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Introduction

HSE and MCA are the relevant authorities for health and safety at offshore renewable energy developments. Jointly they require renewable energy developments to have arrangements for evacuation, escape, recovery and rescue to prevent and reduce harm to persons working at those developments.

This document sets out principles to be adopted to ensure compliance with relevant legislation (see appendix A). Terms in italics are further defined in the glossary at appendix B. It does not replace the requirements of industry guidelines including the Emergency Response Plan (ERP), Emergency Response Cooperation Plan (ERCoP) and Integrated Emergency Response Plan (IERP). The MCA document titled *Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for Search and Rescue and Emergency Response*; provides additional important information for duty holders.¹

Offshore Renewable Energy Developments (ORED) will need to assess that their arrangements cover all elements of emergency preparedness; where gaps are identified ensure they are addressed.

OREDs should have arrangements that are self-reliant and suitably robust.

Scope of the Emergency Response Arrangements

This document should assist the ORED duty holder (e.g. operators, developers and other employers) to develop emergency response arrangements for the construction, operation,

¹This document forms Annex 5 of Marine Guidance Note 543

maintenance and decommissioning of a renewable energy installation and extended to the export, inter-array cables and associated plant and equipment.

Those arrangements should form the basis of an emergency response plan. For the purposes of clarity, functionality and usability there should be one emergency response plan per site with supporting management arrangements. This does not remove any legal duty from any duty holder to ensure that they cooperate to:

- Establish and where necessary give effect to appropriate procedures to be followed in the event of serious and imminent danger to persons at work;
- Contact the relevant authorities for first aid, emergency medical care and rescue work;
- Coordinate with other duty holders at the wind farm to ensure all can comply with their statutory duties.

The duty holder who has the greatest extent of control over the site should take the responsibility of being *the person in control* to ensure the above and other requirements under the Management of Health and Safety Regulations 1999, when applicable to emergency response arrangements are met.

Where the transmission installations, plant and equipment are owned by an organisation other than the duty holder then there will be a requirement for separate emergency arrangements, unless an agreement exists which delegates emergency response to the ORED duty holder. Such circumstances must be clearly documented. Opportunities to provide mutual support and coordination between the offshore wind farm operator and OFTO should be taken.

The principles listed below should be adopted to provide suitable arrangements.

Principles to be adopted

Risk Assessment

Each renewable energy development is unique and therefore the person in control is required to carry out a suitable and sufficient assessment to determine the measures required for that site to ensure the relevant statutory provisions are met. HSE and MCA provide guidance on how to carry out risk assessment. Although PFEER² does not apply to renewable energy developments, the guidance contained within can be used beneficially. The arrangements should be suitable for any unexpected event of whatever nature with the potential to cause harm and to require the evacuation, escape and rescue of one or more persons and extend to occurrences for the potential for a *major accident hazard*. For the purposes of emergency planning, the risk assessment should be suitable and sufficient, and should identify:

- Appropriate organisational arrangements for emergency preparedness;
- Arrangements to raise the alarm in case of an emergency;
- Suitable equipment and arrangements for communication for all parts of the ORED;
- Arrangements to limit the extent of an incident to reduce potential harm;
- Arrangements to review and revise the emergency response plan to ensure they remain effective and current;
- Arrangements to account for all persons during an emergency;
- Arrangements for evacuation;
- Means of escape to a *place of safety*;

² Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations 1995

- Arrangements for the rescue and recovery of personnel to a *place of safety*;
- Suitable and sufficient life-saving equipment;
- Suitable provision of fire-fighting equipment;
- Suitable personal protective equipment for use in an emergency; and
- Suitable arrangements for medical interventions and evacuations

In order to ensure that the arrangements are effective, suitable performance standards should be determined. This will provide a basis to review incidents and exercises, learn lessons and make necessary improvements. A performance standard should contain sufficient information against which to assess the suitability and condition of the items to which they apply and cover **functionality, reliability, availability and survivability** where appropriate. To determine suitable performance standards, consideration of risk and human vulnerability criteria should be taken into account. Performance standards, which should be time based, are required for all significant parts of the emergency response arrangements including but not limited to raising the alarm, contacting the emergency services, implementing the command and control arrangements, accounting for all individuals, evacuation, escape and rescue. HSE, MCA and industry trade bodies have produced data that can be used to develop performance standards e.g. exposure times for persons in water at different temperatures. However each duty holder needs to determine performance standards suitable for the specific ORED.

