3.1 Hours of rest

The Vessel Operator should ensure that the vessel has sufficient qualified crew members to avoid the need to work excessive hours. Crew numbers should be sufficient to ensure that a suitably qualified person is always on duty.

The minimum permitted hours of rest are defined by the Maritime Labour Convention (MLC) and any national requirements.

The Master should ensure (unless work is required in response to an emergency) that all crew members comply with the minimum hours of rest, are properly rested when they begin work and obtain adequate rest when not on duty. Crew members who have participated in an emergency response during scheduled rest periods should be provided with an adequate period of compensatory rest as soon as practicable.

Hours of work limits apply to individual crew members. The operating schedule for the vessel should therefore include vessel start-up, shut-down and refuelling time in port, as these tasks must be performed within the permitted working hours of the crew (see 3.5.1).

If crew members are expected to take rest periods while the vessel is on station, consideration should be given to the suitability of the vessel's accommodation to ensure that they are not disturbed by normal vessel operations, weather conditions or external noise.

The required hours of rest should be considered as a minimum and allowance should be made for the following considerations:

- Changes in weather conditions or unexpected changes to operational requirements may delay the vessel, and allowance should be made so that such delays do not take the crew below their minimum hours of rest.
- Tidal conditions may need to be considered on some sites.
- The physical demands of working on a small vessel for extended periods may lead to increased fatigue, particularly in certain sea states (due to vessel movement).
- An effective navigational watch must be maintained at all times, so waiting time between transits cannot automatically be considered as hours of rest.
- Account should also be taken of the number of consecutive working days, as tiredness may accumulate during busy periods.
- There will be a limited number of crew available to share the workload, so consideration should be given to the demands placed upon each crew member, particularly the Master, who will have additional responsibilities.

While travel to and from work is not included in hours of work, it is good practice to take into consideration whether crews need to travel long distances to join the vessel or from the vessel to accommodation during their rest period.

Masters, and any member of the crew, should be empowered to stop work if there is a risk of hours being breached or if they believe that fatigue is affecting safe operation.

Documentation on compliance with regulations on hours of rest should be kept updated and available on board.

7.3.2 Drugs

No person under the influence of non-prescribed drugs or alcohol should be considered fit for duty as marine crew.

8 MARINE OPERATIONS

8.1 OPERATIONAL PROCEDURES

The Vessel Operator should establish procedures, plans and instructions, including checklists as appropriate, for key shipboard operations. Procedures should be available for:

- conducting toolbox talks;
- operation within an offshore wind farm;
- entering a restricted zone (see 3.7.2);
- mooring;
- bunkering (see 8.4.10 for offshore bunkering, if relevant);
- lifting operations relevant for the lifting appliances on board, including external lifting appliances used for loading or discharging;
- lashing and seafastening;
- transport of dangerous goods (according to IMDG);
- connection or disconnection of shore power;
- handling of garbage, waste and sewage;
- transfer of personnel from vessel to or from offshore structure (in accordance with the Charterers' procedures);
- access to the ship in port (use of gangway or equivalent);
- transfer of personnel from ship to ship (if relevant);
- offshore fuel transfer (if relevant), and
- sailing in following seas.

8.2 PRIOR TO DEPARTURE

8.2.1 Vessel induction

All people (e.g. back office company employees) wishing to board the vessel should obtain sufficient knowledge regarding safety on board through a vessel induction. Induction and vessel familiarisation for the marine crew are covered in 7.2.

Industrial personnel and passengers should be provided with a vessel-specific induction covering:

- Communication with other persons on board on elementary safety matters and understanding of safety information symbols, signs and alarm signals, particularly for:
  - a person falling overboard;
  - detection of fire or smoke, and
  - fire, abandon ship or general alarms.
- Requirements for the carriage and stowage of dangerous goods.
- Procedures for being on deck while in transit (if permitted), smoking (if permitted), crane operations, seating (i.e. when approaching Wind Turbine Generators [WTGs]).
- Requirements and instructions in the use of PPE.
- Location and instruction in the use of lifesaving appliances.

- Identification of muster stations and emergency escape routes.
- Other immediate actions required of them in the event of an emergency.
- Availability and provision of medical treatment.

Such inductions should be provided prior to the vessel beginning a transit to the wind farm. Pre-recorded visual and audio inductions may be used when service vessel equipment allows and may be kept running continuously during embarkation and preparation for departure.

Site management may require inexperienced industrial personnel and passengers to be escorted by a designated site representative.

Industrial personnel and passengers who will be undertaking transfers should have their familiarity with the site (and vessel-specific where appropriate) transfer procedures assessed to the satisfaction of the marine crew.

8.2.2 Passage planning

A proper passage plan should be in place before departing port, which is known and understood by the Master, watchkeepers and Marine Coordination. The passage plan should be in accordance with the requirements of Chapter V, Regulation 34 of *SOLAS* and consider all available information relevant to the vessel, including at least the following:

- Met-ocean conditions:
  - wind/current strength and direction;
  - sea state;
  - visibility;
  - weather forecasts, and
  - tidal conditions.
- Planned route:
  - tracks, distances, times and waypoints:
    - use of parallel index lines should be planned where appropriate, and
    - WTGs' offshore platforms or other wind farm installations should not be used as waypoints for passage planning,
  - navigational hazards and/or exclusion zones;
  - shipping lanes, separation schemes and local port transit restrictions;
  - intended transit gate to the wind farm, and
  - nearest safe havens along the planned route.
- Pilotage:
  - port of departure/arrival;
  - navigation marks and lights;
  - relevant VTS information/notices and warnings;
  - constraints en-route, and
  - radio channels to be used.
- Watches:
  - maintenance of hours of rest, and
  - watchkeeping duties and rota.

Passages planned during restricted visibility should identify the control measures in place to manage the additional risks.

All crew involved in vessel navigation should sign or initial the passage plan to show that they have read and understand the contents. Amendments made to the plan during the execution

and monitoring stages should also be documented and endorsed accordingly.

The Master should be familiar with any pre-defined or template passage plans for regular passages. Such plans may be produced by either site management or the Vessel Operator. The Master should advise Marine Coordination of their intention to use such a plan, in which case the Master should also advise any intended deviations from the plan. The Master should also review such a passage plan to ensure that due account has been made of any new Notices to Mariners, shipping hazards or information from Marine Coordination. The use of a pre-defined or template passage plan is solely at the discretion of the Master.

The Master should have at all times up to date hydrographic information and navigational charts (paper or electronic – see 5.2.1), and is responsible for keeping this information up to date (e.g. navigation warnings, notice to mariners, port/local notices) with the support of the Vessel Operator.

Marine Coordination may at any time recommend an alternative transit gate to that in the passage plan, based on current marine operations, environmental conditions and vessel traffic and should notify the Master of any change. The Master should notify Marine Coordination of the necessary deviations from the passage plan.

8.2.3 Preparation for departure

Before departing port, the following should be verified to the satisfaction of the vessel Master:

- Pre-departure checks of machinery and equipment are carried out in accordance with Vessel Operator policy and manufacturer's recommendations.
- Manifest and referenced Requests for Access are confirmed with Marine Coordination.
- Latest weather forecast has been confirmed with Marine Coordination.
- Sufficient reserves of fuel and consumables are on board for the transit and planned marine operations, such that a minimum 10 % pumpable margin is available upon return to port.
- Industrial personnel, passengers, cargo and equipment are as declared on the vessel manifest.
- All cargo and equipment is safely loaded, stowed and secured so as not to pose a hazard to the vessel or persons on board.
- Any hazardous materials or dangerous goods are loaded, stowed, secured and properly documented in accordance with Flag Administration, Coastal Administration, Vessel Operator and site management requirements.
- All industrial personnel and passengers are appropriately dressed for the vessel's passage (and transfer where applicable) in accordance with site management requirements.

In addition, Marine Coordination is to be advised of the passage plan, including details of:

- vessel name;
- manifest reference;
- planned departure point and time, and
- estimated arrival time at wind farm limits.

Site Management is responsible for ensuring dangerous goods are properly packed and manifested and the Vessel Operator informed. The Master should be notified accordingly and may refuse to load the goods if satisfactory notification has not been received or the goods are not properly packaged.

8.3 TRANSIT

8.3.1 Departure from port

The Master should notify Marine Coordination at the time of departure from port, confirming:

- number of marine crew, industrial personnel and passengers as per manifest, and
- updated estimated time of arrival.

Notification of departure should also be provided to any relevant local authorities.

8.3.2 Transit to wind farm

When in transit to the wind farm, the Master should adhere fully to the requirements of the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs) and local Notices to Mariners, in addition to the following:

- Adhere to local radio reporting requirements for port control, VTS and other sea users.
- Listen to any scheduled safety broadcasts by local authorities.
- Adhere wherever possible to recommended routes agreed with local authorities, respect agreed speed limits and any enforceable or statutory safety zones.
- Report to Marine Coordination on arrival at planned waypoints.
- notify Marine Coordination of any significant deviation from the passage plan, including:
  - reason for deviation (e.g. weather conditions), and
  - revised estimated time of arrival.

The marine crew are responsible for maintaining accountability of industrial personnel and passengers during transit and ensuring adherence to vessel safety rules and transit restrictions. The Master has the right to refuse to sail with any industrial personnel or passenger who fails to follow instructions on board, and to return to port in the event of a person refusing to obey lawful instructions or service vessel/site procedures.

For their safety, all CTV passengers should remain seated with seatbelts fastened during periods of transit, transfer and berthing or when asked to do so by the crew. If passengers need to leave their seat for welfare or work reasons, they shall do so only for the time required.

Industrial personnel and passengers should only be permitted access to open decks with the permission of the Master. No industrial personnel or passenger should be permitted to be on the open deck alone. Access to the open deck should be prohibited when the service vessel is transiting at high speed or in marginal/adverse weather conditions.

Site management should, in consultation with the Master and Vessel Operator, prepare vessel-specific guidelines for seating and deck access restrictions. These should consider:

- arrangements for the protection of personnel on the open deck;
- seating arrangement including motion compensation;
- service vessel transit speeds;
- vessel motion characteristics, and
- limiting environmental criteria.

8.3.3 Arriving at the wind farm

When transiting to the wind farm, the Master should notify Marine Coordination when the vessel is within two nautical miles of the transit gate assigned in the passage plan.

The Master should notify Marine Coordination when passing through the assigned transit gate and notify all personnel on board of entry to the wind farm.

8.3.4 Departing from the wind farm

On completion of the assigned marine operations, the Master should confirm the location of all manifested industrial personnel and passengers, and request Marine Coordination for permission to depart the wind farm in accordance with the passage plan.

When departing the wind farm through the assigned transit gate on a return transit to port, the Master should again notify Marine Coordination, with estimated time of arrival and notify all personnel on board that transit restrictions are in effect.

8.3.5 Return to port

Following a return transit from the wind farm, the Master should notify Marine Coordination at the time of mooring and again when all personnel have disembarked from the vessel.

8.4 IN-FIELD MARINE OPERATIONS

The following sections describe site management requirements for a series of marine operations. These requirements should be observed in the preparation of site operating procedures and RA/MS for any such operations.

Operating procedures and RA/MS for other marine operations not listed here should observe applicable requirements for the listed operations and aim to achieve an equivalent level of control and reporting.

8.4.1 In-field transits

Service vessels should not undertake in-field transits between locations within the wind farm without first notifying Marine Coordination of the point of departure and the intended destination.

Service vessels should obey any speed restrictions imposed by Marine Coordination while undertaking in-field transits.

Restrictions on personnel movement and access to the outside deck apply as defined in 8.3.2.

Navigation within the wind farm limits should be subject to additional safety controls (see

3.7.4). These restrictions may be disregarded if:

– the Master judges it necessary for safe navigation, or
– the service vessel is taking part in an emergency response.

In such cases, notification should be given to Marine Coordination at the earliest opportunity.

8.4.2 Entry into restricted zones

No service vessel is to enter a restricted zone (see 3.7.2) without first obtaining permission from Marine Coordination. In the case of a restricted zone around a major marine operation, permission should be requested from the Master or officer in charge of the navigational watch of the principal vessel.

If permission to enter the restricted zone is given, the service vessel Master should comply with any restrictions on navigation or vessel activities that are requested. Marine Coordination should be informed of the decision and of any restrictions that have been imposed.

Once permission is granted, but prior to entering a restricted zone, the Master should advise all personnel on board of any special restrictions applying to the restricted zone. The marine crew are responsible for enforcing such restrictions.

If permission is not given, the service vessel Master should agree an alternative route or ordering of tasks with Marine Coordination.

If a small service vessel is undertaking a marine operation (e.g. vessel-to-vessel transfer) with a larger service vessel while making way, the Master of the larger vessel is responsible for ensuring that the combined operation adheres to restricted zone navigation restrictions.

8.4.3 Personnel transfer to wind farm structures

All transfers of personnel between service vessels and offshore structures in the wind farm should be conducted in accordance with the relevant sections in EI/G+ ***Good practice guideline: Working at height in the offshore wind industry***, and also with reference to applicable parts of the IMCA SEL 025/M 202 ***Guidance on the transfer of personnel to and from offshore vessels and structures***.

Before approaching an offshore structure where personnel are already engaged in work activities, communication should be established between the service vessel and the personnel on the structure. The transfer should only proceed if both the Master and the personnel on the structure are satisfied that the work activity does not present a risk to the service vessel and that the presence of the service vessel poses no risk to the work activity. If either party does not consider these conditions to have been met the transfer should be postponed and Marine Coordination informed. Either party may propose additional operational safety measures to be in place before proceeding with the transfer; these should be agreed by both parties and reported to Marine Coordination.

The vessel radars should, wherever possible, be switched off while transferring people so the transferees are not exposed to any radar beams.

