

Guidelines for onshore and offshore wind farms

Health & Safety in the Wind Energy Industry Sector

2010



RenewableUK is the trade and professional body for the UK wind and marine renewables industries. Formed in 1978, and with over 600 corporate members, RenewableUK is the leading renewable energy trade association in the UK.

Wind has been the world's fastest growing renewable energy source for the last seven years, and this trend is expected to continue with falling costs of wind energy and the urgent international need to tackle CO2 emissions to prevent climate change.

In 2004, RenewableUK expanded its mission to champion wave and tidal energy and use the Association's experience to guide these technologies along the same path to commercialisation.

Our primary purpose is to promote the use of wind, wave and tidal power in and around the UK. We act as a central point for information for our membership and as a lobbying group to promote wind energy and marine renewables to government, industry, the media and the public. We research and find solutions to current issues and generally act as the forum for the UK wind, wave and tidal industry, and have an annual turnover in excess of four million pounds.

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Acknowledgements

RenewableUK acknowledges the time, effort, experience and expertise of all those who contributed to this document. Details of the organisations and individuals who participated in the consultation and editorial of this document are available on request from RenewableUK.

Foreword

Health and Safety Executive

The Health and Safety Executive (HSE) encourages industry to develop its own guidance and standards. I am very pleased that RenewableUK has stepped up to this challenge by once again revising their Guidelines, which were first published in 1994. Representative organisations such as RenewableUK are in a position to play a key role in driving health and safety improvements.

Members of RenewableUK and their contractors are of course free to take whatever action they feel necessary to ensure Health and Safety in their workplaces. HSE welcomes the revised Guidelines for Health & Safety in the Wind Energy Industry Sector being produced in the spirit of good industry practice, and feels that the efforts of RenewableUK will continue to make a significant contribution to improving Health and Safety on wind farm sites both onshore and offshore.

The revision of the Guidelines follows the publication of HSE's new strategy, The Health and Safety of Great Britain – Be part of the solution. It also coincides with a period of rapid expansion in the development of the wind energy sector. This therefore provides a timely reminder of what needs to be considered to ensure not only the prevention of pain and suffering to people caused at work, but also to deliver improved workforce commitment and enhance reputation. I am very encouraged that, through RenewableUK, the wind energy industry has indeed 'signed-up' and pledged to be part of the solution, and so play a part in reducing the numbers of work-related deaths, injuries and ill-health in Great Britain.

Nick Summers

Head of Utilities Section, Operational Strategy Division

Health and Safety Executive

(HSE observer at RenewableUK Health and Safety Strategy Group)

RenewableUK

The 2010 version of the Guidelines for Health & Safety in the Wind Energy Industry Sector ('Guidelines') reflects our commitment to keeping RenewableUK members and the industry up to date with Health and Safety developments, new legislation, guidance and best practice. The Guidelines are intended for information, general guidance and as an aide-mémoire for senior and operational managers within the industry sector. We will include minor changes reflecting any revised information in further versions of the document and by updates to members. As such, we welcome and encourage any comments on the format, quality and accuracy of this publication.

We acknowledge that improvements can always be made, and whilst the Guidelines do not constitute advice, or indicate any specific course of action, we wish to support and promote the sharing of good practices within the industry, so please contact RenewableUK if you have any enquiry on these Guidelines or the supporting Health and Safety issues they aim to promote.

Chris Streatfeild, RenewableUK Director of Health and Safety

Disclaimer

The contents of these Guidelines are intended for information and general guidance only, do not constitute advice, are not exhaustive and do not indicate any specific course of action. Detailed professional advice should be obtained before taking or refraining from taking action in relation to any of the contents of these Guidelines or the relevance or applicability of the information herein.

Glossary

Note: entries are primarily limited to those terms not explained in the text.

AC	Alternating Current
ACOP	Approved Code of Practice
AOGB	Health and Safety at Work etc. Act 1974 (Application outside Great Britain) (Variation) Order 2009
ADC-UK	Association of Diving Contractors
ASMS	Active Safety Management System
APS	Association of Project Safety
BIS	Department for Business, Innovation & Skills (formerly Business, Enterprise & Regulatory Reform)
CAA	Civil Aviation Authority
CDM	Construction (Design & Management) Regulations 2007
CIAT	Chartered Institute of Architectural Technologists
CIBSE	Chartered Institute of Building Services Engineers
CIOB	Chartered Institute of Builders
CITB	Construction Industry Training Board
Client	The organisation which carries out a project or for which a project is carried out
Commoners	Persons who have rights over land
COSHH	Control of Substances Hazardous to Health
CPHSP	Construction Phase Health & Safety Plan
DC	Direct Current
DECC	Department for Energy and Climate Change
Distribution Code	Regulations governing the connection and operation of generating plant to the distribution network
DNO	Distribution Network Operators
DRA	Design Risk Analysis (as used by designers under CDM)
DSEA	Dangerous Substances and Explosive Atmospheres
EAW	Electricity at Work Regulations
EMAS	Employee Medical Advisory Service
EMEC	European Marine Energy Centre
ERP	Emergency Response Plan
FLO	Fisheries Liaison Office
HASWA	Health & Safety at Work etc. Act 1974
HAV	Hand Arm Vibration
H&S	Health & Safety
HIAB	Truck or lorry mounted crane (proprietary name)
HSE	Health & Safety Executive
HSF	Health & Safety File (as defined under CDM)
HV	High Voltage – a voltage exceeding 1000V AC or 1500V DC measured between conductors, or 600V AC or 900V DC measured between conductors and earth
ICE	Institute of Civil Engineering
IEC	International Electrotechnical Commission
IMCA	International Marine Contractors Association
IMechE	Institute of Mechanical Engineers
IRATA	International Rope Access Trade Association
IMO	International Maritime Organisation
IOSH	Institution of Occupational Safety & Health
ISM	International Safety Management Code
ISPS	International Ship and Port Facility Security
IStructE	Institute of Structural Engineers

IVB	Independent Verification Body
KPI	Key performance indicator
kV	kilovolt
LV	Low Voltage – a voltage exceeding 50V AC or 120V DC, whether measured between conductors or to earth, but not exceeding 1000V AC or 1500V DC measured between conductors, or 600V AC or 900V DC measured between conductors and earth
MAIB	Marine Accident Investigation Branch
MCA	Marine and Coastguard Agency
MFA	Marine & Fisheries Agency
MHSWR	Management of Health & Safety at Work Regulations 1999 (as amended)
MOB	Man Overboard
MOD	Ministry of Defence
MRCC	Maritime Rescue Coordination Centre
MTC	Marine Traffic Coordinator
NATS	National Air Traffic Services
NLB	Northern Lighthouse Board
NOK	Next of Kin
O&M	Operations and Maintenance
OREI	Offshore Renewable Energy Installations
PLB	Personal Location Beacon
PPE	Personal Protective Equipment
PPM	Planned Preventive Maintenance
PTW	Permit to Work
RIBA	Royal Institute of British Architects
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995
RNLI	Royal National Lifeboat Institution
ROV	Remotely Operated Vehicle
RSPB	Royal Society for the Protection of Birds
SARCP	Search and Rescue Cooperation Plans
SCADA	Supervisory Control and Data Acquisition
SMS	Safety Management System
SOLAS	Safety of Life at Sea
TSO	Transmission System Operator
UKOPA	United Kingdom Onshore Pipeline Operators' Association
UXO	Unexploded Ordnance
WTG	Wind Turbine Generator
WAH	Work at Height Regulations 2005
WTSR	Wind Turbine Safety Rules (developed by RenewableUK and now commonly used within the industry)

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BEST PRACTICE GUIDELINES FOR WIND ENERGY HEALTH AND SAFETY

1. Introduction

- 1.1 RenewableUK, formerly known as BWEA, was established in 1978 as a professional association for those involved in wind energy research and development. It is now the trade association for the wind, wave and tidal energy industry, with over 600 company members. An important aspect of its work is the promotion of high standards and a commitment to continuous improvement in the management of Health and Safety within the industry, for both onshore and offshore activities.
- 1.2 Members are expected to adhere to the highest standards and ensure that contracts for design, procurement, construction, commissioning and operation are written so as to promote safe practices and avoid clauses that may compromise Health and Safety. This is fundamental to the development and maintenance of a strong safety-first culture within the industry.
- 1.3 RenewableUK recognises the importance of the Client in establishing high standards for Health and Safety at every stage of a renewable energy project. Clients and developers should promote high standards through the selection and management of the whole of their supply chain, including designers, manufacturers, contractors and operators. Clients also have enhanced legal responsibilities for project safety under CDM, as explained later in this document, which include ensuring that sufficient resources, including time, are allocated to a project. It is further recognised by the regulations that designers and manufacturers will have significant impact on Health and Safety throughout the life of the project. Designers have an obligation to eliminate, or, if impractical, reduce the severity of hazards. As such they have a major influence in promoting improvements in Health and Safety within the industry.
- 1.4 It is also accepted that a commitment to good practice requires that throughout the life cycle of a wind farm, steps are in place to ensure that the workforce are involved in improving Health and Safety standards as far as reasonably practicable through appropriate consultation, suitable training, competence assessments and by ensuring adequate supervision. To this end RenewableUK strongly recommends the adoption of minimum training standards for operative personnel and supervisors working both onshore and offshore. Section 2.4 below gives further details.
- 1.5 RenewableUK wishes to promote experience transfer between members so that good and best practices can be disseminated through learning from accidents, incidents, near events and operating experience. It is recognised that significant costs to operators, designers, manufacturers and suppliers can occur as a result of workplace accidents. Investment in safety to reduce accidents makes sound commercial sense. To help the industry learn from its collective experience, a Health and Safety Database, capturing onshore and offshore data, has been set up for RenewableUK members. More information on this valuable resource and how to benefit from it can be found in Section 2.5 below.
- 1.6 Recognising the advantages of having a common standard for safeguarding persons from the inherent dangers that exist from electrical and mechanical plant, RenewableUK has adopted a safe system of work for operational turbines. This is known as the Wind Turbine Safety Rules ('the Rules'). The Rules do not replace legislation or other regulatory requirements, however, they have been welcomed by owners, operators and service organisations and are already in widespread use on UK operational turbines. They have been refined over recent years following pilot studies and subsequent broader application. More detailed information on the Rules and guidance on their application can be found in Section 10.3 and at www.renewable-uk.com.

- 1.7 These Guidelines have been drawn up in consultation with the Health and Safety Executive (HSE) with the aim of enhancing Health and Safety on wind energy developments. They incorporate lessons learned in the wind sector since the Guidelines incorporating offshore aspects were last fully revised in October 2008. Specific changes made in that revision and references to progress in newer topic areas have been made as a result of
- the implementation of the 2007 CDM Regulations and the published guidance on implementing CDM and associated ACOP L144, Managing Health and Safety in Construction – see Section 6.4.;
 - interpretation and application of the 2005 Work at Height Regulations – see Sections 9.13.7 and 10.13.7;
 - procurement advice for work-at-height PPE – see Sections 8.4.3 and 9.13.7;
 - ensuring long-term turbine integrity through O&M best practice – see Section 10.5;
 - management of potentially high-impact, low-frequency risks on onshore wind farms – see Section 7.5;
 - heavy-vehicle transport and on-site safety – see Sections 7.5, 9.13.2 and 10.13.1;
 - emergency rescue cooperation – see Sections 9.9 and 10.11;
 - selection and operation of jack-up vessels – see Section 9.13.5;
 - informed contracting of diving services – see Section 9.13.6; and
 - access to nacelles/fitness to climb – see Sections 9.24 and 10.19.

These changes were made in the Guidelines issued in 2008. Additional updates in this 2010 edition include

- the Glossary;
- Principles of Successful Health and Safety Management (Section 5);
- Legislation and Standards (Section);
- Appendix 1: Guidance on Access, Egress, Abnormal Events and Emergency Response for Offshore Wind Turbine Generators (WTG) and Other Offshore Structures;
- Appendix 2: Know the Law;
- Appendix 3: References; and
- Appendix 4: Useful Contacts.

- 1.8 As with the previous version of these Guidelines this document it has been determined that further revisions will be appropriate to reflect changes in legislation and, as the offshore wind industry matures, to take account of new experience.

It should be emphasised that technical and equipment changes can impact on the equipment they interface with, which could affect performance. These should therefore be considered when undertaking any new or revised risk assessments. Details will be provided by RenewableUK

- 1.9 While the majority of these Guidelines is applicable to any geographic location, the document assumes that UK mainland legislation applies. Where this is not the case, reference to the appropriate regulatory requirements will need to be made.
- 1.10 A companion Guidelines document, developed jointly by RenewableUK and EMEC, is also available covering the emerging wave and tidal energy industry sectors. It is in a similar format and embraces similar philosophies. As with this document, it will be subject to periodic revision as the sectors expand and practical experience is gained.
- 1.11 RenewableUK welcomes feedback on its published material and readers are encouraged to forward comments and suggestions for future revisions to safety@renewable-uk.com.

2. The Nature of the Guidelines

- 2.1 These Guidelines are intended to be relevant to all organisations contributing to the life cycle of wind farms (from initial feasibility studies through to decommissioning) and particularly relevant to senior and operational management within organisations developing, constructing or operating wind farms, or considering becoming involved in the sector.

These Guidelines are not intended to provide in-depth advice and guidance on all aspects of Health and Safety in relation to the design, construction, commissioning, operation, maintenance and removal of wind turbines. Nor are they designed to replace existing HSE ACOPs and guidance. These Guidelines are intended to provide a summary of existing guidance so as to provide senior management with sufficient information to ask the necessary questions in relation to these aspects, in order to satisfy themselves that their organisation is promoting good standards of Health and Safety within this industry.

- 2.2 The Guidelines have been formulated for both land-based and offshore wind farms. Much of the information is common to both types of site. Therefore, in each section below, guidance relevant to both types of site is dealt with first, followed by additional guidance, where necessary, in relation to offshore sites. Offshore wind farms are exposed to the forces of waves, tides and extreme weather, which present greater challenges and risks in terms of access, work and dealing with emergency situations than equivalent onshore schemes. Appendix 1 provides more detailed guidance on offshore access and abnormal events specific to offshore wind farms.

(Where a section of this document describes guidance across the sector, any material specific to offshore wind farms is printed in blue for ease of identification.)

- 2.3 This revision recognises the more recent challenges that can influence Health and Safety in our busy, fast-growing industry – particularly offshore. These include issues of competence, adequate resources, short-service employees, workers whose mother tongue is not English, and the relatively small number of offshore turbine suppliers and installation vessels, to give a few examples.
- 2.4 In most respects this document describes existing guidance on Health and Safety. However, with regard to training for personnel working on wind farms, RenewableUK has introduced a safety accreditation scheme whereby wind industry personnel undergoing training to minimum standards recommended by RenewableUK are accredited accordingly. The scheme uses external training providers. Revised accreditation and approvals processes are being put into effect during 2010 for
- marine survival; and
 - work at height/escape from turbine.

Note: RenewableUK is reviewing all aspects of accredited training. Details will be announced to members as soon as they have been agreed. RenewableUK members are advised to use only those organisations whose personnel have undergone training relevant to their roles preferably from RenewableUK-accredited service providers under the scheme. While RenewableUK recognises that non-accredited training providers (including overseas companies) may offer equivalent acceptable courses, such companies should seek to obtain RenewableUK accreditation to widen members' choice of training service providers. The scheme, including the arrangements for training course providers, is described in detail in the 'Training' area of the **RenewableUK website**.

RenewableUK does not currently recognise accreditation schemes and qualifications of other organisations. (e.g MCA). However, RenewableUK is reviewing all training and competence standards relevant to the industry. Details are expected to be announced in 2010.

- 2.5 RenewableUK recognises the value of being able to learn from experience in order to better manage the

Health and Safety risks associated with all wind-farming activity. To this end, a user-friendly scheme has been developed to allow the reporting to RenewableUK of accidents, incidents and near events for both onshore and offshore wind projects, on a non-attributable basis. The information gathered, which is subject to confidentiality provisions, enables RenewableUK to assess the industry Health and Safety performance and issue quarterly reports on key issues. This information does not replace the existing reporting requirements of RIDDOR.

In order to learn as much as possible from incidents reported to RenewableUK through this process, it is vital that Health and Safety activity is reviewed, event root causes assessed and statistical analysis emailed to members who have signed up to use the database. In significant cases, 'Safety Alerts' are posted on www.renewable-uk.com, in the 'Health and Safety' area. RenewableUK recommends that companies, particularly wind farm developers, contractors and owners, sign up to and use this free database package and that Clients and their contractors have provisions in contracts to facilitate the submission of Health and Safety information to the database. Further details and arrangements for submitting and accessing data are contained in the 'Lessons Learned Database' area of the RenewableUK website.

3. Status of the Guidance in these Guidelines

- 3.1 Organisations involved with the wind energy industry are reminded that they have statutory duties under UK Health and Safety legislation. The purpose of this document is to offer advice on Health and Safety issues that are specific to the wind energy industry. Satisfying the requirements of these Guidelines should not be viewed as an indication of total compliance with the law. There is no substitute for knowledge of individual duties and legal requirements.
- 3.2 This document is primarily aimed at addressing relevant Health and Safety issues. It does not attempt to consider in detail environmental risks as they may relate to any wind farm project. However, duty holders are reminded that there is often significant overlap in fulfilling both Health and Safety, and environmental responsibilities. Policies, procedures, training and risk assessments should pay due regard to both areas in the most effective and pragmatic manner to ensure they are adequately considered.

4. Further Information

- 4.1 Appendix 1 contains information on Access and Emergency Response (see also Section 9.9)
- 4.2 Appendix 2 contains a brief explanation of the main areas of legislation applicable to the wind energy industry and Section 6 provides guidance on their application across the wind farm life cycle.
- 4.3 A list of some useful Health and Safety publications can be found in Appendix 3.
- 4.4 Further advice is available directly from the HSE, and some contact points are provided in Appendix 4.
- 4.5 Where any organisation does not have the necessary knowledge, competence or resources available to it, specialist advice can be sought from independent third parties and consultants. It is likely that in most situations the first port of call to enquire about selecting a consultant will be via the Chartered Institution of Occupational Safety and Health (IOSH) (<http://www.iosh.co.uk/>). IOSH provides details of how to obtain Health and Safety assistance. Other specialist organisations that may provide additional advice and expertise are listed in Appendix 4.

5. Principles of Successful Health and Safety Management

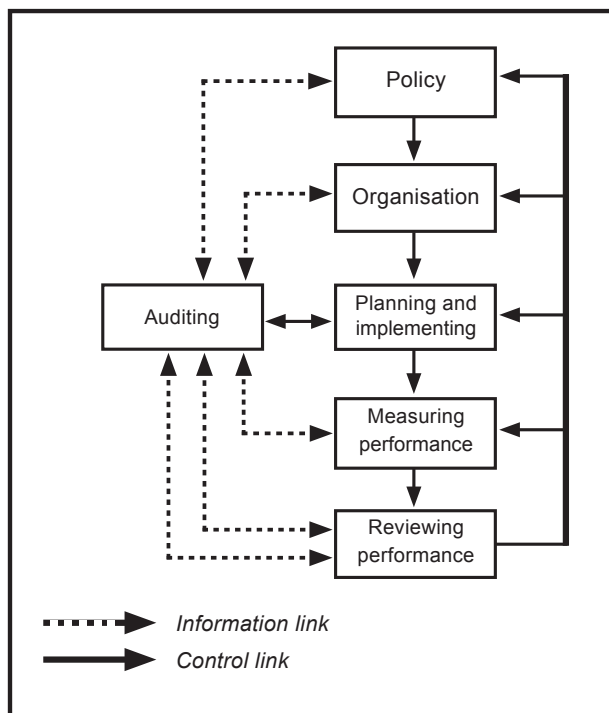
5.1 Legislative requirement

The Health and Safety at Work etc. ACT 1974 (HASWA) and supporting legislation require all employers to establish a Health and Safety policy, organisation and arrangements, and to document the system so as to ensure the effective implementation of the policy. High standards of Health and Safety may only be achieved where relevant responsibilities are formally specified and the organisation can demonstrate a strong Health and Safety culture.

The key elements of successful Health and Safety management are:

- clear policy;
- organisation;
- planning;
- implementation;
- measurement of performance; and
- auditing and review.

Key elements of successful Health and Safety management



Properly linked, these key elements combine to form a coherent and effective Health and Safety management system. (Figure reproduced from Successful Health and Safety Management: HSG 65, with permission from HSE). Further summary guidance on the elements is set out in Sections 5.3–5.6.

A further management system standard of relevance is BS OHSAS 18001:2007, Occupational Health and Safety Management Systems. More details on this standard are contained in Section 6.

The MHSWR require that organisations should obtain the advice and assistance of ‘Competent Persons’ on Health and Safety matters. These Competent Persons can be in-house advisers or a team of safety professionals, or the advice may be outsourced to external consultants. HSE prefers to see the appointment of internal advisers, who may have simplified access to a wide area of documents and confidential information.

5.2 Leadership

It is well recognised that effective Health and Safety performance is driven by the commitment and leadership of senior management. Health and Safety must be regarded as a key risk-management issue that must be driven from the top. Failure to do so can put employees and members of the public at risk and expose the organisation, its Directors, senior managers and employees to serious legal, contractual and financial consequences.

Organisations operating across the supply chain are strongly encouraged to pay due regard to these actions and the relevant Guidelines that support them.

Effective Health and Safety performance comes from the top; members of the Board have both collective and individual responsibility for Health and Safety. Directors and Boards need to examine their own behaviour, both individually and collectively, and compare this with any guidance given. If they see that their actions fall short of the standards required, then they should take action to change what they do to become more effective leaders in Health and Safety.

Why Directors and Board members need to act:

- Protecting the health, safety and welfare of employees, and that of members of the public who may be affected by their activities, is an essential part of risk management and must be led by the Board.
- Failure to include Health and Safety as a key business risk in Board decisions can have catastrophic results. Many high-profile safety cases over the years have been rooted in failures of leadership.
- Health and Safety law places duties on organisations and employers, and Directors can be personally liable when these duties are breached; Members of the Board have both collective and individual responsibility for Health and Safety.
- The Corporate Manslaughter and Corporate Homicide Act 2007 in conjunction with the Health and Safety (Offences) Act 2008 places greater needs on a business to ensure that their health and safety management is sufficiently adequate in the event of an incident especially if a fatality occurs.

Questions for Directors and Board members to answer for themselves include:

- How do you demonstrate the Board’s commitment to Health and Safety?
- What do you do to ensure appropriate Board-level review of Health and Safety?
- What have you done to ensure your organisation, at all levels, including the Board, receives competent Health and Safety advice?
- How are you ensuring all staff, including the Board, are sufficiently trained and competent in their Health and Safety responsibilities?
- How confident are you that your workforce, particularly safety representatives, are consulted properly on Health and Safety matters, and that their concerns are reaching the appropriate level including, as necessary, the Board?
- What systems are in place to ensure your organisation’s risks are assessed, and that sensible control measures are established and maintained?

Specific information on actions for Company Directors and Board members can be found in the joint HSE/IOD document *Leading Health and Safety at Work*, available from www.hse.gov.uk/leadership.

These and other questions relating to the Directors' and senior managers' operational control of the business are likely to be asked by the police or the HSE in the event of a serious incident.

5.3 Policy

Setting the overall aims of the organisation and confirming management commitment

The first steps for any business seeking to implement key elements of a successful Health and Safety management system are to set out the ultimate aims of a sound Health and Safety policy. The Board should apply the logic and rigour of business planning to the identification and control of risks.

Your Health and Safety policy should influence all your activities, including the selection of people, equipment and materials, the way work is done, and how you design and provide goods and services. The policy should demonstrate to staff and anyone else that you have arrangements in place to manage and control Health and Safety risks.

This control is normally focused on tackling hazards according to a risk base – i.e. assessing what the risks are, ranking them, and tackling the greatest risks first. This risk-based approach is reflected elsewhere as the organisation's risk assessment strategy (see also Section 5.7).

5.4 Organisation

Identifying who will do what

The Board is normally in overall control of the organisation and it is incumbent upon the Board to obtain competent advice and the assistance of the relevant Competent Persons to advise it on its strategy.

In recent years there have been several (failed) initiatives to try to require organisations to appoint individuals as Health and Safety Directors or to nominate individuals to be responsible for Health and Safety. These initiatives have not as yet been successful. However, with the introduction of the Corporate Manslaughter and Corporate Homicide Act in 2007 and the Health and Safety (Offences) Act in 2008, Health and Safety has now achieved a higher priority on the agenda of most organisations. Personal prosecutions are becoming more frequent and the penalties that individuals now face include imprisonment for individual failings and very high fines for failings identified as those of senior management.

To secure the implementation of good or best practice and the continual development of a high quality Health and Safety policy, it is essential to have a clearly defined structure to manage the implementation of policy and for clear procedures to be implemented.

Although Health and Safety is the responsibility of everyone in an organisation, specific responsibilities may be delegated by the Board to individuals involved in the management of Health and Safety. These responsibilities may be appropriate for all levels of the organisation, and the relationships between those individuals may be set out along normal reporting lines. The aims of the organisation should be to:

- ensure communication of relevant information throughout the organisation;
- secure the competence of employees;
- monitor the performance of the organisation; and
- review the operation of the safety management system.

5.5 Planning and implementation

Putting policy into practice

To be successful in Health and Safety management, it is necessary to draw up plans and set performance standards, with the overall aim of eliminating or controlling risks. The plans define the standards of Health and Safety that the organisation is aiming to achieve, how they will be accomplished, and the timescale for achievement. The planning and implementation process, which should include staff consultation and training, will result in operating and maintaining systems which:

- identify objectives and set timescales for their achievement and review;
- set performance standards for management actions;
- set performance standards for the control of risks to employees and others affected by work activities
(for example, customers and visitors);
- set performance standards for contracts and key performance indicators for monitoring contractors
(to enable selection or re-selection);
- establish priorities for provision and maintenance of control measures;
- ensure adequate supporting documents for all performance standards; and
- provide adequate resources, including time.

In devising control measures, it is necessary to analyse work practices. Where possible, the operatives as well as the Competent Person should be involved in the assessment. This should enable the actual work processes to be systematically assessed to identify hazards and then to carry out meaningful risk assessments of these hazards (see Section 5.6). In formulating risk control measures after the risk assessments have been completed, it is recommended that the following hierarchy of risk management be used:

- If possible, completely eliminate the hazard so that risks can be avoided altogether.
- Substitute a less hazardous work process.
- If not possible to eliminate or substitute, tackle the hazard source to reduce its potential.
- Failing this, priority should be given to measures to control the risk, which will protect all workers (Collective Measures).
- As a last resort only, measures must be taken to control the risk by means of personal protection (Personal Measures).
- Physical measures such as guards are preferable to systems, supervision or training.
- If systems are used then these should, if possible, be designed to fail to safe rather than failing to danger.

Detailed reference should be made to regulations that may specify a hierarchy of measures particular to that regulation, hazard or activity. In particular the principles of prevention set out in MHSWR must be considered.

5.6 Measuring and reviewing performance

Check standards are really being achieved, praise achievement, and ensure faults and opportunities for improvement are acted upon

In order to check that the Health and Safety standards are actually being achieved in practice, it is necessary to measure performance against the predetermined plans, standards and procedures. Any areas in which the planned standards are not being met should be identified for remedial action. The types of systems that can be used to monitor Health and Safety performance can be categorised into active and reactive systems.

Active monitoring systems (before things go wrong), also known as proactive monitoring

- Monitoring of specific objectives and reporting results quarterly or monthly
- Periodic examination of documents to review performance assessment, recording of training needs and delivery of suitable training
- Systematic inspection of premises, plant and equipment by supervisors, maintenance staff, management and safety representatives, or other employees to ensure the continued effective operation of workplace precautions
- Environmental monitoring and health surveillance to check on the effectiveness of health control measures and to detect early signs of harm to health
- Direct observation of work and behaviour by first line supervisors to assess compliance with procedures, rules and risk control
- Operation of audit systems
- Regular review of Health and Safety performance reports by the Board of Directors
- Periodic inspection of vacant property carried out by suitably qualified and experienced property surveyors

Reactive monitoring systems (after things go wrong)

Identify where Health and Safety standards are not being met, and report and analyse failures – for example, accidents, cases of ill health or damage to property.

When reporting and response systems are put in place, it is important to ensure that monitoring information is evaluated by people competent to recognise situations in which there is an immediate risk to health or safety, as well as longer-term trends. They must have sufficient authority to ensure that appropriate remedial action is taken. Effective investigation and analysis requires that:

- priority is given to incidents that indicate the greatest risk;
- both the immediate and the underlying causes of events are identified;
- information reaches management with sufficient authority to initiate remedial action, including organisational and policy changes; and
- adequate analysis is made of all collected data to identify common features or trends and initiate improvements at an organisational level.