Offshore renewable energy developments are not subject to a safety case regime. However the arrangements in place should be equally as robust as for other offshore industries. While there is limited hydrocarbon risk there is the potential for a major accident including:

- An event involving major damage to the structure of an *Offshore Renewable Energy Installation (OREI)* or vessel in attendance or any loss in the stability of the OREI or vessel.
- Collision of a helicopter with an OREI or attending vessel;
- Any event arising from a work activity involving death or serious personal injury to five or more persons on the OREI or engaged in an activity in connection with it;
- Diving operations.

Therefore particular attention should be given to ensuring the emergency response arrangements can manage the response to such incidents.

The risk assessment should also determine the:

- Competency requirements for persons with any specified role in the emergency response arrangements;
- The content of an annual programme of drills and exercises which aim to include every individual designated a specific role or potentially required to participate and ensuring all elements of the response arrangements is tested. The delivery of the annual programme should be monitored to ensure that individuals with designated roles remain competent. For infrequent visitors to site, then suitable information should be provided in their induction training.

Organisational Arrangements for emergency response

This should include arrangements for:

- A command structure, policies and procedures which are effective throughout an emergency;

- A sufficient number of competent persons available to undertake emergency duties within the command structure, policies and procedures;
- A sufficient number of competent persons to operate relevant equipment;
- Lists of persons referred to above to be available at suitable locations;
- Prior to the commencement of work suitable induction training on the steps to take if an emergency arises; and
- Adequate information, instruction, training and supervision to all relevant persons for the appropriate action to be taken in an emergency.

Arrangements to raise the alarm in case of an emergency

The duty holder should make appropriate arrangements to ensure that the alarm is raised, internally and with the emergency services, at an early stage for any incident that may require an emergency response. Suitable information regarding such incidents should be conveyed without delay to persons who can instigate and/or have roles within the emergency response arrangements.

Suitable arrangements and equipment for communication

The duty holder should ensure there is reliable and effective equipment and arrangements for communication when dealing with an incident requiring an emergency response. This can include a range of compatible equipment and ensure communication can take place between the following:

- a) persons on the OREI;
- b) OREI to vessel/aircraft;
- c) From the OREI to shore;
- d) From the OREI to the emergency services and
- e) From the incident to medical support.

The arrangements and equipment should be capable of remaining effective in an emergency. This should extend to ensuring individuals are not overloaded with tasks and communications, deputies are nominated and in protracted incidents cover is available. As a minimum there should be two means of communication available to ensure sufficient redundancy.

Arrangements to limit the extent of an incident to reduce potential harm

The duty holder should take appropriate measures with a view to limiting the extent of an emergency, and ensure that:

- a) Consideration is given to other persons at work in the ORED and where their health, safety and wellbeing could be affected then relevant operations ceased;
- b) where appropriate, those measures include provision for the remote operation of any work equipment including machinery and installations; and
- c) any arrangements made and equipment provided are capable of remaining effective for the entirety of the emergency response.

The purpose of this requirement is to prevent the escalation of an emergency and mitigate the consequences of the incident. Control measures may consist of operational and management procedures, plant and equipment and their control systems. Examples include the remote operation of turbine blades to allow safe access by rescue helicopter.

Arrangements to review and revise the emergency response plan to ensure they remain effective and current

The duty holder should ensure that the emergency response arrangements and equipment provided are appropriate for the activities on going at the ORED. They must be capable of remaining effective during all stages of the emergency response.

A review and revision of the emergency response should take place when there is significant change in either activity at site or a change of status and/or ownership. A significant change in activity would include but is not limited to:

- commencement of construction;
- significant changes during construction e.g. the commencement of tower erection;
- transition to operations;
- operation and maintenance activities;
- major component exchanges;
- diving operations;
- decommissioning/demolition; etc

Notwithstanding the above there should be a regular review and where necessary revision of the arrangements, including taking account of incidents, drills and exercises. The review should be part of the annual emergency exercise programme.