The means of communication between the service vessel and the personnel to be transferred should be tested and verified to be working before the transfer takes place.

The Master should advise personnel before engaging with an offshore structure to undertake transfer and all personnel are responsible for taking appropriate precautions to mitigate the impact.

All industrial personnel and passengers should remain seated with seatbelt fastened until the vessel is safely pushed on to the structure and the marine crew gives the clearance to stand.

A member of the marine crew should be designated as the Transfer Assistant. Transferees (i.e. personnel undertaking transfer) should remain at a safe location on the vessel clear of the transfer area until called forward by the Transfer Assistant.

The Transfer Assistant should:

– conduct visual inspections of the ladder, transfer area, boat and structure fendering;
– conduct pre-use checks of the Self-Retracting Lifeline (SRL);
– conduct pre-use checks of any personnel transfer system in use, and
– notify the Master on satisfactory completion of the checks.

The Master should authorise personnel transfer based on:

– the motions of the service vessel;
– the prevailing environmental conditions, and
– the stability of the connection between the vessel and the structure.

Vessel motion monitoring systems may be fitted to assist the Master in judging the appropriate conditions for a safer transfer.

Once the Master has authorised transfer from the vessel, the Transfer Assistant should:

– call the first transferee forward to the transfer area;
– check correct use of PPE by the transferee;
– check transferee for any items that may fall during climbing or working aloft, such as radios, tools or other items not in an approved lifting bag;
– pull down the SRL and assist the transferee in attaching it;
– stand back from the transfer area and observe the transfer when the transferee is clear of the vessel, and
– notify the transferee and the Master of any potential hazards observed during the transfer.

When recovering personnel to the vessel, the Transfer Assistant should:

– count down the remaining rungs of the ladder to the transferee and inform the transferee when it is safe to step across to the vessel;
– assist the transferee back onto the service vessel, and
– assist with disconnection from the SRL.

Once disconnected from the SRL, transferees embarking to the vessel should move to a safe location clear of the transfer area.

Notification should be made to Marine Coordination before undertaking any transfer and confirmation given upon completion. This notification should include the following information:

– vessel or structure with which the transfer is taking place, and

– ID numbers of transferees.

The Master should maintain a daily log of all transfers noting this information and the time of transfer.

The logging and notification of personnel transfers should be through an electronic solution integrated with Marine Coordination's OMS. Regardless of the means of logging and notification, the location of all manifested industrial personnel and passengers should be available to the vessel and Marine Coordination at any time.

Unscheduled transfers (not required by an RFA) may be authorised by Marine Coordination on a case-by-case basis. Personnel may only be recovered to a service vessel other than that which they are manifested to with the approval of Marine Coordination, who should notify both service vessel Masters accordingly.

In an emergency situation, the Master may conduct transfers of personnel as deemed necessary for their safety, but should notify Marine Coordination at the earliest practical opportunity.

8.4.4 Vessel-to-vessel personnel transfer

Vessel-to-vessel personnel transfers between small vessels are not recommended, and should only be undertaken with the prior approval of Marine Coordination and the agreement of all parties involved. There should be a demonstrable requirement for the transfer.

Vessel-to-vessel personnel transfers may include:

– transfers between two small service vessels such as CTVs or small workboats;
– transfers between small service vessels and SOVs (which may be dynamically positioned), or
– transfers between small service vessels and accommodation vessels (which may be moored).

Each type of transfer involves different hazards, and may require different types of mitigation. Guidance on vessel-to-vessel transfer using a small boat is given by the IMCA SEL 025/M 202 *Guidance on the transfer of personnel to and from offshore vessels and structures*.

The method of transfer should be subject to a RA/MS and with a plan in place for the transfer prepared by Marine Coordination in consultation with the vessel Masters. The plan should clearly define the responsibilities of the service vessels, Marine Coordination and transferees. The plan should have been circulated to all parties for review and acceptance. The plan should consider:

– certification status of the transferees;
– supervision of the transfer method;
– communication between transferees, marine crew, vessel Masters and any other persons taking part in the operation, and
– limiting environmental criteria and vessel motion considerations for the method of transfer.

8.4.5 In-field waiting time

Service vessels not actively engaged in marine operations but whose continued presence in the wind farm is necessary (e.g. continued recovery of technicians from structures) should observe safe distances from other wind farm traffic and marine operations, and should take account of restricted zones (See section 3.7.6).

Marine Coordination may request service vessels to hold positions within the wind farm such that in the event of an emergency on any manned offshore structure an appropriate service vessel will be able to render assistance within 20 minutes.

If conditions permit, and with permission from Marine Coordination, service vessels may loosely moor to wind farm structures,

A proper lookout and listening watch should be maintained at all times when within the wind farm.

Anchoring is prohibited within the wind farm limits except within specially defined anchoring zones or if the need to anchor is clearly defined in the marine operation method statement. Regardless, anchoring is only to take place with permission from Marine Coordination.

8.4.6 Guard vessels

Guard vessels should in general:

– hold station at the wind farm limits at the closest points of approach by local shipping lanes;
– maintain a low speed transit around the wind farm limits, or
– hold station down-wind/tide from a major marine operation restricted zone.

8.4.7 Restricted visibility

During periods of restricted visibility, complying with COLREGs is paramount. The Master should follow site guidance on when to transfer personnel.

8.4.8 Thunderstorms

The vessel Master should report any observations of thunder or lightning to Marine Coordination and make a note of such in the vessel logbook (see 3.7.3 for operational restrictions in such cases).

8.4.9 Oil transfer to wind farm structures

Offshore oil transfer may include transfer of fuel to generators on wind turbines or performing gearbox oil exchanges on turbines. The transfer may involve pumping of bulk liquids or lifting of drums. Offshore bunkering is discussed separately in 8.4.10.

All personnel involved in the transfer operation should be familiar with such procedures. The procedures should define the process to be followed for the personnel responsible for:

– controlling the vessel during the oil transfer;
– controlling the bunkering operation on the vessel, and

– controlling the filling hose and nozzle on the structure.

Service vessels transferring oils should be specially equipped for the purpose, to the satisfaction of flag and Coastal Administration requirements (see IMO ***International convention for the prevention of pollution from ships*** (MARPOL) Annex I and IMO ***International maritime dangerous goods*** (IMDG) Code).

Oils transferred from designated tanks forming part of the structure of the service vessel should be classified under UN 1202 (gas oil, diesel fuel or heating oil, light). Where such tanks form a part of the vessel's fuel system only marine fuels in compliance with the necessary requirements of MARPOL Annex I should be transferred.

Two fire hoses and nozzles should be prepared with immediate availability of water from the fire main, in case it is needed for boundary cooling. Additional portable fire extinguishers should be provided and be readily available for use.

Transfer arrangements should not interfere with the supply of fuel to the main propulsion and auxiliary systems.

The design and installation of the transfer arrangements should adequately control the risk of fire and explosion. For this purpose, the following functional requirements should be met:

– means should be provided to control leakage of oil;
– means should be provided to limit the accumulation of flammable vapours;
– the ignitability of combustible materials should be restricted, and
– ignition sources should be separated from combustible materials and flammable liquids.

Piping systems for transfer should be protected from mechanical damage and effectively secured against excessive movements and vibration.

Filling hoses should:

– be certified for use with flammable liquids (e.g. EN 13765);
– be effectively stowed when not in use and protected from damage;
– be fitted with an appropriate filling nozzle incorporating an automatic shut-off device;
– be fitted with dry break couplings, and
– be arranged to avoid excessive tension in couplings.

8.4.10 Offshore bunkering

The vessel's bunkering procedure should be bridged to site-specific bunkering procedures. Records of bunkering should be maintained in the vessel's logbook and oil record book for the duration of the charter.

8.4.11 Lifting operations

All lifting operations carried out to or from a service vessel should be conducted in accordance with a recognised guideline or standard e.g. IMCA M187 *Guidelines for lifting operations*, BS 7121 *Code of practice for the safe use of cranes* or OGP RP 376 *Lifting and hoisting safety*

recommended practice.

Routine lifts (e.g. personal equipment bags) may be conducted with service vessel marine crew acting as banksman and/or slinger, provided that they have received appropriate training in these roles.

Guidance on dropped object prevention is provided in the G+ *Good practice guideline: Working at height in the offshore wind industry* and the G+*/DROPS Reliable securing booklet for offshore wind*. Aspects of DROPS that could be applied to lifting operations from small service vessels include a pre-task checklist, best practice recommendations on reliable securing, and a backloading guide.

8.5 WATCHKEEPING

Watchkeeping should be conducted in accordance with the requirements, principles and guidance set out in STCW sections A-VIII and B-VIII, observing in particular that:

- A proper lookout should be maintained at all times while at sea.
- The person in charge of the navigational watch should be physically present at the control position or in a directly associated control location at all times while at sea.

The person in charge of the navigational watch should not be considered to be the lookout when navigating in restricted visibility or severe weather.

The person in charge of the navigational watch should consider assigning another member of the navigational watch as a lookout when navigating in confined or congested waters.

When navigating in confined or congested waters, restricted visibility or severe weather, no person without an operational function may be present at the control position.

In addition to members of the navigational watch, persons with an operational function include:

- Other members of the marine crew who are conducting work that cannot be performed elsewhere, including training.
- Persons performing urgent repairs to navigational equipment that cannot be postponed.
- Persons evaluating the members of the navigational watch.
- Port and sea pilots.
- Surveyors, inspectors and any agent of the flag or Coastal Administration in performance of official duties.

Other persons may be designated as having an operational function by the Vessel Operator where there is a specific operational need to access the control position, but in all cases their presence may only be at the agreement of the person in charge of the navigational watch.

Confined waters are defined as an area of sea where the vessel's manoeuvring is constrained by the width of the safely navigable waterway.

Congested waters are defined as an area of water where due to the presence of many vessels in the vicinity, a repeated risk of collision exists, and/or an area of water where actions to avoid a collision are limited by the existence of another vessel or fixed structure.

When navigating in these conditions, all members of the navigational watch should use closed loop communication to acknowledge instructions are heard and understood. Navigational orders should be repeated back to the person giving the order who should confirm the repetition is correct. If the order is incorrectly repeated the person giving the order should respond in the negative and repeat the order.

9 EMERGENCY PREPAREDNESS

The vessel should carry and adhere to a project-issued ERP (see section 4).

The Vessel Operator should identify potential emergency situations and develop emergency procedures to respond to them. Emergency procedures should be available for:

- man overboard and recovery;
- injury or sickness of passengers, industrial personnel or crew;
- grounding;
- collision;
- fire;
- evacuation of vessel;
- oil pollution;
- loss of engine power;
- loss of ability to manoeuvre;
- towing, and
- assistance to vessels in distress.

The Master should conduct frequent training of emergency drills and communicate the purpose of on-board training. Drills should be as realistic as practicable and should, when possible, incorporate crew, industrial personnel and passengers. This obligation should be included in the Master's checklist and induction.

10 REFERENCES

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EN 166 Personal eye protection. Specifications

EN 354 Personal fall protection equipment. Lanyards

EN 355 Personal protective equipment against falls from a height. Energy absorbers

EN 358 Personal protective equipment for work positioning and prevention of falls from a height. Belts for work positioning and restraint and work positioning lanyards

EN 361 Personal protective equipment against falls from a height. Full body harnesses

EN362 Personal protective equipment against falls from a height - Connectors

EN 388 Protective gloves against mechanical risks

EN 397 Industrial safety helmets

EN ISO 12402-2 Personal flotation devices. Lifejackets, performance level 275. Safety requirements

EN ISO 12402-3 Personal flotation devices. Lifejackets, performance level 150. Safety requirements

EN 12492 Mountaineering equipment. Helmets for mountaineers. Safety requirements and test methods

EN 13765 Thermoplastic multi-layer (non-vulcanized) hoses and hose assemblies for the transfer of hydrocarbons, solvents and chemicals - Specification

EN 14052 High performance industrial helmets

EN ISO 20345 Personal protective equipment. Safety footwear

EN ISO 21420 Protective gloves — General requirements and test methods

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International convention on the international regulations for preventing collisions at sea, COLREG

International convention on the safety of life at sea, SOLAS

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International safety management (ISM) Code

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Seafarers' training, certification and watchkeeping (STCW) Code

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29 CFR Labor

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ANNEX A
EXAMPLE REQUIREMENTS FOR CREW TRANSFER VESSELS

No.	Category	Subject	Requirement
1	General requirements	3rd party verification	The vessel should carry a valid IMCA Common Marine Inspection Document (CMID), not more than 12 months old in reference to date of delivery to the Charterers. The CMID should be provided by the Owners and the inspection should be conducted by a 3rd party IMCA inspector. The CMID report should be made available to the Charterers upon request. Evidence should be provided for all findings being addressed, before the vessel is accepted on hire
2	General requirements	Points of contact	The Owners should appoint single points of contact respectively at their office, covering all issues, and one at each vessel, being the Master. The Owners should provide contact details for points of contact before the vessel is accepted on hire
3	General requirements	Charterers right to obtain data from vessel operator	If requested by the Charterers, the Owners should provide records from ECDIS, RADAR, CCTV, VDR etc as applicable
4	General requirements	Hand-over at crew changes	Masters and officers, on CTVs all crew members, should have a formalised procedure to secure proper sharing of operational information at crew change. Written hand-overs should be available for all crew changes
5	General requirements	Access control	The Master and crew should safeguard that no unauthorised personnel are allowed to come on board or go offshore
6	Vessel construction, structure etc	Asbestos	The vessel should satisfy national regulations on asbestos
7	Vessel construction, structure etc	Accommodation, general	The accommodation should be in accordance with the Maritime Labour Convention (MLC 2006). Any deviations should be approved by flag state or classification society and evidence for approval should be available on board