The response to auditing is the final step in the Health and Safety management cycle. Together, performance auditing and review constitute the ‘feedback loop’ needed to enable the organisation to maintain and develop its ability to manage risks to the fullest possible extent. Auditing and review ensure that any inadequate performance is identified and appropriate remedial action is put into effect. Regular auditing of Health and Safety systems can identify whether they have deteriorated or are becoming obsolete. Auditing needs to be comprehensive and to examine over time all the components of the Health and Safety management systems in an organisation.

Legal Privilege (after problems are identified)

If consultants or auditors have identified an issue that may result in a prosecution for a breach of statutory duty or a claim for personal injury (or other legal proceedings), then it may be possible to carry out further investigations under legal privilege. You are advised to take legal advice if any investigation is likely to proceed in this manner.

5.7 Risk assessment

Risk assessment is a key activity in the management of Health and Safety. It is a legal requirement under the Management of Health and Safety at Work Regulations 1999, for every employer to make a suitable

and sufficient assessment of the risks to the health, safety and welfare of their employees whilst they are at work, and to the health and safety of others who may be affected by the work they undertake.

An assessment of risk is also a requirement of several other regulations, including Working at Height, Control of Substances Hazardous to Health, Manual Handling and others.

Risk assessments should address all Health and Safety risks, during every phase of the life cycle of a wind farm, including those to members of the public, as well as personnel working on site. Various techniques are available and some are more suited than others to different phases of a wind farm development, such as design, manufacture, installation, commissioning, operation, maintenance and decommissioning. Organisations should define the risk assessment techniques to be used within their Health and Safety management system, along with the levels of competence required by those performing or reviewing the risk assessments.

Risks should be designed out or reduced to as low a level as reasonably practicable. Designers have a duty under the CDM to identify and eliminate hazards at every stage of the design process, and to provide information with the design as to the nature of any significant risks remaining. Clients are in a strong position to influence designers, by placing emphasis on, and ensuring throughout that the design achieves a high standard of Health and Safety compliance.

The findings of a risk assessment should be in the form of controls to be applied to the workplace to reduce exposure to the identified risks. Both the identified risks, and the control measures selected to prevent the realisation of those risks, must be communicated to those carrying out the work, prior to work commencing. Records of all information, instruction and training are required to be retained as evidence that they were provided.

The findings of all risk assessments are required to be recorded and reviewed at regular intervals to ensure they remain up-to-date. Initial guidance on risk assessment can be found in the HSE's publication INDG163, Five Steps to Risk Assessment.

It should be noted that this guidance is very basic and duty holders are, in most situations, encouraged to develop their own risk assessment procedures and templates, which can take into account industry- and site-specific issues.

To facilitate the production of project-specific risk assessments and operating procedures for specific Health and Safety events associated with offshore wind farms, Appendix 1 contains a subset of generic procedures for offshore access, egress, abnormal event and emergency responses in flow-chart format. These are provided for guidance only; project-specific risk assessments must be prepared in every case to define the actual working procedures.

Method Statements

Project-specific risk assessments may be used to devise methods of work (sometimes referred to as 'method statements'). These method statements should not be prepared entirely as generic 'process' documents unless the process is unlikely to change. If there is a possibility that these method statements will be revised (e.g. ground conditions are unknown), then the method statements should be under the control of an operative or supervisor qualified and competent to be able to review the effectiveness of the method, or to call a halt to the work pending revision of the method of work.

Sufficiently robust work instructions should be given to operatives and contractors to ensure that work is stopped and delayed if necessary. In addition, adequate precautions in contracts may need to be reviewed for delay caused as a result of safety precautions.

If the method of work is not capable of change without reference to a manufacturer or designer then

these people should be on-hand to assist and revise the method statement as needed. Contractual requirements in procurement may assist with this responsiveness.

5.8 Management of change

Temporary and permanent changes to an organisation, personnel, systems, procedures, working methods and practices, equipment and materials may be planned or unplanned. Although every effort should be made by designers and others to identify appropriate work methods (including assembly instructions and equipment to be used) and control measures to eliminate risks and to minimise the need for change, unexpected or unforeseen events or situations may still arise at any stage throughout the wind farm cycle. These events and situations may require unplanned changes to be implemented quickly which, if not managed effectively, may significantly increase risk to Health and Safety.

CDM requires all parties to cooperate and coordinate their activities throughout the construction phase and Clients have specific responsibility to ensure all parties are provided with sufficient time and resources to enable them to plan and carry out their work safely.

Whether changes are planned or unplanned it is important to ensure that their potential impact on Health and Safety is properly assessed, so that hazards or risks associated with the change are identified and effectively managed.

Organisations should develop an effective management of change process, which is capable of being implemented across all aspects of wind farm development and operation, to enable changes to be effectively managed into the workplace. This process should consider:

- the methods and work required to be changed;
- the methods and work required to implement the change;
- additional equipment required to be used to implement change or that which is required to be introduced as a result of the change;
- the review and, where necessary, revision of existing risk assessments;
- the review and, where necessary, revision of existing safe system of work, method statements and work instructions;
- any additional control measures – organisational, procedural, engineering controls and/or PPE, necessary to implement the change and/or required to be introduced as a result of the change;
- the issuing of modified information and instruction;
- the re-training of personnel involved with the work; and
- the allocation of sufficient time and resources to implement the change.

5.9 Management of supply chain

One of the greatest risks in any safety management system concerns the management of the interaction with suppliers or contractors. Supply chain management can take large resources to control and it can easily result in problems if it is not well managed.

The key issues for the Board and the Competent Person to focus their attentions on are:

- the selection of suitable Competent Persons (see Section 9.6), such as CDMCs or internal business advisers;
- the selection of suitable contractors (see CDM ACOP – Appendix 4);
- the contractual definition of key performance indicators (KPIs); and
- the monitoring of contractors according to KPIs, and compliance with method statements.

6. Legislation and Standards

6.1 Health and Safety legislation relevant to wind farm projects

The law relating to Health and Safety in the UK consists of statutory duties under Health and Safety legislation, and also duties under the common law. The legislation covering statutory duties and the common law exist side by side, and some statutes have created duties under the common law. The legislation that is most likely to be relevant to different phases of a wind farm is listed in the table below.

At common law, the burden remains on a plaintiff to show that the employer has failed to take reasonable care to avoid the risks of harm that he ought reasonably to have foreseen might arise in the circumstances. The hallmark of liability at common law is that the employer must be shown not to have acted reasonably.

In breaches of statutory duty, the burden of proof is reversed and it is incumbent upon the employer to show that there was no risk, or if there was a risk, then everything reasonably practicable had been done to avoid it. The adjective 'reasonably' serves only to qualify the concept of practicability. Reasonableness of conduct does not stand as the hallmark by which statutory liability is avoided as it does at common law.

The focus of the defence by which liability for an alleged breach of statutory duty is avoided, once it has been shown that the place of work was unsafe, is practicability – qualified by reasonableness.

Under statute, there are absolute duties (not qualified by anything) to 'ensure' that the employee's place of work is safe. If the place of work is not safe (even though the danger is not great or the risk is not very likely to occur) the employer's duty is to do what is reasonably practicable to eliminate it.

Once any risk has been identified, the approach must be to ask whether it is practicable to eliminate it and then, if it is, to consider whether, in the light of the quantum of the risk, and the cost and difficulty of the steps to be taken to eliminate it, the employer can show that the cost and difficulty of the steps substantially outweigh the quantum of risk involved.

The Construction (Design & Management) Regulations 2007 (CDM) supported by the Health & Safety at Work etc. Act 1974 and the Management of Health & Safety at Work Regulations 1999 (MHSWR), are the main pieces of Health and Safety management legislation required to be considered when preparing for and carrying out construction activities, including planning, design, installation, commissioning, maintenance and decommissioning.

The table below is intended to provide a guide as to which Act or Regulation may apply to each of the wind farm life cycle phases, which are described in Sections 7 to 10 of this document. It is not exhaustive and the indication of applicability should not be taken as a legal interpretation.

The legislation is set out more fully in Appendix 2, which includes a synopsis of each item. More recent UK Health and Safety legislation has been drafted to enact European Directives and thus the general provisions should prove familiar to suitably competent persons from other EU countries.

Marine operations performed on offshore wind farms may fall under the Merchant Shipping Regulations and the jurisdiction of the Maritime and Coastguard Agency (MCA). Additional guidance has been provided within the Marine Legislation section below.

Note: The Health and Safety at Work etc. Act 1974 (Application outside Great Britain) (Variation) Order 2009 has now extended the prescribed provisions of the HASWA to work activities beyond the territorial sea and to other specified areas designated by order under section 1(7) of the Continental Shelf Act 1964 (See Appendix 2 for more detail).

Name of Legislation
Health & Safety at Work etc. Act
Health & Safety at Work etc. Act 1974 (Application outside Great Britain) Order 2001 (as amended by the Health and Safety at Work etc. Act 1974 (Application outside Great Britain) (Variation) Order 2009)
Management of Health & Safety at Work Regulations 1999
The Construction (Design & Management) Regulations 2007
Merchant Shipping and Fishing Vessels (Health & Safety at Work) Regulations 1997
The Workplace (Health, Safety & Welfare) Regulations 1992
The Docks Regulations 1988
The Regulatory Reform (Fire Safety) Order 2005
Fire (Scotland) Act 2005
Fire Safety (Scotland) Regulations 2006
The Health & Safety (Consultation with Employees) Regulations 1996
The Safety Representatives and Safety Committee Regulations 1977
The Diving at Work Regulations 1997
Provision and Use of Work Equipment Regulations 1998
The Supply of Machinery (Safety) Regulations 2008
Lifting Operations and Lifting Equipment Regulations 1998
Pressure Equipment Regulations 1999 (Pressure Equipment Directive)
Pressure System Safety Regulations 2000
Electricity at Work Regulations 1989
The Electricity (Safety, Quality and Continuity) Regulations 2002
Working at Height Regulations 2005 (as amended 2007)
Confined Space Regulations 1997
The Control of Vibration at Work Regulations 2005
The Control of Noise at Work Regulations 2005
Control of Substances Hazardous to Health Regulations 2002 (as amended 2005)
Dangerous Substances and Explosive Atmospheres Regulations 2002
The Carriage of Dangerous Substances & Use of Transportable Pressure Equipment Regulations 2007
Registration, Evaluation and Authorisation of Chemical Regulations (EC) 2007
Health & Safety (Display Screen Equipment) Regulations 1992 (as amended 2002)
Manual Handling Regulations 1992 (as amended)
Personnel Protective Equipment Regulations 1992 (as amended)
The Construction (Head Protection) Regulations 1989
The Health & Safety (Safety Signs and Signals) Regulations 1996
The Health & Safety (First Aid) Regulations 1981
The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995
The Occupier's Liability Act 1957 and 1984
Health & Safety Miscellaneous Amendments Regulations 2002
The Coast Protection Act 1949 (as amended by the Merchant Shipping Act 1988)
The Factories Act 1961

*Note that the Workplace Regulations will apply to any support bases remote from the construction site during the construction phase, such as quayside facilities in support of an offshore wind farm, to which the Docks Regulations would also apply.

6.2 Marine legislation

A number of international conventions have been ratified to cover the Health and Safety of merchant shipping, and the use and operation of vessels. Under the Merchant Shipping Act, the UK Government has adopted the international convention orders and implemented its requirements into UK law, which are detailed under 'Merchant Shipping Regulations'. The MCA is responsible for monitoring the implementation and compliance of this legislation.

Due to the specialist nature and availability of appropriate construction vessels, many of which are contracted from non-UK countries, they will not necessarily comply with UK marine legislation, but should meet with their own country's version of the international convention.

Under CDM, Clients and principal contractors have specific responsibility for ensuring the competence of contractors who they may engage to carry out work on their sites and are required to ensure all vessels contracted from outside the UK comply with (as a minimum) the following international conventions:

SOLAS – International Convention for the Safety of Life at Sea (SOLAS), 1974

STCW – International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1995

COLREG – Convention on the International Regulations for Preventing Collisions at Sea, 1972

Marine Guidance Note 275 – Proposed UK Offshore Renewable Energy Installations (OREI) – Guidance on Navigational Safety Issues

MARPOL – covers the management and control of waste and pollution at sea

6.3 Relevant British and European standards

The following British and European Standards have been created specifically for use within the wind energy industry. The content of some may impact on Health and Safety. Where relevant the BS EN number has been used as opposed to the applicable IEC reference. However both should be checked.

PD IEC WT01:2001 – IEC System for Conformity Testing and Certification of Wind Turbines – Rules and procedures

BS EN 61400-1:2005 – Wind turbines – Design requirements

BS EN 61400-2:2006 – Wind turbines – Design requirements for small wind turbines

IEC 61400-3:2009 – Wind turbine generator systems – Design requirements for offshore wind turbines

BS EN 61400-11:2003 – Wind turbine generator systems – Acoustic noise measurement techniques (amended 2006)

DD IEC TS 61400-13:2001 – Wind turbine generator systems – Wind turbine power performance testing

DD IEC/TS 61400-14:2005 – Wind turbine generator systems – Measurement of mechanical loads

IEC/TS 61400-14:2005 – Wind turbine generator systems – Declaration of apparent sound power level and tonality values

IEC 61400-21:2008 – Wind turbine generator systems – Measurement and assessment of power quality characteristics of grid connected wind turbines

IEC TS 61400-23:2002 – Wind turbine generator systems – Full-scale structural testing of rotor blades

PD IEC/TR 61400-24:2002 – Wind turbine generator systems – Lightning protection

BS EN 61400-25-1:2007 – Wind turbine generator systems – Communications for monitoring and control of wind power plants – Overall description of principles and models

BS EN 61400-25-2:2007 – Wind turbine generator systems – Communications for monitoring and control of wind power plants – Information models

BS EN 61400-25-3:2007 – Wind turbine generator systems – Communications for monitoring and control of wind power plants – Information exchange models

BS EN 61400-25-4:2008 – Wind turbine generator systems – Communications for monitoring and control of wind power plants – Mapping to communication profile

BS EN 61400-25-5:2007 – Wind turbine generator systems – Communications for monitoring and control of wind power plants – Conformance testing

BS EN 61400-25-6:2008 – Wind turbine generator systems – Communications for monitoring and control of wind power plants – Logical node classes and data classes for condition monitoring

BS EN 50308:2004 – Wind turbine generator systems – Protective measures – Requirements for design, operation and maintenance

PD CLC/TR 50373:2004 – Wind turbine generator systems – Electromagnetic compatibility

IEC 60050-415:1999 – Wind turbine generator systems – International electrotechnical vocabulary – Part 415

BS EN 61508-7:2002 – Functional safety of electrical/electronic/programmable electronic safety-related systems

BS ISO 81400-4:2005 – Wind turbine generator systems – Design and specification of gearboxes

DD IEC/TS 62257-9-1:2008 – Recommendations for small renewable energy and hybrid systems for rural electrification – Micropower systems

Other relevant standards include, but are not limited to:

BS EN ISO 14122-1:2001 – Safety of machinery – Permanent means of access to machinery – Part 1: Choice of fixed means of access between two levels

BS EN ISO 14122-2:2001 – Safety of machinery – Permanent means of access to machinery – Part 2: Working platforms and walkways

BS EN ISO 14122-3:2001 – Safety of machinery – Permanent means of access to machinery – Part 3: Stairs, stepladders and guard rails

BS EN ISO 14122-4:2004 – Safety of machinery – Permanent means of access to machinery – Part 4: Fixed ladders

BS EN 795:1997 – Protection against falls from a height – Anchor devices – Requirements and testing

BS 7883:2005 – Code of Practice for the design, selection, installation, use and maintenance of anchor devices conforming to BS EN 795

- The structure of standards enables other more commonly used standards such as BS EN ISO 9001 (Quality Management) and BS EN ISO 14001 (Environmental Management) to be easily transposed into a single Integrated Management System (IMS) covering all three internal company disciplines.
- BS OHSAS 18001:2007 is auditable, and certification to the standard by accreditation bodies is now being awarded to companies which have demonstrated that they have achieved a specific level of competence in respect of their Health and Safety management.

6.4 The Construction (Design and Management) Regulations 2007

CDM were introduced to achieve uniformity, structure and focus in the management of Health and Safety in construction and demolition projects. CDM were revised in 2007 following a long consultation. They provide a framework within which all projects should be managed. The key aims of CDM are to: 'integrate Health and Safety into the management of the project and to encourage everyone involved to work together to

- a) improve the planning and management of projects from the very start;
- b) identify hazards early on, so that they can be eliminated or reduced at the design or planning stage, and the remaining risks can be properly managed;
- c) target effort where it can do the most good in terms of Health and Safety; and
- d) discourage unnecessary bureaucracy'.

The regulations apply to all projects, whether onshore or offshore. However, a specific criterion determines whether the project is notifiable to the HSE. This criterion is: where the project work is expected to last more than 30 days or involve more than 500 person days of work. It is anticipated that the majority of the works relating to wind farm development will be notifiable.

A 'notifiable' project requires the formal assessment and appointment of CDM Coordinator and Principal Contractor.

CDM defines a number of key duty holders within a project:

- Client
- CDM Coordinator
- Designer(s)
- Principal Contractor
- Contractors.

6.4.1 The Client

A Client is an organisation or individual for whom a construction project is carried out. The Client can be considered to be the entity to which the final project will be delivered. The CDM ACOP states:

'The Client has one of the biggest influences over the way a project is delivered. They have substantial influence and contractual control, and their decisions and approach determine:

- a) *the time, money and other resources available for projects,*
- b) *who makes up the project team, their competence, when they are appointed and who does what,*
- c) *whether the team is encouraged to cooperate and work together effectively,*
- d) *whether the team has the information that it needs about the site and any existing structures, and*
- e) *the arrangements for managing and coordinating the work of the team, because of this they are made accountable...'*

Joint Ventures

In the case of a Joint Venture (JV), the role of Client must be agreed by the steering committee, and either:

- that an individual organisation within the JV accepts the role formally with the full written agreement of all of the other parties in the JV

or

- that the steering committee of the JV undertakes the role of Client themselves. CDM place greater emphasis on the 'non-transferable' responsibilities of the Client than the Construction (Design and Management) Regulations (CDM 1994) that they replace.

Reference should also be made to the Health and Safety at Work etc. Act 1974 (Application outside Great Britain) (Variation) Order 2009 when reviewing the nature of activities being performed offshore.

6.4.2 The CDM Coordinator (CDMC)

The CDMC should be appointed before any significant design decisions are made on the project, and consequently this should be as early as practicable in the project timeline.

The CDMC should have sufficient independence from the Client to allow him to act impartially in considering the safety and health throughout the project. This is not to say that the CDMC may not be an employee of the Client but, if he is, then he should be able to demonstrate true impartiality.

The CDMC is appointed by the Client and shall follow a robust assessment of competence. The CDMC should ideally have continuity throughout the project.

A prospective CDMC should be offered the role by the Client in writing and he shall give a written acceptance of this. Included in this written acceptance is the confirmation that the CDMC considers himself competent to undertake the role within the given parameters.

6.4.3 The Designer(s)

The Designer(s) is/are appointed by the Client. In the initial stages of the development life cycle the main or lead designer may be an individual within a development team who is tasked with creating the layout of the project. This individual is key to ensuring that the appropriate DRA is performed on the design as it evolves. During later stages of the development process other designers may be appointed; these designers may be civil, electrical, etc. and are commonly external companies or consultants contracted to the project. It is important that designers understand that they hold this designated role, as defined within CDM. Their appointment and their design works should be coordinated by a lead designer and/or the CDMC as appropriate. The lead designer and CDMC shall assess the competence and resources of all additional design contractors prior to appointing them to the project.

Examples of those who may be designers:

- project developer
- external project development consultant (or company)
- geotechnical consultant
- noise consultant
- wind assessment consultant
- wind turbine manufacturer.

It should be noted that, where a design is prepared or modified outside Great Britain for use in construction work, this will apply to the person who commissions it (if established within Great Britain) or, if that person is not so established, any Client for the project should ensure that the duties for designers are complied with.

6.4.4 The Principal Contractor (PC) and Contractors

The CDMC should support the Client to assess the competence and suitability of a Principal Contractor (and other contractors where these are not to be appointed by the PC) as part of the tender evaluation process, using as a guide Appendix 4 of the CDM ACOP L144. The Principal Contractor will commonly be an external construction organisation that has demonstrated its competence in the form of experience, suitably skilled employees, robust management systems and adequate resources to deliver the project.

6.4.5 Role-holder duties (Extracted from CDM ACOP L144)

All construction projects (Part 2 of the Regulations)	Additional duties for notifiable projects (Part 3 of the Regulations)
Clients	
<ul style="list-style-type: none"> • Check competence and resources of all appointees • Ensure there are suitable management arrangements for the project including welfare facilities • Allow sufficient time and resources for all stages • Provide pre-construction information to designers and contractors 	<ul style="list-style-type: none"> • Appoint CDM Coordinator* • Appoint Principal Contractor* • Ensure that the construction phase does not start unless there are suitable: <ul style="list-style-type: none"> - welfare facilities, and - construction phase plans in place • Provide information relating to the Health and Safety file to the CDM Coordinator • Retain and provide access to the Health and Safety file(* There must be a CDM Coordinator and Principal Contractor until the end of the construction phase)
CDM Coordinator	

	<ul style="list-style-type: none"> • Advise and assist the Client with his/her duties • Notify HSE • Coordinate Health and Safety aspects of design work and cooperate with others involved with the project • Facilitate good communication between Clients, designers and contractors • Liaise with Principal Contractor regarding ongoing design. Identify, collect and pass on pre-construction information • Prepare/update the Health and Safety file
Designers	
<ul style="list-style-type: none"> • Eliminate hazards and reduce risks during design • Provide information about remaining risks 	<ul style="list-style-type: none"> • Check Clients are aware of duties and CDM Coordinator has been appointed • Provide any information needed for the Health and Safety file
All construction projects (Part 2 of the Regulations)	Additional duties for notifiable projects (Part 3 of the Regulations)
Principal Contractors	
	<ul style="list-style-type: none"> • Plan, manage and monitor construction phase in liaison with contractor • Prepare, develop and implement a written plan and site rules • (Initial plan completed before the construction phase begins) • Give contractors relevant parts of the plan • Ensure suitable welfare facilities are provided from the start and maintained throughout the construction phase • Check competence of all appointees • Ensure all workers have site inductions and any further information and training needed for the work • Consult with the workers • Liaise with CDM Coordinator regarding ongoing design • Secure the site
Contractors	

<ul style="list-style-type: none"> • Plan, manage and monitor own work and that of workers • Check competence of all their appointees and workers • Train own employees • Provide information to their workers • Comply with the specific requirements in Part 4 of the Regulations • Ensure there are adequate welfare facilities for their workers 	<ul style="list-style-type: none"> • Check Client is aware of duties, a CDM Coordinator has been appointed and HSE notified before starting work • Cooperate with Principal Contractor in planning and managing work, including reasonable directions and site rules • Provide details to the Principal Contractor of any contractor whom he engages in connection with carrying out the work • Provide any information needed for the Health and Safety file • Inform Principal Contractor of problems with the plan • Inform Principal Contractor of reportable accidents, diseases and dangerous occurrences
Everyone	
<ul style="list-style-type: none"> • Check own competence • Cooperate with others and coordinate work so as to ensure the Health and Safety of construction workers and others who may be affected by the work • Report obvious risks • Comply with requirements in Schedule 3 and Part 4 of the Regulations for any work under their control • Take account of and apply the general principles of prevention when carrying out duties 	

6.4.6 Activities falling under the Regulations

Regulations are applicable to the design and construction and commissioning phases of projects, ongoing operations and maintenance, and decommissioning of wind farms.

6.4.7 Approved Code of Practice (ACOP)

Additional information on interpretation and application of CDM can be found in the ACOP L144.

6.4.8 CDM (Part 4)

Part 4 (regulations 26 to 44 of CDM) encompasses the requirements previously detailed in the Construction (Health, Safety & Welfare) Regulations 1996 (now wholly repealed). Although guidance is not provided in the ACOP L144 for these regulations, the regulations themselves can be found in the ACOP Appendix 1 and these set out clear requirements, with respect to construction work, in the following areas:

- safe places of work
- good order and site security
- stability of structures
- demolition or dismantling
- explosives
- excavations
- cofferdams and caissons
- reports of inspections

- energy distribution installations
- prevention of drowning
- traffic routes
- vehicles
- prevention of risk from fire
- emergency procedures
- emergency routes and exits
- fire detection and fire fighting
- fresh air
- temperature and weather protection
- lighting.

The requirements of these regulations must be implemented fully to ensure a safely managed site. The Client is responsible for checking that these requirements have been complied with at the beginning of a project, but they do not then have to keep checking on these requirements as the project evolves; that is the responsibility of the Principal Contractor.

7. Site Development and Planning

7.1 Introduction

This section highlights the considerations that should be given to Health and Safety when appraising the feasibility of proceeding with a wind farm project. This phase also deals with the period covering the preparation and application for planning consent and includes information that might be required on Health and Safety for inclusion in any Environmental Statement. It is at this stage that fundamental design decisions are likely to be taken.

7.2 Legislative Requirements

7.2.1 A table of the various legislative requirements and guidance on their applicability to each stage of the project is included in Section 6.

It is important that each Client is in a position to discharge its duties under CDM in the early stages of project development and that those persons taking such decisions understand their obligations as Designers under CDM. Where Clients do not have the relevant expertise then a CDMC can be asked to advise.

The Client should appoint the right people; pass on all reasonably obtainable information in its possession to the other duty holders; allow a minimum amount of time before the construction phase commences for the planning and preparation of work; and ensure that suitable management arrangements are in place.

The Client needs to ensure that Contractors provide their workers with the correct welfare facilities and that Designers ensure that their designs meet Health and Safety requirements for workplaces during their construction.

Competency of those fulfilling CDM roles has been given greater emphasis in the 2007 version of CDM. To be competent, an organisation or individual may need to be assessed separately. They must have:

- the relevant arrangements in place to manage Health and safety, and
- sufficient work experience in the field of work in which they are proposing to work, as well as those where they may be asked to do work (in the event of 'contract creep'). Work experience may include:
- knowledge of the specific tasks to be undertaken and the risks the work will entail;
- experience in carrying out similar work in the past;
- relevant qualifications and certification; and
- sufficient expertise and ability to carry out their duties in relation to the project; to recognise their limitations and take appropriate action in order to prevent harm to those carrying out construction work, or those affected by it.

The HSE has produced an Approved Code of Practice L144, Managing Health and Safety in Construction, which gives clear guidance on assessing competence in Appendix 4. The ACOP notes that assessments should focus on the needs of a particular job and should be proportionate to the risks arising from the work. Unnecessary bureaucracy associated with competency assessments obscures the real issues and diverts effort away from them.

7.2.2 Any person procuring or arranging site investigation or other preliminary works, e.g. a met mast, should check whether the work is defined as construction work and ensure that, where appropriate, a CDM coordinator is appointed.

7.3 Public safety considerations

This section focuses on the need to ensure that potential risks to non-industry personnel, e.g. members of the public, are addressed throughout the life phases of projects and that residual risks are acceptable when compared with people's expectations of day-to-day risk exposure. RenewableUK is committed to working with relevant authorities to continue to develop and promote clear guidelines for use by developers and planning authorities to deal with risks to the public. These, together with relevant standards (see 6.3) and industry good practice, should minimise risks. It is important to stress the excellent safety record of modern wind turbines and that the issues listed below relate to events that occur very infrequently.

7.3.1 The project development process requires identification of hazards and management of risks to public safety. Risk assessments combine consideration of the hazard presented by the specific installation/ location (taking due account of all risk control measures) and the nature and frequency of public exposure. The process must provide assurance that the risks from the proximity and layout of turbines in relation to areas used by the public, are acceptable.

7.3.2 Specific issues on which public safety assurance is appropriate include:

- turbine structural integrity,
- fire/flame spread,
- ground stability,
- lightning,
- falling objects,
- ice throw/shedding,
- public access,
- site security and signage (for vehicles), and
- [leisure craft traffic](#)

RenewableUK offers further guidance on turbine integrity in Section 10.5 of this document as well as information in Section 7.4.3 on potential issues for consideration in risk assessment. Additional information on public safety is contained within HSE document HSG 151 – Protecting the Public, see Appendix 3 – References.