Arrangements to account for all persons during an emergency/muster areas

A *muster area* is a designated place where individuals can assemble and be accounted for safely.

The duty holder should make appropriate provision for:

- establishing arrangements for individuals to muster safely in designated areas in an emergency;
- ensuring safe egress from accommodation and work areas, and safe access to muster areas, temporary refuge, and evacuation and escape points are maintained;
- safe evacuation and escape points; and
- where necessary provide alternative means of access and alternative muster areas for situations where it is not safe to use the initial designated areas and means of access.

The duty holder should put in place procedures for accounting for personnel during an emergency. This should include ensuring availability of up to date lists of persons allocated to a muster area. All persons should be instructed on their muster area and accounting arrangements.

Arrangements for evacuation

Evacuation refers to the planned and controlled method of leaving the OREI or vessel without directly entering the sea. Successful evacuation will result in people being transferred to a *place of safety* (i.e. an onshore location or a suitable and safe offshore location or vessel). The *means of evacuation* should offer protection from the hazard, and should have its own motive power to enable people to move quickly away from the OREI. In addition to the primary means of evacuation, a different means should be available in a timely manner to ensure safety.

The duty holder should provide arrangements and equipment, to ensure the safe evacuation of all persons from OREI and adjacent vessels, to a *place of safety*, or to a place from which they can be recovered and taken to a *place of safety*.

Where a duty holder employs the services of a contractor, e.g. a vessel operator, then they should carry out sufficient checks to ensure the arrangements and manning levels on the vessel/installation/aircraft are suitable.

Means of escape to a place of safety

The duty holder should provide such means as will ensure the safe *escape* of all persons from the OREI and attending vessels in case arrangements for evacuation fail. This means that people may escape from the OREI and attending vessels if the evacuation system fails. As a last resort this may mean entry into the sea, therefore suitable equipment and PPE should be provided to protect persons from the environment.

Arrangements for recovery and rescue

Duty holders are required to make effective arrangements to enable people who have to evacuate and/or escape from the OREI to be recovered or rescued and taken to a *place of safety*. This extends to arrangements for the rescue of people from the sea near the OREI, people falling overboard, or a helicopter ditching on landing, take-off or during operations within an ORED. Specifically the arrangements should include the:

- recovery of persons following their evacuation or escape from the OREI/vessel/aircraft; and
- rescue of persons near the OREI/vessel; and
- taking such persons to a *place of safety*.

Should circumstances exist for which only a suitable vessel/helicopter standing by will provide effective arrangements, in these circumstances, such a vessel/helicopter will need to be available within a reasonable time as defined by the individual site performance standards.

Arrangements for Medical Evacuations

The duty holder should ensure that provisions are made for:

- sufficient competent personnel offshore to respond to persons ill or injured, as determined by a first aid needs assessment;
- robust procedures to raise alarm with the emergency services in a timely manner;
- adequate consideration on the provision of telemedicine; and
- performance standards for initial medical treatment of an ill or injured person offshore and time to extract the person to further care.

Medical treatment may be given at an ORED or an OREI by trained personnel. Further medical care should be available at an onshore facility or a suitable offshore facility. The evacuation of an ill or injured person may be by the emergency services but duty holders must consider when this resource may not be available and therefore have suitable contingency arrangements in place.

Suitability of personal protective equipment for use in an emergency

Suitable and compatible personal protective equipment should be provided which protects a person in an emergency against risks to their health and safety from:

- immersion in the sea;
- where appropriate fire, heat, smoke, fumes or toxic gas; and
- access and egress in, around and from OREIs.

Suitable arrangements should be provided for the testing, maintenance and storage of PPE.

Life Saving Appliances

Sufficient life-saving appliances should be provided to ensure that all persons can be safely evacuated, rescued and recovered following an incident at the ORED. Life-saving appliances including survival craft, life rafts, life buoys, life jackets and equipment should be:

- of a suitable colour which will make them conspicuous when in use;
- suitably equipped including, where appropriate, communications equipment and medical equipment, and tracking devices
- where appropriate suitable for a person injured in an incident; and
- available for immediate use and in sufficient numbers.