No.	Category	Subject	Requirement
8	Vessel construction, structure etc	Accommodation, general	Indoor or sheltered dry baggage storage should not obstruct the escape way, muster station, etc
9	Vessel construction, structure etc	Noise	The design of the passengers' area should be such that noise and vibrations are kept to as low as possible
10	Vessel construction, structure etc	Trip hazards	Trip hazards should be mimimised and should be clearly marked
11	Vessel construction, structure etc	Comfort, climate control	The vessel should be equipped with HVAC (Climate control) system in the accommodation before 1 January 2019
12	Vessel construction, structure etc	Equipment, general	Adequate, sufficiently approved and suitably located equipment should be provided for safe and efficient operation of the vessel
13	Vessel construction, structure etc	Equipment, general	Relevant equipment should as a minimum be in accordance with IMO conventional requirement and applicable equipment directives and approval standards to the nationality of the vessel. – lifesaving appliances; – marine pollution prevention equipment; – fire protection; – navigation equipment, and – radio communication equipment.
14	Vessel construction, structure etc	Equipment, general	Without prejudice to other requirements, all equipment should comply with IMO conventional requirement and applicable equipment directives and approval standards to the nationality of the vessel
15	Vessel construction, structure etc	Smoking area	All enclosed areas should be non-smoking
16	Vessel construction, structure etc	Smoking area	If designated smoking areas are provided, they should be clearly defined and provided with waste disposal facilities
17	Vessel construction, structure etc	Walkways	Handrails should be installed along the entire walkway from the accommodation to the transfer area
18	Vessel construction, structure etc	Wheelhouse	The Master should be able to control the vessel from the wheelhouse whilst having an unobstructed view over the docking and MOB area

No.	Category	Subject	Requirement
19	Vessel construction, structure etc	Wheelhouse	All areas of the vessel used as rescue zones should be either visible from the bridge or monitored from the bridge by CCTV
20	Vessel construction, structure etc	Rescue zone	Rescue zones should be clearly marked on the freeboard
21	Vessel construction, structure etc	Propulsion	The vessel should have minimum two independent drivelines
22	Vessel construction, structure etc	Propulsion	The vessel should have minimum two independent propulsion engines
23	Vessel construction, structure etc	Propulsion	The vessel should have a service speed of at least 22 knots
24	Vessel construction, structure etc	Public toilets	Toilet facilities should be permanent, integrated installations with safe access in any conditions
25	Vessel construction, structure etc	Accommodation, galley	The accommodation and galley should be maintained in a clean and hygienic condition
26	Vessel construction, structure etc	Accommodation	The vessel should be equipped with individual seating (including seatbelts fitted) for all persons on board. Seating comfort and whole body vibration should be taken into consideration in the design
27	Vessel construction, structure etc	Accommodation	The passenger area should have windows preferably with a view to the horizon forward or aft
28	Vessel construction, structure etc	Accommodation	There should be at least two emergency exits from the passenger area
29	Vessel construction, structure etc	Accommodation	The passenger area should have power sockets for computers
30	Vessel construction, structure etc	Accommodation	The passenger area should contain at least one table for four persons
31	Vessel construction, structure etc	Accommodation	The passenger area should have enough space for the passengers to safely put on the safety equipment, immersion suits etc
32	Vessel construction, structure etc	Stability	The stability booklet should be approved by the Flag State, Classification Society or certifying authority

No.	Category	Subject	Requirement
33	Lifesaving appliances	Lifesaving appliances approval	Lifesaving appliances should comply with the LSA Code and the EU Marine Equipment Directive and carry respectively SOLAS approval and Wheel Mark as applicable
34	Lifesaving appliances	LSA manual	A vessel-specific LSA manual should be available
35	Lifesaving appliances	Life raft capacity	The vessel should carry life raft capacity of 200 % of the maximum allowed number of persons on board. It should be possible to launch a minimum capacity of 100 % from either side of the vessel If all life rafts can be launched to either side or over the stern, the total capacity, minus any one life raft, may be reduced to 100 %
36	Lifesaving appliances	Life rafts	Manual release of life rafts should be possible from deck level without climbing deck structures
37	Lifesaving appliances	Life-jackets	The vessel should carry approved life-jackets for the maximum number of persons on board plus 10 %
38	Lifesaving appliances	Immersion suits	The vessel shall carry immersion suits for the maximum number of crew and for all industrial personnel and passengers on board when proceeding to sea
39	Lifesaving appliances	MOB	The number and location of lifebuoys should be in accordance with an approved safety plan. As a minimum, two lifebuoys, one on each side of the vessel, one with min. 18 m line and one with light
40	Lifesaving appliances	MOB	The vessel should be fitted with a man overboard (MOB) recovery arrangement to allow an unconscious person to be recovered from the water. It should be appropriate for operation by the marine crew
41	Lifesaving appliances	MOB	Equipment for a conscious person to recover from the water by their own efforts (e.g. a Jason's cradle) should be available on board
42	Lifesaving appliances	SART	Search and Rescue Transponder (SART) should be available on board
43	Lifesaving appliances	EPIRB	Emergency Position Indicating Radio Beacon (EPIRB) should be available on board

No.	Category	Subject	Requirement
44	Lifesaving appliances	Emergency pyrotechnics	Emergency pyrotechnical signal equipment, in accordance with flag state requirements, should be available on board
45	Safety equipment	Medical equipment	An updated supply of medicine and medical equipment should be available on board, in accordance with Flag State and charterer's requirements, taking account of the area and pattern of operation of the vessel
46	Safety equipment	Automated external defibrillator	An Automated External Defibrillator (AED) should be available on board. (type subject to Charterer's approval)
47	Safety equipment	Emergency shower	Minimum one emergency shower should be available on board
48	Safety equipment	Lifelines	Lifelines should be fitted with shock absorbers as applicable
49	Safety equipment	Safety information boards	Information boards for general information regarding safety or other important information should be installed in public areas
50	Safety equipment	Safety information equipment	Audio/video equipment should be installed in public areas for the purpose of communicating safety information
51	Safety equipment	SOPEP equipment	Sufficient oil spill kit should be available on all vessels
52	Safety equipment	Rescue	The vessel should ensure that site management has provided a spine board and stretcher for casualty evacuation and abandonment kits, together with appropriate training and induction for marine crew
53	Safety equipment	Rescue	The rescue stretcher should be prepared for hoisting
54	Safety equipment	Search and rescue equipment	The vessel should be fitted with a means of monitoring and tracking signals from the Personal Locator Beacon (PLB) system in use on the wind farm, unless provided for by navigation equipment
55	Safety equipment	Seating with seat belts	Seat belts should be fitted for all industrial personnel and passengers. The style of the belt should be a lap belt, as a minimum

No.	Category	Subject	Requirement
56	Safety equipment	Emergency plan	Emergency posters/muster lists should be displayed, clearly showing the responsibilities of crew, industrial personnel and passengers
57	Safety equipment	Signs	Relevant IMO and health and safety signs/posters should be in place
58	Safety equipment	Search lights	The vessel should be fitted with at least one permanently mounted searchlight and one battery-powered portable searchlight
59	Safety equipment	CCTV	The transfer area, engine rooms and MOB recovery area/rescue zone should be covered by CCTV with loop recording function for minimum 72 hours
60	Safety equipment	CCTV	The aft deck and the smoking area should be covered by CCTV with monitoring from the bridge
61	Navigation equipment	General	All installed bridge and navigation equipment should be readily available and in full working condition
62	Navigation equipment	Navigation lights	The vessel should be capable of showing all relevant lights and signals in accordance with the International Regulations for Preventing Collisions at Sea (COLREGs)
63	Navigation equipment	Navigation lights	A redundant navigation light system should be installed on vessels built after 1 January 2018, and for older vessels where practicable
64	Navigation equipment	Alarm system	A general alarm (GA) system should be installed, audible anywhere on board the vessel
65	Navigation equipment	Public announcement system	A public address (PA) system should be installed where appropriate for the vessel
66	Navigation equipment	Intercom	A communication system should be installed for communication between bridge personnel and deck personnel at relevant areas, including mooring decks, MOB station and transfer areas
67	Navigation equipment	Electronic chart display	If electronic chart display is used as the primary means of navigation, the system should be approved by flag state and/or classification society. The navigation officers/OOW should carry certification of training and competence for the system

No.	Category	Subject	Requirement
68	Navigation equipment	Nautical charts, updating	All nautical charts on board, either paper charts or electronic chart display, shall be kept updated at any time including OWF specific navigational and operational information, issued by the Charterers. A schedule for updating the primary navigation chart should be available and documented
69	Navigation equipment	Electronic chart display	An electronic chart display, preferably with AIS and RADAR overlay should be installed. The chart system should facilitate voyage and target tracking. It shall be possible to produce a screen dump for voyage tracking
70	Navigation equipment	Magnetic compass	A fixed magnetic compass should be installed. The compass should be properly adjusted and the vessel should carry a deviation table in accordance with the SOLAS Convention
71	Navigation equipment	Electronic compass	A gyro compass or satellite compass should be installed on board
72	Navigation equipment	Radar	Two radars with plotting/ARPA function should be available on board, including at least one X-band radar
73	Navigation equipment	GPS	A satellite based navigation system (GNSS, e.g. GPS, GLONASS, BEIDOU or Galileo), with alarm for loss of fix, should be installed on board
74	Navigation equipment	AIS	An Automatic Identification System (AIS Class A) should be installed. The AIS should be readily available (subject to local restrictions), kept operational and updated with correct vessel details
75	Navigation equipment	Speed log	A speed and distance measuring device should be installed
76	Navigation equipment	Rudder indicator	A rudder angle/thrust angle indicator should be installed
77	Navigation equipment	Echo sounder	A depth sounding device should be installed
78	Communication equipment	GMDSS	The vessel should be fitted with radio communications equipment appropriate to the GMDSS Sea Area of operation and meeting the requirements of the flag Administration or classification society
79	Communication equipment	GMDSS	A GMDSS shore-based maintenance agreement should be available on board

No.	Category	Subject	Requirement
80	Communication equipment	On board communication	Additional emergency hand-held VHF radios should be available on board
81	Communication equipment	Site communication	The vessel should be provided with two independent means of communicating with contractors working within the wind farm. The preferred means of communication should be UHF/TETRA, with mobile telephone acceptable as a backup
82	Communication equipment	Site communication	The vessel should be fitted or provided with any additional equipment necessary to ensure compatibility with wind farm communications infrastructure and communication
83	Communication equipment	Internet connection	The vessel should be equipped to connect to the internet via mobile data network, wireless LAN etc., as available at the site, to facilitate safety related communication, e.g. transfer manifests, weather forecasts, email communication etc
84	Communication equipment	Internet connection	The vessel should have a designated email address
85	Communication equipment	Telecom	The vessel should be fitted with a suitable mobile- and/or sat telephone
86	Deck arrangements and equipment	Lighting	Adequate and appropriate lighting should be available above all deck areas to allow for safe working during darkness
87	Deck arrangements and equipment	Handholds	The vessel should be designed to ensure, as far as reasonably practicable, that personnel can maintain three point contact anywhere on the deck and in the accommodation areas
88	Deck arrangements and equipment	Clear access	Access to safety equipment or emergency escape routes should not be impeded at any time
89	Deck arrangements and equipment	Passage ways	The vessel should have sufficient passage ways for the operations to be undertaken by the vessel in such a manner that the safety of personnel or cargo is not compromised
90	Deck arrangements and equipment	Safe zones	Safe areas and places of refuge should be clearly marked

No.	Category	Subject	Requirement
91	Deck arrangements and equipment	Anti skid surface	All walkway passages should have non-skid surface paint or other means to avoid slippery deck surfaces
92	Deck arrangements and equipment	Cargo area	The vessel should be arranged with a dedicated cargo area. There should be free passage/walkways around the cargo area
93	Deck arrangements and equipment	Cargo securing	The dedicated cargo area should be equipped with suitable lashing points of sufficient number and strength
94	Deck arrangements and equipment	Cargo securing	Lashing points should be clearly marked/ specified with Safe Working Load/ Working Load Limit (SWL/WLL)
95	Deck arrangements and equipment	Stowage, securing	Equipment not in use should be properly stowed and secured
96	Deck arrangements and equipment	Bunker stations	Bunker stations should be fitted with a spill tray
97	Deck arrangements and equipment	Overflow pipes	Overflow pipes from oil and bunker tanks should be equipped with sufficient means of spillage prevention/spill trays and spark arrestor
98	Deck arrangements and equipment	Craning area	A designated craning area for hooking on and off cargo, should be defined and clearly marked. The craning area should be located within reach of the turbine foundation davit crane and arranged in such a way that double-handling of goods is minimised. The craning area should be at the same level as the cargo area and manual handling should, as far as practically possible, be avoided
99	Deck arrangements and equipment	Cranes	Any cranes installed on board should be approved and certified, and regularly tested (i.e. once per year) according to manufacturer's specifications and/or local requirements
100	Deck arrangements and equipment	Register of lifting appliances	If any lifting appliances are on board, the vessel should maintain a 'Register of lifting appliances and items of loose gear'
101	Deck arrangements and equipment	Lifting gear	A dedicated quarantine box should be available for lifting gear not in use