For wind farm schemes in the process of development, it is recommended that the Environmental Assessment accompanying the planning application includes a section on public safety considerations, stating how it is intended to address the above aspects.

7.3.3 Specific issues on which public health assurance may be appropriate include:

- Noise and vibration, and associated issues

Detailed commentary and advice on public health issues are not considered in these guidelines. For further details on the current state of knowledge and guidance please refer to www.renewable-uk.com.

7.4 Initial site investigations and exploratory activities

7.4.1 Some activities undertaken during this phase can, in themselves, pose a significant Health and Safety risk and as such require the same degree of attention as construction and later-phase activities. Typical site development activities may include:

- met mast installation and wind data monitoring (onshore and [offshore](#)),
- onshore surveys including boreholes, peat probing/excavations,

- exhibitions/roadshows,
- surveys requiring use of aircraft,
- offshore surveys including diving (see 9.13.6), and
- subsea surveys, including soil sampling, cone penetration tests, use of ROVs, side-scan sonar and magnetometers.

7.4.2 Significant site-specific hazards should be identified so that

- appropriate risk assessments can be carried out;
- workers can be made aware of the risks;
- control measures can be put in place; and
- training, including toolbox talks, can be provided.

7.4.3 Method statements should be prepared for all activities in sufficient detail to ensure that a safe system of work can be established and high-risk activities are identified, controlled and monitored. In undertaking risk assessments and preparing method statements, due regard should be given to:

- occurrences of incidents and near events as collated and reported in the RenewableUK Health and Safety Database, including all Safety Alerts issued; and
- the applicability of sections 9.9–9.23 of these Guidelines.

7.5 Wind farm layout

7.5.1 When selecting the position of wind turbines, the following should be considered:

- the boundaries of land ownership and rights of way;
- the location of existing site services, e.g. overhead or underground electrical and telecommunication cables;
- the identification of buried services, e.g. gas, oil or other hazardous substance transmission pipelines;
- public safety, e.g. risks from mechanical failure, ice etc.;
- the proximity of other turbines, meteorological masts and buildings;
- the effects of fatigue loading;
- vehicular access, e.g. one-way systems to allow safe access and egress, and to reduce the need to reverse vehicles in the site layout;
- access for technicians to the proposed wind turbine site;
- the inclusion of pedestrian gates adjacent to cattle grid crossings;
- previous and future mining activity;
- contaminated ground;
- aircraft activity including balloonists (see 7.5.7 below);
- drop zones for parachutists;
- other factors related to consents;
- explosive and other dumping grounds;
- military activity zones;
- coastal erosion;
- effects of impact on existing radar and communication systems;
- interests of RSPB, CAA, NATS, MOD, MCA, RNLI and port authorities, and attention to guidance issued by such organisations;
- geotechnical anomalies and geohazards – peat, shallow gas pockets both onshore and offshore, turbidity, seabed topography;
- the location of subsea pipelines;
- the location of subsea electrical and telecommunication cables;
- nature and stability of the seabed surface;
- shipping lanes and leisure craft activity areas, and the effects of high-impact low-frequency events;
- fishing grounds;

- dredging areas;
- the location of unexploded ordnance;
- wrecks and other marine archaeological sites;
- vessel access and depth of water (sea states, tidal ranges and tidal currents over shallower depths, and the effect this will have on vessel selection and operation); and
- consent from the Secretary of State under the Coastal Protection Act regarding navigational risks and from the MFA regarding fishing grounds and food chain habitats.

RenewableUK advises members to engage with the UKOPA to identify any hazardous pipelines on or close to existing wind farms and discuss any necessary precautionary measures. It is also advised that members note the UKOPA guidance (1.5 times tower-height from any hazardous pipeline) when designing layouts for new sites and engage with the UKOPA member where a potential breach of guidance is identified.

Members are also advised to refer to advice and guidelines issued by National Grid, which may specify a figure of 5 times tower-height from applicable transmission lines.

It is important that consideration is given to the potential hazards that apply during each of the different life phases of the scheme, as some hazards may only apply to specific life phases. For example, coastal erosion is most likely to be an issue only during the operational phase, whereas soft ground pockets are most likely to be an issue during the construction and installation phase but could affect the operational phase as well. Equally, other hazards, e.g. wrecks and/or explosive dumping grounds, are applicable to the early phases of design activity (as well as the build and operational phases) as they are potential hazards to offshore site investigations.

7.5.2 The following site-specific weather conditions should be considered. Available regional data can be used depending on the type and stage of assessment being carried out.

- Mean and maximum wind speeds in relation to the survival wind speed of the turbine;
- turbulence levels arising from complex terrain (hilly) sites or nearby structures/buildings;
- temperature and the likely incidence of icing;
- susceptibility to lightning strike;
- susceptibility to fog;
- excessive precipitation, e.g. causing difficult site access or flooding;
- any requirements for continued collection of meteorological data;
- any requirements for collection of oceanographic data;
- oceanographic conditions, i.e. tides and likely wave conditions;
- extreme conditions in relation to potential vessels/rigs likely to be deployed during the life cycle of the wind farm;
- salt burdens in the atmosphere on coastal/offshore sites.

7.5.3 Site-specific information on ground conditions may be required to assess:

- contamination from previous land use;
- strength requirements of foundations;
- stability of excavations, e.g. the possibility of peat slides;
- requirements for access roads, hard standings and support pads for crane outriggers;
- site drainage, e.g. proneness to flooding, water retention on roads;
- hazards from previous use, e.g. mining, disposal of waste, military range;
- requirements to maintain present use, e.g. arable, grazing land;
- properties of the seabed and subsoil, including susceptibility to scour, e.g. bathymetric, geophysical surveys, including, where needed, geotechnical surveys; and
- stability of sandbanks.

7.5.4 Requirements for the site electrical system and electrical connection to the grid will include:

- consultation with Distribution Network Operators (DNOs)/National Grid;
- reference to British and European standards on equipment supply;
- details of potential gradient and pH of soil or seabed;
- capability to isolate, earth and lock off installed equipment as appropriate;
- establishment of short-circuit levels;
- voltage regulation;
- suitable protection systems, e.g. fault clearance times, discrimination;
- suitable location for onshore substation;
- suitable arrangements to prevent damage to subsea cables and pipelines, and new cabling; and
- suitable location for landfall of subsea cables.

Offshore transmission owner (OFTO) arrangements are currently under consultation for the design, build and commissioning of grid connections. The current status of proposals should be determined from National Grid.

7.5.5 Satisfactory arrangements will be needed for site access, including:

- checking vehicle weights, sizes and ground clearances, and overhang/oversail;
- liaison with local authorities and police, and notification of local inhabitants;
- liaising with the local emergency services to ensure all parties are aware of each other's emergency response capabilities and requirements;
- maintenance of public access requirements, e.g. parking, passing places, public highways;
- establishing sustainable site ground pressures, e.g. requirements for specialist vehicles;
- ensuring vehicle stability on steep slopes and in possible collapse of old mine workings or other excavations;
- establishing requirements for temporary signs and notices;
- maintaining public rights of way, e.g. footpaths and bridleways;
- preventing interference between vehicles and underground/overhead services;
- preventing nuisance noise to local population, generated by large vehicle movements;
- taking account of the range of poor weather conditions;
- providing adequate means for traffic control, passing places and parking;
- segregation of vehicles and pedestrians;
- vehicle speed limitations;
- accounting for likely sea states and constant monitoring of offshore weather conditions;
- onshore facilities for construction and service bases in areas with large tidal ranges or severe currents, which may limit vessel type and/or access;
- local site rules in dockside locations;
- liaising with harbour authorities regarding passage plans, navigational risk assessments, vessel arrival/embarkation times, piloting of vessels through harbour areas, berthing arrangements (including tying up);
- use of specialised vessels, e.g. barges and lifting vessels, during the construction and O&M phases (see also RenewableUK guidelines on the selection and operation of jack-up barges);
- transfer of personnel, vessel-to-vessel and vessel-to-quayside;
- transfer of equipment to and from the vessels, use of craneage and other quayside facilities;
- accounting for likely sea states;
- use of specialised vessels, e.g. barges and lifting vessels, during the construction of bases/foundations and erection of turbines by smaller vessels, including suitable arrangements for transfer of personnel and equipment to and from the vessels, and to the wind turbines/other offshore structures, for maintenance operations (see also RenewableUK guidelines on the selection and operation of jack-up barges); and
- considering the proximity and availability of onshore facilities for construction and service bases in areas with large tidal ranges or severe currents, which may limit vessel type and/or access.

7.5.6 Take account of local habitation in respect of:

- excessive vehicle movements and routes;
- nuisance during construction, e.g. noise and dust levels;
- noise emission levels from the wind turbines;
- visual impact; and
- presence of children.

7.5.7 Ensure that the site is not affected by regular aviation by:

- taking account of local civil/military airfields and notifying the appropriate bodies, where necessary using the pro-forma consultation document supplied by RenewableUK (reference: www.renewable-uk.com/aviation);
- checking that it is not subject to low-flying aircraft; and
- identifying and managing local pursuits, such as ballooning, parachuting, microlight aircraft or model aircraft flying.

7.5.8 Consult with landowners regarding:

- existing and likely future land usage;
- crops and livestock;
- recreational shooting and stalking;
- location and marking of buried services; and
- their responsibilities.

7.5.9 Make provision for members of the public by:

- establishing a procedure to control visitors, taking account of any rights to roam;
- establishing whether the land has any commoners', crofters' and other similar rights;
- taking security measures against unauthorised access and vandalism; and
- [ensuring each wind turbine / other offshore structure has appropriate signage for use by seafarers in distress.](#)

The above list, although very comprehensive, may not cover every project-specific risk. For example other site/project-specific issues could include security risks (criminal/terrorism) and nature/wildlife conservation issues.

8. Design, Specification, Manufacture and Assembly

8.1 Introduction

- 8.1.1 This section highlights the considerations that should be given to Health and Safety in the design phase of a wind farm. For the purposes of this Guidance the term 'design' also includes the specification, manufacture, assembly and procurement of components, which, when put together during the construction phase, constitute an operational wind farm.
- 8.1.2 It is the responsibility of wind farm designers to ensure that the wind turbines and associated equipment are designed to avoid or, where this is not entirely possible, to minimise risks to Health and Safety whilst they are being assembled, constructed, installed, commissioned, operated, maintained and decommissioned. RenewableUK recognises that it is best practice continually to strive for safer designs, minimising the risk to personnel and the public alike.
- 8.1.3 It is strongly recommended that operations personnel be involved as early as possible during the design, construction and commissioning phases, so that they may add valuable practical knowledge and experience to enhance the overall design.
- 8.1.4 During design, the ultimate decommissioning and dismantling of the wind farm should be addressed. Relevant information needs to be incorporated into the Health and Safety file required under CDM.

8.2 Legislative requirements

- 8.2.1 A table of the various legislative requirements and their applicability to each stage of the project is included in Section 6 (additional detail is provided in Appendix 2).
- 8.2.2 The design will be developed during this phase. CDM places important duties on designers. The regulations and HSE Guidance should be studied to understand the detailed obligations imposed on those involved in the design phase of a scheme.
- 8.2.3 The Client-appointed CDMC will be active during the design phase, to ensure that designers are taking appropriate action under CDM, and to collect information to prepare (or ensure that some person prepares) the relevant Health and Safety information, as specified in CDM, for issue to the intended construction and installation contractors.

8.3 Site data

- 8.3.1 Information that will almost certainly be required by the designer includes:
- detailed analysis of wind conditions, e.g. survival wind speeds, turbulence levels;
 - other relevant weather/climatic information, e.g. incidence of freezing conditions;
 - risk of lightning;
 - soil conditions, e.g. resistivity, pH;
 - ground conditions, e.g. mine workings;
 - [properties of the seabed and subsoil, including man-made obstructions, e.g. wrecks;](#)
 - [details of tides and currents \(general ranges and extremes\), including scour potential;](#)
 - [impact of shoals \(shallow areas\) on tidal flows, e.g. water surges;](#)
 - [detailed analysis of historical data with respect to wave height and periodicity \(general ranges and extremes\);](#)
 - [and seabed topography.](#)

8.3.2 Continuing needs for information about site conditions may require:

- installation of meteorological instruments and
- [installation of instrumentation for the recording of oceanographic conditions.](#)

Where on-site data collection activities are involved, the applicability of guidance detailed in Section 7.4 above should be reviewed.

8.4 Wind turbine/associated hardware design

8.4.1 Consultation with Distribution Network Operators (DNOs) will be required in respect of:

- the distribution code;
- any technical or engineering recommendations issued by the DNO;
- the DNO's safety rules;
- substation layout and design;
- short-circuit fault levels;
- electrical protection, e.g. fault clearance times, discrimination; and
- voltage/frequency regulation.

Note: larger capacity wind farms may require liaison with the Transmission System Operator (TSO) and attention to the equivalent documentation, e.g. the Grid Code.

8.4.2 Reference to British and European standards (see Section 6.3) will be required to:

- ensure compliance with current best practice and
- make a comparative assessment of other standards for suitability of use in the UK.

8.4.3 Specific design considerations will be required in respect of:

- manufacturer's turbine certification;
- manufacturer's operations manual and maintenance instructions;
- results of factory acceptance testing;
- provision of assembly instructions, drawings and design information for the construction phase;
- assembly criteria and workmanship standards to be achieved;
- inspection, test and commissioning criteria and documentation;
- interfaces between turbine mechanical, LV and HV activities;
- safe isolation of mechanical and electrical equipment for maintenance, e.g. locking-off devices, clamping of rotating parts;
- fail-to-safe modes, e.g. to ensure all critical component failures fail to a safe condition and prevent additional runaway failure events;
- earthing and protection;
- safe remote control/operation, e.g. preventing remote control when a machine is being maintained;
- in-service condition monitoring systems, devices and components;
- insulation of electrical equipment and cables;
- guarding of dangerous parts of machinery;
- turbine overspeed control;
- controls, e.g. for starting or changing operating conditions, stopping, emergency stop;
- provision of clear and unambiguous markings and warnings;
- provision of safe working access, e.g. striving to minimise the risks associated with vertical ladders by way of safety harness anchor points, providing rest platforms, powered personnel hoists, lighting, including emergency lighting;
- the selection of work equipment for work at height must:
 - be suitable and sufficient, and be of adequate strength for its intended use;

- be appropriate to the nature of the work to be performed and the foreseeable loadings on it;
- allow passage without risk for the duration and frequency of use;
- offer collective protection over personal protection;
- provision of safe work areas;
- preventing unauthorised access and control of the equipment, e.g. security and passwords, only allowing control by personnel in the nacelle during maintenance;
- practicality of access by helicopter;
- the need for fire detection/protection;
- provision of a safe means of escape;
- provision of accommodation and emergency rations;
- occurrences of incidents and near events as collated and reported on the RenewableUK Health and Safety Database, including all safety alerts issued;
- emergency response arrangements for the evacuation and removal of injured personnel from the turbine and treatment of injured personnel in remote locations;
- PPE;
- avoidance of or minimising the need for working on, near or over water;
- provision of appropriate navigation aids, i.e. lights and foghorn;
- access to navigation aids for maintenance;
- access onto turbines and other offshore structures;
- potential damage, wear and corrosion from waves and weather;
- potential damage from ship collisions;
- specific implications of fire at an offshore installation;
- access to the base of the wind turbines from a vessel, whether by mooring alongside a landing stage or via a personnel transfer system, to take account of tidal range and tidal streams; this must also be considered for met mast locations;
- provision and storage for survival suits, buoyancy aids and PLBs;
- provision of appropriate systems for communication between personnel located on offshore structures and the attendant vessels, vessels and the shore-based control centres, and emergency services;
- the need to undertake subsea remotely operated vehicle (ROV) operations during the construction or operational phases (in preference to diving);
- the need to undertake unavoidable diving operations, either during the construction or operational phases;
- Provision of suitable first aid as part of the risk assessment
- the need to remotely stop turbine blades in the appropriate formation to allow for access by helicopter; and
- emergency response arrangements, including the provision of first aid equipment, rations and equipment in the event of stranding.

In putting into effect these design issues, direct reference should be made to the relevant regulations, codes of practice, standards and guidance that may apply.

8.4.4 The design should take account of Health and Safety during:

- erection and construction, e.g. sequence of erection, stability of partially built structures or site environmental conditions likely to be experienced;
- commissioning;
- normal operation and maintenance;
- dismantling, demolition and removal;
- abnormal/unplanned scenarios; and
- emergency situations.

8.4.5 Designers should aim to minimise the work to be undertaken offshore by maximising the work that can be done onshore, such as fabrication, component assembly, commissioning and testing.

8.4.6 Navigation aids will need to be fitted and commissioned at the earliest opportunity to turbines, offshore substations and site monitoring masts, and also to part-completed structures, such as piles.

8.4.7 Provision will be required against unauthorised damage/interference/ operation by:

- either humans or animals;
- third parties when carrying out maintenance on site;
- specifying adequate safety clearance from exposed electrical conductors;
- provision of devices such as anti-climbing guards;
- recognition that the above may not apply to offshore wind turbines and other structures in view of the accepted need to ensure that offshore structures are accessible to mariners in distress;
- unauthorised access from vessels;
- ship collision;
- pollution; and
- the need for exclusion or safety zones.

Note: MGN 371 (M+F) Marine Guidance Note has replaced MGN 275. MGN 371 is entitled Offshore Renewable Energy Installations (OREIs): Guidance on UK Navigational Practice, Safety and Emergency Response Issues. It highlights issues that need to be taken into consideration when assessing impact on navigational safety and emergency response from offshore renewable energy developments. Specific annexes within MGN 371 address issues covering site position, structures and safety zones (Annex 1); developments, navigation, collision avoidance and communications (Annex 2); MCA's wind farm shipping template for assessing wind farm boundary distances from shipping routes (Annex 3); safety and mitigation measures recommended for OREI during construction, operation and decommissioning (Annex 4); and, search and rescue (SAR) matters (Annex 5).

Recommendations in the guidance note should be used by offshore renewable energy installation developers seeking consent to undertake marine works and should be read in conjunction with the Methodology for Assessing the Marine Navigational Safety Risks of Offshore Wind Farms published by the DTI in association with MCA and DFT.

8.4.8 The design should include the provision of information and instructions to:

- cover all aspects of normal operation and maintenance;
- cover any actions in the case of foreseeable abnormal situations; and
- take account of residual risks in any relevant design risk assessments.

This would include, for example, the measures to be taken to ensure compliance with the 2005 Work at Height Regulations, through consideration of the appropriate means of access and egress from the turbine nacelle.

9. Construction, Commissioning and Demolition

9.1 Introduction

The installation and commissioning phases of the project will represent one of the highest risk phases with respect to Health and Safety considerations. As discussed in Section 8, much can and should be done in the design phase to remove or reduce construction phase risks, and Section 9 now addresses key steps to further mitigate risks during this phase of the project.

The term 'construction' includes commissioning, dismantling and demolition, and the term 'Contractor' includes all persons/organisations undertaking such work.

9.2 Legislative requirements

- 9.2.1 A table of the various legislative requirements and their applicability to each stage of the project is included in Section 6. See also Appendix 2.
- 9.2.2 During the construction phase of a project, the works will be under the control of the Principal Contractor appointed by the Client under CDM. All persons and organisations working on the project site (including persons working for the Client) come under the control of the Principal Contractor and must comply with the site rules. Only one Principal Contractor may be appointed for a single site at any time.

However, it may be appropriate, where different work packages are being carried out in parallel, for these to be defined as separate projects, each with its own Principal Contractor, provided each has a separate delineated site and access to it. The interfaces between each project would need to be explained in the Pre-Construction Health and Safety Information. In this situation, the Health and Safety plans prepared by the Principal Contractor must recognise the interfaces involved and contain measures to manage those interfaces. Duties of the Principal Contractor and others on site (defined as Contractors) are listed in Section 6.

9.3 Notification

CDM requires the HSE to be notified of any project that will last more than 30 days (of construction) or involve more than 500 man days. The CDMC is responsible for notifying the HSE of the construction project (usually by means of completion of Form F10) shortly after their appointment. If information is missing from the form (e.g. this is before the Principal Contractor is appointed) then an additional notification may be sent in.

Prior to erection or use of tall structures and equipment, whether temporary or permanent, e.g. cranes, turbine towers or tall met masts, the following authorities and organisations should be informed:

- MOD, CAA, NATS (the minimum information required is OS/GPS location and tip-height above existing ground level);
- local airfields; and
- parachutist, paraglider, microlight and ballooning organisations.

The MCA requires a project contacts list to be provided, should they need to engage with the construction management team. Notices to mariners and regular navigational warnings will need to be given prior to and during offshore construction activities, and other third parties may need to be informed of certain activities, such as fishermen, and local yachting and boating clubs.

Request confirmation from all parties informed, to ensure all information provided has been made available to all potential air users.

9.4 Document control and record keeping

Requirements for compiling and retaining Health and Safety records are defined in the specific legislation contained within Section 6. It is recommended from the outset that a document control and record keeping procedure is established, and arrangements made for the storage, retrieval and maintenance of the records for their required retention period.

Typical project documentation will include:

- Health & Safety management system procedures and documentation;
- pre-construction information;
- construction phase plan;
- drawings and specifications;
- minutes of project meetings;
- project reports;
- method statements;
- risk assessments;
- COSHH assessments and health surveillance records;
- test and commissioning reports;
- training records and certification;
- equipment certification;
- daily personnel attendance records; and
- post-construction surveys.

In addition to the above, CDM requires the Client to ensure that a Health & Safety File is created and maintained for the lifetime of the structure. This file is required to contain all relevant information relating to the structure (further details are contained within the ACOP L144).

9.5 Planning, communication and coordination

Maintaining high standards of planning, communication and coordination of project Health and Safety goals, rules and requirements throughout the construction phase can go a long way in preventing accidents.

9.5.1 Planning

A Construction Phase Plan is required to be completed by the Principal Contractor under CDM. In addition to this plan, the Principal Contractor is required to define a timetable for project completion. Sufficient time must be built into the project timetable to allow for Health and Safety to be effectively managed. Consideration should be given to:

- project organisational structure and clearly defined Health and Safety roles and responsibilities of all appointees under CDM, responsible persons and site personnel;
- setting of clear objectives and goals for Health and Safety throughout the project;
- setting of clear Health and Safety site rules and performance requirements;
- defining systems, procedures and documentation to be used to manage Health and Safety;
- interfaces between contractors and overlapping work;
- the construction methods to be used, including the preparation of method statements, risk assessments and safe systems of work;
- the order of construction activities/events required to complete the work safely;
- the equipment, facilities and personnel to be utilised throughout the construction phase;
- safety precautions to be implemented;
- allocation of appropriate resources to ensure all necessary information, instruction and training is provided;

- allowing sufficient time for employee consultation;
- working times and limitations on personnel, shift rotation and handover;
- project programming to define timescales of work completion and project milestones; and
- review of planning and plan arrangements, frequency, responsibility and actions.

9.5.2 **Communication and coordination**

Both CDM and MHSWR require employers who share a workplace to cooperate and coordinate their activities in the interest of Health and Safety. Arrangements for maintaining communication and coordination throughout the construction phase should consider:

- the frequency and methods of communication between Clients, CDMC, Designers and Contractors;
- site personnel;
- third parties and other site users;
- the public;
- arrangements for shared workplaces;
- arrangements for emergency response;
- provision of information, instruction and training;
- equipment to be used to post or deliver communication information; and
- audit and review to measure performance and make sure 'the message is getting through', and everyone at all levels understands their role within the project.

Coordination of marine operations and vessel movements is required to ensure vessel traffic is safely managed, vessel collisions are avoided and emergency response support is provided when necessary.

9.5.3 **Communication on site**

Maintaining good communication on site is crucial to help maintain Health and Safety standards, and to respond effectively to requests for support and emergency assistance. Arrangements should ensure:

- contact can be maintained with key personnel, e.g. by mobile phones or radios, at all times;
- procedures are established for persons working alone or in small groups (lone access to towers and remote places should be avoided);
- all workers understand instructions and information whatever their native language;
- appropriate systems for communication between:
 - the wind farm and attendant vessels,
 - vessels on site and general vessel traffic within the area,
 - the Marine Traffic Coordinator and construction vessels,
 - the bridge (vessel master) and deck operations (including crane operators),
 - vessels and individuals located on turbines and other offshore structures,
 - vessels and coastguard, using the appropriate VHF emergency channel, and
 - the shore and the MCA in case of emergency;
- suitability and selection of appropriate communication equipment for the environment and area of use;
- correct channel frequency selection to avoid interference with neighbouring operations, e.g. UHF radios – line of site; and
- appropriate backup equipment is available for use, for both vessels and individuals working remotely on turbines and/or offshore structures.

When working offshore with differing nationalities a common language should be used for all communications. This should be a contract requirement.

9.6 **Competence**

- 9.6.1 A key stage in the successful delivery of any project is ensuring that only competent organisations and individuals are appointed. The HSE states that for an organisation or individual to be deemed competent they must possess sufficient knowledge of the specific tasks to be undertaken and the risks that the work will entail; have sufficient experience and ability to carry out their duties in relation to the project; and be able to recognise their limitations and take appropriate action in order to prevent harm to those carrying out construction work, or those affected by the work. (Source: HSE CDM ACOP)

In addition, ACOP L144 also states that ‘no-one should undertake any work which they themselves are not competent to perform’.

The Association of Project Safety (APS) holds registers of both corporate and individual members who have demonstrated levels of competence in their particular construction discipline. It is recommended that those organisations and personnel appointed under CDM are, as a minimum, registered with APS.

- 9.6.2 It is recommended that a two-stage assessment is performed. An example for a technical or managerial level role would involve:
- Stage 1 would include task knowledge appropriate for the tasks to be undertaken. This would include knowledge and experience of the design and construction process. Typically, individuals would be professionally qualified to a chartered level (e.g. CIBSE; ICE; IEE; IMechE; IStructE; RIBA; CIAT; CIOB, etc.). In addition, evidence of Health and Safety knowledge would be expected. This could include relevant CPD qualifications (e.g. IOSH Managing Safely, NEBOSH National General Certificate in Construction Occupational Safety and Health) and registers (e.g. ICE), and membership (e.g. IOSH, APS).
 - Stage 2 would be to gather evidence to determine if the individual has the experience and ability to perform the task. This would specifically include evidence that they have experience of projects with comparable hazards and complexity. This will be particularly important for wind farm projects. It should be noted that a similar approach is recommended when assessing the competence of organisations.
- 9.6.3 Those appointed in respect of 9.6.2 above should take into consideration occurrences of incidents and near events as collated and reported on the RenewableUK Health and Safety Database, and note the contents of all Safety Alerts issued.

9.7 Risk assessments and method statements

- 9.7.1 Risk assessments have been covered in Section 5.7 above. However, the risk assessment process should remain ‘live’ throughout the construction phase, so that appropriate reviews, modifications and updates may be made to reflect actual events during the work. Changes in work methods and practices, and subsequent risk assessment should be controlled in accordance with Section 5.8 – Management of Change.
- 9.7.2 Method statements should be prepared for all activities in sufficient detail to:
- provide a clear understanding of the work to be performed;
 - provide an understanding of the appropriate control measures and precautions to be used;
 - provide an understanding of residual risks that cannot be otherwise controlled;
 - provide an understanding of roles and responsibilities related to the work to be undertaken;
 - allow the Principal Contractor to develop the Health and Safety plan; and
 - allow high-risk activities to be properly monitored and controlled.
- 9.7.3 In preparing both risk assessments and method statements, due regard should be given to occurrences of incidents and near events as collated and reported in the RenewableUK Health and Safety Database,

including all Safety Alerts issued.

9.8 Safe systems of work

Apply the RenewableUK Wind Turbine Safety Rules when the turbines become energised. See Section 10.9 below for further information.

9.8.1 Permit-to-work systems should be considered for:

- activities in which it is not practical to remove significant hazards;
- high-risk activities, e.g. excavations, hot work (the application of heat, including welding, burning or grinding on plant containing flammable materials) and entry into confined spaces; and
- working on installed equipment that has been put into service, i.e. post-energisation.

Further information may be found in HSE Guidance document HSG 250 – Guidance on permit-to-work systems (see Appendix 3).

9.8.2 Procedures should be established:

- for high-risk activities, e.g. working at height, working over water and heavy lifting;
- for equipment to be 'handed over' or 'energised';
- to keep all contractors, and their employees, informed of equipment status;
- to ensure that the work of one contractor does not adversely affect others;
- for connection of equipment to 'live' services;
- to control access to equipment that is automatically or remotely controlled;
- to assess the requirements for first aid training and the provision of equipment;
- for lone and remote workers;
- for the management of vessel movements, especially when several may need to be in the vicinity simultaneously;
- for the transfer of personnel to and from a vessel or a wind farm;
- for the transfer of personnel on and off turbines;
- to track personnel between the wind farm and an accommodation vessel; and
- for unloading and back loading supply vessels.