Fire Fighting Equipment

The duty holder should determine and provide at suitable locations sufficient and appropriate for every person on a OREI fire-fighting equipment. life-saving appliances and PPE for use in emergencies. Information on the location of that equipment should be easily available

Inventory of Equipment and Personnel

The duty holder should maintain an inventory of available equipment, its ownership, location, transport to and mode of deployment at the OREI. An inventory of persons with responsibilities for the emergency response plan should be maintained. This could be held within the emergency response arrangement document.

Examples of equipment should include but not limited to:

- Life rafts;
- Life-saving equipment;
- Location aids;
- Personal devices for controlled descent;
- Communication equipment; and
- Vessels with emergency response capability including access medical care, fast rescue craft.

Initiation and direction of Emergency Response and Liaison with External Response Authority

The duty holder must authorise one or more persons to:

- Initiate an emergency response
- Direct an emergency response; and
- Liaise with the MCA

Appendix A - **Statutory Legal Provisions**

Health and Safety at Work Etc Act 1974

The Health and Safety at Work etc Act 1974 (HSW Act) places general duties on employers to ensure, so far as is reasonably practicable, the health and safety of their employees, and others who might be affected by their undertaking (HSW Act, sections 2, 3 and 4).

Management of Health and Safety at Work Regulations 1999

These general duties are supported by the requirement in regulation 3 of the Management of Health and Safety at Work Regulations (SI 1992/2051) (MHSWR) for employers to undertake risk assessments for the purpose of identifying the measures which need to be put in place to prevent accidents and protect people against accidents.

The risk assessment should result in the following:

1. Identification of the events that could result in a major hazard accident
2. Identification of events that could result in the need for evacuation, escape, recovery and rescue
3. Evaluation of the likelihood and consequence of such events
4. The establishment of standards of performance to be attained for the effective evacuation, escape and recovery to avoid or minimise the consequences of a major accident hazard.
5. The selection of the appropriate measures

Regulation 5(1) requires:

Every employer shall make and give effect to such arrangements as are appropriate, having regard to the nature of his activities and the size of his undertaking, for the effective planning, organisation, control, monitoring and review of the preventive and protective measures.

Regulation 8 requires the duty holder to provide procedures for serious and imminent danger and for danger areas, the arrangements should:

- (a) establish and give effect to appropriate procedures to be followed in the event of serious and imminent danger to persons at work in the windfarm;
- (b) nominate a sufficient number of competent persons to implement those procedures in so far as they relate to the evacuation from locations within the windfarm; and
- (c) ensure that persons do not have access to any area in the windfarm is necessary to restrict access on grounds of health and safety unless the employee concerned has received adequate health and safety instruction.

The procedures and arrangements should:

- (a) so far as is practicable, require any persons at work who are exposed to serious and imminent danger to be informed of the nature of the hazard and of the steps taken or to be taken to protect them from it;
- (b) enable the persons concerned (if necessary by taking appropriate steps in the absence of guidance or instruction and in the light of their knowledge and the technical means at their disposal) to stop work and immediately proceed to a *place of safety* in the event of their being exposed to serious, imminent and unavoidable danger; and

(c) save in exceptional cases for reasons duly substantiated (which cases and reasons shall be specified in those procedures), require the persons concerned to be prevented from resuming work in any situation where there is still a serious and imminent danger.

A person shall be regarded as competent for the purposes of these arrangements where he has sufficient training and experience or knowledge and other qualities to enable him properly to implement the evacuation procedures referred to.

Regulation 9 requires the duty holder to make contact with external services particularly as regards first-aid, emergency medical care and rescue work.

Construction (Design and Management) Regulations 2015

Regulation 9(2) requires

When preparing or modifying a design the designer must take into account the general principles of prevention and any pre-construction information to eliminate, so far as is reasonably practicable, foreseeable risks to the health or safety of any person:

- (a) carrying out or liable to be affected by construction work;
- (b) maintaining or cleaning a structure; or
- (c) using a structure designed as a workplace.

Regulation 30 requires

(1) Where necessary in the interests of the health or safety of a person on a construction site, suitable and sufficient arrangements for dealing with any foreseeable emergency must be made and, where necessary, implemented, and those arrangements must include procedures for any necessary evacuation of the site or any part of it.