No.	Category	Subject	Requirement
102	Deck arrangements and equipment	Hook on points	Tested and certified hook on points/ wire for safety lines should be located anywhere on board with a risk of falling more than 2 metres or into the water. At the following locations as a minimum: – pilot station; – MOB recovery station; – transfer points, and – signal mast
103	Deck arrangements and equipment	Work zones	Working on open decks close to the water or over the side requires use of lanyard or fall arrestor
104	Deck arrangements and equipment	Fresh water	Insect nets should be fitted on air pipes for fresh water tanks
105	Deck arrangements and equipment	Paint and chemicals	Paint and chemical stores should be properly secured and all chemicals and paint should be recorded and Material Safety Data Sheet (MSDS) and COSHH assessment should be available for use
106	Mooring, berthing and personnel transfer	Moorings	The vessel should carry own mooring lines, suitable for the size of vessel and enabling the vessel to perform secure mooring at a given berth on site/ harbour. Mooring lines should be type approved, certified as applicable and subject to regular visual inspection and maintenance according to PMS
107	Mooring, berthing and personnel transfer	Mooring arrangement	Bollards should be marked/specified with their SWL/WLL
108	Mooring, berthing and personnel transfer	Mooring arrangement	A bird's eye view diagram should be posted of the mooring deck arrangement showing the whole area as a 'snap-back' danger zone
109	Mooring, berthing and personnel transfer	Means of embarkation	Means of safe and secure embarkation and disembarkation of personnel is the responsibility of the vessel and should comply with IMO Maritime Safety Committee Circ. 1331; ***Guidelines for Construction, Installation, Maintenance and Inspection/Survey of Means of Embarkation and Disembarkation***

No.	Category	Subject	Requirement
110	Mooring, berthing and personnel transfer	Means of embarkation	The means of embarkation should minimise the stepping gap and preferably should consist of a flat walkway or similar, resting at the quayside/pontoon and at the vessel. Means of safe access is subject to approval by the Charterers
111	Mooring, berthing and personnel transfer	Means of embarkation	If a gangway is used with any risk of falling into the water, a safety net should be rigged under the gangway
112	Mooring, berthing and personnel transfer	Means of embarkation	Life saving appliances, e.g. lifebuoy and line equipment, should be readily available near the gangway
113	Mooring, berthing and personnel transfer	Lighting at gangway	The gangway area should be suitably illuminated
114	Mooring, berthing and personnel transfer	Lighting at transfer area	Personnel transfer areas should be suitably illuminated
115	Mooring, berthing and personnel transfer	Bow fender	The vessel should be fitted with a bow fender manufactured from appropriate materials to provide adequate friction when pushed onto an offshore structure foundation. A clearance of minimum 500 mm between the fully compressed fender and the ladder, and a maximum stepping distance of 650 mm between a suitable non-slip surface on the vessel and the ladder, should be provided. The bow fender should be adapted to the specific boat landing of the OWF (geometry, strength etc.) and dimensioned for the displacement and manoeuvrability of the vessel to ensure minimum impact to the boat landing
116	Mooring, berthing and personnel transfer	Bow fender	The bow fender should be adequately maintained and in safe, technical condition during the contract period
117	Mooring, berthing and personnel transfer	Impact load	The Owners should be able to document that the loads transferred to the boat landing complies with Charterers' requirements. The Charterers should provide boat landing design strength for the particular site

No.	Category	Subject	Requirement
118	Mooring, berthing and personnel transfer	Transfer area	The transfer area should be of sufficient size for a vessel crew member to assist safely in offshore transfer operations
119	Mooring, berthing and personnel transfer	Transfer capability	The vessel should be able to carry out transfers to wind turbines in an agreed maximum significant wave height, as specified by the Charterers
120	Personal protection equipment	PPE instructions	A PPE-matrix, defining mandatory PPE for each task and compartment on board, should be available on board and instructions/signs posted at relevant entries/exits
121	Personal protection equipment	PPE availability	PPE should be provided by the employer, and used by all crew
122	People tracking equipment	People tracking equipment	The site-specific people tracking system should be installed on board. (Swipe card system, subject to Charterer's delivery)
123	HSE and HSE Management	Safety organisation	The Owners should have established a Company Health and Safety organisation. The Health and Safety organisations should be documented with an overview of the members and their duties, roles and responsibilities. The organisation and overview should include vessel crew
124	HSE and HSE Management	HSE resource	The Owners should nominate an HSE representative whose responsibilities include the obligation to work closely together with the Charterers on HSE
125	HSE and HSE Management	Site specific requirements	The vessel should comply with, and adhere to, local operational and emergency procedures and requirements in force at the site or project, as stipulated by the Charterers. All requirements (legal and other) should be documented.
126	Safety Management System	International Safety Management (ISM)	The vessel should use a Safety Management System (SMS) according to the principles of the International Safety Management (ISM) Code, whether or not this is a statutory obligation. As a part of the SMS, a 24-hour shore-side contact person should be designated

No.	Category	Subject	Requirement
127	Safety Management System	Vessel-specific SMS	The SMS should be specific to the vessel
128	Safety Management System	SMS implementation	The Owners should be able to demonstrate and document that the SMS is implemented, working and continuously improved
129	Safety Management System	Health and safety policy	Health and Safety policies should be properly communicated to employees to ensure awareness and understanding. A signed Health and Safety policy should be available on board
130	Safety Management System	Environmental policy	Environmental polocy should be properly communicated to employees to ensure awareness and understanding. A signed environmental policy should be available on board
131	Safety Management System	Drug and alcohol policy	Drug and alcohol policy should be properly communicated to employees to ensure awareness and understanding. A signed drug and alcohol policy should be available on board
132	Safety Management System	Drug and alcohol policy	The drug and alcohol policy should be compliant with Charterer's policy
133	Safety Management System	Smoking policy	Smoking policy should be properly communicated to employees to ensure awareness and understanding. A signed smoking policy should be available on board
134	Safety Management System	IT policy	IT policy should be properly communicated to employees to ensure awareness and understanding. A signed IT policy should be available on board
135	Safety Management System	Management of change procedure	A Management of Change procedure should be available on board
136	Safety Management System	Risk assessments, method statements and working instructions	The SMS should include risk assessments, method statements/working instructions relating to the operation, manoeuvring and normal work procedures carried out on board the vessel
137	Safety Management System	Risk assessment process	Identification of essential equipment and equipment redundancy requirements should form part of the risk assessment process

No.	Category	Subject	Requirement
138	Safety Management System	Risk assessments, method statements and working instructions	The SMS should facilitate ad hoc risk assessment and method statement by means of a generic RAMS procedure, to be conducted before commencement of any task, work or assignment to be carried out on board or by the vessel
139	Safety Management System	Compliance with Charterer's HSE management system	The vessel SMS should comply with the Charterer's HSE Management system as laid down for the individual site. The obligations of the Owners include bridging of vessel procedures with site-specific procedures as applicable
140	Safety Management System	Charterer's review of SMS	A copy of the SMS should be made available for the Charterers' review upon reasonable request and ahead of the contract period
141	Safety Management System	Permit to work	A permit to work system should be implemented and used for higher risk activities, e.g. hotwork
142	Protection of the environment	Garbage Management Plan	A Garbage Management Plan should be available and implemented on board
143	Protection of the environment	Spill control	Vessel Operators should provide a spill response plan for any oil or chemical spills
144	Protection of the environment	Reporting of spillage	Spills of oil or chemicals in quantities deemed reportable under applicable legislation should be notified to the Charterers immediately with a follow-up incident report
145	Safety culture	Safety culture	The Master is responsible for a positive and proactive safety culture among crew, industrial personnel and passengers on board. All crew should show positive, safe behaviour Promotion of proactive safety culture should be documented (e.g. employee surveys, safety campaigns, sharing of good practices and lessons learned, etc.)
146	Safety culture	Reporting	The Master and Crew should report any incidents, accidents, near-misses and observations according to the vessel's SMS and the Charterers' procedures

No.	Category	Subject	Requirement
147	Safety culture	Continuous improvement	Master, crew and all other representatives of the Owners, should report any suggestion for improvement of safety and safe behaviour A process for documenting suggestions for improvements should be available to all crew members
148	Master's responsibilities	Safety ambassador	The Master should act proactively as a safety ambassador on board
149	Master's responsibilities	Fatigue prevention	The Master should ensure that the planning for his vessel allows for sufficient rest for his crew and himself, as agreed with the Charterer
150	Master's responsibilities	Masters responsibility/ RAMS	Master should communicate the purpose of risk assessments and method statements and ensure that toolbox talks are held before any work is commenced
151	Master's responsibilities	Master's daily reporting	The Master should produce a daily report on operation and performance of the vessel in accordance with Charterers' requirements
152	Master's responsibilities	Master's reporting, breakdown	The master should report any defect or failure which may render the vessel unsafe or not fit-for-purpose to the Vessel Operator and the site management
153	Master's responsibilities	Master's reporting, incidents	The Master should as early as practically possible report any case of emergency, incident or accident to the Charterers and Marine Coordination/Site Administration
154	Master's responsibilities	Call off transfer	The Master is responsible for calling off operations in case of unsafe conditions
155	Master's responsibilities	People tracking	The Master is responsible for ensuring the people tracking system is used. The obligation includes keeping the system updated with the present location of each person in the field
156	Manning	Number of crew	The number of crew should be minimum two. Where practicable, it should be possible to increase to three crew members on board without reducing the maximum number of passengers
157	Crew competences	Master certification	The Master should be qualified according to the vessel's safe manning document

No.	Category	Subject	Requirement
158	Crew competences	Crew certification	All marine crew should be qualified according to the vessel's safe manning document
159	Crew competences	Crew certificates of competence	Original certificates of competence should be kept on board
160	Crew competences	Master certification	The Master should hold an STCW CoC/ CeC issued under STCW Regulation II/2 or II/3. UK Master certification for less than 200 GT with STCW endorsement is acceptable. Commercially endorsed RYA/ MCA Yacht Master is not acceptable
161	Crew competences	Mate/deckhand certification	The mate/deck hand should as a minimum, be qualified as a navigational watch rating, according to STCW II/4
162	Crew competences	Redundancy	One member of the marine crew should have demonstrated sufficient vessel handling skills and familiarisation with vessel controls to manoeuvre the vessel in the event of the Master being incapacitated
163	Crew competences	Job descriptions	The responsibility of the individual should be defined and all operational tasks should be assigned to qualified personnel through a job description for each individual position on board
164	Crew competences	Crew matrix	The Owners should provide a crew matrix to verify the compliance between the competence requirements for each position and the competence of the individual crew members on board. The crew matrix may be a combined document. The Owners are responsible for issuing an updated crew matrix in due time before the vessel or any new crew members arrive on site

No.	Category	Subject	Requirement
165	Crew competences	Crew matrix	The list of competence requirements for each position on board should, as a minimum, state the following as applicable: – Rank; – Min. Certificate of Competence (STCW); – Min. radio operation qualifications; – Min. level of English skills; – Min. Medical Care competence; – Min. IMDG Dangerous goods competence; – Min. Bridge Team Management (BTM) competence; – Min. Company Personnel Safety Training; – Min. time employed with operator; – Min. time in rank; – Min. time service in the Offshore Wind industry, and – Min. time service at sea in total
166	Crew competences	Crew matrix	The Owners should maintain a record of the competence for individual crew members
167	Crew competences	Crew experience	The crew should be experienced and know the waters around the area of operation
168	Crew competences	Language/English skills	All crew members should speak, read, write and understand maritime English and no limitations to the operation or safety due to language barriers may occur
169	Crew competences	Language/English skills	The crew should competently be able to express correct terms for the OWF assets in English
170	Crew competences	Language/English skills	In case of doubt or dispute on a crew member's ability to communicate effectively in English, the Owners may be required to arrange for a test of spoken English to be completed, and for the result to be presented to the Charterer's representative
171	Crew competences	Medical training	Suitable medical training for the crew and suitable equipment should be provided based on a site-specific risk assessment and, as a minimum, Flag State requirements

No.	Category	Subject	Requirement
172	Crew competences	AED training	All crew members should be trained in the use of Automated External Defibrillator (AED)
173	Crew competences	Lifting operations	If the vessel is equipped with a crane, this should be operated only by appropriately qualified and trained operators. Training in crane operation should be documented on board. Lighting procedures and good practices should be documented and available on board
174	Crew competences	Lifting operations	All crew involved in lifting operations should be able to demonstrate the international signals for lifting operations
175	Crew competences	Spine board and stretcher training	Vessel crew members should be familiar with transfer and hoisting of a spine board and stretcher
176	Crew competences	Lifting operations	The deck hand should be qualified for the slinger/banksman duty and this should be documented on board
177	Familiarisation and training	Familiarisation with vessel-specific procedures	All crew should be sufficiently trained in ship board operations prior to service on board the vessel
178	Familiarisation and training	Company crew training programme	The Vessel Operator should apply a crew training and familiarisation programme for new crew members
179	Familiarisation and training	Master's training	A new Master should be trained by an appointed and experienced training Master and complete a familiarisation test
180	Familiarisation and training	SMS training	The crew familiarisation programme should include the vessel's SMS, including vessel procedures, PMS, incident reporting, training on site specific legal requirements, and the Emergency Response Plan
181	Familiarisation and training	Operational training period	All newly employed crew should have completed a training period (as supernumerary) on board the vessel
182	Familiarisation and training	Operational training period	The supernumerary training period should be specified in the SMS
183	Familiarisation and training	Shipboard operations	Documentation on training of critical shipboard operations and procedures should be available on board for each crew member as applicable