Procedures regarding vessels and personnel transfers at sea should all be under the control of a Marine Traffic Coordinator (MTC).

9.9 First Aid

Suitable risk assessments should be conducted to ensure that adequate and appropriate equipment, facilities and personnel are provided to ensure employees receive immediate attention if they are injured or taken ill at work. This should conform to the duties set out in the Health and Safety (First-Aid) Regulations 1981.

Specific examples that may require further attention for wind related projects include consideration of:

- Adequate eye wash, defibrillators, emergency showers, stretchers and other specific items of equipment relevant to the project
- Suitable measures to ensure first aid provisions are properly maintained;
- Additional training with respect to electric shock/burns, hypothermia, suspension syncope. (Note: Only following advice from a suitable competent person)
- The need to communicate to everyone on site what first aid provisions there are and where to find/summon them including the equipment and first-aiders
- Recording of first aid treatment in accordance with the statutory and company specific requirements

Note: Principles and practice apply to operations and maintenance activities as well.

9.10 Emergency arrangements (see also further recommendations in Appendix 1 for offshore wind farms)

9.10.1 A site Emergency Response Plan (Project ERP) must be in place during the construction phase, with appropriate additions or adjustments for specific or 'one-off' operations. Where contractors are involved, the plan must detail 'bridging' arrangements between the Emergency Response Plans of individual contractors and individual vessels engaged. Offshore Wind Farm Operators and developers are required to use the MCA's 'Emergency Response Cooperation Plan (ERCop)' in formulating their Emergency Response Plans and site safety management systems.

Note: These Guidelines do not currently provide detailed advice on dealing with emergencies offshore. These are a vital and complex area, and duty holders need to ensure that policies, plans and risk assessment arrangements take account of all the operational safety interfaces. Offshore wind farm Emergency Response Plans will need to be discussed with the MCA and the relevant MRCC. However, communication and, as necessary, emergency arrangements will need to be put into effect to take account of advice from other regulatory bodies (e.g. HSE) and the emergency services.

When developing the ERP, consideration should be given to the remoteness of the site location and response times of emergency services, and appropriate arrangements provided, i.e. equipment and trained personnel (e.g. first aid / rescue training), to ensure self sufficiency and preservation of life until emergency services are in attendance.

Emergency Response Plans must include (as a minimum):

- the roles and responsibilities of all key personnel appointed to effectively manage the organisation's emergency response arrangements, including those in overall control and those appointed to control each site;
- contact details for organisation's legal advisers to be used in the event of serious incidents;
- emergency contact details for all internal and external parties involved in the works;
- vessel contact details (note: vessels >300 tonnes will be ISO-registered with a certified ISM system);
- third-party emergency service contact details;
- the location of all site access points and site plans;
- details of potential hazards and emergency situations that the emergency services may encounter;
- details and locations of significant hazards, e.g. high-voltage equipment;
- details and locations of nearby installations that may provide assistance in an emergency;
- emergency communications procedures;
- emergency response procedures for initial actions in emergencies that could be anticipated, including:
 - evacuation of nacelle and WTG,
 - emergency shutdown of energised equipment,
 - failed lifting operations,
 - fire,
 - sickness,
 - injury,
 - pollution,
 - bomb threat / sabotage,
 - extreme weather,
 - man overboard,
 - vessel collision / grounding / punch-through,

- vessels not under command, and
- diving emergencies (if applicable);
- procedures for personnel tracking;
- procedures for the notification of next of kin;
- public relations procedures for dealing with the press;
- statutory reporting requirements;
- training and drills requirements;
- procedures for liaising with the emergency services and regulatory authorities; and
- procedures for calling-off assistance to represent employees during interviews with regulatory authorities (note: work colleagues may be prevented from assisting as nominated persons).

It is recommended that exercises are regularly undertaken to validate the ERP and to ensure that operations staff are familiar with it. It is particularly important to engage local emergency services, including medical facilities, in understanding the potential needs of the project and the environmental conditions under which they may be asked to assist. Ideally other parties, including the MCA, SAR or even the police, may also need to be involved when planning and carrying out exercises.

9.10.2 The following procedures should be established in line with the ERP, based on suitable and sufficient risk assessments and following consultation with local emergency services:

- all foreseeable emergency situations relevant to both onshore and offshore sites, including evacuation and escape;
- safe transportation and storage of hazardous materials, e.g. flammable substances;
- hazardous activities, such as hot work (the application of heat, including welding, burning or grinding on plant containing flammable materials), potentially including cable jointing/terminating;
- abnormal weather conditions, e.g. extreme cold, floods and lightning; and
- abnormal sea states, high winds and poor visibility.

9.10.3 Based on a suitable and sufficient fire risk assessment, working areas should be provided with:

- means of raising the alarm;
- clear and accessible evacuation instructions;
- suitable means of escape, including signage, emergency lighting and designated assembly areas;
- portable fire-fighting equipment;
- means of disposing of scrap and waste materials safely;
- fixed fire detection and extinguishing systems, where appropriate;
- additional precautions/devices as recommended by the fire risk assessment (e.g. smoke hoods, places of safety, refuges etc.); and
- provision for disabled egress (in case of injury and for Disability Discrimination Act compliance).

9.10.4 Ensure that persons working on site:

- are familiar with all relevant emergency arrangements;
- are trained, well versed and practised with the arrangements, and know what to do; and
- know who will take charge in emergency situations.

Further information and recommendation for offshore wind farms may be obtained from Appendix 1 or within HSE Guidance document HSG142 – Dealing with offshore emergencies (see Appendix 3).

9.11 Information, consultation, training and supervision

9.11.1 Ensure that:

- persons appointed to work on site possess the necessary level of skills and competence;

- statutory notices and posters are clearly displayed;
- employees are able freely and openly to express their views about Health and Safety;
- employees are provided with information about Health and Safety, e.g. toolbox talks;
- site induction training is provided, registered and enforced, so that no person may access the works without having been inducted;
- information is displayed on site-specific hazards, e.g. warning notices;
- sufficient supervision of appropriate experience is provided;
- all workers are trained to RenewableUK-recommended minimum standards (see www.renewable-uk.com);
- training takes account of potential language barriers of workers; and
- any additional training to be confirmed via risk assessment and training-needs analysis.

9.11.2 Before and during work on site it is necessary to:

- establish the level of competence of persons as they arrive on site;
- make an assessment of any necessary further specialist training or refresher training to be provided;
- ensure details of all training are recorded;
- provide Health and Safety information regarding the site to all contractors;
- provide training on working at height techniques;
- [provide training in offshore survival techniques;](#)
- [ensure appropriately trained, competent crew are manning any vessels used to transport personnel and equipment; and](#)
- [provide training in emergency response and evacuation procedures \(see Appendix 1\).](#)

9.12 Weather conditions

An adverse-weather policy should be established to cover:

- effects of high winds, e.g. specify permissible wind speeds governing lifting operations;
- effects on workers of inclement weather, e.g. when working at height, on steep slopes and in bad ground conditions;
- risk of being snowed in or cut off, e.g. due to flooding;
- lack of visibility, e.g. fog and low cloud;
- work on, or in close proximity to, metal structures when there is a risk of lightning strike;
- dry weather increasing the risk of heath/moorland fires;
- hot sunny weather increasing risk of sunstroke, sunburn and dehydration;
- cold weather increasing the risk of frostbite/hypothermia;
- additional weather-related PPE;
- [a clear definition of when work will cease due to either high winds and poor weather, or significant sea states;](#)
- [all vessels and equipment used are capable of being made safe and/or are able to reach sheltered waters in adverse weather conditions;](#)
- [that cranes used offshore are capable of withstanding abnormal wind loadings when not in use; and](#)
- [vessel and vessel equipment operational limits.](#)

9.13 Temporary facilities

9.13.1 Provision should be made for:

- location of temporary structures, e.g. on firm ground, secured/anchored against high winds;
- safe access to working areas, which might include pedestrian and site transport;
- first aid facilities and trained first-aiders;
- communication links on and off site, e.g. temporary landlines, mobile phones and radios;
- safe unloading, storage and laydown of materials;
- preventing unauthorised access to quarrying activity or borrow pits;

- adequate and safe installation of temporary services, e.g. electricity, LPG supplies and fuel supplies;
- adequate maintenance and servicing of any gas appliances (and associated flue systems) that are provided for the use of workers, e.g. water heaters, cookers or heaters; and
- [rescue/recovery arrangements for persons falling into the water.](#)

9.13.2 Temporary facilities should be:

- kept clean and regularly maintained;
- securely fenced and contained against vandalism or leaks to the environment, e.g. fuel oil; and
- waste should be regularly removed from the site.

9.13.3 Welfare arrangements for workers should include:

- protection against extremes of climate;
- toilets and washing facilities, including hot water;
- mess and first aid facilities;
- storage for personal protective equipment;
- changing/drying rooms;
- [sleeping accommodation and equipment \(if there is a possibility of being stranded overnight\); and](#)
- [survival rations/equipment \(if there is a possibility of being stranded overnight\). For further details, see Appendix 1.](#)

9.14 Site access

9.14.1 Liaison with public highway authorities will be required to plan delivery of materials, plant and equipment to ensure safe passage and ensure that associated risks are managed, as far as other road users are concerned. This often involves the development and agreement of transport plans.

Temporary access roads should be established which:

- allow safe transition of vehicles from the public highway, which avoids the need for reversing;
- are subject to a speed limit;
- should be marked with warning signs and notices;
- are constructed to support anticipated loads, e.g. mark soft verges;
- identify specific hazards, e.g. steep inclines;
- provide properly designed and constructed crossings, e.g. at watercourses, underground services;
- avoid or warn against the presence of overhead services, e.g. electricity cables;
- take account of the risks to pedestrians and livestock from site vehicles and segregate pedestrians from vehicles;
- allow sufficient space for long/heavy vehicles to manoeuvre.

9.14.2 Areas of 'hard standing' should be established:

- allowing vehicles to be parked off the public highway;
- which are reinforced and marked, sufficient to withstand the weight of heavy vehicles;
- to support crane outriggers without settlement; and
- for adequate laydown or storage areas.

If the need for reversing vehicles cannot be eliminated, provide and keep clear adequate turning areas, and provide effective systems to control it.

9.14.3 Transport on site should be:

- assessed and selected for suitability, so as to be safe and right for the job, to deal with site conditions, e.g. rough terrain, enforced speed limits;
- subject to proper maintenance, repair and inspection; and
- only driven or operated by suitably trained persons with banksmen and supervisors as required (following risk assessment).

Note: particular consideration should be given to ensuring that visiting drivers understand what they have to do to ensure safe working on the site. This is likely to require vehicle control measures at entrances to the site.

9.14.4 Temporary fences and/or barriers may be required to:

- segregate vehicles from pedestrians;
- restrict or control access to members of the public;
- restrict access to areas containing crops or livestock; and
- indicate rights of way or landowners' boundaries.

9.14.5 Offshore wind farms need to take into account the following (see also Section 9.8.2 above):

- site access by vessel will be dependent on height of the tide, tidal stream and other factors;
- vessel access to and egress from the towers and other offshore structures will be dependent on sea state and weather conditions (see Appendix 1);
- the transport, storage and handling of materials will involve the use of various vessels;
- careful thought will have to be given to the choice of vessel, taking into account:
 - ability to hold position,
 - water depth and vessel draft,
 - currents, and
 - likely sea states;
- strong currents may make the seabed prone to scour problems;
- the selection and operation of jack-up vessels is a complex matter and a number of important factors must be properly considered and addressed before such a vessel is deployed. For detailed guidance refer to the RenewableUK guidelines on the selection and operation of jack-up barges.
- the need to submit passage plans and assess navigational risks for vessel movements, in accordance with MCA and OREI guidelines;
- weather conditions described above in Section 9.11;
- limitations on working hours and amount of time personnel may remain offshore; and
- compliance of vessels with requirements of the International Ship and Port Security Code (ISPS).

9.14.6 Diving operations

Diving is a high-hazard activity that, if not properly managed, can lead to serious incidents, including fatalities. In the light of the inherent risks involved, a principal objective at the design phase of any offshore wind project is to aim to prevent or, where not practicable, minimise the need for diving operations. However, most offshore projects will require diving operations to be conducted before and during the construction phase, and subsequently for discrete operations and maintenance work. It is therefore vital that whenever there is a possibility of diving activities, early planning is conducted to prevent and minimise diving risks.

Diving operations are subject to the Diving at Work Regulations 1997. They require a risk assessment approach for all diving activities, which, if correctly applied to work-scope, location and other information relating to the diving project, should dictate the dive plan and the resources required to carry out the diving work safely.

The Regulations are supported by the following approved codes of practice (ACOP) published by the HSE:

- L103 – Commercial Diving Projects Offshore
- L104 – Commercial Diving Project Inland/Inshore

The non-standard nature of diving operations on renewable energy projects often requires a more precautionary approach to that set out in the relevant ACOP. For example, the requirements set out for commercial inland/inshore diving may not be fully appropriate to the more complex and extreme environments that may be encountered on some renewables projects. Competent advice should always be obtained from an experienced diving contractor/organisation when making any judgement about the suitability of an agreed diving plan.

Key areas that need to be considered when planning and conducting any diving operation will include:

Site-specific information –

Relevant and accurate site-specific information should be made available by the Client to the diving contractor. The more reliable and comprehensive the information, the higher the quality of the dive contractor's risk assessment and work method statement. This would increase the level of safety of any dive performed. Typical information would include:

Works/Project information –

- L103 – Commercial Diving Projects Offshore
- L104 – Commercial Diving Project Inland/Inshore
- Task/dive/project outcomes and deliverables
- Anticipated work loads/volume
- Method statements, lift plans, technical information, etc.
- Interface with crane operations, transition piece works, barge operations
- Tooling requirements and quality assurance requirements
- Anticipated boundaries of the dive site
- Historical information (technical and safety);

Environmental conditions –

- Water depth across site and at each dive location (across full tidal range)
- Seabed make up and topology
- Known/expected underwater visibility
- Tidal data: flow rates, directions, tide times for site (or nearest known location), slack water times
- Statistical weather data: wind/wave/surface visibility
- Seabed hazards: existing seabed infrastructure/works, contaminants/gas pockets, wrecks, marine life forms and other natural hazards
- Shipping hazards and anchoring hazards.

Worksite arrangements

- Site location and marine charts
- Turbine/cable maps
- Details on port of operations; tidal restrictions, facilities available to diving contractors, access and egress arrangements to/from vessels, contact details
- Alternative port of operations with associated information as above
- Emergency beach heads

- Dive vessel restrictions/requirements (if not provided by Client): maximum air draft, maximum draft for port access, anchoring restrictions, minimum technical requirements (AIS, radio channels)
- Dive vessel details (if provided): deck space available, freeboard, power supply, transit time to port
- Shipping movements (both construction and passing)
- Site emergency plan, site rules, site-specific training requirements and induction requirements
- Site controller, i.e. who will issue the permit to dive
- What other activities will be taking place during diving operations.

Note: this is only an indicative list. A detailed evaluation would need to be performed by the Client/ developer in consultation with potential diving contractors to ensure all relevant information is obtained and communicated.

Dive contractor competence and capability

The selection of any diving contractor should be based on the competence of the contractor carrying out the work and the individual capabilities of the divers. The basic principles of selecting a contractor are well set out in Health and Safety regulations (e.g. CDM) and relevant guidance and standards (e.g. HSE and British Standards). This would normally consist of an assessment of:

- Direct experience of relevant diving work
- Health and Safety policies and arrangements
- Details of Health and Safety performance (e.g. accidents/incidents/enforcement)
- Specific diving qualifications and skills held
- Medical and health surveillance provision
- Details of risk assessments, diving plans and method statements
- Details of diving training and supervision provided
- Worker consultation procedures
- Independent assessments of diving and organisational competence
- Membership of a relevant trade or professional body (e.g. ADC-UK, IMCA)
- Relevant insurance.

Planning and management

The diving contractor is responsible for ensuring that the diving project is planned, managed and conducted to ensure the Health and Safety of all persons taking part in that project. Areas that need to be considered in planning and managing a diving project include:

- the diving project plan and evidence of preparation and updating;
- appointment of a person to supervise the project;
- records detailing appointments;
- competence and numbers of people to perform the diving project;
- suitable and sufficient plant available to carry out the project (e.g. surface supplied diving equipment);
- additional plant to address first aid and foreseeable emergencies connected with the diving project;
- maintenance and examination of plant and equipment; and
- procedures to ensure persons comply with statutory provisions and the diving project plan.

A vital component of every diving project is the diving project plan. This is based on a detailed assessment of the risks to the Health and Safety of any person taking part in the diving project. It records the planning carried out and the information and instructions necessary to give advice to, and to regulate the behaviour of, those taking part in the diving operation.

Due to the high risks associated with diving work, independent advice may need to be obtained to provide advice on the detailed legal, technical and procedural requirements of particular diving work for renewable energy projects. Further information is available from various bodies including the HSE, the

[Association of Diving Contractors UK and the International Marine Contractors Association](#) (see also [Appendix 3](#)).

9.14.7 Working at height

The Work at Height Regulations 2005 require employers to:

- avoid the need to work at height wherever possible;
- ensure the work is properly planned;
- carry out a suitable and sufficient risk assessment;
- ensure the work is appropriately supervised throughout;
- ensure the work is carried out in a safe manner;
- provide suitable and sufficient measures to prevent anyone falling; and where necessary to mitigate the effects of a fall should it occur
- not start work until appropriate emergency and rescue arrangements are in place;
- ensure work is only undertaken when weather conditions do not jeopardise safety;
- ensure no person engages in any activity, including organisation, planning and supervision, in relation to work at height or work equipment for use, unless they are competent to do so, or if being trained, are supervised; and
- ensure all places of work at height and all equipment used are inspected prior to use and on an ongoing basis throughout the work.

Organisations involved with performing work at height during the construction phase should ensure they develop and implement appropriate procedures and documentation to ensure all effective controls are in place, are being maintained and are compliant to the requirements of the regulations. Further information on specific aspects of working at height are given below.

Selection of work equipment for work at height

The following requirements must be considered when selecting equipment:

- give collective protection measures priority over personal protection measures;
- take account of:
 - the working conditions and the risks to the safety of persons at the place where the work equipment is to be used,
 - the distance and consequences of a potential fall,
 - the duration and frequency of use,
 - the need for easy and timely evacuation and rescue in an emergency,
 - any additional risks posed by the use, installation or removal of that work equipment, or by evacuation and rescue;
- ensure its characteristics and dimensions are appropriate to the nature of the work to be performed and the foreseeable loadings, and allow passage without risk;
- ensure all purchased equipment is supplied with a CE Mark and relevant certification.

Where work platforms are used for access and egress the potential falling distance must be negotiated.

Existing places of work and means of access or egress at height should:

- be stable and of sufficient strength and rigidity for the purpose for which it is intended to be, or is being used;
- where applicable, rest on a stable, sufficiently strong surface;
- be of sufficient dimensions to permit the safe passage of persons and the safe use of any plant or materials required to be used, and to provide a safe working area having regard to the work to be carried out there;

- possess suitable and sufficient means for preventing a fall;
- possess a surface which has no gap:
 - through which a person could fall,
 - through which any material or object could fall and injure a person,
 - giving rise to other risks of injury to any person, unless measures have been taken to protect persons against such risk;
- be so constructed and used, and maintained in such condition, as to prevent, so far as is reasonably practicable:
 - the risk of slipping or tripping,
 - any person being caught between it and any adjacent structure; and
- where it has moving parts, be prevented by appropriate devices from moving inadvertently during work at height.

Fragile surfaces

Ensure that:

- no person passes across or near, or works on, from or near, a fragile surface when not required to do so;
- where this cannot be prevented, suitable and sufficient platforms, coverings, guard rails or similar means of support or protection are provided and used;
- where a risk of falling remains, suitable and sufficient measures to minimise the distances and consequences of a fall are provided, e.g. fall arrest;
- warning notices are fixed at the approach; and
- where this is not practicable, persons are made aware of it by other means.

Falling objects

Employers must:

- take suitable and sufficient steps to prevent the fall of any material or object;
- take suitable and sufficient steps to prevent any person being struck by any falling material or object;
- ensure that no material or object is thrown or tipped from a height; and
- ensure that materials and objects are stored in such a way as to prevent risk from collapse, overturning or unintended movement.

Danger areas

All work areas that present a risk of falling or being struck by a falling object must be fitted with equipment and signage that prevents unauthorised access.

Use of personal fall protection systems

A personal fall protection system shall be used only if:

- a risk assessment has demonstrated that:
 - the work can be performed safely while using that system and
 - the use of other, safer work equipment is not reasonably practicable;
- the user and a sufficient number of available persons have received adequate training specific to the operations envisaged, including rescue procedures.

A personal fall protection system shall:

- be suitable and of sufficient strength for the purposes for which it is being used;
- where necessary, fit the user;

- be correctly fitted;
- be designed to minimise injury to the user and, where necessary, be adjusted to prevent the user falling, or slipping from it, should a fall occur; and
- be so designed, installed and used as to prevent unplanned or uncontrolled movement of the user.

A personal fall protection system designed for use with an anchor shall be securely attached to at least one anchor, and each anchor and the means of attachment shall be suitable and of sufficient strength and stability for the purpose of supporting the load.

A work positioning system shall be used only if:

- the system includes a suitable backup system for preventing or arresting a fall;
- the user is connected to it; and
- where it is not reasonably practicable, all practicable measures are taken to ensure that the work positioning system does not fail.

A rope access or positioning technique shall be used only if:

- it involves a system comprising at least two separately anchored lines, of which one ('the working line') is used as a means of access, egress and support, and the other is the safety line;
- the user is provided with a suitable harness and is connected by it to the working line and the safety line;
- the working line is equipped with safe means of ascent and descent, and has a self-locking system to prevent the user falling should they lose control of their movements; and
- the safety line is equipped with a mobile fall protection system, which is connected to and travels with the user of the system.

Taking the risk assessment into account, and depending in particular on the duration of the job and the ergonomic constraints, provision must be made for a seat with appropriate accessories.

The system may comprise a single rope where:

- a risk assessment has demonstrated that the use of a second line would entail higher risk to persons and
- appropriate measures have been taken to ensure safety.

A fall arrest system shall incorporate a suitable means of absorbing energy and limiting the forces applied to the user's body.

A fall arrest system shall not be used in a manner:

- that involves the risk of a line being cut;
- where its safe use requires a clear zone (allowing for any pendulum effect), that does not afford such a zone;
- that otherwise inhibits its performance or renders its use unsafe.

A work restraint system shall be so designed that, if used correctly, it prevents the user from getting into a position in which a fall can occur.

Use of ladders

- Ladders may only be used when the result of a risk assessment has demonstrated that the use of more suitable work equipment is not justified because of the low risk, because the duration of required use is short, or because of existing features on site which cannot be altered.
- Any surface upon which a ladder rests should be stable, firm, of sufficient strength and of suitable composition to support the ladder safely, so that its rungs or steps remain horizontal with any loading intended to be placed on it.
- A ladder should be positioned to ensure its stability during use.

- A suspended ladder should be attached in a secure manner so it cannot be displaced and swinging is prevented.
- A portable ladder should be prevented from slipping during use by:
 - securing the stiles at or near their upper or lower ends and
 - an effective anti-slip or other effective stability device.
- A ladder used for access should be long enough to protrude sufficiently above the place of landing to which it provides access.
- No interlocking or extension ladder shall be used unless its sections are prevented from moving relative to each other while in use.
- Where a ladder or run of ladders rises a vertical distance of 9 metres or more above its base, there should, where reasonably practicable, be provided at suitable intervals sufficient safe landing areas or rest platforms.
- Every ladder should be used in such a way that:
 - a secure handhold and secure support are always available to the user and
 - the user can maintain a safe handhold when carrying a load.

Inspection – This means visual or more rigorous inspection by a competent person as is appropriate for safety

Inspection of places of work at height

Ensure that the surface and every parapet, permanent rail or other such fall protection measure are checked prior to use.

Inspection of work equipment

Employers must ensure that:

- all installed work equipment is not used unless it has been inspected;
- work equipment exposed to conditions causing deterioration is inspected at suitable intervals and after extreme events;
- no work equipment leaves its site unless it is accompanied by physical evidence that it has been inspected and is within its retest date; and
- the results of an inspection are recorded and kept until the next inspection.

Inspection of working platforms – scaffolding

The requirements relating to working platforms and scaffolding may be found in Schedule 3 of the Work at Height Regulations 2005.

Employers must ensure that:

- platforms above 2m are not used unless inspected;
- the person carrying out an inspection prepares a report in accordance with Schedule 7 of the Work at Height Regulations 2005 and submits it to the person requesting the inspection within 24 hours; and
- reports are kept on site until the construction work is completed, thereafter at an office for 3 months.

Inspection reports

Inspection reports must contain the following information:

- the name and address of the person for whom the inspection was carried out;
- the location of the work equipment inspected;
- a description of the work equipment inspected;
- the date and time of the inspection;
- details of any matter identified that could give rise to a risk to the health or safety of any person;
- details of any action taken as a result of any matter found;
- details of any further action considered necessary; and

- the name and position of the person making the report.

Duties of persons at work

Every person must:

- report any activity or defect that is likely to endanger themselves or others;
- use any work equipment or safety device provided to them by their employer; and
- use the work equipment or device in accordance with the training and information provided to them.

9.15 Security

The Occupier's Liability Act 1957 and 1984 requires employers to make provision for both lawful and unlawful visitors. Security measures should be sufficient to prevent access by any unlawful visitors without causing them harm.

All security measures should be put into effect prior to construction work starting and should be updated as necessary throughout occupation of the site. The measures should:

- ensure provision to prevent unauthorised access to the site;
- ensure materials are stored without risk to Health and Safety;
- ensure construction plant is secured against unauthorised operation;
- establish procedures for control of visitors;
- establish procedures for visiting workers; and
- ensure provision to monitor the effectiveness of the security arrangements.

Additional measures will be required when reviewing security arrangements during the construction and operational phases offshore.

9.16 Existing services / previous land usage

9.16.1 The pre-construction information required to be provided by the Client to the Principal Contractor under CDM should identify all existing services on site. Before work starts on site a physical check by the Principal Contractor should be performed to confirm the location of all key services and signs of previous land use. This would typically involve:

- contacting all public utilities;
- identifying existing services and marking on drawings or charts;
- obtaining suitable detection equipment, e.g. cable locators;
- land is not contaminated from previous dumping or tipping;*
- checking that no old mine workings exist;*
- checking for previous military use, e.g. unexploded ordnance.*

*Obtain specialist advice if potential for such conditions exists.

9.16.2 Before and during construction the following practices should be observed:

- check for, identify and mark buried services before excavation takes place (see HSG47);
- treat all services as live;
- determine whether live services can be temporarily de-energised or diverted;
- expose buried services by appropriate means, e.g. hand digging;
- place 'goalposts' to warn of overhead services; and
- use buoys to mark existing pipelines, subsea cables and anchor lines, and establish exclusion zones where necessary.

9.17 Excavation

9.17.1 Regulation 31 of CDM specifically covers requirements for excavations. Prior to excavations being undertaken ensure:

- a proper assessment is made of local ground conditions;
- that the proposed excavation will not cause any premature collapse of, or damage to, surrounding structures;
- the excavation is located away from traffic routes, or traffic routes are relocated;
- the excavation is prevented from collapsing;
- people, work equipment and materials are prevented from falling into the excavation; and
- no buried services (e.g. gas, electricity, water) exist in the locality.

9.17.2 As excavations are carried out:

- the sides should be supported or 'battered' back;
- it should be kept free of water;
- it should not be allowed to deteriorate as a result of bad weather;
- any deterioration should be made good;
- adequate barriers should be kept in place to prevent unauthorised access;
- the condition of the excavation is required to be inspected at the start of a shift, after any event that may have affected the strength of the excavation and after any unintentional fall or material is dislodged; and
- inspections should be recorded as evidence they were performed, and by a competent person.

9.18 Lifting and handling

9.18.1 Before carrying out any manual handling operation, ensure:

- compliance with the Manual Handling Operations Regulations 1992 as amended;
- a relevant risk assessment has been carried out; and
- persons are trained on and adopt the correct manual lifting techniques and practices; HSE document L23 provides additional advice and guidance (see Appendix 3).