(2) In making arrangements under paragraph (1), account must be taken of—

- (a) the type of work for which the construction site is being used;
- (b) the characteristics and size of the construction site and the number and location of places of work on that site;
- (c) the work equipment being used;
- (d) the number of persons likely to be present on the site at any one time; and
- (e) the physical and chemical properties of any substances or materials on, or likely to be on, the site.

(3) Where arrangements are made under paragraph (1), suitable and sufficient steps must be taken to ensure that:

- (a) each person to whom the arrangements extend is familiar with those arrangements; and
- (b) the arrangements are tested by being put into effect at suitable intervals.

Relationship with other legislation

Most mobile installations are also classed as ships, and as such may be subject to various international maritime conventions. Codes issued by bodies such as the International Maritime Organisation (IMO) may also be relevant.

In addition, mobile installations will be required to comply with the relevant maritime legislation and conventions of their flag states and with UK port state requirements, where appropriate, as well as with the provisions of these Regulations. Compliance with the

relevant provisions of maritime legislation and conventions may contribute towards discharging duties under these Regulations.

Appendix B – Definitions and Glossary of Terms

Emergency - means any unexpected event of whatever nature with the potential to cause harm and to require the evacuation, escape or rescue of one or more persons from the installation

Emergency response - means action in response to potential major accidents; and also to some lesser incidents, for example persons overboard, sickness or injuries to personnel which necessitate urgent evacuation from the installation for medical treatment or recuperation.

Escape – means the process of leaving the structure in an emergency when the evacuation system has failed; it may involve entering the sea directly and is a ‘last resort’ method of getting people off the structure

Means of escape – covers items that help descent to the sea, such as davit-launched life-rafts, chute systems, ladders and individually-controlled descent devices, as well as items in which personnel can float on reaching the sea, such as throw-over life-rafts

Evacuation - means the planned and controlled method of leaving the installation without directly entering the sea. Successful evacuation will result in people being transferred to a *place of safety* (ie a safe onshore location or a safe offshore location or vessel).

Means of evacuation includes helicopters, direct sea transfer, bridge-links, TEMPSC, etc. It should offer protection from the hazard, and should have its own motive power to enable people to move quickly away from the installation.

Major Accident Hazard is:

- (a) an event involving a fire, explosion, or other event with a significant potential to cause, death or serious personal injury to persons on the OREI or engaged in an activity on or in connection with it;
 - (b) an event involving major damage to the structure of the OREI or [include vessel involved in any associated work activity] plant affixed to it or any loss in the stability of the OREI etc. causing, or with a significant potential to cause, death or serious personal injury to persons on the OREI or engaged in an activity on or in connection with it;
 - (c) the failure of life support systems for diving operations in connection with the installation, the detachment of a diving bell used for such operations or the trapping of a diver in a diving bell or other subsea chamber used for such operations;
 - (d) any other event arising from a work activity involving death or serious personal injury to five or more persons on the installation or engaged in an activity on or in connection with it;
- or
- (e) any major environmental incident resulting from any event referred to in paragraph (a), (b) or (d),

and for the purposes of determining whether an event constitutes a major accident under paragraph (a), (b) or (e), an OREI that is normally unattended is to be treated as if it were attended;

For the offshore renewable energy industry there are a number of foreseeable scenarios that could result in a major accident including HV electrical incidents, aviation impact, vessel impact, diving operations and structural integrity. Although the priority should be to prevent, there remains a need to ensure that emergency response arrangements are able to deal with such situations.

Muster Area – are clearly identified, protected from the immediate effects of the emergency, and provided with appropriate communications facilities so that information can be passed on about the emergency's progress and further action may be taken where necessary. They can be on a structure or vessel.

Offshore Renewable Energy Development (ORED) – The area leased by the Crown Estate for the development and operation of renewable energy devices

Offshore Renewable Energy Installation (OREI) – Fixed and floating structures that make up a renewable energy development and include offshore transformer stations, met masts, wind turbine generators.

Place of safety – means an onshore or safe offshore location or vessel where medical treatment and other facilities for the care of survivors are available. It must be available in all but 'exceptional' weather and sea conditions and that these 'exceptional' conditions must be defined by the operator.

TEMPSC – Totally Enclosed Motor Propelled Survival Craft – a lifeboat used for evacuating an OREI or vessel.