No.	Category	Subject	Requirement
184	Familiarisation and training	Navigational disciplines	Documentation on training in navigational disciplines should be available on board for all personnel forming part of the navigational watch
185	Familiarisation and training	MOB	Documentation on MOB training should be available on board for each crew member
186	Familiarisation and training	Lifting operations	Documentation on training for lifting operations with vessel crane and davit crane on assets as applicable, should be documented on board for each crew member involved in lifting operations
187	Familiarisation and training	Sea trial	Documentation on an operational sea trial for training should be available on board for each crew member
188	Familiarisation and training	Berthing	Documentation on berthing training should be available on board for each crew member
189	Familiarisation and training	Offshore personnel transfer	Documentation on boat landing and transfer training should be available on board for each crew member
190	Familiarisation and training	Crew seminars	The Owners should demonstrate good safety engagement through regular meetings with the vessel crew
191	Familiarisation and training	Site induction	All marine crew should receive a site induction in accordance with the wind farm operator's policy. This should include familiarisation with the Master's handbook and demonstration of site personnel transfer procedures. Satisfactory understanding of the induction should be assessed by a designated site representative or the vessel Master
192	Familiarisation and training	Passenger familiarisation	All people (e.g. back office company employees) wishing to board the vessel should obtain sufficient knowledge regarding safety on board through a vessel induction
193	Familiarisation and training	Passenger familiarisation	All visitors and inexperienced personnel going offshore should be escorted by a designated site representative

No.	Category	Subject	Requirement
194	Familiarisation and training	Passenger familiarisation	Personnel who will be undertaking transfers should have their familiarity with the site (and vessel-specific where appropriate) transfer procedures assessed to the satisfaction of the marine crew
195	Rest hours	Fatigue prevention	The Master and crew should be well rested on duty in compliance with country-specific regulations on hours of rest
196	Rest hours	Rest hour rules compliance	Documentation on compliance with regulations on hours of rest should be kept updated and available on board
197	Shipboard operation procedures	Commencement of work	The Vessel Operator should establish procedures, plans and instructions, including checklists as appropriate, for key shipboard operations
198	Shipboard operation procedures	Toolbox talks	A procedure for toolbox talks should be available on board
199	Shipboard operation procedures	Restricted zone (500 m zone)	A procedure for entering a restricted zone should be available on board
200	Shipboard operation procedures	Navigation and manoeuvring near offshore structures	A procedure for operation within an offshore wind farm should be available on board
201	Shipboard operation procedures	Mooring	A procedure for mooring should be available on board
202	Shipboard operation procedures	Bunkering	A procedure for bunkering should be available on board
203	Shipboard operation procedures	Bunkering	The bunkering procedure should be bridged to site-specific bunkering procedure
204	Shipboard operation procedures	Lifting operations	A procedure for lifting operations relevant for the lifting appliances utilised on board, incl. external lifting appliances used for loading or discharging, should be available on board
205	Shipboard operation procedures	Shore power	A procedure for connection or disconnection of shore power should be available on board

No.	Category	Subject	Requirement
206	Shipboard operation procedures	Garbage, waste, and sewage	A procedure for handling of garbage, waste and sewage should be available on board
207	Shipboard operation procedures	Transfer to offshore structures	A procedure for transfer of personnel from vessel to offshore structure or vice versa should be available on board. The procedure should be in accordance with the Charterers' procedures
208	Shipboard operation procedures	Ship-to-ship transfer	A procedure for transfer of personnel from ship to ship should be available on board
209	Shipboard operation procedures	Fuel transfer (offshore)	A procedure for offshore fuel transfer to foundation/TP should be available on board
210	Shipboard operation procedures	Sailing in following seas	A procedure for sailing in following seas should be available on board
211	Bridge procedures	Bridge discipline	Master's standing orders should be readily available
212	Bridge procedures	Ship's logbook	A formal ship's logbook should be maintained with daily entries, for the duration of the charter
213	Bridge procedures	Logbook entries	It should be clearly evident in the logbook who is in charge of the navigational watch
214	Bridge procedures	Logbook entries	Tests of GMDSS equipment should be recorded in the log book or separate radio log book as applicable
215	Bridge procedures	Logbook entries	Records of garbage should be maintained with daily entries for the duration of the charter
216	Bridge procedures	Continuous radio watch	Continuous radio watch, listening on VHF channel 16 and other relevant channels for port authorities etc. should be maintained during all operations
217	Bridge procedures	Continuous radio watch	Continuous radio watch, listening on the nominated site-specific radio communication channels, should be maintained during all operations

No.	Category	Subject	Requirement
218	Bridge procedures	Site-specific navigational information	The Owners should ensure that all site-specific navigational and operational information, including safety notices on navigational aids (e.g. new dangers and obstructions, buoys out of position, lights extinguished etc), issued by the Charterers, local navigation authorities and/or site administration/Marine Coordinators are made available for the vessel
219	Bridge procedures	Communication procedures	Prior to arriving at the site, the vessel should obtain communications plan including radio channels/frequencies from the Charterers
220	Bridge procedures	Communication to passengers	Master should clearly give notice of the following: – Personnel having to prepare for transfer – If personnel are to stay seated due to weather conditions – Any abrupt manoeuvres prior to taking place
221	Bridge procedures	Low keel clearance	A procedure for under keel clearance should be implemented
222	Bridge procedures	Passage planning	Procedures for the planning and implementation of passage plans should be implemented
223	Engine procedures	Procedure for operation of engines	A procedure for operation of engines (main- and aux. engines) incl. start/stop of engines should be available on board
224	Engine procedures	Logbook entries	Records of engine start and stop time, and all other safety relevant engine records, shall be maintained with daily entries for the duration of the charter
225	Engine procedures	Logbook entries	Records of bunker and oil/bunker transfer should be maintained in the vessel's logbook for the duration of the charter
226	Dangerous goods	Dangerous goods	Vessel crew should be familiar with the IMDG Code and able to identify and handle dangerous goods in accordance with the Code
227	Dangerous goods	Dangerous goods	A procedure for handling and carrying dangerous cargo should be available on board

No.	Category	Subject	Requirement
228	Emergency procedures	Emergency procedures	The vessel should carry and adhere to a project issued ERP
229	Emergency procedures	Emergency procedures	Emergency procedures should be available on board for the following: – man overboard; – injury or sickness of passengers, industrial personnel or crew; – grounding; – collision; – fire; – evacuation of vessel; – oil pollution; – loss of engine power; – loss of ability to manoeuvre; – towing, and – assistance to vessels in distress.
230	Emergency procedures	Towing equipment	The vessel should carry a towing line/ sling/towing bridle and be arranged with bollards ready for emergency use. Bollards to be SWL/WLL marked
231	Emergency training	Drills and on-board training	The Master should conduct frequent training of emergency drills and communicate the purpose of on-board training. Drills should be as realistic as practicable and should, when possible, incorporate crew, industrial personnel and passengers. The use of PPE should be incorporated in the drill where practicable. Drills should be recorded in the vessel log book, deck log book, or other similar document
232	Emergency training	Drills and on-board training	Master's checklist and induction should include his obligation to conduct drills, involving crew, industrial personnel and passengers

No.	Category	Subject	Requirement
233	Emergency training	Passenger safety induction	All non-crew members should be provided with a vessel-specific safety induction covering: – shipboard policies; – safety information relevant for the particular voyage; – (weather and sea conditions); – what to do if observing Man Overboard, fire or smoke; – alarm signals regarding: – Man Overboard, and – fire, evacuation and general alarm – location and instruction for the use of lifesaving; – appliances; – location of muster stations and emergency; – escape routes; – availability and provision of medical treatment; – smoking areas, and – opportunity to ask safety related questions
234	Emergency training	Passenger safety induction	A safety induction should be provided prior to the vessel beginning a transit to the wind farm. If a generic video induction is used it should be combined with verbal induction on voyage-specific issues. If video induction is not available, the crew should be consistently able to provide a thorough safety induction in a language well understood by the non-crew members
235	Emergency training	Documentation of safety induction	The on-board safety induction should be signed off when completed
236	Fire safety	Fire pumps	The vessel should be fitted with a power-driven fire pump that is independent of main machinery failures
237	Fire safety	Fire hoses	The number and distribution of fire hydrants and hoses with nozzles should be minimum two and adequate to fight fire in any compartment on board
238	Fire safety	Fire detection system	The vessel should be fitted with an automatic fire detection and alarm system for machinery spaces with indication at the vessel's control station

No.	Category	Subject	Requirement
239	Fire safety	Fixed fire extinguishing system	An approved fixed fire extinguishing system should be installed in all machinery compartments in which e.g. combustion engines, fuel transfer pumps etc. are located. It should be kept readily available for deployment from outside the compartments
240	Fire safety	Fixed fire extinguishing system	The ventilation system should stop automatically when the fixed fire extinguishing system is activated or the stop buttons should be located by the fixed fire system activation points
241	Fire safety	Portable fire fighting equipment	The vessel should be fitted with a sufficient number of portable fire extinguishers including at least one on each deck, one in each accommodation area and one at the entrance to each machinery space
242	Fire safety	Fire blankets	Fire blankets should be in place in accordance with the safety plan. At least one fire blanket should be available in the accommodation
243	Fire safety	Firefighting	All firefighting equipment should be maintained as per legal requirements and ready for immediate use
244	Safety records	Reporting to Charterer's reporting system	All recordings on observations, near misses and incidents made by the Owners should be reported to the Charterer's reporting system
245	Safety records	Track history	A track record of incidents, near misses and observations should be made available for the Charterers upon request ahead of or during the contract period
246	Vessel management and maintenance	Planned Maintenance System	The vessel should utilise a Planned Maintenance System to manage all maintenance and provide traceability of all maintenance activities
247	Vessel management and maintenance	Shore-based support	A strong and dedicated support set-up (e.g. superintendent, HSE officer and local technical support as applicable) should be in place, reflecting the characteristics and requirements to the operation of the vessels at the particular site
248	Vessel management and maintenance	Availability of shore based support	The shore-based support functions should have a 24-hour contact

No.	Category	Subject	Requirement
249	Vessel management and maintenance	Critical spare part list	A list of critical spare parts should be available on board
250	Vessel management and maintenance	Spare parts availability, general	There should be sufficient spare parts and consumables on board each vessel or readily available onshore as applicable to meet the requirements of planned maintenance
251	Vessel management and maintenance	Spare parts availability, emergency	Sufficient spare parts should be carried on board or be readily available to undertake repairs to essential equipment to avoid undue delay and return safely to port, in the event of equipment breakdown
252	Vessel management and maintenance	Lifting equipment	All lifting equipment should be maintained in accordance with the manufacturer's instructions. Colour coding should be applied
253	Certification	Valid certification	A vessel should be delivered on charter with valid certification required for the vessel type and its intended area of operation
254	Certification	Certificate and documentation maintenance	The vessel and all certification and documentation should be maintained in accordance with the relevant statutory requirements for the duration of the charter
255	Certification	Insurance	The vessel should carry documentation on relevant insurance for the duration of the charter
256	Certification	Reservations	Any reservations or exemptions from class or flag state requirements should be stated in the certification and presented proactively by the Owners for evaluation by the Charterers
257	Health protection	Food preparation	The vessel management system should include requirements for the cleaning of food preparation areas and training of any marine crew members involved in the preparation of food for personnel on board
258	Health protection	Refrigeration	Every fridge and freezer should contain thermometers. Temperature log for fridges and freezers should be on board and maintained daily or weekly

No.	Category	Subject	Requirement
259	Health protection	Towels	Disposable towels or hand-driers should be provided at every washbasin/lavatory
260	Health protection	Disinfectant agent	Disinfectant agent dispensers should be provided at minimum every washbasin/ lavatory
261	Health protection	Deep cleaning	Regular (deep) cleaning of deckhouse/ accommodation/galley should be done and recorded
262	Health protection	Potable water	Fresh drinking water should always be available. Where water is drawn from fresh water tanks for drinking or showering and/or cooking, water quality test certificates should not be older than six months
263	Health protection	Potable water	The vessel management system should describe any disinfection arrangements for potable water facilities and the arrangements for testing and inspection of fresh water systems for the presence of legionella bacteria

ANNEX B
MASTER'S HANDBOOK – RECOMMENDED CONTENT

B.1 OBJECTIVE

Site management are responsible for producing the handbook and operational manual for all vessels operated on an offshore wind farm and maintaining it up-to-date. The purpose is to provide the service vessel Master and crew operating on the wind farm with guidance and information relating to the functions that the service vessel will perform and site-specific operational considerations for the wind farm. Service vessels should refer to their own procedures in conjunction with the handbook and any other relevant wind farm procedures.

B.2 ADDITIONAL INFORMATION

The handbook should include:

- explanation of definitions and abbreviations used in the handbook, and
- references to wind farm operator's governing and advisory documents and relevant local legislation.

B.3 CONTACT DETAILS AND INFORMATION

The handbook should include a brief summary of the owning/operating structure of the wind farm and registered address of the current operator.

Contact details (telephone and e-mail as applicable) should be provided for:

- Marine Coordination control room, and
- site management with responsibility for:
  - overall operation;
  - safety, and
  - marine management.

B.3.1 Roles and responsibilities

The handbook should include a summary of the responsibilities for the Master, marine management and Marine Coordination as given in 2.1 of this guideline.

B.4 SAFETY AND THE ENVIRONMENT

The handbook should include the wind farm operator's safety and environmental policy and relevant goals.

The handbook should detail the incident reporting requirements of the wind farm operator. It should make clear that these requirements are independent of regulatory authority reporting requirements and the Vessel Operator's management system (unless already provided for

in a cooperation plan between wind farm operator and regulatory authorities or bridging documents between the wind farm management system and the Vessel Operator's management system).

The handbook should detail the RA/MS process, any other relevant control of work processes in use on the wind farm and any requirements to the Vessel Operator and service vessel Masters that these contain.

B.5 WIND FARM INFORMATION

The handbook should include relevant information about the wind farm including:

- naming reference and coordinates of all fixed structures within the wind farm;
- type of foundations of all fixed structures;
- water depth within the wind farm (as a range and/or with areas where there are significant differences separately indicated);
- turbine nacelle height above sea level and turbine rotor diameter;
- cable routings within the wind farm;
- defined anchorage zones within the wind farm;
- recommended transit routes to the wind farm from service ports (where these are agreed with local authorities or stakeholders);
- wind farm transit gates;
- Unexploded Ordnance (UXO) survey coverage;
- statutory safety zones;
- restricted zones;
- relevant extant local notice to mariners, and
- navigational hazards.