9.18.2 Where reasonably practicable the elimination of manual handling risks should be considered by means of supply to site of machine-handled loads e.g. pre-fabrication off-site, palletised loads etc. General good practice principles that should be considered include:

- Tasks which are carried out most frequently and that involve stooping, twisting, travelling or climbing with loads should be prioritised for improvement
- Every individual's capability and competence should be considered before manual handling is undertaken. Training should be provided for all those carrying out manual handling tasks
- Wherever possible loads should be marked with their weight and presented with suitable hand holds
- Wind farms present an Environment with challenges such as restricted work spaces, complex travel routes and exposure to the elements.

9.18.2 Before any lifting devices, including cranes, are used on site, ensure:

- appointment of a competent person to be in control of lifting operations;
- valid test certificates exist, including those for slings, lifting chains, shackles and lifting points on structures;
- only competent personnel trained in the use of the lifting equipment and accessories are involved;

- proper risk assessments are made on the lifting operation to be undertaken;
- account is taken of ground conditions and uneven terrain;
- precautions are taken to avoid contact with site services, e.g. overhead electrical cables;
- any restrictions on operations in poor weather conditions are clearly identified;
- all operations involving the use of elevated access platforms or man riding platforms are properly risk assessed, and control measures identified and implemented;
- all lifting operations are properly planned with all staff fully briefed, and lifting devices are of adequate capacity;
- cranes and HIABs are derigged before moving off;
- when selecting cranes, account is taken of the marine environment and the additional stresses imposed on such equipment when lifting loads from a moving vessel;
- the additional difficulties associated with such operations are taken into account when assessing the competence of those involved, e.g. crane drivers and banksmen;
- that an offshore lifting supervisor is appointed to oversee all lifting operations on board the construction vessel;
- loads to be sent offshore are suitably packed and secured for transport by sea, e.g. in purpose-built containers or, in the case of large items, secured by appropriate sea fastenings to the deck of a barge or vessel;
- the need for sealed bags, flotation aids and recovery ropes on loads is addressed;
- offshore tower platforms have davits located adjacent to access ladders for the lifting of operatives' tools and equipment from the vessel to the platform; and
- appropriate controls are in place when working near to other construction activities.

The following HSE documents provide additional advice and guidance (see Appendix 3):

- ACOP L113 – Safe Use of Lifting Equipment ACOP
- HSG221 – Technical guidance on the safe use of lifting equipment offshore

9.19 Electrical Safety

Safe system of work procedures and in some cases permit-to-work procedures will be necessary to control work activities on or near live electrical systems. The RenewableUK Wind Turbine Safety Rules provide instruction to control post-installation and energisation operations.

WTG/infrastructure electrical assembly work completed during the construction phase should be performed by an appropriately qualified and competent electrical assembly engineer, and work completed in accordance with the relevant IEE and IEC standards for electrical installation.

The integrity of the electrical infrastructure of all site facilities (offices, workshops, welfare facilities) should be assessed at the time of accepting the lease / after installation (temporary facilities), and thereafter at prescribed intervals in accordance with the Electricity at Work Regulations 1989 and support guidance.

Signage should be installed on all electrical generating equipment, junction boxes, switchgear panels and doors to identify the Health and Safety risks that personnel may be exposed to should they open covers, doors or panels. All covers, doors and panels should be locked, or otherwise prevented from being opened without a mechanical device/tool, to restrict access and prevent exposure to live electrical components and systems.

Portable appliance testing (PAT) should be performed on all electrical equipment used by employees to perform their work, to ensure the equipment is safe to use. Thereafter, PAT should be performed at prescribed intervals in accordance with the Electricity at Work Regulations 1989 and support guidance.

Further advice on electrical safety is listed in Appendix 3.

9.20 Chemicals and substances

9.20.1 A suitable COSHH assessment should be made, utilising materials safety data sheets (from the supplier) and other sources of information for:

- all chemicals and other substances used on site, e.g. epoxy-based materials, oils, lubricants and fuels;
- processes causing dust and fumes, e.g. welding, grinding, etc.; and
- biological hazards that may be present on site from previous and/or existing animal inhabitants, e.g. Weil's disease (rats), anthrax (cattle), brucellosis (cattle), bovine tuberculosis (cattle), and cystic echinococcosis or hydatid disease (sheep).

HSE document EH40, published annually, provides information on substance exposure limits (see Appendix 3).

9.20.2 Ensure that proper arrangements are made for:

- reviewing the need to use the substance, substitution with a safer alternative, or reduction of quantities used and stored on site;
- correct handling of chemicals/substances including disposal;
- correct storage of chemicals/substances, including bunding/ventilation;
- correct transport arrangements;
- provision of suitable first aid;
- welfare facilities;
- containment, clean-up and reporting of spillages;
- detection and management of vapours and fumes where necessary;
- environmental monitoring; and
- employee health surveillance.

HSE ACOP L5 – Control of Substances Hazardous to Health (Fifth Edition), provides additional advice and guidance to the regulations (see Appendix 3).

Employers and contractors should be aware of the new REACH regulations that place additional duties on the downstream users of chemicals. REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) is a European regulation that has direct application in all EU member states. The regulations should lead to an improved level of Health and Safety information being passed down the supply chain. Further details are available via the HSE, which is acting as the UK's competent authority.

9.21 Dangerous substances and explosive atmospheres

An assessment of the risks posed by substances that are flammable, highly flammable, extremely flammable, oxidising or explosive, and any dusts which when mixed with air may form an explosive mixture (classified as 'Dangerous Substances' under the Dangerous Substances and Explosive Atmospheres Regulations 2002), needs to be performed to assess their potential for the creation of an explosive atmosphere within the workplace.

Sites that use and store Liquid Petroleum Gas (LPG) canisters, fuels or substances that are classified in any of the above categories, are required to carry out a DSEAR assessment.

The assessment should identify the potential for an explosive atmosphere to occur within the workplace. Areas of significant risk require zonal classification and additional controls to prevent sources of ignition and accidental release of dangerous substances.

The following should be considered to reduce risk:

- reducing the quantity of dangerous substance;
- avoiding or minimising release;
- controlling any release at source;
- preventing the formation of an explosive atmosphere;
- collecting and containing releases;
- avoiding ignition sources;
- avoiding adverse conditions, e.g. high temperature; and
- segregating incompatible substances.

Areas which contain dangerous substances should be categorised into the following zonal classifications:

Zone 0 – an explosive atmosphere is present continuously;

Zone 1 – an explosive atmosphere is present occasionally; and

Zone 2 – an explosive atmosphere is not likely to occur in normal operation, but if it does, persists for a short period only .

All zonal areas are required to be identified with an EX warning sign. Additional control measures are dependent on the zonal area classifications, which are defined within the HSE ACOP L138 – Dangerous Substances and Explosive Atmospheres (see Appendix 3).

9.22 Noise

The Control of Noise at Work Regulations 2005 sets limitations on the levels of noise employees may be exposed to whilst at work.

- Action values – the level at which employers must take action to reduce noise
- Exposure limits – the level of which must not be exceeded

Employers who perform work that is liable to expose any employees to noise at or above the action level must carry out a risk assessment. When performing the assessment consideration should be given to:

- the level, type and duration of exposure;
- the effect on employees or groups of employees;
- indirect effects from audible alarm systems;
- information provided by manufacturers;
- the availability of alternative equipment designed to reduce the emission of noise;
- noise levels beyond normal working hours;
- exposure in rest facilities;
- information obtained from health surveillance; and
- availability of hearing protectors.

The risk assessment must be performed by a competent person, who has obtained appropriate qualifications and experience in accordance with the Institute of Acoustics guidelines. Further information may be found in HSE Guidelines L108 – Controlling Noise at Work (see Appendix 3).

9.23 Vibration

9.23.1 There are two types of physical effect from exposure to vibration at work:

Hand–arm vibration – vibration that is transmitted into the hands and arms during work activity, e.g. from pneumatic drills/hammers, electrical power tools; and

Whole body vibration – mechanical vibration that is transmitted into the body when seated or standing,

through the supporting surface during work activity, e.g from ride-on plant or plant equipment, vehicles and helicopters.

9.23.2 The Control of Vibration at Work Regulations 2005 sets limitations on the levels of vibration employees may be exposed to whilst at work.

Daily exposure action limit – the level at which employers must take action to reduce exposure to vibration

Daily exposure limit value – the level which must not be exceeded; if exceeded or likely to be exceeded, employees must be provided with health surveillance

9.23.3 Employers performing work liable to expose any employees to vibration levels at or above the daily exposure action limit must carry out a risk assessment, which should address:

- the magnitude, type and duration of exposure;
- employees whose health is at particular risk from such exposure;
- the condition of equipment and maintenance records;
- information provided by the manufacturers;
- the availability of replacement equipment designed to reduce exposure to vibration;
- any extension of exposure at the workplace to whole body vibration beyond normal working hours;
- specific working conditions, such as low temperatures; and
- previous health surveillance records.

The following should be considered when assessing appropriate prevention and control measures:

- alternative working methods that eliminate or reduce exposure;
- work equipment that produces the least possible vibration;
- the use of auxiliary equipment that reduces the risk of injuries caused by vibration;
- maintenance programmes for work equipment, the workplace and workplace systems;
- the design and layout of workplaces, work stations and rest facilities;
- suitable and sufficient information and training for employees, to ensure the work equipment is used correctly and safely;
- limitation of the duration and magnitude of exposure to vibration;
- appropriate work schedules with adequate rest periods; and
- the provision of clothing to protect employees from cold and damp.

9.23.4 Vibration exposure calculations

THE HSE has created a ready reckoner table to provide a visual guide to the levels of vibration exposure that are thought to be safe and those that may start to initiate vibration-related injuries. This can be downloaded from the HSE website (www.hse.gov.uk). This table provides those planning work with a guide to exposure times and can indicate from the outset those who may be at risk before work commences, allowing employers to take action at the earliest opportunity.

The duration and magnitude of vibration exposure is required to be recorded for each individual daily, and reviewed to ensure personnel have not exceeded the daily exposure limit value.

The HSE has also created a vibration calculator, which can be downloaded from the HSE website (www.hse.gov.uk). The calculator allows employers to work out how much exposure over an 8-hour period employees have actually been exposed to. The calculator is designed to allow for multiple entries of vibration values (durations and magnitudes) from multiple tasks performed throughout the day by an employee. This provides the employer with accurate data of actual exposure and as stated in 9.22.2, if this value is exceeded, employees must be provided with health surveillance.

Additional information may be found in HSE documents L140 – Hand–Arm Vibration and L141 – Whole Body Vibration (see Appendix 3).

9.24 Personal protective equipment (PPE)

9.24.1 Persons working on site must be provided with appropriate PPE to protect against risks identified within a risk assessment that cannot be controlled by other means.

The PPE must be suitable for the individual and sufficient to provide adequate protection. When selecting appropriate PPE, consideration of the individual's physical size, make up and personal characteristics (such as facial hair), existing health conditions and whether or not the introduction of the PPE will increase risk to the individual's Health and Safety, needs to be given.

Accommodation for the PPE is required to be provided to allow the individual to store it in a clean and protected environment, which prevents contamination and deterioration.

Appropriate information, instruction and training (and, where necessary, supervision) is required to be provided to the individuals supplied with PPE, covering the reasons why the PPE is required to be worn (including risks and potential health effects of exposure) and on the correct use, storage and maintenance of the PPE.

The condition of the PPE should be monitored and it should be replaced when necessary.

9.24.2 When assessing the requirements for PPE to be used within the workplace, consideration should be given to:

- the risk assessment for the work required to be performed and the residual risks which cannot be controlled;
- the remoteness of the site and climatic conditions (both winter and summer);
- the need to work outside, e.g. exposure to ultraviolet light;
- the problems of access, e.g. the need to work at height;
- the need to work on, near or over water;
- the use of hazardous substances, e.g. type, nature, routes of entry into the body, levels of exposure and workplace exposure limits (WEL);
- [the mode of transport to and from an offshore wind farm;](#)
- [the transfer of operatives – vessel to vessel and vessel to tower/other; and](#)
- [the work to be performed on an offshore structure.](#)

9.24.3 The provisions of RenewableUK PPE (Work at Height) Procurement guidance for WAH equipment should be noted. See the RenewableUK website (www.renewable-uk.com).

9.25 Occupational health

All organisations should ensure that there is appropriate occupational health ((OH) support and, where appropriate, there are specific health surveillance programmes. This would typically include policies and procedures that define:

- any requirements for a pre-employment medical;
- any legal requirements for health surveillance, e.g. vibration (HAVS), manual handling, hazardous substances, display screen equipment;
- requirements for health surveillance identified by a risk assessment, e.g. climbing;
- any local minimum standards, e.g. fitness, eyesight, hearing; and
- proper arrangements for managing health records, e.g. confidentiality.
- [appropriate medicals for personnel working offshore](#)

Where a number of employees work together on the same site the owner/operator of that site should ensure the OH arrangements are adequate, co-ordinated and consistent to the OH risks involved.

9.26 Reporting of accidents/dangerous occurrences and near events

9.26.1 To comply with statutory requirements:

- details of all accidents must be recorded in an accident book (Accident Book BI 510);
- reports under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 must be made to the enforcing authority (generally this will be HSE) in due time and can be made by phone (0845 300 99 23), online, by email or by post (see: www.hse.gov.uk/riddor);
- ensure that reports under the Electricity (Safety, Quality and Continuity) Regulations 2002 are made; and
- ensure that the MCA and MAIB are notified of incidents involving vessels and crews, e.g. vessel collision.

9.26.2 In accordance with good practice, for all workers:

- details of all 'near events' and incidents should be recorded and investigated;
- appropriate remedial action should be taken following all 'near events' and incidents to prevent any recurrence; and
- clients should ensure that the RenewableUK Health and Safety Database (see Section 2.5) is informed of all 'near events' and all accidents and incidents.

9.27 Completion of works

9.27.1 Before leaving site:

- remove all unused materials, waste, plant and equipment;
- restore all temporary workings to a safe condition and to the satisfaction of the landowner; and
- carry out a thorough site inspection.
- [It may be necessary to undertake a seabed survey, using remotely operated vehicles in preference to divers, in order to ensure that the site is free of debris.](#)

9.27.2 The Health and Safety File

CDM requires the publication of the Health and Safety File for the installation on completion of the works. This is a very important document for the ongoing operation and maintenance of the site, since it includes specific information about the key hazards and risks associated with the installation that must be taken into account in any future works being planned. The Health and Safety File must be updated to reflect any changes to the installation during the project lifetime.

Further information regarding the content of the Health and Safety File may be found in the CDM ACOP L144 (see Appendix 3).

10. Operation and Maintenance

10.1 Introduction

10.1.1 This section highlights the consideration that should be given to Health and Safety in the operation and maintenance of wind farms. The operation and maintenance phase covers all aspects of normal routine operation, planned and breakdown maintenance, inspections and testing. Much of the guidance in Section 9, 'Construction, Commissioning and Demolition', is also relevant to operation and maintenance of wind farms and should also be consulted.

- 10.1.2 Persons with responsibilities will include the owner of the wind farm, the operator (if different), operation/maintenance crews and contractors. The ultimate responsibility invariably lies with the owner of the wind farm. However, reference should be made to the duties set out in specific legislation, which will determine the duty holder responsible for any particular aspect of a wind farm's activity.
- 10.1.3 A person should be appointed to be in charge of the site and responsible for all operations with a clear mandate for dealing with any eventualities. A site Health and Safety Adviser should also be appointed to support and advise the 'person in charge' on all matters of Health and Safety. It should be made clear to everyone on site who these persons are, along with an explanation of their roles and responsibilities.
- 10.1.4 Those appointed in respect of 10.1.3 above should take into consideration occurrences of incidents and near events as collated and reported on the RenewableUK Health and Safety Database, including all Safety Alerts issued.
- 10.1.5 Best practice is to provide on site controlled copies of relevant Health and Safety information for the site and the equipment installed, in addition to the controlled copies held by site management personnel.

10.2 Legislative requirements

- 10.2.1 A table of the various legislative requirements and their applicability to each stage of the project is included in Section 6. See also Appendix 2.
- 10.2.2 The Health & Safety at Work etc. Act 1974 and Provision and Use of Work Equipment Regulations 1998 require all work equipment, plant and plant equipment to be maintained in an efficient state, in efficient working order and in good repair.
- 10.2.3 Most maintenance activities fall under CDM, however, the extent of compliance with these regulations depends upon whether or not the work to be performed is defined as construction work under the regulations, or the amount of time required to complete the work requires it to be classified as a notifiable project, e.g. 30 days or 500 man days. Further information is provided in Section 6 and in the CDM ACOP L144 (see Appendix 3), but it is worth noting that the definition of construction work (pages 65–66 in the ACOP) includes waste resulting from the demolition or dismantling of a 'structure', and the definition of 'structure' includes masts, towers or parts of them.
- 10.2.4 A suitable Health and Safety management system should be identified and implemented to ensure that all activities are suitably planned, and all foreseeable risks assessed and mitigated. See Section 5 for further information.
- 10.2.5 Safe systems of work should be established and implemented regarding all work on all mechanical and electrical parts of the wind farm.

10.3 Operation

10.3.1 Operational instructions

Under the requirements of CDM, the EU Machinery Directive and CE Marking process, and the WTG Certification programme specified in IEC WT01, manufacturers of the wind farm hardware (including electrical infrastructure equipment and WTG) are required to supply to the owners/operators with an operations and maintenance manual. This manual is required to explain how the equipment is to be safely operated, maintained and inspected. The manual should also detail the frequency of maintenance checks and appropriate maintenance activities (including recommendations for component replacements) to be performed to maintain the integrity and the ongoing safety of the device.

Risk assessments for the operational instructions may also be required by the 2009 Machinery Directive (Directive 2006/42/EC, replacing Directive 98/37/EC, with effect from 29 December 2009).

10.3.2 Operational activities

Owners/operators shall commence the operational phase once handover of the hardware is complete. As covered in 10.2.4 and Section 5, a Health and Safety management system should be developed to ensure policies are established and appropriate arrangements are in place for Health and Safety throughout the operational wind farm site. To prevent knowledge gaps and increased Health and Safety risks to operational personnel, the Health and Safety management system should ideally be fully developed and operational before site handover is complete.

Owners/operators should ensure all operational monitoring activities are clearly defined for the operational phase. It is recommended that all routine operations performed during this phase are properly risk assessed and are controlled through standardised procedures, method statements and safe systems of work. Familiarity with standardised procedures and controls should increase operator awareness and reduce the potential for human error and frequency of accidents and incidents.

10.3.3 Condition monitoring

Condition monitoring (although a maintenance activity) is undertaken as part of the operational phase. Depending upon the level of condition monitoring equipment/systems installed, it may offer significant detailed feedback on the performance of components and WTG, and provide advanced warning of developing technical problems, such as component wear-out, whether premature or predicted. This will allow for early intervention, reduce the potential for a more serious failure event occurring and make the service life of the equipment more efficient.

Owners/operators should consider, at the earliest possible stage (design), the level and complexity of the condition monitoring required on their installed WTG and infrastructure. When defining the levels of condition monitoring required the following should be considered:

- any legal requirements relating to the equipment;
- the consequences of potential failure events;
- the criticality of equipment failure, and the need to identify and replace components quickly, e.g. to reduce the risk to public safety, the effects and cost of downtime, and penalty clauses;
- the availability of condition monitoring technology from the manufacturer or other organisations;
- any specific monitoring requirements required as a condition of planning consents;
- any historical data of similar component/equipment failures;
- the additional risks placed on individuals required to access the equipment, e.g. monitoring remotely to prevent the need for personnel to access turbine nacelles or visits to turbines offshore;
- the availability of spare components, e.g. increased downtime waiting for replacement components/equipment;
- the availability, logistics and cost issues relating to obtaining heavy installation equipment on site to install replacement parts, e.g. reactive failures may cause increases in downtime from a lack of available equipment / weather window; and
- data from the RenewableUK Health and Safety Database and previous Safety Alerts.

10.4 Maintenance

10.4.1 Planned Preventive Maintenance Programme

A PPM programme is required to be developed to ensure regular checks are made on critical components, and the likelihood of possible future component failures is identified (in conjunction with condition monitoring). Issues that need to be considered when developing a PPM programme include:

- information provided by the manufacturers;
- frequency of maintenance activities;
- when the maintenance is to be performed, e.g. time of year, day/night, during peak or off-peak generation;
- maintenance activities to be performed (see 10.4.2 below);
- tools and equipment to be used, including calibration requirements;
- competent personnel, disciplines required, specialist knowledge, employed personnel or contractors;
- risk assessment and method statements;
- **safe systems of work to be used;**
 - permits-to-work and locking-off, where there is significant risk to Health and Safety;
 - records to be made, written scheme of examination, reports;
 - information, instruction and training to be provided or obtained, specialist competencies, local site rules and task-specific hazards, and control measures;
 - PPE to be worn;
 - other safety precautions to be adopted and/or implemented; and
 - emergency arrangements.

10.4.2 PPM procedures for maintenance, inspection and testing activities should be established for:

- installed safety devices, e.g. overspeed devices, electrical protection;
- safety features, e.g. attachment points for safety harnesses;
- installed lighting and emergency backup;
- portable electrical appliances;
- electrical earthing and lightning conductors;
- equipment installed with high integrity, e.g. blade fixings;
- lifting equipment;
- access plant and equipment;
- mechanical handling equipment;
- cathodic protection and coating systems;
- foundation integrity;
- seabed scour and remedial burial of subsea cables; and
- monitoring corrosion of access equipment.

10.4.3 Reactive maintenance (unplanned intervention)

The number of failures that require this will be reduced by planned maintenance, but many circumstances, such as severe weather conditions, can arise, which require workers to carry out tasks beyond their normal work experience and/or which are more than usually hazardous by their nature. Records of all breakdowns should be kept to influence future planned maintenance policy revisions, training and designs.

Arrangements should be considered to manage unknown and changeable situations as a result of breakdowns, major component failure and resultant damage. These should be considered and, where necessary, additional training provided to maintenance personnel in Health and Safety, situation management and management of change (see Section 5.8).

10.4.4 Review of performance and maintenance data

All condition monitoring data and maintenance records should be reviewed at regular and periodic intervals, to identify any repetitive patterns and trends relating to component reliability and breakdown. Both the condition monitoring and PPM programme should be reviewed, and where any patterns and trends of component failure arise, additional monitoring and maintenance activities should be introduced.

10.5 Long-term turbine integrity

It is recommended that owners/operators consider the following when addressing the long-term integrity of their WTG.

At all times adhere to the manufacturers' recommended preventive maintenance instructions, including:

- the frequency of examinations and maintenance activity;
- methods to be used to perform the maintenance;
- component replacement recommendations; and
- any guidance provided to ensure the work is performed safely.

Ensure all manufacturer-recommended modifications are completed within recommended timescales, or as soon as is reasonably practicable. Note: where routine maintenance is not carried out by the original equipment supplier, it is suggested that the turbine manufacturer be contacted for confirmation that all appropriate modifications have been implemented.

Periodically (but not less than every 12 months), contact the turbine manufacturer to share performance information and be appraised of any additional measures that they now recommend, following experience from other turbines of the same model, or similar design or components, installed elsewhere. Carry out these measures to provide assurance of the continuing integrity of the turbine.

Prior to purchasing turbines second hand, seek appropriate competent expertise on the suitability of the turbine(s) for the site. All second hand turbines purchased should be supplied with all historical maintenance records, including as a minimum, details of modifications made and results of thorough examinations performed. Ensure prior to commissioning, an appropriate technical assessment has been carried out and new integrity certifications obtained from a recognised competent body.

If the operational conditions of any turbines have changed significantly during their operational lives, e.g. machines being exposed to increased wind turbulence due to the erection of significantly sized buildings nearby or adjacent tree growth, ensure that appropriate advice is sought on the continued compatibility of the turbine(s) for their location(s).

For any turbines approaching the end of their design lives and where operational lives are proposed to be extended, ensure that appropriate technical assessments are carried out and new integrity certifications obtained beforehand from a recognised competent body.

10.6 Record-keeping

10.6.1 Ensure that:

- a Health and Safety policy statement is written and displayed within the workplace;
- employers' liability certificates for subcontractors are capable of being displayed/viewed on site;
- the Health and Safety management system is documented;
- all drawings, specifications, and operation and maintenance manuals are made available to relevant personnel;
- all risk assessments, method statements and safe systems of work are made available to relevant personnel;
- the Health and Safety file is made available and updated when necessary, including drawings, following any modification to the wind farm;
- all EC Declaration of Conformity Certificates and WTG Certifications are readily available;
- written schemes of examination are available for relevant pressure systems, lifting equipment and lifting accessories;

- any health records are properly maintained, available for at least forty years and secured to prevent unauthorised access;
- all training records and competency assessments are retained and made readily available; and
- an accident book is available to workers and its location is known.

10.6.2 Establish appropriate records, such as those for:

- maintenance/inspection of PPE, e.g. safety harnesses;
- testing of fire alarms and drills;
- maintenance/inspection of fixed and portable firefighting equipment;
- written risk assessments, e.g. vibration, COSHH, manual handling, foreseeable significant risks;
- training;
- auditing, monitoring, checks or inspections carried out, and actions taken;
- tests on any installed safety features, e.g. overspeed devices, emergency lighting;
- maintenance reports and maintenance logs, e.g. to record when maintenance activities were performed on the WTG, by whom and any actions taken;
- calibration of inspection, measuring and test equipment;
- portable electrical appliance testing; and
- significant events, such as high-voltage switching.

10.7 Competence

10.7.1 Contractors

Competence of contractors and those appointed under CDM has been covered in Section 9.6 above. It is recommended that owners/operators of wind farms who engage contractors to perform works on their site, utilise the same principles stated under Section 9.6 and refer to CDM ACOP L144.

10.7.2 Operation and maintenance personnel

Owners/operators who select and appoint key personnel should adopt the principles set out in Section 9.6.2 above. In addition, they should establish for the site a comprehensive training and competency development programme for all personnel, taking into account:

- the level of competence they already possess;
- the level of competence they require to enable them to complete their work safely and/or unsupervised;
- the type and nature of the work they will undertake;
- industry standards for minimum training requirements, e.g. RenewableUK recommendations for working at height, offshore survival;
- legislative requirements, e.g. high-voltage switchgear;
- identification of training and development needs;
- scheduling of training and development activities;
- review frequencies;
- performance review by managers and supervisors; and
- review and appraisal with individuals.

10.8 Risk assessments and method statements

10.8.1 Risk assessments have been covered within Sections 5.7 and 9.7. It is recommended that owners/operators use the principles set out within these sections and the supporting HSE Guidelines.

Operational and routine maintenance operations are unlikely to change significantly throughout the operation and maintenance phase. This allows owners/operators to develop appropriate risks

assessments and method statements more efficiently. Wherever possible, these operations and the control measures identified should be standardised so personnel become familiar with common hazards and the precautions required.

Reactive maintenance activities as a result of a breakdown pose significantly greater Health and Safety risks to personnel, e.g. exposure to unfamiliar situations as a result of damage created during component failure. In these circumstances consideration should be given to the following:

- the additional hazards posed as a result of component failure, e.g. falling debris, damaged/unstable work platforms, damaged lighting restricting visibility;
- the actions required to make the area safe, de-energised; removal of debris, damaged components, etc.;
- the hazards, and precautions required to make the area safe;
- seeking additional and expert advice from the appointed site Health and Safety Adviser;
- information from the Health and Safety File and Operations and Maintenance manual regarding replacement of components;
- additional emergency arrangements required for both the cleanup and replacement of components;
- the use of a Management of Change process (see Section 5.8) to cope with changing situations and events during the rectification work;
- additional training requirements; and
- incidents and near events as collated and reported by RenewableUK in its Health and Safety Database, together with all Safety Alerts issued.

10.8.2 Method statements have been covered in Section 9.7. It is recommended that owners/operators use the principles set out within this section to assist with the development of appropriate operation and maintenance method statements.

Method statements covering work on site must be prepared so that:

- high-risk activities can be identified, assessed, controlled and monitored;
- safe systems of work are devised;
- contractors can demonstrate adequate controls and compliance with their legal responsibilities; and
- lessons learned from incidents and near events should be used where appropriate to modify work procedures.

10.8.3 Consideration should be given to conditions associated with remoteness and climate:

- the risk of lightning;
- extremes of temperature, e.g. ice, snow, heat, risk of exposure;
- exposure to ultraviolet radiation;
- working at height;
- access at height;
- lone working;
- working on, near or over water;
- exposure to salt spray; and
- corrosion.

10.9 Safe systems of work

10.9.1 A safe system of work for operational wind turbines (onshore and offshore) has been developed and implemented by RenewableUK member companies and is known as the Wind Turbine Safety Rules (WTSR). The WTSR clearly specify actions and procedures that have to be followed in order that persons working on wind turbines are safeguarded from inherent dangers that exist from the installed electrical and mechanical equipment. These rules have set a common standard across the onshore and offshore wind sector for maintaining turbines.

For more detailed information please refer to the RenewableUK website (www.renewable-uk.com), where the 'Wind energy' area of the Health and Safety section contains links to the following documents, available for download:

- the Wind Turbine Safety Rules;
- Introduction to WTSR;
- Guidance: How to use the WTSR documentation;
- a model implementation plan (a list of chronological activities to achieve successful implementation);
- a model WTSR training course (a set of slides for use in training staff);
- a model audit programme for WTSR (a guide to areas requiring audit following implementation of the WTSR);
- guidance on the application of the WTSR; and
- WTSR support procedures (example documents for use by individual companies to develop site- or company-specific support procedures).

Since January 2010 a new Operational Safety Rules (E&M) Group was convened, which replaced the previous WTSR group. Its primary remit is to develop and communicate a common understanding and approach of good practice to ensure electrical (LV and HV) and mechanical safety of planned and installed renewable energy capacity.

10.9.2 The WTSR set down the procedures to be followed when undertaking work or testing on plant and low-voltage (LV) apparatus associated with a wind turbine generator (WTG). Any work or testing on the high-voltage (HV) infrastructure that forms part of the wind farm or WTG should only be permitted under a set of approved HV safety rules.

10.9.3 The RenewableUK OSR sub-group has identified a need to examine how the rules could be developed to encompass the HV equipment that provides the connection to the grid, and which is now becoming increasingly present inside wind turbines. The result of this work is a new set of rules that can be applied to the turbines alone, or to the whole wind farm. The progress and results of a set of new rules, currently under operational trials, are available on the RenewableUK website (www.renewable-uk.com).

10.9.4 In order to establish a safe system of work, consider:

- the need to establish safe working methods and written procedures;
- the need to establish permit-to-work procedures;
- any requirements for isolation, locking-off or tagging;
- cross boundary/interface safety, e.g. with Distribution Network Operators;
- how persons are set to work and supervised;
- access to the workplace, e.g. scaffolds, installed ladders, lighting; and
- monitoring and reviewing of requirements.

10.9.5 Permit-to-work systems should be considered for:

- activities where it is not practical to remove significant hazards; and
- high-risk activities, which may include
 - hot work (the application of heat, including welding, burning or grinding, on plant containing flammable materials),
 - work on or near to live electrical systems,
 - work on systems, components or devices that require locking off to prevent premature energisation,
 - entry into confined spaces and
 - access to dangerous work areas.

Further information may be found in Section 9.8.1 and in HSE Guidance document HSG 250 – Guidance on permit-to-work systems (see Appendix 3).

10.9.6 Special controls, including supervision, may be required in the following situations:

- visitors or contractors attend a site: make sure they understand what they have to do to ensure safe working;
- people are working at height;
- people are working alone;
- equipment can be operated remotely;
- working over water;
- organised shooting on or adjacent to a wind farm;
- public access, e.g. use of footpaths across work areas, etc.;
- where non- or poor-English-speaking workers are employed;
- for the transfer of personnel to and from vessels/wind farms;
- for the transfer of personnel on and off turbines;
- to track personnel between wind farms and accommodation vessels; and
- for unloading and back-loading supply vessels.

10.9.7 Some general site rules should be established, covering aspects such as:

- coordination of deliveries by various subcontractors;
- segregation of vehicles and pedestrians;
- vehicle movement on site, especially reversing, and the use of banksmen; where possible, the need for reversing should be eliminated;
- limiting the speed vehicles move around the site, ideally by fixed features that mean drivers cannot move too quickly; speed limits are not always appropriate or enforceable;
- the wearing of personal protective equipment, e.g. hard hats, safety footwear, high-visibility clothing, etc.;
- control of access to work areas;
- working in inclement weather; and
- accessing offshore sites e.g restricting access due to adverse weather.

10.9.8 Appropriate policies and procedures should be devised and implemented with respect to site visits offshore, distinguishing between planned maintenance visits and unplanned intervention visits in the event of a breakdown.

10.10 Communication

Section 9.5.2 identifies methods of communication that should be used within the construction phase of the wind farm. However, the same principles may be adopted for use during the operational phase of the wind farm. It is recommended that owners/operators establish a procedure for communication and ensure that communication is covered in all work instructions, method statements, safe systems of work procedures and permit-to-work systems. Issues that should be considered include:

- frequency and methods of communication to be used between:
 - site personnel and the management team,
 - functions within a wind farm,
 - third parties,
 - the public,
 - shared workplaces, and
 - emergency services;
- aids to assist communication, e.g. notice boards, provision of information;
- accessibility of key staff and management commitment;
- methods of feedback and dealing with requests for information;
- meetings including purpose, frequency, format, distribution of meeting minutes; and

- audit and review of communication performance.

Advice should be taken to determine which radio frequencies are authorised for emergency and routine communications offshore.

10.11 Emergency arrangements

An Emergency Response Plan (ERP) for dealing with all foreseeable onshore and offshore emergency situations on an operational wind farm site will need to be drawn up, with appropriate additions or adjustments for specific or 'one off' operations.

Section 9.9 explains how an ERP should be developed, and these Guidelines, along with those referenced at the end of this section, should be used to develop the ERP for an operational wind farm.

Owners and operators are reminded to involve and discuss the ERP with all local emergency services, and the MCA and MRCC regarding offshore wind farms.

Information and recommendations for offshore emergency response can be found in Appendix 1, Section 9.9 above and [HSE Guidance document HSG142 – Dealing with Offshore Emergencies \(see Appendix 3\)](#).

10.12 Information, consultation, training and supervision

10.12.1 Information to be provided to employees

- The Health and Safety policy
- Company and site Health and Safety induction
- Relevant sections and requirements of the Health and Safety management system
- Information on Health and Safety hazards and the control measures required to prevent risks to their Health and Safety
- Site Health and Safety rules and procedures
- Information on work procedures, risk assessment, method statements, and safe systems of work procedures
- Information on fire safety and fire prevention, including risks of and control measures to prevent fire outbreak, evacuation procedures and those responsible for their implementation, and the use of firefighting equipment
- Information on first aid arrangements, names of first-aiders, location of first aid equipment, and procedures for accidents and incidents
- Information on relevant sections of the Emergency Response Plan
- Information on the welfare facilities
- Information on all changes to the workplace and their effects on Health and Safety
- Requirements for health surveillance
- Guidance on who should be trained as a first aider
- Guidance on additional first aid, emergency and occupational health support available
- For further information on first aid see section 9.9

10.12.2 Information to be displayed in the workplace

- Statutory notices and posters, and site Health and Safety policy, displayed within the workplace at a location accessible to all
- Appropriate signage to provide warning of workplace hazards, prohibitions, controls, measures such as PPE, evacuation routes and location of safety equipment
- Site maps, including the location of wind turbines and other wind farm equipment, safety equipment

and emergency response equipment

10.123 Information for contractors

- Relevant pre-construction information required to be provided under CDM
- Site safety rules and procedures
- Roles and responsibilities of key site personnel
- Health and Safety information regarding the site and hazards that exist within the workplace that they may be exposed to
- Interfaces between work activities and other contractors
- First aid and welfare facilities available on site
- Emergency Response Plan and arrangements

10.124 Information to third parties

- Provide information to landowners, e.g. location of buried cables
- Provide information for members of the public, e.g. designated rights of way
- Ensure statutory warning notices are in place
- Provide information to mariners and notices to fishermen
- Provide all relevant information to the MCA and MRCC

10.125 Consultation

A procedure should be established to ensure proper consultation with employees or their representatives on all matters of Health and Safety within the workplace. The procedure should consider:

- whether or not the company should consult all individuals or ask them to appoint a representative;
- election processes for representatives;
- equipment, facilities and resources to be made available to representatives;
- provision of information in due time to allow employees or their representatives to provide feedback and input to decisions made on Health and Safety;
- provision of information regarding changes within the workplace;
- encouragement to involve employees in the risk assessment process; and
- encouragement to develop an open workplace in which views are respected and opinions shared.

10.126 Training

Training and development programmes should be set up for all personnel, with the aim of identifying and providing all necessary training related to their work, and monitoring and developing competence. Training should include:

- site Health and Safety policy;
- site Health and Safety induction;
- site rules and procedures;
- site personnel roles and responsibilities, including those of the individual being trained;
- relevant sections of the site's Health and Safety management system
- RenewableUK-recommended minimum Health and Safety standards for accessing sites covering:
 - working at height techniques and
 - offshore survival techniques;
- all technical aspects relating to their work;
- risk assessments, method statements, safe systems of work procedures, permit-to-work procedures, and emergency response arrangements and evacuation procedures relative to the work they shall undertake;
- additional training should be provided for additional roles, such as first aid and assigned

- responsibilities under the Emergency Response Plan; and
- Training provided should be in a common language to all; assistance should be provided where language barriers exist.

10.127 Supervision

Supervision and enforcement of Health and Safety instructions is a necessary requirement to ensure the successful implementation of the Health and Safety policy. Employers should ensure:

- adequate and appropriately experienced personnel are appointed to manage and supervise personnel;
- sufficient numbers are provided taking into account working hours, shifts and offshore restrictions; and
- supervisors are provided with appropriate and ongoing training and development to enable them to lead by example, manage personnel and situations effectively and without risk, ensure consistent compliance to Health and Safety standards, be able to motivate and inspire others, and actively encourage a positive Health and Safety culture.

10.13 Site access

10.13.1 Site access roads and hard standing areas should:

- have adequate provision for vehicular movement on site;
- be sufficiently reinforced to withstand the weight of heavy vehicles;
- be adequately maintained;
- be provided with means of restricting access, e.g. gates, fences and signage;
- be properly identified, e.g. through signs, notices, drawings and plans;
- provide adequate protection from overhead power lines; and
- identify speed limits and other precautionary instructions to drivers.

10.13.2 Transport on site should:

- be assessed for suitability to deal with site conditions, e.g. rough terrain;
- be subject to proper maintenance;
- be driven or operated by suitably trained and competent persons;
- be regularly inspected (daily checks and weekly checks should be completed and a report of their being carried out submitted to the Principal Contractor / site owner); and
- have adequate provision to cope with incidents, e.g. first aid, environmental.

10.13.3 Special care must be taken:

- to control access of specialist vehicles to the site, e.g. cranes, excavators, access platforms;
- in poor weather conditions;
- to segregate pedestrians from vehicles;
- with free-roaming livestock; and
- when visitors and members of the public are encountered.

10.13.4 Adequate provision must be made to:

- prevent unauthorised access to installed equipment, e.g. transformers, substations and WTG;
- prevent theft and vandalism;
- control or restrict public access or advise of potential risks, while recognising right-to-roam legislation, e.g. Land Reform (Scotland) Act 2003;
- safeguard landowners; and

- check the integrity of security measures.

10.13.5 Site access by vessel will be dependent on the weather, tide and other factors.

- Appropriate policies and procedures need to be devised and implemented with respect to the transfer of personnel and equipment between a vessel and a wind farm.
- Careful thought will need to be given to the selection of vessels to be used (specialised commercial access systems and craft are available for this type of operation).
- Vessel access to and egress from the towers and other offshore structures will be dependent on sea state and weather conditions (see Appendix 1), as described in Section 9.11 above.
- There will need to be limitations on working hours and length of time personnel may remain offshore.

10.13.6 Site access requiring diving is covered in Section 9.13.6 above.

10.13.7 Site access involving work at height is covered in Section 9.13.7 above. It is recommended that owners and operators utilise this Guidance and establish procedures of safe systems of work for all climbing and working at height operations. Consideration must be given to ensuring:

- employees are appropriately screened and are passed medically fit to perform work at height;
- appointed employees are sufficiently competent to organise, plan and ensure the work is completed safely;
- the work is properly planned;
- a suitable and sufficient risk assessment is performed;
- equipment is carefully selected and is fit for its intended use;
- the work is appropriately supervised throughout;
- the work is always carried out in a safe manner;
- suitable and sufficient measures to prevent anyone falling are in place, and are effective;
- appropriate emergency and rescue arrangements are in place and are practised in line with the site ERP;
- clear instructions are established to specify unacceptable weather conditions that may jeopardise safety; and
- all places of work at height and all equipment used are inspected, and records are maintained.

10.14 Security

Section 9.14 identifies legal requirements and suggests issues that must be considered when assessing security needs for a wind farm. It is recommended that owners/operators use this Guidance to establish appropriate procedures and measures unique to their site.

10.15 Site services

Due account must be taken of:

- overhead power lines and suitable safety clearances;
- underground services, e.g. gas, electricity, telephone, water;
- the need to inform landowners, mariners and fishermen;
- the location and depth of underground services and accuracy of installation drawings;
- the need to provide detection equipment, e.g. cable-location devices;
- the owners of the services;
- electrical hand tools: power supply is to be 110V centre tapped earth, and a favourable risk assessment is to be provided for other voltages; and
- subsea pipelines, export power cabling and telecommunication cables, during work activities and when travelling over them.

10.16 Safety equipment

10.16.1 The requirement for safety equipment should be identified within risk assessments. This may typically include:

- cable detectors;
- high-voltage measuring devices;
- portable earthing devices;
- temporary barriers, screens and notices;
- isolation devices for installed equipment, e.g. locks, chains, mechanical clamps; and
- [survival/immersion suits, lifejackets, buoyancy aids, throwing lines and personal location beacons.](#)

10.16.2 Ensure that when safety equipment is used:

- it is recorded on a register;
- persons are trained and competent in its use;
- it is properly stored, cleaned and maintained;
- it is periodically checked to ensure it remains in good working order and is safe to use; and
- all inspections and examinations are recorded, and records are retained.

10.17 Site safety

10.17.1 The legal requirements and issues to be considered when defining the appropriate measures required for the Health and Safety topics listed below have been covered in various parts of Section 9.

It is recommended that owners and operators use the guidance provided in Section 9 when developing appropriate procedures and arrangements for a wind farm. Additional information unique to the operations and maintenance of a wind farm are listed below.

10.17.2 Weather (see Section 9.11)

A procedure should be established to monitor weather and provide ongoing updates of changing conditions. Consideration should be given to:

- setting weather limitations on operational activities, and instructions should conditions change;
- scheduling of maintenance activities against favourable seasonal climates, e.g. if non-essential, arrange for the work to be completed in summer months; and
- establishing methods of monitoring weather conditions to obtain accurate forecasting to aid in planning work activities and personnel; consider the use of the Met Office or other more local weather and forecast monitoring stations.

10.17.3 Temporary facilities (see Section 9.12)

Temporary facilities may be required during:

- remote working on major maintenance activities;
- site refurbishment;
- replacement or refurbishment of existing buildings and infrastructure; and
- dock/quayside operations.

10.17.4 Lifting and handling (see Section 9.18)

This includes daily manual handling activities and lifting operations on site, both routine and major lifts.

When establishing the procedures required for manual handling, and to control the use of mechanical lifting equipment and devices, consider the following issues:

- identification and risk assessment of manual handling operations;
- the provision and use of equipment that reduces the need for manual handling;
- the provision of information, instruction and training to increase awareness and improve techniques;
- the need for health surveillance;
- the periodic testing and thorough examination of lifting equipment and accessories;
- risk assessment for lifting operations;
- preparation of safe systems of work and use of competent personnel for lifting operations, especially offshore where an Offshore Lift Supervisor must control lifting operations;
- training of personnel, operators and banksmen; and
- retaining records of testing and thorough examination.

10.17.5 Electrical safety (see Section 9.18)

Procedures for the control of electrical safety throughout a wind farm site should be established, and should consider:

- maintenance activities and the use of method statements, safe system of work procedures, permits-to-work, lock-off and precautions to be used, including PPE;
- integrity testing of the electrical infrastructure, e.g. in all buildings (every 3 years) and facilities;
- periodic Portable Appliance Testing (PAT) of all hand-held or portable electrical equipment used on site;
- defining competency levels to perform work;
- providing ongoing training and awareness to all staff on site; and
- emergency response to accidents/incidents involving electricity.

10.17.6 Chemical substances (see Section 9.19)

This covers use, storage and transportation of lubricants, oils and fuels, epoxy resin systems, solvents and paints.

Procedures for the control of substances hazardous to health should include:

- development and updating of a hazardous substance register for the site;
- establishing minimum quantities of materials to be stored on site;
- justification for the use and/or introduction of a new substance into the workplace prior to its purchase;
- assessment of risk from hazardous substances;
- need for environmental monitoring;
- transportation of hazardous substances;
- storage arrangements for hazardous substances;
- provision of information, instruction and training; and
- need for health surveillance.

10.17.7 Dangerous substances and explosive atmospheres (see Section 9.20)

If storing dangerous substances, e.g. flammable, highly flammable, extremely flammable materials, on

site, such as fuels for generators, a DSEA assessment is required. This is particularly relevant to offshore substations, and should be addressed during the design stage.

If no flammable substances are stored on site, no action is required.

If required, procedures should consider:

- the carrying out of a DSEA assessment by a competent person;
- defining zonal classification requirements and areas to be zoned;
- **introduction of explosion protection and devices, to plant, lighting and equipment in the area, and provision of Ex signage;**
- emergency response procedures and equipment to deal with accidents and incidents;
- information, instruction and training; and
- monitoring and reporting on the effectiveness of controls.

10.17.8 Noise (see Section 9.21)

Noise may be a concern in areas around generators, compressors and vehicle movement.

Procedures for assessing and, where necessary, controlling noise levels at work should be established, considering:

- identification of all areas of the site where noise levels may exceed daily limits;
- performance of noise assessments in areas of concern, by a competent person;
- identification of areas of risk, areas of safety and actions required to reduce levels;
- provision of information, instruction, training and, if necessary, PPE; and
- provision of health surveillance.

10.17.9 Vibration (see Section 9.22)

This covers the use of hand-held power tools, vehicles and being located on vibrating staging or surfaces. Procedures for controlling vibration at work should include:

- identification of vibrating work equipment;
- performance of a risk assessment on each piece of vibrating equipment;
- establishing control measures;
- maintaining personal exposure records during operation;
- assessment of actual exposure against daily limits;
- provision of information, instruction and training; and
- the need for health surveillance.

10.18 Personal protective equipment (PPE)

Section 9.24 identifies principles to be used for the identification, selection and control of PPE. These principles should be adopted for all PPE requirements during the operational and maintenance phase. Routine operations and activities undertaken on an operational wind farm are unlikely to change significantly, allowing the owners/operators to, wherever possible, standardise the PPE requirements for use on most operations performed on site. Familiarity with the standardisation of PPE requirements will increase awareness and reduce the potential for non-compliance.

10.19 Occupational health (see Section 9.25)

Establish procedures that define:

- any requirements for a pre-employment medical, e.g. fitness to climb;
- any legal requirements for health surveillance; e.g. vibration, COSHH, manual handling, display screen equipment;
- any local minimum standards, e.g. fitness, eyesight, hearing;
- proper arrangements for health records, e.g. confidentiality and security of personal details;
- record-keeping requirements for audiometry testing, COSHH or asbestos exposure records; and
- [appropriate medicals for personnel working offshore](#).

10.20 Reporting of accidents/dangerous occurrences

Section 9.26 identifies the statutory requirements and suggests good practice to be adopted when reporting accidents, incidents and dangerous occurrences. It is recommended that owners/operators establish procedures for reporting accidents, incidents and dangerous occurrences, and investigating their root causes.

These procedures should be developed in line with the ERP and should identify:

- how accidents, incidents and dangerous occurrences are to be reported and who should be notified, including internal personnel, local authorities, HSE, MCA and MAIB;
- methods of recording;
- who should carry out the organisation's own investigation, alongside any enforcement authority;
- the process of investigation;
- how the findings are to be reviewed;
- how employees and their representatives are to be notified of the findings; and
- how improvements and preventive measures shall be identified, agreed and implemented.

11. Developing Industry Best Practice and Emerging Risks

11.1 Introduction

It is not possible in the scope of these Guidelines to address every possible Health and Safety risk that may be encountered across the life cycle of a wind energy project. The dynamic nature of the industry is such that development and adoption of best practice is emerging very rapidly. Added to this, the scale and complexity of both planned and possible future projects will present many challenges in terms of Health and Safety risk management.

RenewableUK, on behalf of the industry, will take a lead in identifying, prioritising and communicating the most important issues relevant to the long-term safety and integrity of the industry. In developing a long-term Health and Safety strategy RenewableUK strongly advise that all duty holders take full account of the current and emerging state of knowledge of the risks and controls appropriate to a given project, technology or task involved. In particular, account should be paid to:

- the development of policies and procedures, including risk management arrangements, that are proportionate to the scale and complexity of the project;
- conducting robust risk assessment that takes account of the environmental constraints (e.g. extreme weather) that may be foreseeable;
- ensuring that product and operational safety checks pay particular attention to legal and safety standards when adopting new technologies;
- the training and competence standards that will be required; and
- developing an open safety culture that encourages the sharing and communication of Health and Safety best practice and lessons learned.

In addition to the direct operational Health and Safety risks across the life phases of a project, consideration should also be given to the:

- indirect and consequential Health and Safety impacts of projects and programmes;
- Health and Safety issues in contracts;
- emerging international dimensions of Health and Safety standards and best practice; and
- developing guidance from the HSE, e.g. via the Emerging Energy Technologies Programme (EET).

11.2 Specialist activities and support services

These Guidelines are intended to be relevant to all organisations contributing to the life cycle of wind farms (from initial feasibility studies through to decommissioning), and particularly relevant to senior and operational management within organisations developing, constructing or operating wind farms, or considering becoming involved in the sector.

These Guidelines therefore do not provide detailed advice on any specialist activities or support services that may be required to be carried out. Where these are provided, then, the basic principles in the selection, appointment and monitoring of those individual(s) will apply. In every situation and/or organisation an individual must have:

- sufficient knowledge of the specific tasks to be undertaken and the risks that the work will entail, and
- sufficient experience and ability to carry out their duties in relation to the project, to recognise their limitations and to take appropriate action in order to prevent harm to those carrying out the work, or those affected by the work.

Emergency equipment – personal protective equipment (PPE)

Item of PPE	Guidance
Personal Flotation Device / Lifejacket	Suitable Personal Flotation Device / Lifejacket for the task and subject to the operator's risk assessment. Consider the need for this equipment to be automatically inflated, with manually and orally inflated backup systems. . RenewableUK strongly recommends a Personal Flotation Device / Lifejacket conform to requirements of IMO SOLAS and BS EN ISO 12402-2:2006. It should be fully compatible with a Personal Locator Beacon (PLB) where such equipment is to be issued. Must be compatible with all other PPE.
Immersion suit	Suitable Immersion suit for the task and subject to the operator's risk assessment. Consider the need for this equipment to reduce the body heat loss of a person wearing it in cold water. RenewableUK strongly recommends a Immersion suit conform to requirements of IMO SOLAS and BS EN ISO 15027-2. Must be compatible with all other PPE.
Head Protection	Suitable helmet for the task and subject to the operator's risk assessment. Consider the need for a helmet of an approved standard, designed specifically for climbing and working at height which should not have a peak and must have a chin strap. RenewableUK strongly recommends a mountaineering style helmet complying with BS EN 12492 2000 however it must also be taken into consideration that advances in head protection are being made and head protection that combines benefits of differing standards maybe be considered where the operators risk assessment takes this into account. Must be compatible with all other PPE.
Gloves	Suitable gloves for the task and subject to the operator's risk assessment. Consider the need for protection from marine growth, cold/wet conditions and to improve grip. Must be compatible with all other PPE.
Safety Footwear	Suitable safety footwear for the task and subject to the operator's risk assessment. Consider the need for safety footwear of an approved standard including reinforced toes and non slip soles. Must be compatible with all other PPE.
Safety Footwear Fall arrest system	Suitable fall arrest system for the task and subject to the operator's risk assessment. Consider the need for a fall arrest system of an approved standard including; being appropriate for specific method of vessel/WTG transfer, WTG specific design, appropriate for the competence of personnel. Must be compatible with all other PPE.

APPENDIX 1

Guidance on Access, Egress, Abnormal Events and Emergency Response for Offshore Wind Turbine Generators (WTG) and Other Offshore Structures

The guidance given in this appendix has been gained from the experience of individuals that have been actively involved in the erecting, commissioning and operation of the UK's first large commercial offshore wind farms. It should not be regarded as a definitive list of Health and Safety requirements for offshore wind farm erection, commissioning or operations. However, it does give recommendations on what should be considered with regard to the technology and equipment available at the time of publication of this document. As the industry develops and new technology becomes available the guidance given here may require revision accordingly.

RenewableUK and the HSE strongly recommend that helicopters should not be the only primary or emergency means of access/egress from wind turbine generators or associated offshore structures.

Note: some of the recommendations in this appendix regarding emergency procedures could also apply to onshore wind turbine generators.

Ladder access/egress requirements

Ladders and access platforms should conform to the following guidance:

- Suitable ladders should be provided and positioned in place to suit optimum wind and tidal conditions.
- Where ladders extend more than nine metres from the mean sea level, a rest platform is to be fitted. The level of the platform shall be high enough to be completely clear of any service vessel at high tide (spring).
- The upper ladder from the rest platform is to be fitted with hoops or a fall arrest system.
- All fall arrest wires/channels must undergo six-monthly checks (wires to be replaced annually) until a wear/corrosion pattern has been established. Further advice should also be sought from the manufacturer.
- Ladder rungs are to be square with an edge facing upward (protection against slipping, algae growth, ice).
- Ladders are to be protected by two fenders capable of withstanding vessel impact during routine operations.
- All ladder access is to have an adjacent davit/winch fitted (motorised and lockable) for the raising of tools and small generators.
- All platform access hatch/gratings are to be fitted with a lock open latch.
- J tube/cable runs from platform into tower are to be clear of access hatches.
- Platforms should be equipped with fitted lifting equipment with a capacity to handle foreseeable replacement parts.
- All mechanical/electrical lifting equipment and safety/emergency equipment is to be stored inside the tower, out of the weather.
- All lifting equipment should receive regular examination and testing
- Ladder access/fender and service vessel docking design are to be compatible.
- Where tidal flow is not an issue then prevailing wind is to be a consideration in the positioning of ladders.

All operatives must be trained in access/egress via ladders from a vessel and in appropriate sea survival techniques. Risk assessments should also take account of:

- PPE (suitability and approval);
- PPE should also consider compatibility (e.g any fall arrest harness with immersion suit/life jacket)
- first aid;
- PPE risk assessments should also consider issues of compatibility (e.g a fall arrest harness and compatibility with an immersion suit, life jacket etc.
- Methods of communications suitable to the location
- Suitability of markings of the turbine to allow clear identification of the WTG to facilitate safe access & egress
- Rescue equipment (selection and use);
- Method to record personnel numbers on vessels/WTGs;
- Weather working limits;
- Medical evacuation; and
- Medical fitness.

It will also be important to clarify the person in overall responsibility for personnel whilst on a vessel and whilst on a WTG.