During the construction phase the handbook should include up-to-date build status/schedule of works for wind farm structures.

B.5.1 Lighting and marking

The handbook should describe all lighting and marking maintained within the wind farm, such as:

- marker buoys, and
- turbine lights.

Such descriptions will include:

- coordinate locations;
- focal plane height;
- colour, period and phase of the lights (as appropriate);
- nominal range, and
- any conditions or restrictions on operation of lights.

B.6 PORT DETAILS

The handbook should contain details of all ports in regular use by service vessels working in the wind farm, including:

- a general description of the port and approach channel(s);
- contact details for the port authorities;
- details of any vessels controlled by the port authorities;
- Harbour-Master's directions, including arrival and departure procedures and radio channels in use, and
- relevant extant local notice to mariners.

B.7 WIND FARM OPERATIONAL REQUIREMENTS

The handbook should describe operational procedures for service vessels operating under the direction of Marine Coordination, including:

- radio channels in use;
- reporting requirements to Marine Coordination;
- anchoring restrictions, and
- procedures relating to transfer of personnel, equipment or oil offshore.

The handbook should additionally provide information relating to:

- interaction with and agreements with other sea users in the area;
- communication blackspots and mitigation measures;
- weather reporting services provided by Marine Coordination, and
- requirements of any statutory safety zones.

B.8 EMERGENCY RESPONSE

The handbook should provide an overview of the wind farm ERP including:

- incident scenarios;
- the coordination with local and national authorities;
- initial actions required by service vessels and the lines of incident reporting, and
- details of any dedicated wind farm emergency response resources.

ANNEX C
READILY ACCESSIBLE EMERGENCY RESPONSE PROCEDURES REQUIRED FORMAT

[Incident type]	
Responsible	**Action**
Installation	– For incidents on or involving a wind farm structure, the actions required by any personnel working on the structure should be defined – The actions described should include notification of the CGOC/ Marine Coordination as agreed in the ERP and parties with which communication should be established – References to applicable Contractor procedures should be included
Service vessel	– For incidents on or involving a service vessel, the actions required by the vessel Master and crew should be defined – The actions described should include notification of the CGOC as agreed in the ERP and parties with which communication should be established – The actions may distinguish between a 'casualty' service vessel and a service vessel assigned to carry out first response – References to applicable Vessel Operator procedures should be included
Other vessels	– General responsibilities and expectations of other service vessels not involved in the incident but required in a supporting role may be included
Marine coordination	– Marine Coordination's role in the incident response should be defined, including which communications will be coordinated from Marine Coordination – When agreed in the ERP, the initial and follow-on actions of Marine Coordination should be documented
CGOC	– When agreed in the ERP, the initial and follow-on actions of the CGOC should be documented for the reference of other parties

ERCoP contacts	**Telephone**	**Radio**
CGOC	*[Telephone]*	*[Channel]*
Marine Coordination	*[Telephone]*	*[Channel]*
[Other local Authorities, as required]	*[Telephone]*	–

ANNEX D
REGULATORY FRAMEWORKS

The information in Annex D is intended to supplement this Good Practice Guideline by providing information on country/region specific regulatory frameworks for the use of small vessels in the offshore wind industry. While reasonable efforts have been made to accurately describe the information herein, the relevant regulatory bodies are responsible for evaluating applicability and compliance with domestic regulations.

D.1 GENERAL

D.1.1 Design and construction standards

D.1.1.1 International conventions

Small service vessels are in general not subject to the international conventions that are adopted by the International Maritime Organization (IMO) to govern the safety of larger vessels. The conventions that are most relevant to design and construction standards are:

– the International Convention on Load Lines (ICLL), and
– the International Convention for Safety of Life at Sea (SOLAS).

Both ICLL and SOLAS only apply to commercial vessels on international voyages. ICLL applies to vessels with a load line length of 24 m or more, and SOLAS construction standards (Chapter II) apply to vessels with a gross tonnage of 500 GT or more, or carrying more than 12 passengers.

The International Code of Safety for High-Speed Craft (HSC Code) is a part of SOLAS providing equivalent regulations for vessels operating at high speed under operational restrictions. The speed threshold for application of the HSC Code varies with the vessel displacement, and is governed by the following equation:

HSC speed threshold (m/s) = $3.7 \times \nabla^{0.1667}$
where:
∇ = volume (m3) of displacement corresponding to design waterline

Example displacement and associated speed thresholds for application of HSC are illustrated in Table D.1.

Table D.1: High-speed craft thresholds

Displacement (tonnes)	Speed threshold (knots)
50	13.9
75	14.8
100	15.6

125	16.1
150	16.6
200	17.5

The requirements of these conventions are reflected in the national regulations of each Flag Administration, and are largely independent of the country of operation.

D.1.1.2 Domestic regulations

Many small service vessels are 'non-convention vessels', with a load line length less than 24 m, a gross tonnage less than 500 GT, carrying 12 or fewer passengers and not trading internationally. They are typically certificated under national legislation for small domestic vessels.

In some cases, a version of the HSC Code is applied. The HSC Code was developed for vessels trading internationally on a fixed route, and this creates some obstacles in applying to small service craft. However, these are typically overcome by a rewording of the Permit to Operate (or Trading permit) to cover an area of operation rather than a route.

Small service vessels are normally built to a technical standard offering an equivalence to national safety regulations. As classification societies introduce dedicated notations for service vessels, most Flag Administrations are now accepting these as equivalence for construction standards.

D.1.2 Crew certification requirements

D.1.2.1 International conventions

Certification requirements for marine crew on convention vessels are governed by the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). This prescribes minimum standards relating to training, certification and watchkeeping for seafarers which states are obliged to meet or exceed in their requirements for the manning of vessels.

STCW requires Flag States to implement Certificates of Competency (CoC) for various roles. The ones relevant to small service vessels are as follows (numbering denotes the relevant regulation of STCW):

– II/1 – Officer in Charge of a Navigational Watch (OOW), vessel > 500 GT.

– II/2 – Master/Chief mate, vessel > 500 GT.

– II/3 – Master/Officer in Charge of a Navigational Watch, vessel < 500 GT restricted to near coastal voyages.

– III/1 – Officer in Charge of an Engineering Watch (EOOW).

– III/2 – Chief Engineer/2nd Engineer, vessel with > 3 000 kW propulsion power.

– III/3 – Chief Engineer/2nd Engineer, vessel with 750-3 000 kW propulsion power.

Flag States have introduced additional sub-categorizations of these certificates (for example,

to introduce restriction categories for OOW and EOOW), but in general the requirements are aligned for convention vessels.

Mutual recognition of STCW certificates is also relatively well established, with a Flag State able to issue a recognition certificate for holders of a CoC issued by another flag State whose training institutions are STCW approved and covered by a bilateral agreement with the Flag State.

D.1.3 Area restrictions

Area of operations and voyage classes are defined by the relevant flag state of the vessel. This is especially important for small service vessel as the definition of 'near-coastal voyage' may differ amongst Flag State, and these definitions may impact the design and construction standards for small service vessels.

D.1.4 Industrial personnel and passengers

To date, SOLAS has distinguished between crew and passengers in a way that treats personnel travelling to work on wind farms in the same way as members of the public who have no training and have never travelled offshore before.

In 2016, IMO adopted Resolution MSC.418(97) Interim recommendations on the safe carriage of more than 12 industrial personnel on board vessels engaged on international voyages. The intention is that SOLAS will be modified to make these recommendations mandatory under the Industrial Personnel (IP) Code. This guide therefore adopts the terminology from interim recommendations. The targeted entry into force date for the draft of the new SOLAS regulation and the accompanying IP Code is 1 January 2024.

'Industrial personnel' are defined as people 'who are transported or accommodated on board for the purpose of offshore industrial activities performed on board other vessels and/or other offshore facilities' and who meet criteria regarding age, appropriate training, familiarization with the vessel and appropriate procedures, inclusion in the ship's life-saving equipment, provision with PPE, and medical standards.

Acceptance of industrial personnel as other than passengers is subject to the safety standards being accepted by the Flag and Coastal State, taking into consideration IMO Resolution MSC.418(97).

D.1.5 Statutory safety zones and enforcement

The United Nations Convention on the Law of the Sea (UNCLOS) entitles Coastal Administrations to establish statutory safety zones up to a maximum distance of 500 m around any installation within its Exclusive Economic Zone. Within these statutory safety zones, the Coastal Administration may take appropriate measures to ensure the safety of both navigation and of the installation or structure.

The national requirements for safety zones around wind farms are outlined in country/region specific sections of this Annex.

D.2 NORTH SEA REGIONS

D.2.1 Design and construction

D.2.1.1 Domestic regulations

Table D.2 summarises the regulatory basis applied by North Sea states (based on the *Summary Report on North Sea Regulations and Standards* published by DMA and DNV GL in 2015).

Table D.2: National requirements for small service vessel design and construction

Flag Administration	Specialised Requirements for Small Service Vessels	Application of HSC Code
United Kingdom	Workboat Code[1]	Interim standards for High-Speed Offshore Service Craft[2] based on exemption from Cargo Craft requirements
Denmark	Small Commercial Vessel[3] or DNV GL HSLC Rules (Small Service Craft)[4] with additional national requirements	Category A Passenger Craft of the HSC Code
Germany	Offshore Service Vessels[5] (high-speed or traditional build)	
Netherlands	Small cargo vessel[6]	Category A Passenger Craft of the HSC Code

Notes:
1. Maritime and Coastguard Agency, 'The Workboat Code', Industry Working Group Technical Standard, 2014. Before 2014, the applicable standard was MGN 280 'Small vessels in commercial use for sport or pleasure, workboats and pilot boats – Alternative construction'.
2. Maritime and Coastguard Agency, 'High Speed Offshore Service Craft Code (HS-OSC Code)', Draft Marine Guidance Note, 2015.
3. Danish Maritime Authority, 'Notice F – Technical regulation on the construction, equipment, etc. of small commercial vessels'.
4. DNV GL, 'Rules for Classification: High speed and light craft, Chapter 6 Small service craft', 2015.
5. BG Verkehr, 'Safety directive for cargo ships', Annex 5.
6. The Netherlands Regulation Safety Seagoing Vessels, Annex 3.

Some requirements depend on the area of operation of the vessel (see Table D.4). In the UK, most service vessels are certified to Area Category 2. Categories 1 and 0 introduce additional design, equipment and crew certification requirements including: damaged stability, additional life saving appliances, stricter fire safety and bilge pumping requirements, and greater medical care standards (equipment and care-giver certification).

D.2.1.2 Small service vessels

The following brief comparison of the design and construction standards for small service vessels illustrates the similarities and differences between the national requirements. For the sake of simplicity and to focus on the requirements relevant to most service craft, this comparison only considers the requirements for small service vessels of less than 24 m in load line length (i.e. not subject to ICLL). For Denmark, the UK and the Netherlands this restriction is explicit in the national requirements, while in the case of the German standard circular the size restriction for applying the standard is based on gross tonnage. However, in practice there are very few vessels exceeding 24 m load line length which are also less than 100 GT. Furthermore, this comparison does not

consider vessels of less than 15 m in length (which would not be subject to the supplementary regulations of the Danish Notice F) or which would not meet the UK's area category 2 service restriction (operation up to 60 nm from a safe haven).

All jurisdictions accept the rules of a recognised Classification Society for hull construction standards, though the UK may also accept equivalent standards or first principles calculations. The Netherlands regulations additionally delegate standards for other naval architectural aspects (i.e. watertight subdivision and stability) to the rules of a recognised Classification Society.

Requirements for watertight subdivision include collision and machinery space bulkheads, with the German regulations also expecting a double bottom arrangement as far as practicable and compatible with the design. UK vessels designed to operate more than 60 nm from a safe haven are also required to meet damage stability criteria. Separate stability criteria are provided for vessels such as catamaran service craft with a low waterplane area but large intact freeboards.

Significant fire safety and life-saving appliance requirements from the different regulations are summarised in Table D.3.

Table D.3: Comparison of national safety requirements for small service vessels

Flag Administration	Fire safety	Life-saving appliances
United Kingdom	Machinery space structural fire protection[1]. Machinery space fixed fire-extinguishing system. Fire pump (outside of machinery space).	Immersion suits. 100 % total ISO 9650 liferaft capacity[2].
Denmark	A-30 machinery space structural fire protection. B-15 galley fire protection. Machinery space fixed fire extinguishing system. Two fire pumps.	Immersion suits. 200 % SOLAS liferaft capacity (split port and starboard).
Germany	Flame resistant machinery space Insulation. Machinery space fixed fire-extinguishing system. Two fire pumps.	Immersion suits. 100 % total SOLAS liferaft capacity.
Netherlands	Machinery space fixed fire-extinguishing system. Fire pump.	200 % SOLAS liferaft capacity (split port and starboard).

Notes:
1. Special test procedure according to Appendix 9 of the Workboat Code or MGN 407 required for fibre reinforced plastic (FRP) construction. Aluminium construction should have an equivalent level of protection to FRP. A-15 standard may be accepted in lieu of test procedure. Steel construction requires no mandatory protection but it should be considered in way of accommodation spaces.
2. UK vessels operating more than 150 nm from a safe haven require SOLAS approved liferafts such that 100 % capacity is available following the loss of any one liferaft.

D.2.1.3 High-speed craft

Service vessels exceeding the speeds in Table D.1, and which are above the relevant size threshold (24 m load line length in the UK, 24 m length in Denmark and 100 GT in Germany), are typically expected to comply with the requirements of the HSC Code.