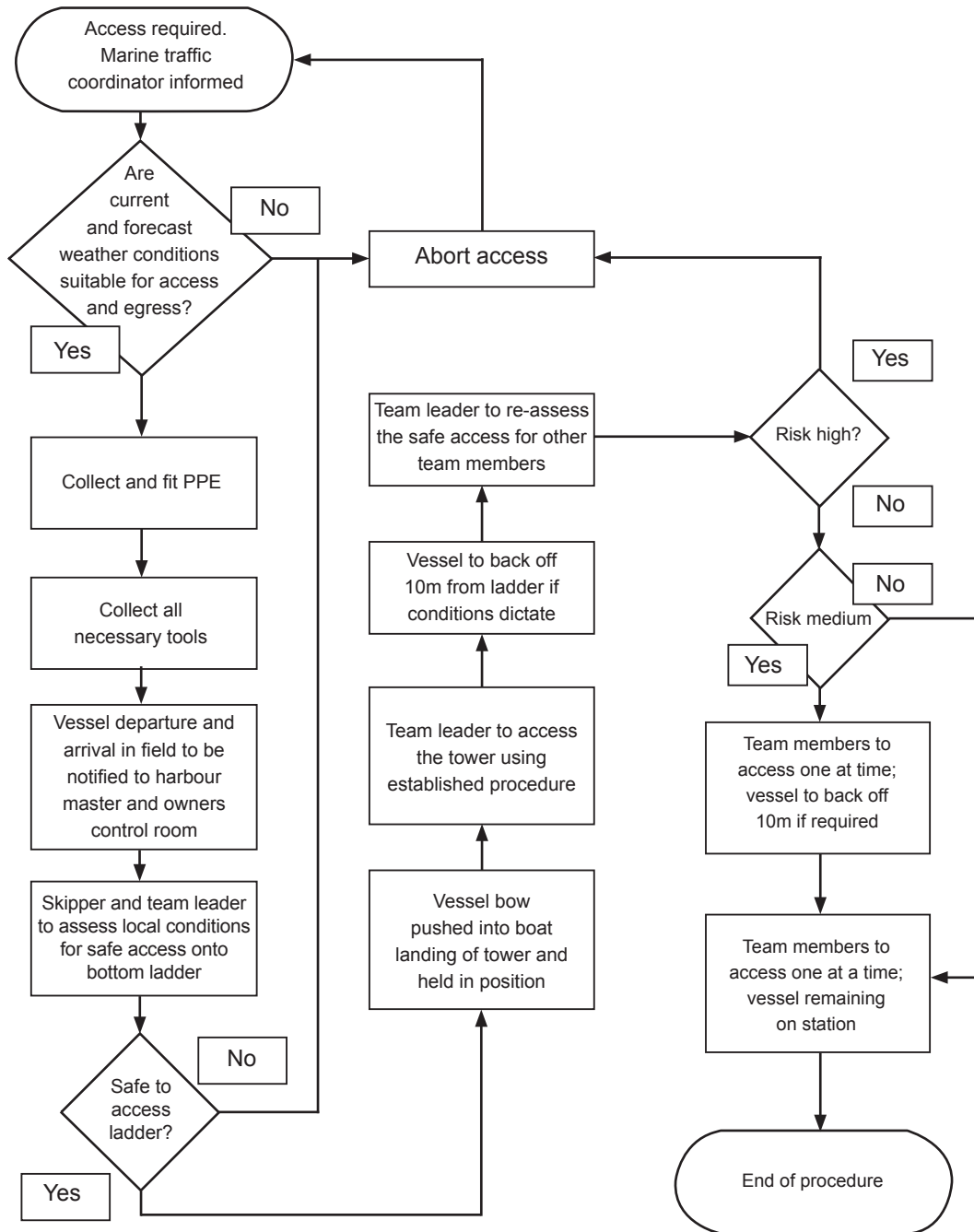
Arrangements for vessel access for personnel and visitors should conform to the following recommended procedures shown in flowchart form. This appendix includes a number of flowcharts for information and guidance. These are only intended to provide a simple and generic framework when addressing access, egress and emergency situations. They should be modified as required to address the specific scenarios relevant to a specific site or project.

Site-specific procedures and flowcharts should be prepared for each wind farm, based on appropriately detailed risk assessments. For more complex projects, duty holders may wish to embed these procedures into an Emergency Response Plan.

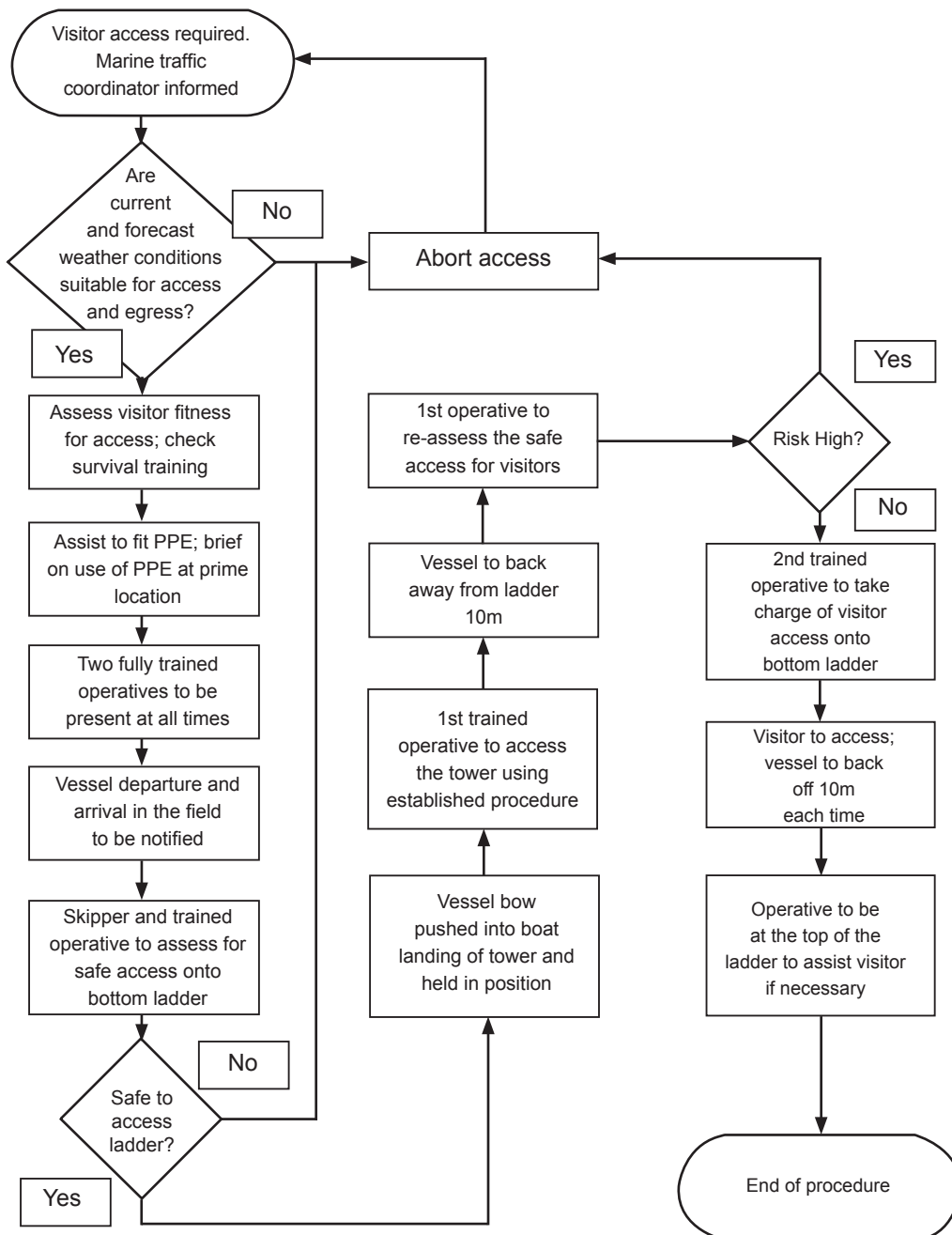
The principles set out in the access flow diagrams can be modified and applied in a similar manner for vessel egress.

Note: state-of-knowledge, best practice and technology is developing rapidly in this area. Duty holders should therefore take this into account when conducting or reviewing risk assessments for access/egress.

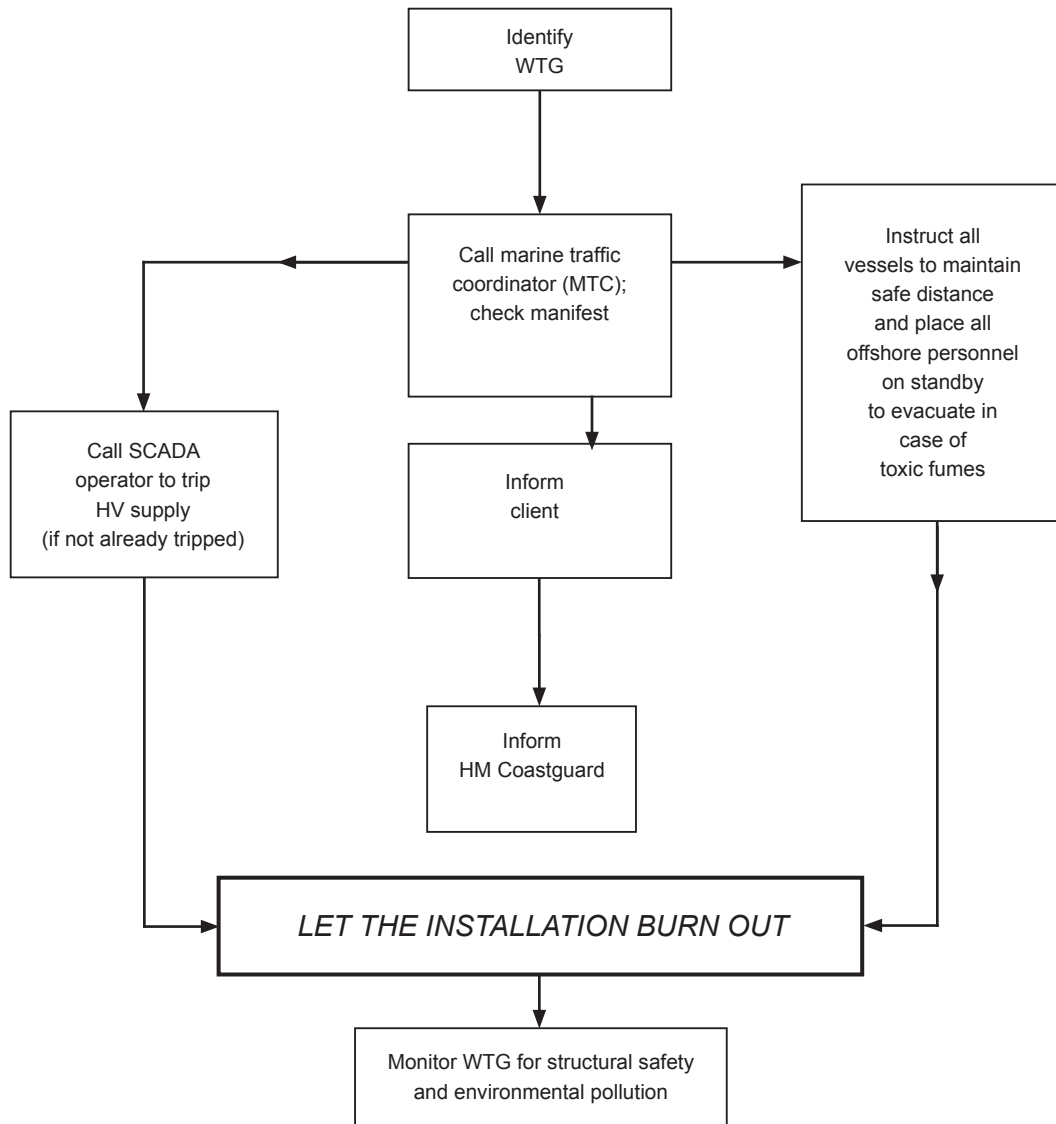
Vessel access procedures / Normal activity boat access



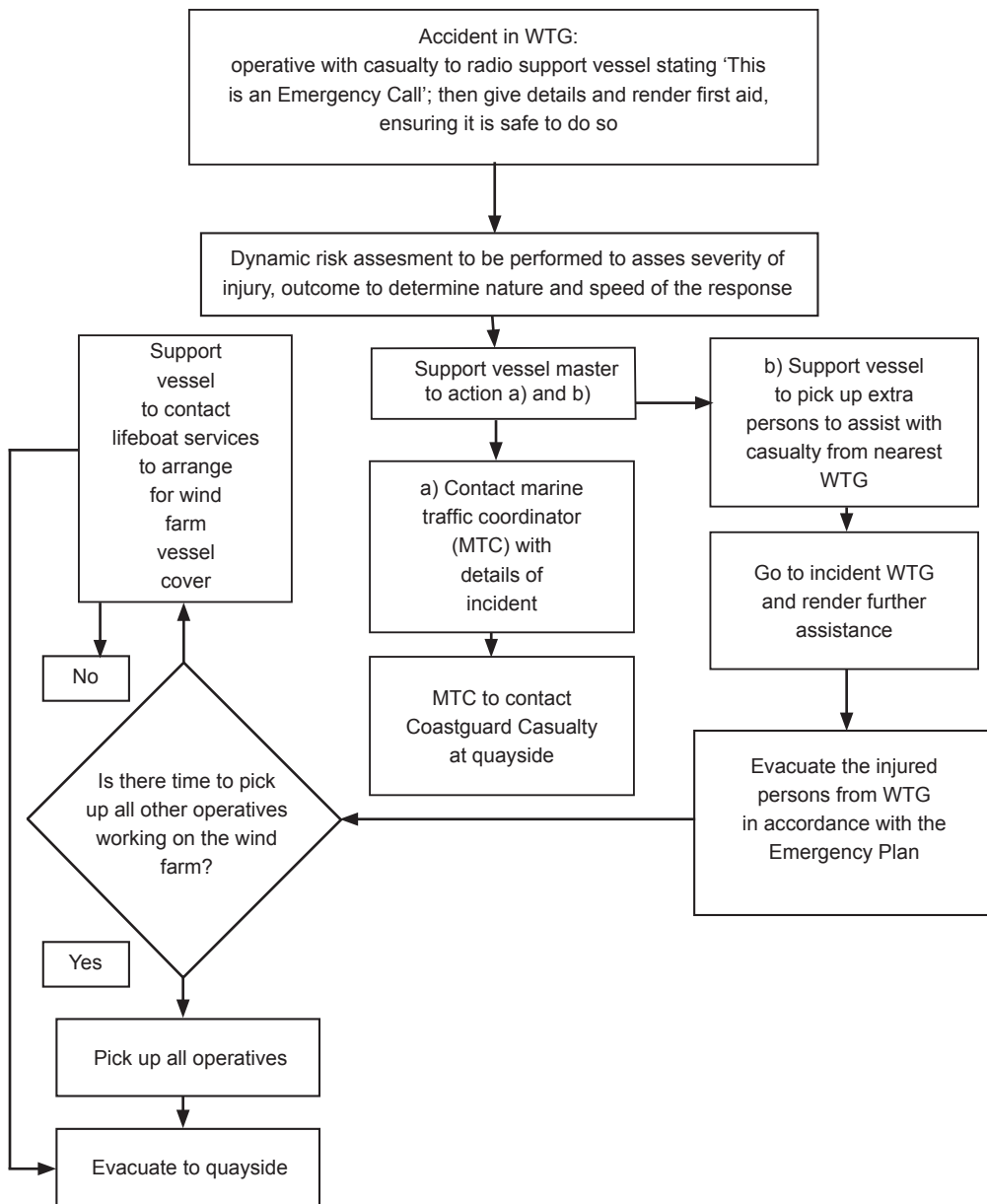
Vessel access procedures / Procedure for visitor access



Emergency procedure: fire in WTG

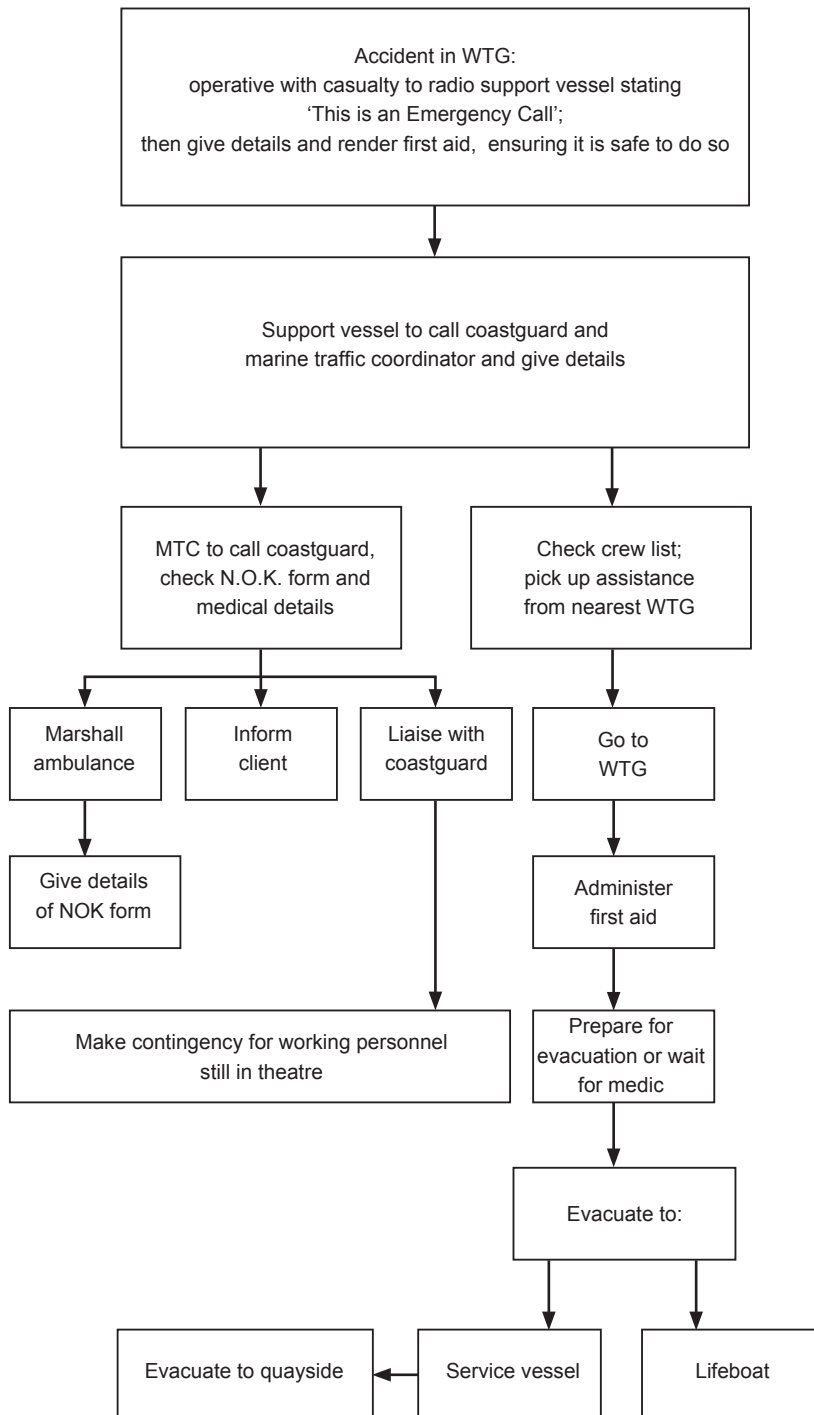


Emergency procedure: accident in WTG

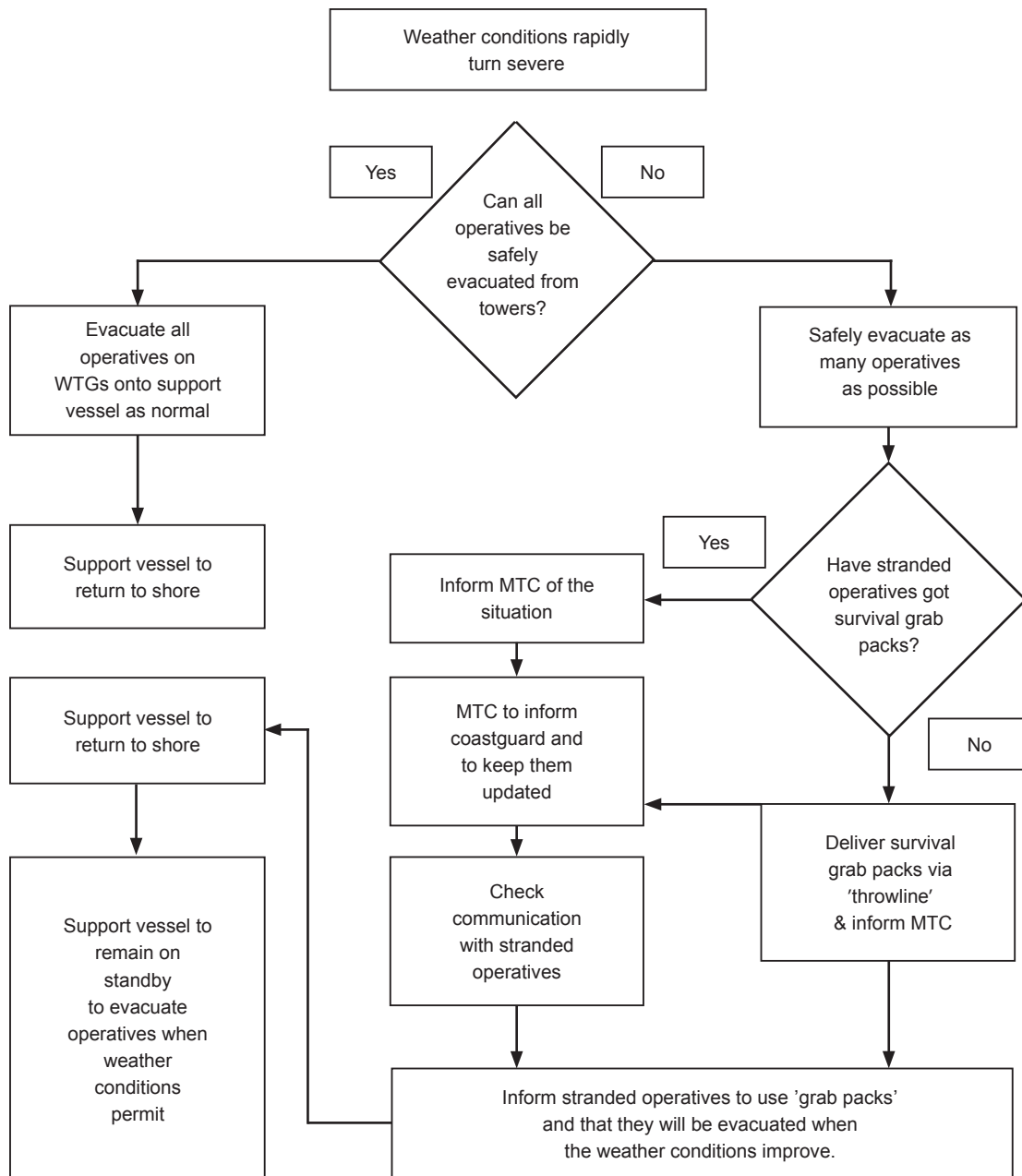


* A precacutionary approach is strongly recommended to enable early notification of incident to emergency services.

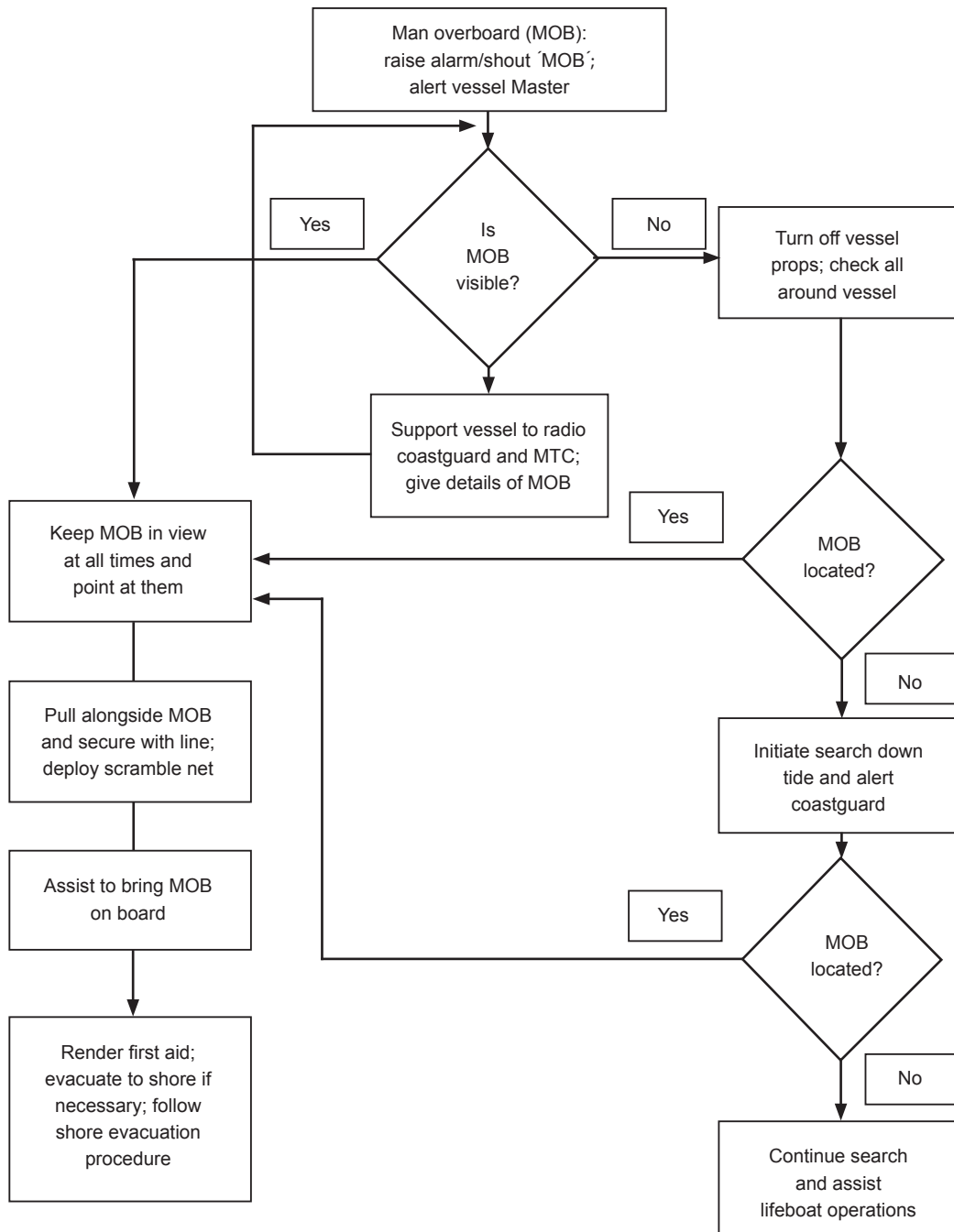
Emergency procedure: stretcher casualty



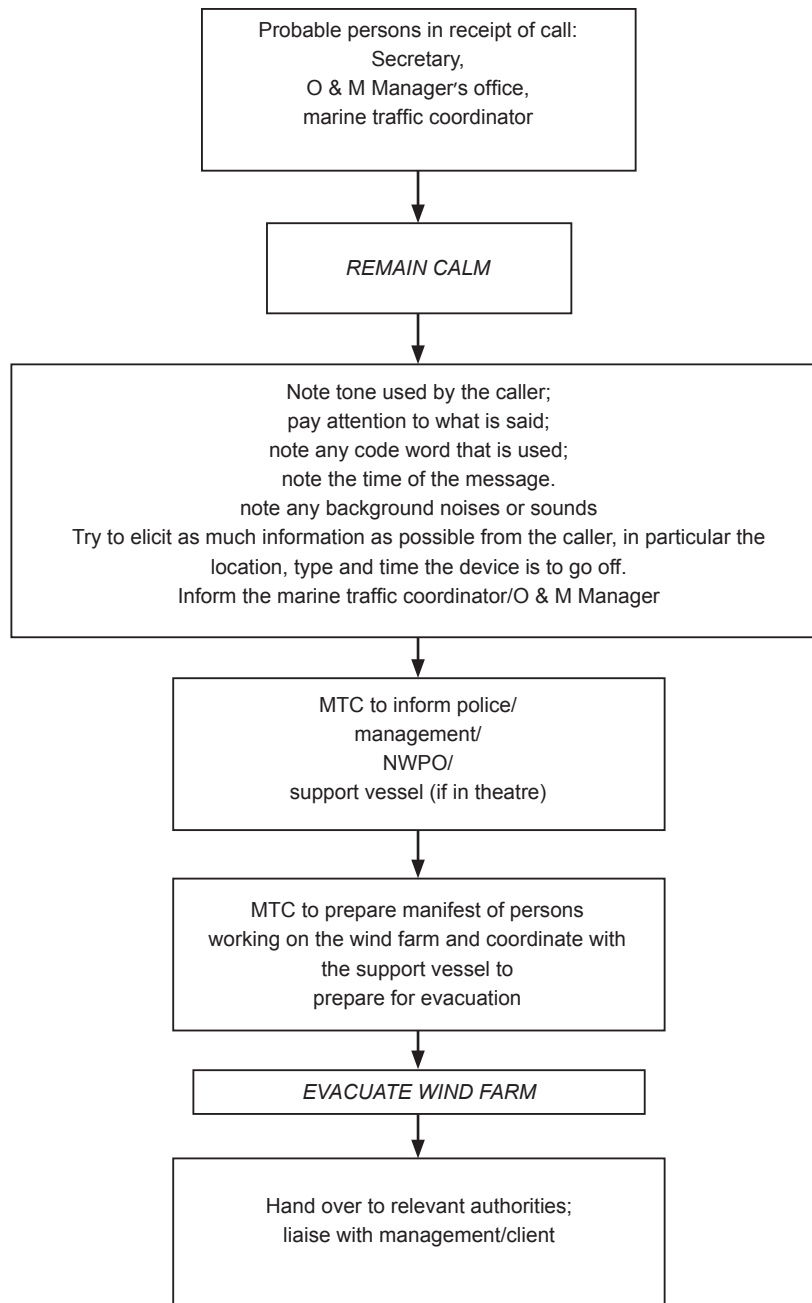
Emergency procedure: stranded by weather