High-speed-craft-specific requirements include: an endorsement (Type Rating Certificate) for the Master and officers, valid for the type of high-speed craft and a Permit to Operate the craft limiting its use to a defined area or route of operation up to a limiting significant wave height. Flag Administration application of the HSC Code to service vessels differs (see Table D.2).

D.2.2 Area Restrictions

The requirements of the UK Workboat Code depend on the area of operation. The area categories most relevant to small service vessels are listed in Table D.3.

One significant difference between European flags (and especially relevant to small service vessels) is the definition of 'near-coastal voyage'. A summary of current requirements is provided in Table D.4. This is also relevant for design and construction standards for small service vessels.

Table D.4: Area restrictions applied for 'Near-Coastal' voyages

Flag Administration	Area restrictions
United Kingdom	Areas of operation for small workboats: – Area Category 2 – up to 60 nm from a safe haven – Area Category 1 – up to 150 nm from a safe haven – Area Category 0 – Unrestricted service 'Safe haven' is defined as 'a harbour or shelter of any kind which affords safe entry and protection from the force of weather' In practice, the relevant area of operation restriction applied to CoC by the UK is 150 nm from a safe haven
Denmark	Trade areas for small commercial vessels: – F5 – trade in the North Sea east of 4° westerly longitude, south of 62° northerly latitude and south of 56° northerly latitude in the Baltic – F6 – trade as for F5, in addition to all sea areas within 100 nm of the nearest land
Germany	Coastal shipping range: An international journey between Germany, Denmark, Poland or the European parts of the Netherlands (i.e. excluding the Caribbean Netherlands) Small special craft (<100 GT) are limited to 10 nm from shore (may be extended if built to Class rules)

Netherlands	Near coastal: A trading area that extends to a maximum of 30 nm from the coast, with the understanding that the vessel is no more than a 12-hour voyage away from a base port specifically referred to in the certificate of seaworthiness, and never more than six-hour voyage away from a sheltered harbour

D.2.3 Industrial personnel and passengers

Table D.5 below is intended to supplement Table 1 in Section 2.4.1 by providing North Sea region specific guidance on requirements for guidance on industrial personnel and passenger certification requirements.

Table D.5: Crew, industrial personnel, and passenger certification requirements – North Sea

Certificate	Crew (not accessing WTG)	Industrial personnel	Passengers
Working at height		GWO Basic safety or BGR 198/199 (Germany)	
Medical		Hardanger agreement1, AWMF (Germany) or Dansk offshore (Denmark)	
Notes: 1. Mutual recognition of Oil and Gas UK, Norske olje and gass, Nederlandse Olie en Gas Exploratie en productie Associatie approved medicals, operating in the North Sea.			

D.2.4 Statutory safety zones and enforcement

Table D.6 summarises the national requirements for safety zones around wind farms.

Table D.6: National requirements for safety zones around wind farms

Country	Construction	Operation
United Kingdom	500 m normally applies	No mandatory safety zones. A wind farm can apply for a 50 m nominal safety zone around each structure
Denmark	500 m normally applies	No mandatory safety zones
Germany	500 m normally applies	Closed to outside activity
Netherlands	500 m normally applies	Based on assessment framework. 500 m is common practice

D.2.5 Other information

D.2.5.1 Oil transfer to wind farm structures

Regarding vessels involved in the transfer of oil in bulk (section 8.4.9), in the UK, sections 29.7 and 29.8 of MCA The Workboat Code give requirements for transfer of oil in bulk and portable tanks respectively. Where relevant, the Workboat Code certificate should be endorsed for the transfer of oil.

D.3 UNITED STATES OF AMERICA

D.3.1 Design and construction

D.3.1.1 Domestic regulations

United States Coast Guard

In the United States (US), the Code of Federal Regulations (CFR) is a consolidated set of regulations, which is divided into 50 titles. Of these 50 titles, the following are most applicable to the maritime industry:

– 33 CFR – Navigation and Navigable Waters
– 46 CFR – Shipping

The United States Coast Guard (USCG) is responsible for ensuring the enforcement of domestic and international shipping regulations, and the inspection of vessels which are registered in the US or are foreign ships in US waters.

The Alternate Compliance Program (ACP) allows for recognized Classification Societies to act on behalf of the Flag for statutory inspections; however, this program is only applicable to US flag vessels certificated for international voyage (i.e., convention vessels). Under the ACP, the USCG retains the responsibility for vessel security audits, safe manning and credentialing and fire/safety drill performance.

Tonnage

An important aspect of US flagged vessels is the method used to determine the value for 'gross tonnage'. There are two measurement systems which are used to determine a value for 'gross tonnage' of a specific vessel.

The first tonnage measurement is the Gross Regulatory Tonnage, identified as GRT on vessel certificate of inspection (COI). This value is calculated in accordance with the US Domestic tonnage measurement system.

The second measurement system is the 'Convention' tonnage system and is denoted as GT or GT ITC. This value is calculated in accordance with International Convention of Tonnage Measurement of Ships. This convention tonnage value is generally required for vessels engaged on international trade.

Both tonnage measurements are based on the principle of measurement of the internal volume of a vessel; however, the US Domestic tonnage measurement system allows for more spaces to be exempt from the tonnage calculation than is allowed with the convention tonnage calculation method. Therefore, the GT of a US flagged vessel is generally significantly larger than the GRT of the same vessel.

As the value of the tonnage often determines which regulations are applicable to the design and construction of a vessel, it is important to ensure that the correct tonnage value is being used.

The Jones Act

A critical law regulating maritime commerce in the US is The Merchant Marine Act of 1920, commonly referred to as the 'Jones Act'. Simply put, the Jones Act requires all vessels transporting merchandise between two coastwise points in the US to be US-built, US-flagged, US-owned, and US-crewed.

Current rulings have found that vessels engaged in the following activities would be required to be Jones Act Compliant:

- Vessels engaged in transportation of wind turbine components from a U.S. port to offshore wind development
- CTVs and SOVs when operating between coastal zones, including marshalling/load out zones of an offshore wind development.

The Jones Act has potential to lead to complications, costs, and operational risk by limiting the fleet of vessels available. For vessels of a specialized type, there may not be any existing Jones Act compliant vessels.

D.3.1.2 Small service vessels

33 CFR defines the role of the USCG in regulating the marine industry, while 46 CFR defines vessel categories and associated regulations to which vessels must comply. Under 46 CFR, an Offshore Supply Vessel is defined as a vessel 'that regularly carries goods, supplies, individuals in addition to the crew, or equipment in support of exploration, exploitation, or production of offshore mineral or energy resources'. It has been confirmed by the USCG that 'energy resources' does include wind energy, and therefore, self-propelled vessels that support wind energy meet the definition of an OSV. The following subchapters of 46 CFR are often found to be applicable to such vessels:

46 CFR – Shipping

- SUBCHAPTER T – Small Passenger Vessels
  - Applies to OSVs <100 tons carrying persons in addition to the crew with a keel laid date before March 15, 1996.
  - Mostly crew boats and a few utility vessels. Many are still in operation today.
- SUBCHAPTER I – Cargo and Miscellaneous Vessels
  - Applies to OSVs transporting cargo or freight with a keel laid date before March 15, 1996.
  - Applies to OSVs >100 GRT with a keel laid date before March 15, 1996.
  - Prior to Subchapter 'L', OSVs <100 GRT had the option of Subchapters 'T' or 'I' depending on type of service. A vessel constructed and certificated as Subchapter 'I' today is not an OSV unless it is multi-certificated.
- SUBCHAPTER L – Offshore Supply Vessels
  - Applies to all OSVs with a keel laid date on or after March 15, 1996.
- Multi-Certificated OSVs
  - OSVs which are inspected and certified to conduct multiple services without having to be reinspected when changing their intended service. The vessel would have one COI issued which is endorsed with the types of services allowed. It is noted that a change in service may impact vessel allowances such as cargo type/ quantity allowance, manning requirements, etc.

Further information and guidance on applicability of 33 CFR & 46 CFR to small vessels supporting the offshore wind industry can be found in the following documents produced

by the Outer Continental Shelf National Center of Expertise (OCS NCOE):

– Introduction to Offshore Supply Vessel, Rev. October 22, 2020
– OSV 101, Rev. October 19, 2020

As noted above, OSVs certificated under Subchapter L are typically limited to the carriage of 'goods, supplies, individuals in addition to crew, or equipment in support of exploration, exploitation, or production of offshore mineral or energy resources'. This definition does not include towing operations. Therefore, OSVs conducting towing operations will need to comply with requirements beyond those in Subchapter L. The examples noted below are taken directly from publicly available USCG information (https://www.uscg.mil/). These examples are provided for illustrative purposes, and regulations applicable to specific vessels should be evaluated on a case by case basis.

– *Any vessel engaged in towing operations is required to be under the control of a credentialed Master or Mate, with the proper endorsements identified in 46 CFR 15.805(a)(5), 46 CFR 15.810(d), or 46 CFR 15.535.*
– *Vessels 300 GRT or more meet the definition of a seagoing motor vessel and therefore are inspected under 46 CFR Subchapter I. OSVs 300 GRT or more that engage in towing need to be multi-certificated under Subchapters L and I. A vessel multi-certificated under L and I must meet the more stringent design and equipment standards of the applicable rules and regulations (including SOLAS, if applicable). Special stability requirements for towing vessels are outlined in 46 CFR 173.095 and 46 CFR 174.140. Additionally, vessels longer than 12 meters that engage in towing are required to meet the operational requirements generally outlined in 33 CFR 164.70 through 164.82.*
– *OSVs less than 300 GRT that engage in towing, other than on an occasional basis, need to be a multi-certificated vessel under Subchapters L and M. A vessel multi-certificated under L and M must meet the more stringent design and equipment standards of the applicable rules and regulations (including SOLAS, if applicable). Special stability requirements for towing vessels are outlined in 46 CFR 173.095 and 46 CFR 174.140. Additionally, vessels longer than 12 meters that engage in towing are required to meet the operational requirements generally outlined in 33 CFR 164.70 through 164.82.*

Upon completion of the inspection of a US vessel, and assuming that the condition that the vessel and its equipment are found satisfactory and approved by the inspector, a Certificate of Inspection (COI) is issued by the Officer in Charge, Marine Inspection. The COI outlines details of the vessel, the route the vessel may travel, the minimum manning requirements, the safety equipment and appliances required to be on board, the total number of persons that may be carried, and the names of the owners and operators. The period of validity is also stated on the certificate.

It is noted that modern vessels may include technology or arrangements (i.e., mixed concepts) that are not directly captured by USCG regulations. In such instances, a design basis agreement may be created by the designer/builder to identify all applicable class rules, codes and standards that are being adopted to provide an equivalent level of safety to the USCG regulations. It is expected that the design basis agreement method will be utilized more often in the future as complex and mixed operation designs require clarification on design and construction equivalencies which are acceptable to the USCG.

D.3.1.3 High-Speed Craft

There is no requirement to meet the HSC Code for domestic voyages in the USA. The USCG

only requires compliance with 46 CFR Subchapter L or Subchapter T as discussed in D.3.1.2.

While not required, a request to use the HSC Code as an alternative to domestic regulations can be named to the USCG.

D.3.2 Crew certification requirements and minimum safe manning

As per 46 CFR Part 15, a vessels COI, which is issued by the USCG Officer in Charge, Marine Inspection (OCMI), specifies the minimum complement of officers and crew necessary for the safe operation of the vessel. The manning requirements for a vessel are determined by the OCMI after consideration of factors such as size and type of vessel, installed equipment, routes of operation, frequency of port calls, type of service, degree of automation, etc.

Information and requirements for manning and licensing of crew can be found in the USCG Marine Safety Manual Volume 3.

D.3.3 Areas restrictions

46 CFR Part 10.107 defines a near coastal voyage as waters not more than 200 miles offshore from the U.S.

D.3.4 Industrial personnel and passengers

46 CFR Subchapter L considers Industrial Personnel to be offshore workers as defined below:

Offshore worker means an individual carried aboard an OSV and employed in a phase of exploration, exploitation, or production of offshore mineral or energy resources served by the vessel; but it does not include the master or a member of the crew engaged in the business of the vessel, who has contributed no consideration for carriage aboard and is paid for services aboard.

The requirements for safety orientation and emergency instructions related to offshore workers traveling on an OSV can be found in 46 CFR Subchapter L, Part 131.

The number of offshore workers carried on a vessel will impact the design and construction regulations which are applicable to a specific vessel. Please refer to D.3.1.2 for applicable design and construction regulations.

D.3.5 Statutory safety zones and enforcement

Based on offshore wind development ruling and decisions made to date, the Bureau of Ocean Energy Management (BOEM) does not have the authority to restrict access to a Wind Development Area (WDA) during operational phase. In addition, the USCG's authority to establish safety zones only extends to the boundary of the territorial waters of the US, which is 12 nautical miles.

The USCG has stated that safety zones would be evaluated on a case-by-case basis. The USCG has also indicated that they intend only to implement restrictions during construction, but specific final determinations have not been made. For example, the USCG implemented a temporary 500 yard safety zone around wind turbine locations at Block Island Wind Farm during that project's construction activities.

As part of the regulatory framework, a developer is required to submit a Construction and Operations Plan (COP) to BOEM. The COP includes navigation risk assessment (NSRA). The USCG reviews the NSRA on behalf of BOEM and provides recommendations concerning mitigation measures. Experience has shown that a common mitigation recommendation from this NSRA is the implementation of temporary safety zones during construction and installation activities.

D.3.6 Other information

D.3.6.1 Personnel transfer

There are several solutions being used by CTVs as it relates to personnel transfer to wind turbine platforms and between vessels. These solutions can be as simple as personnel stepping directly from the CTV to a ladder/landing platform or may involve the use of dedicated personnel transfer equipment such as winch lifts or motion compensation walk to work gangways.

The USCG do not have requirements related to personnel transfer, but Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926.1431) provide basic standards for marine personnel lifting devices.

In addition, American Petroleum Institute (API) 2C provides design requirements for the lifting appliance for personnel transfer.

D.3.6.2 Restrictions on CTV speed

When considering suitability of a CTV for the area of operation and activities to be undertaken, consideration should be given to the vessel speed reductions due to National Oceanic and Atmospheric Association (NOAA) Right Whale restrictions. As per 50 CFR Part 224.105, speed restrictions of no more than 10 knots applying to all vessels 65 ft (19.8 m) or greater in overall length in certain locations and at certain times of the year along the east coast of the U.S. Atlantic seaboard. The intent of this speed restriction is to reduce the likelihood of collisions between vessels and the endangered North Atlantic right whales.

The speed restriction may lead to increased travel time and operational constraints on the vessel. Subsequent vessel suitability considerations impacted by this may be size of vessel and amount of crew and offshore workers the vessel can accommodate.

Further information and details of the speed restriction zones can be found on the NOAA website.

D.3.6.3 PPE

Table D.7 provides US specific guidance on PPE requirements.

Table D.7: Recommended PPE requirements for industrial personnel and passengers

Description	Additional information
Safety footwear	ANSI Z41 *Personal Protection – Protective Footwear* ASTM 2413 *Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear*
Safety helmet	ANSI Z89.1 *American National Standard for Industrial Head Protection*
Fall Arrest Systems	Refer to guidance in Annex B of the *G+ Good practice guideline – Working at height in the offshore wind industry*
Safety spectacles/ goggles	ANSI Z87.1 *Practice for Occupational and Educational Eye and Face Protection*
Gloves	Appropriate hand protection when exposed to hazards such as harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes. General purpose gloves must meet the compliance of 29 CFR 1910.138

D.3.6.4 Transports of dangerous goods

Shipment of dangerous goods in the US is subject to the following regulations:

Domestic Regulations

- Service vessels transferring oils should follow USCG approved Vessel Transfer Procedures
- 49 CFR Subchapter C
  - Regulations specific to transport on vessels can be found in Part 176 – Carriage by Vessel
  - If a US flag non-tank vessel holds an USCG approved 'non-tank vessel response plan' (NTVRP) and provides evidence of compliance with 33 CFR part 155, subpart J, then the USCG considers the SOPEP regulations met.

International Regulations

- IMDG Code, and
- 49 CFR Part 171.22-25
  - US specific supplement to IMDG Code that allows the use of IMDG code as design basis
  - Outlines conditions and limitations that are to be applied in addition to the IMDG Code

D.3.6.5 Maritime labour convention for U.S. flagged vessels

The US has not ratified the MLC and therefore will not mandate enforcement of its requirements on US vessels or upon foreign vessels while in the Navigable Waters of the United States. However, Article V, paragraph 7 of the Convention requires ratifying governments to impose Convention requirements on vessels from a non-ratifying government when calling on their ports. As a result, US vessels not in compliance with the MLC may be at risk for Port State Control when operating in a ratifying nation.

The USCG has developed a voluntary MLC inspection program for US vessels to voluntarily demonstrate compliance with the Convention. The guidelines of this program are contained in the Navigation and Vessel Inspection Circular (NVIC) 02-13.

ANNEX E
DEFINITIONS

Access conflict	A situation where activities within the wind farm pose a potential hazard to other work being carried out, such as: – overlap of restricted zones; – a need for a service vessel to enter a restricted zone; – existing work on a wind farm structure; – work schedule clashes, and – failure consequences from hazardous activities
Certificate of competency	A certificate issued and endorsed for Masters, officers or GMDSS radio operators in accordance with the provisions of chapters II, III, IV or VII of the Annex to the STCW convention
Certificate of proficiency	A certificate, other than a certificate of competency issued to a seafarer, stating that the relevant requirements of the STCW convention have been met
Closed loop communication	A technique utilised to avoid misunderstandings by ensuring a common understanding of information or orders. It involves repeat back of orders, positive confirmation that the message has been understood and monitoring of the message request
Coastal administration	The Government of the State with jurisdiction (under either a territorial sea or exclusive economic zone regime) over the area in which the wind farm is located and associated service vessels are operating
Dangerous goods	For purposes of this guideline, dangerous or polluting goods are those covered by the IMDG Code, bulk liquid products listed in the IBC Code or oils covered by Annex I of MARPOL
Designated site representative	Any person (including Contractor personnel) designated by site management as familiar with site operating and safety procedures and holding certification for full access. Designated site representatives may act as escorts for other passengers
Fit-for-purpose	A vessel with the appropriate capability, equipment and crewing levels to carry out planned activities at a specific site for a defined duration, taking due consideration of the activity, site location, met-ocean conditions and any changes to plans or incidents which may reasonably be foreseen. To be considered fit-for-purpose a vessel should be operated in accordance with the Vessel Operator's management system and all flag and Coastal Administration regulations relating to the vessel type and the activities planned to be carried out
Flag administration	The Government of the State with which a service vessel is registered and whose flag the vessel is entitled to fly
Industrial personnel	People who are transported or accommodated on board for the purpose of offshore industrial activities

Just culture	A 'Just culture' encourages incident reporting by not punishing operators for actions, omissions or decisions that are commensurate with their experience and training. In contrast, gross negligence, wilful violations and destructive acts are not tolerated
Major marine operations	Significant offshore construction, maintenance and inspection activities planned on a case-by-case basis and that may require the use of offshore construction vessels greater than 500 GT in size, including but not limited to: – installation activities; – cable laying and inspection; – diving operations, or – change-outs of major components
Manifest	A document listing the cargo and people on board a vessel. For a small service vessel, this includes all crew, industrial personnel and passengers
Marine coordination	The part of the wind farm operator's organisation responsible for the coordination and management of activities within the wind farm, specifically: – the management of service vessel traffic; – control of work process for marine operations; – communications with and instructions to all vessels engaged on the business of the wind farm; – coordination of or cooperation with helicopter operations for personnel and equipment transfer in the wind farm, and – initial coordination of emergency response, in cooperation with the CGOC and other relevant Coastal Administration authorities
Marine crew	Any person, including the Master, who is engaged or works in any capacity on board a service vessel, on the business of the vessel
Marine management	People with responsibility for managing marine operations associated with a wind farm
Marine operations	All activities within the wind farm requiring or associated with the operation of a vessel owned or contracted by the wind farm operator or sub-contractor
Master	A person having command or charge of a service vessel
Offshore management system	A system designed for the coordination of maritime operations and support of situational awareness to protect offshore personnel, the marine environment and wind farm assets. An offshore management system uses real time feed from AIS, CCTV, marine VHF and site radio communication and any other available information sources. The system stores data for administrative purposes and incident analysis

Passenger	People carried on a vessel other than members of the marine crew or industrial personnel
Project director	The individual with ultimate responsibility for all activity within a wind farm construction project
Restricted visibility	Any condition in which visibility is restricted by fog, mist, falling snow, heavy rainstorms, sandstorms or any other similar causes
Restricted zone	A nominal area established by the wind farm operator around a fixed structure or ***major*** marine operation in the wind farm during the construction phase, which should not be entered by service vessels without being granted permission from Marine Coordination and within which special reporting requirements and restrictions on service vessel activities may apply. This is to be distinguished from a Statutory Safety Zone established by a coastal administration and has no implications for sea users not engaged on the business of the wind farm
Service operation vessel	A large vessel conducting or supporting work within the wind farm, including on-board accommodation, office and workshop facilities
Site management	Site management consists collectively of the managers and departments reporting to the Project Director/Site Manager with responsibility for safety, the planning and control of work within the wind farm, the marine operations control function and vessel selection, in addition to any relevant more senior positions and nominated deputies
Site manager	The individual with ultimate responsibility for all activity within an O&M wind farm
Small service vessel	A vessel less than 500 GT, operating in offshore wind farms under instructions from site management, e.g.: – crew transfer vessels; – guard vessels (sometimes referred to as scout vessels); – stand-by vessels; – survey vessels; – workboats; – tugs and supply vessels, and – construction support vessels
Statutory safety zone	An area established by the Coastal Administration around an installation or structure under the provisions of Article 60 of the United Nations Convention on the Law of the Sea, within which the Coastal Administration may take appropriate measures to ensure the safety of both navigation and of the installation or structure

Transit gates	Points of entry to the wind farm for use by wind farm traffic defined by Marine Coordination and properly communicated to all service vessel Masters (see Figure E.1). Transit gates should be defined with reference to local conditions, operations within the wind farm and agreements with other local sea users. Transit gates may be contiguous around the wind farm limits
Vessel operator	The owner of a service vessel or any other organisation or person such as the manager or a charterer, who has assumed the responsibility for operation of the vessel from the vessel owner
Wind farm limits	Nominal zone extending a minimum of 500 m from the wind farm within which service vessels should observe the requirements of in-field operations (see Figure E.1)
Wind farm operator	The operator of a wind farm or any other organisation or person who has assumed responsibility to manage the day-to-day control of the main functions of the wind farm

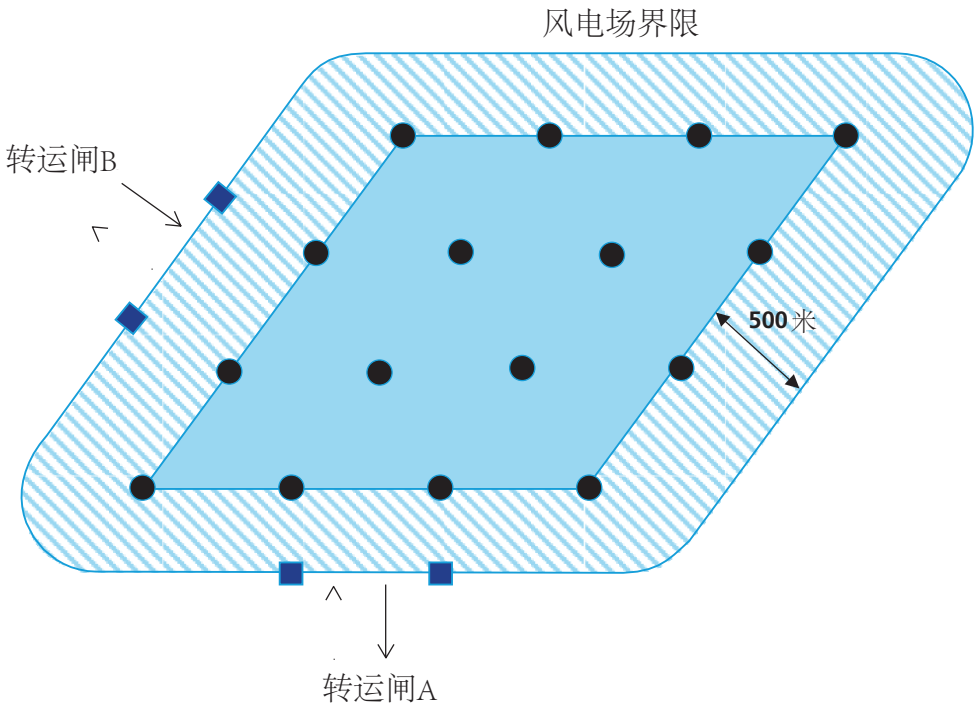

Figure E.1: Example wind farm limits and transit gates

ANNEX F
ABBREVIATIONS AND ACRONYMS

AIS	automatic identification system
ALARP	as low as reasonably practicable
AWMF	Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe/Federal Institute for Geosciences and Natural Resources (Germany)
BGV	Berufsgenossenschaft für Transport und Verkehrswirtscharft/BG Verkehr (Germany)
BOSIET	basic offshore safety induction and emergency training
CCTV	closed circuit television
CeC	Certificate of Equivalent Competency
CGOC	Coastguard Operations Centre
CoC	Certificate of Competency
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
CTV	crew transfer vessel
DG	dangerous goods
DMA	Søfartsstyrelsen/Danish Maritime Authority
ECDIS	Electronic Chart Display and Information System
EI	Energy Institute
EPIRB	emergency position indicating radio beacon
ERCoP	emergency response cooperation plan
ERP	emergency response plan
G+	G+ Global Offshore Wind Health and Safety Organisation
GT	gross tonnage
GWO	Global Wind Organisation
HSC Code	International Code of Safety for High-Speed Craft
HUET	helicopter underwater egress training
ID	identification
IMCA	International Marine Contractors Association
IMDG Code	International Maritime Dangerous Goods Code
IMO	International Maritime Organization
MAIB	Marine Accident Investigation Branch (United Kingdom)
MARPOL	International Convention for the Prevention of Pollution from Ships
MCA	Maritime and Coastguard Agency (United Kingdom)
MED	Marine Equipment Directive
MISW	Marine Inspection Document for Small Workboats

nm	nautical mile
MOWG	G+ Marine Operations Working Group
O&M	operations and maintenance
OMS	offshore management system
OPITO	Offshore Petroleum Industry Training Organisation
OSC	on scene commander
PLB	personal locator beacon
PPE	personal protective equipment
RA/MS	risk assessment/method statement
RFA	request for access
RPM	rotations per minute
RUK	RenewableUK
SAR	search and rescue
SART	search and rescue transponder
SIMOPS	simultaneous operations
SMC	SAR mission coordinator
SOLAS	International Convention for the Safety of Life at Sea
SOV	service operation vessel
SRL	self-retracting lifeline
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (and associated Code)
TETRA	terrestrial trunked radio
UHF	ultra high frequency [radio]
VHF	very high frequency [radio]
VTS	vessel traffic services
WTG	wind turbine generator

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