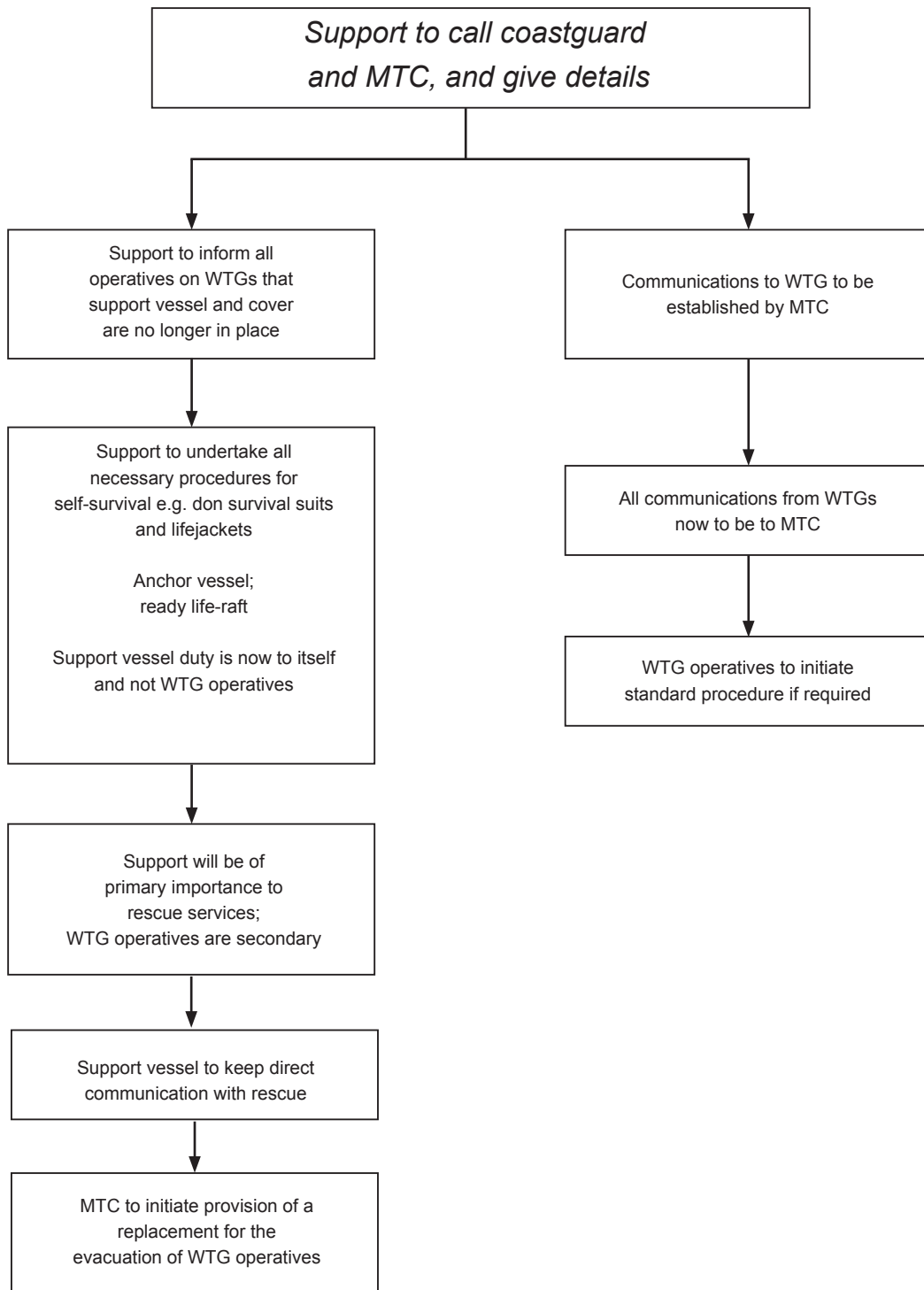
Emergency procedure: man overboard (MOB)



Emergency procedure: bomb threat management



Emergency procedure: incapacitated support vessel
 support vessel incapacitated / engine failure / hull holed / props fouled



APPENDIX 2

Know the Law

Introduction

The following information is a summary of UK Health and Safety legislation that is relevant to wind farm developments. It does not cover offences under the Corporate Manslaughter and Corporate Homicide Act 2007. In addition, the penalties for breaching Health and Safety legislation were amended by the Health and Safety (Offences) Act 2008 to have effect on any offences committed since 16 January 2009. These penalties now include higher fines and the option of imprisonment of individuals for most offences under the Health and Safety at Work etc Act 1974.

The following explanations are not a legal interpretation and do not cover every detail. It is incumbent on all persons with legal responsibilities to ensure that they are aware of, and fully understand, all current legal requirements.

Before acting or refraining from any of the requirements set out in the summaries below you are advised to refer to the applicable primary source of information. In particular, this would include acts and regulations (see www.opsi.gov.uk) and HSC/E codes of practice and guidance. See also www.hse.gov.uk/legislation/.

Health and Safety at Work etc. Act 1974

All employers have a general duty under the Health and Safety at Work etc. Act 1974 (HSW Act) to ensure, so far as is reasonably practicable, that the health, safety and welfare at work of their employees is protected. This duty includes:

- providing and maintaining machinery, equipment, appliances and systems of work that are safe and without risks to health;
- ensuring that articles and substances are used, handled, stored and transported safely and without risks to health;
- providing the necessary information, instruction, training and supervision to ensure the Health and Safety at work of all employees;
- maintaining a workplace that is safe and without risks to health; and
- providing and maintaining a working environment that is safe, without risks to health, and which has adequate facilities and arrangements for employees' welfare at work.

Under the HSW Act, employees also have a legal duty to take reasonable care of themselves and others, and to cooperate with their employers regarding their legal obligations. In addition, the Act applies to all contractors hired to work on a wind farm. They are required to ensure that their activities are not a danger to themselves or others. Employers will also have a responsibility for the Health and Safety of visitors (whether authorised or not), e.g. members of the public, self-employed people or contractors' employees working with them, who may be affected by work activities under the contractors' control. This may entail cooperating and exchanging information with all those employers working on a wind farm about each other's undertakings.

The duties set out here apply to every organisation operating within the UK and its territorial waters.

Employers with five or more employees are required to prepare a written statement of their general policy, organisation and arrangements for the Health and Safety at work of their employees. The statement, and any revision of it, should be brought to the attention of all the employees.

Persons designing, manufacturing, importing or supplying articles or substances for use at work must:

- (a) ensure that they are safe and without risk to health when properly used, i.e. as advised;
- (b) carry out such tests or examinations as may be necessary to ensure that they are safe and without risks to health when properly used;
- (c) provide any information necessary to ensure that they are safe and without risk to health when properly used; and
- (d) any person who erects or installs any article for use at work must ensure that, so far as is reasonably practicable, nothing about the way in which the article is erected or installed makes it unsafe or a risk to health when properly used.

HEALTH AND SAFETY AT WORK ETC. ACT 1974 (APPLICATION OUTSIDE GREAT BRITAIN) ORDER 2001 (S.I. 2001/2127) (AS AMENDED BY THE HEALTH AND SAFETY AT WORK ETC. ACT 1974 (APPLICATION OUTSIDE GREAT BRITAIN) (VARIATION) ORDER 2009)

The 2001 Order replaces the previous 1995 Order, and it has been amended in 2009 to extend its application. It makes explicit the application of this Order to offshore structures and equipment (which may be fixed or floating) and associated equipment and cables. It relates to the activities of construction, repair, maintenance and others, including the operation of these installations as well as the act of landing personnel on such structures, and the loading and unloading of equipment and to diving projects. The Order also applies to other offshore installations, such as pipelines and oil and gas installations, including where there has been a change of use. For a full version of the activities covered, see the 2001 Order and Articles 8A and 8B inserted by the 2009 amendment.

This Order applies Sections 1 to 59 and Sections 80 to 82 of HASWA together with Regulations brought in under HASWA ('Prescribed Provisions') to the installations and activities as described in the above paragraph to the extent where they take place within (on, over or under) UK territorial waters (and by extension to a Renewable Energy Zone)*.

The Order is quite detailed in the activities that are covered, but broadly, the sections apply to all activities relating to an 'energy structure' (including survey and preparation of the seabed) but do not generally apply to the maritime shipboard operation of a vessel itself, such as towing, navigating or transporting, or standby activities, although they do apply to loading/unloading, fuelling and provisioning. They do not apply to a non-UK registered vessels on passage through territorial waters. They also do not apply to aircraft activities. The 2009 amendment also applies the Order to 'related structures' such as those required for energy conversion or accommodation for persons working on structures.

Note also that the Prescribed Provisions of the HASWA shall apply in accordance with the Order to individuals whether or not they are British subjects, and to bodies corporate whether or not they are incorporated under the law of any part of the United Kingdom.

**Section 84(4) of the Energy Act 2004 contains a power to designate an area that can be exploited for the production of energy from water or winds as a Renewable Energy Zone ('REZ').*

The Civil Jurisdiction (Application to Offshore Renewable Energy Installations etc.) Order 2009 ('Civil Jurisdiction Order') brings offshore Renewable Energy Installations (REIs) within REZs for the purposes of Civil Law in England, Wales and Scotland, and the Criminal Jurisdiction (Application to Offshore Renewable Energy Installations etc.) Order 2009 ('Criminal Jurisdiction Order') extends the jurisdiction of the Police to REIs (or on, under or over an REI). Notably this extends the Police's powers to include the investigation of Corporate Manslaughter to REZs.

**MANAGEMENT OF HEALTH AND SAFETY AT WORK REGULATIONS 1999 (S.I. 1999/3242) and
MANAGEMENT OF HEALTH AND SAFETY AT WORK (AMENDMENT) REGULATIONS 2006 (S.I. 2006/438)**

The Management of Health and Safety at Work Regulations 1999 as amended are aimed mainly at improving Health and Safety management. Their main provisions are designed to encourage a more systematic approach to dealing with Health and Safety. The Regulations require employers, amongst other duties, to:

- assess the risks to the Health and Safety of their employees and others who may be affected by their work activity;
- make arrangements for putting into practice the Health and Safety measures that the risk assessment shows to be necessary; these arrangements should cover planning, organisation, control, monitoring and review; and
- ensure cooperation on Health and Safety measures between contractors and subcontractors.

Specific risk assessments already carried out under other Health and Safety legislation, e.g. COSHH and the Manual Handling Operations Regulations, do not need to be repeated or supplemented; they will form part of the overall risk assessment.

The Regulations further expand the general duties under the HSW Act by requiring employers to take into account their employees' capabilities, as regards Health and Safety, when giving them tasks to do, e.g. previous training, knowledge and experience.

Further information is given in the Approved Code of Practice L21 - Management of Health and Safety at Work.

CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2007 (S.I. 2007/3140)

See Section 6.4 for details. Further guidance is given in the CDM Approved Code of Practice L144.

**MERCHANT SHIPPING AND FISHING VESSELS (HEALTH AND SAFETY AT WORK) REGULATIONS 1997
(S.I. 1997/2962)**

These regulations apply to all activities of workers on United Kingdom ships. Some of the Regulations also apply to ships other than United Kingdom ships, which are operating in United Kingdom waters. They give effect to a number of EC directives relating to Health and Safety. They place a general duty upon the employer to ensure the Health and Safety of workers.

WORKPLACE (HEALTH, SAFETY AND WELFARE) REGULATIONS 1992 (S.I. 1992/3004)

The Workplace (Health, Safety and Welfare) Regulations 1992 aim to ensure that workplaces meet the health, safety and welfare needs of each member of the workforce. These Regulations give more detail to the general duties of employers under the Health and Safety at Work etc. Act 1974. Relevant areas include access/egress (including prevention of falls) and risks associated with transport.

Further information is given in the Approved Code of Practice L24 – Workplace Health, Safety and Welfare.

DOCKS REGULATIONS 1988 (S.I. 1998/1655)

These Regulations were formed under the Factories Act 1961. They have been amended by subsequent regulations and EC directives; however, the majority of the Regulations remain in their original form. They impose health, safety and welfare requirements with respect to all dock operations in Great Britain and within territorial waters. They also cover loading, unloading, refuelling or provisioning of a vessel anywhere within the United Kingdom Continental Shelf Area (UKCS).

The main health, safety and welfare provisions of the regulations are:

- the safe planning and execution of the work;
- the provision of adequate lighting;
- safe access and egress;
- transport by water;
- rescue facilities, life-saving equipment, firefighting equipment and the provision of means of escape;
- the condition and use of hatches, ramps and car decks;
- the operation, use and marking of lifting equipment (the original part of the Regulations relating to the examination, testing and certification of lifting equipment now comes under LOLER (Lifting Operations and Lifting Equipment Regulations S.I. 1998/2307)); and
- confined space entry.

REGULATORY REFORM (FIRE SAFETY) ORDER 2005, FIRE (SCOTLAND) ACT 2005 and FIRE SAFETY (SCOTLAND) REGULATIONS 2006

The Order replaces the previous fire legislation and applies in England and Wales. It covers general fire precautions and other fire safety duties, which are needed to protect 'relevant persons' in case of fire in and around most 'premises'. The most significant of these is to prepare a fire risk assessment of the working area. The Order requires fire precautions to be put in place 'where necessary' and to the extent that it is reasonable and practicable in the circumstances of the case.

Responsibility for complying with the Order rests with the 'responsible person'. In a workplace, this is the employer and any other person who may have control of any part of the premises, e.g. the occupier or owner. In all other premises, the person or people in control of the premises will be responsible. If there is more than one responsible person in any type of premises (e.g. a multi-occupied complex), all must take all reasonable steps to cooperate and coordinate with each other.

The Fire (Scotland) Act 2005 and Fire Safety (Scotland) Regulations 2006 apply the same principles as the Order.

HEALTH AND SAFETY (CONSULTATION WITH EMPLOYEES) REGULATIONS 1996 (S.I. 1996/1513)

In non-unionised workplaces where there are no safety representatives or in a workplace that has trade union recognition but either the trade union has not appointed a safety representative or the union safety representative does not represent the whole workforce, the Health and Safety (Consultation with Employees) Regulations will apply. These state that the employer must consult with their employees directly or through elected representatives of employee safety.

A representative of employee safety is an employee elected by the workforce to represent them in consultations on Health and Safety issues. Their employer must consult them 'in good time' on matters relating to Health and Safety at work.

Representatives of employee safety have a range of functions under the law. Their key aim is to ensure that the views of workers are effectively reflected to managers before decisions on Health and Safety matters are taken.

SAFETY REPRESENTATIVES AND SAFETY COMMITTEES REGULATIONS 1977 (S.I. 1977/500) and HEALTH AND SAFETY (CONSULTATION WITH EMPLOYEES) REGULATIONS 1996 (S.I. 1996/1513)

Employers have a duty to consult their employees in good time on matters relating to their Health and Safety at work. This applies irrespective of whether the employees are represented by safety representatives. S.I. 1977/500 has been amended many times, the latest being in 1999. These Regulations cover workplaces where there is representation of the workforce by safety representatives. Safety representatives are usually selected by the union.

S.I. 1996/1513 covers workplaces where there are no safety representatives. This may be because the

workplace is non-unionised.

DIVING AT WORK REGULATIONS 1997 (S.I. 1997/2776)

The Diving at Work Regulations 1997 are the principal document of reference for conducting diving operations. The Diving at Work Regulations (DWR) apply to all diving activities. Using the DWR as the controlling document, the outcomes of the risk assessment for the work scope, location and other information relating to the diving project should dictate the dive plan and the resources required to carry out the diving work safely.

Responsibilities are outlined in Regulation 4, which states:

'Every person who to any extent is responsible for, has control over or is engaged in a diving project, or whose acts or omissions could adversely affect the Health and Safety of persons engaged in such a project, shall take such measures as it is reasonable for a person in his position to take to ensure that these Regulations are complied with.'

This regulation clearly defines responsibilities held by the Client and the diving contractor, as well as any other persons whose operations may affect the safety of the diving operation. The actions and activities of other people can affect the safety of the dive team even though they are not members of the team, and therefore they may have responsibilities for ensuring that the Regulations are complied with for those matters under their control. These people include:

- the site owner/developer;
- the Principal Contractor;
- a consultant or agent acting for any of the above; and
- the Client who has placed a contract with a diving contractor to deliver a diving project. This may be any of the above and/or a third party subcontractor, such as an installation contractor.

The above persons should also take reasonable steps to ensure that:

- the diving contractor selected is capable of complying with the Diving Regulations and
- activities are coordinated adequately so as to avoid placing the diving team in danger.

One of the principal means of ensuring that the duties defined in Regulation 4 are met is to issue the diving contractor with sufficient information to allow him to carry out an adequate risk assessment and compile a diving project plan. This can then be assessed by the Client. This information may include, but is not limited to, the following:

- the results of any risk assessments undertaken by other persons under other statutory legislation, which could affect the Health and Safety of the dive team;
- agreement to provide facilities and extend all reasonable support to the supervisor or diving contractor in the event of an emergency (the diving project plan should reflect this);
- consideration of whether any known underwater or above-water items of plant under their control may cause a hazard to the dive team;
- details of any possible substances likely to be encountered by the dive team, which may be a hazard to their health;
- any changes that may affect the supervisor's diving operation insofar as they have control or knowledge of such changes.

The Regulations also address the responsibilities of diving contractors, supervisors and divers themselves.

Further guidance is contained within five approved codes of practice (ACOP) published by the HSE. The five approved codes of practice are:

- L103 – Commercial Diving Projects Offshore

- L104 – Commercial Inland/Inshore Diving Projects
- L105 – Recreational Diving Projects
- L106 – Media Diving Projects
- L107 – Scientific and Archaeological Diving Projects

The Commercial Inland/Inshore and Commercial Offshore ACOPs are generally regarded as the most relevant standards to be applied to marine renewable projects (within 12 nautical miles of territorial waters). However, this could change in light of planned round 3 projects.

It is not envisaged that recreational diving will take place on offshore generation facilities; however, there may be occasions in which scientific and/or archaeological work is being carried out. It may also be possible that media diving will be carried out during the production of documentaries or for promotional purposes. It should be noted that if these activities are being conducted on a construction site, then the commercial codes of practice will apply.

The HSE has also published useful basic information in the following documents.

- HSE pamphlet INDG 266
- HSE Diving Health and Safety Strategy to 2010.

Information on inland/inshore diving operations can be obtained from the Association of Diving Contractors UK. See www.adc-uk.info.

Information and guidance notes for offshore diving operations may be obtained from the International Marine Contractors Association. See www.imca-int.com.

PROVISION AND USE OF WORK EQUIPMENT REGULATIONS 1998 (S.I. 1998/2306)

The Provision and Use of Work Equipment Regulations 1998 apply to all equipment (including lifting equipment) at work. These Regulations place general duties on employers and list minimum requirements for work equipment to deal with selective hazards, whatever the industry. Important new additions were introduced in 1998 including a requirement to inspect work equipment where significant risk could result from incorrect installation or relocation, deterioration, or as a result of exceptional circumstances, and to record the results of inspections. There are also requirements to deal with risks from mobile work equipment. The work equipment in use at a wind farm will be subject to these Regulations. Further guidance on the Regulations is given in the HSE booklet L22 – Safe Use of Work Equipment.

SUPPLY OF MACHINERY (SAFETY) REGULATIONS 2008 (S.I. 1992/3073)

These Regulations require that suppliers and manufacturers of machinery ensure that the machinery complies with defined requirements, is marked (EC Mark) and is certified by an approved body. 2007 Regulations are due to come into force in December 2009.

LIFTING OPERATIONS AND LIFTING EQUIPMENT REGULATIONS 1998 (S.I. 1998/2307)

In the main, the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) replace existing legal requirements relating to the use of lifting equipment. They aim to reduce risks to people's Health and Safety from lifting equipment provided for use at work. In addition to the requirements of LOLER, lifting equipment is also subject to the requirements of the Provision and Use of Work Equipment Regulations 1998.

Further guidance on the Regulations is given in the HSE booklet L113 – Safe Use of Lifting Equipment.

PRESSURE EQUIPMENT REGULATIONS 1999 (S.I. 1999/2001)

These Regulations are the UK interpretation of the EU Pressure Equipment Directive. They set out specific design criteria for pressure systems and equipment to ensure that they have been constructed correctly, are appropriately tested and, where relevant, CE marked prior to supply. All pressure equipment used within the UK shall be required to comply with these Regulations.

PRESSURE SYSTEMS SAFETY REGULATIONS 2000 (S.I. 2000/128)

These Regulations apply to all installed pressure systems. Where a system exceeds 250 bar litres (product of pressure and volume), a written scheme of periodic examination by an independent competent person is required.

ELECTRICITY AT WORK REGULATIONS 1989 (S.I. 1989/635)

These Regulations lay down principles of safety that apply to the generation, provision, transmission, transformation, rectification, conversion, conduction, distribution, control, storage, measurement and use of electrical energy.

The purpose of the Regulations is to require precautions to be taken against the risk of death or personal injury from electricity in work activities. As such these regulations impose requirements for de-energising systems prior to starting work.

The Regulations impose duties on persons (referred to as 'duty holders') in respect of systems, electrical equipment and conductors, and in respect of work activities on or near electrical equipment.

Further information is given in the HSE publications HSG85 – Electricity at Work: Safe Working Practices and in HSR25 – the Memorandum of Guidance on the Electricity at Work Regulations 1989. .

ELECTRICITY SAFETY, QUALITY AND CONTINUITY REGULATIONS 2002 (S.I. 2002/2665)

These Regulations apply to electricity suppliers and distributors regarding aspects of supply and distribution, including such topics as protection and earthing, substations, underground cables and equipment, overhead lines, generation, and supplies to installations and to other networks.

WORK AT HEIGHT REGULATIONS 2005 (S.I. 2005/735) AS AMENDED BY THE WORK AT HEIGHT AMENDMENT REGULATIONS 2007 (S.I. 2007/114)

These Regulations have been made to prevent the deaths and injuries caused each year by falls at work. They replace all the earlier regulations about working at height. The Work at Height Regulations 2005 consolidate previous legislation on working at height and implement European Council Directive 2001/45/EC concerning minimum Health and Safety requirements for the use of equipment for work at height (the Temporary Work at Height Directive).

The regulations apply to all work at height where there is a risk of a fall liable to cause personal injury.

Working at height must be avoided if possible. If this is not possible then all working at height should be properly planned, organised, risk-assessed, controlled, appropriately supervised and carried out in accordance with a safe system of work.

The safe system of work and selection of equipment for working at height must give priority to the provision of fall prevention methods (e.g. barriers or guardrails) over personal fall protection measures (e.g. fall arrest or work restraint).

Only competent people should be involved in any activity or use any equipment associated with working at height, including the planning, risk assessment and supervision of it.

Further information is available in INDG401 (rev1) – A Brief Guide to the Work at Height Regulations.

CONFINED SPACES REGULATIONS (S.I. 1997/1713)

These Regulations apply to all work situations in Great Britain, except for diving operations and mining. The key duties are:

- to avoid entry to confined spaces, e.g. by doing the work from outside;
- if entry to a confined space is unavoidable, to identify the hazards and follow a safe system of work- normally using a permit to work; and
- to put in place adequate emergency arrangements before the work starts.

Further guidance is given in L101 – Safe Work in Confined Spaces, Approved Code of Practice, Regulations and Guidance.

CONTROL OF VIBRATION AT WORK REGULATIONS 2006 (S.I. 2005/1093)

These Regulations are designed to protect against risk to both Health and Safety from hand–arm vibration, i.e. HAVS, and carpal tunnel syndrome in those exposed, and situations where vibration may affect the ability safely to handle controls or read instructions, or where it may interfere with the stability or security of structures.

CONTROL OF NOISE AT WORK REGULATIONS 2005 (S.I. 2005/1643)

These Regulations require employers to prevent or reduce risks to Health and Safety from exposure to noise at work. Employees have duties under the Regulations too. The Regulations require employers to:

- assess the risks to employees from noise at work;
- take action to reduce the noise exposure that produces those risks;
- provide employees with hearing protection if the noise exposure cannot be reduced enough using other methods;
- make sure that legal limits on noise exposure are not exceeded;
- provide employees with information, instruction and training; and
- carry out health surveillance where there is a risk to health.

The Regulations require employers to take specific actions at certain values. These values are:

- Lower exposure action values:
 - daily or weekly exposure of 80dB
 - peak sound pressure of 135dB
- Upper exposure action values:
 - daily or weekly exposure of 85dB
 - peak sound pressure of 137dB

There are also levels of noise exposure that must not be exceeded:

- Exposure limit values:
 - daily or weekly exposure of 87dB
 - peak sound pressure of 140dB

These exposure limit values take account of any reduction in exposure provided by hearing protection.

Further information is given in the HSE publication INDG362 (rev1) 10/05 and Controlling Noise at Work – Guidance on Regulations – L108.

CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS 2002 (S.I. 2002/2677) AS AMENDED BY S.I. 2004/3386

The Control of Substances Hazardous to Health Regulations 2002 (COSHH) require employers to ensure that exposure of their employees to hazardous substances is either prevented or, if this is not reasonably practicable, adequately controlled. Under these Regulations some of the employer's responsibilities extend to people other than employees, who may be affected by the work activity.

The employer is required to carry out an assessment of the health risks that might arise from the various work activities, and state the action they intend to take to prevent or control the exposure of their workforce to hazardous substances, and to comply with other requirements of the Regulations.

The Regulations require all employers to:

- assess the risk to their employees and others from exposure to hazardous substances at work, and so establish whether precautions are needed. This will include determining what substances are present and in what form, how they are handled, what harmful effects are possible, and who is likely to be affected;
- introduce appropriate measures to prevent or control the exposure to those substances where a risk has been identified that needs to be controlled, such as substitution with a safer product;
- ensure that control measures are used and that equipment is properly maintained and procedures observed; and
- where necessary, monitor the exposure of the workers and carry out an appropriate form of surveillance of their health. Inform, instruct and train employees about the risks and the precautions to be taken.

A key change in recent years has been the focus on the adoption of good practice to prevent and control exposure, and specifically the requirement to apply the eight principles of good practice.

Practical guidance on COSHH is given in the HSE publications COSHH: A Brief Guide for Employers – INDG136 (rev 2) and in some detail in The Control of Substances Hazardous to Health (Fourth Edition): The Control of Substances Hazardous to Health Regulations 2002: Approved Code Of Practice and Guidance – L5. Reference should also be made to the REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) Regulations (EC) No.1907/2006 (<http://www.hse.gov.uk/reach/resources/inbrief.pdf>).

DANGEROUS SUBSTANCES AND EXPLOSIVE ATMOSPHERES REGULATIONS 2002 (S.I. 2002/2776)

These Regulations concern the use in the workplace of any substance or preparation that is explosive, oxidising, extremely flammable, highly flammable or flammable. Risk assessments are required that focus upon the elimination or reduction of risks from dangerous substances.

CARRIAGE OF DANGEROUS SUBSTANCES AND USE OF TRANSPORTABLE PRESSURE EQUIPMENT REGULATIONS 2007 (S.I. 2007/1573)

These Regulations cover the carriage (transportation) by road, rail, air and sea of substances hazardous to health. They require a Dangerous Goods Safety Adviser to prepare appropriate documentation to ensure safe transportation of hazardous substances (and required notification of specific substances).

EUROPEAN UNION – REGISTRATION, EVALUATION, AUTHORISATION AND RESTRICTION OF CHEMICALS REGULATIONS 2006 (No.1907/2006)

REACH regulations place additional duties on the downstream users of chemicals. REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) is a European Regulation that has direct application in

all EU member states. The Regulations should lead to an improved level of Health and Safety information being passed down the supply chain. Further details are available via the HSE, which is acting as the UK's competent authority.

HEALTH AND SAFETY (DISPLAY SCREEN EQUIPMENT) REGULATIONS 1992 (S.I. 1992/2792)

These Regulations impose minimum Health and Safety requirements for work with display screen equipment, which includes computers, where there is a 'user', that is, an employee who habitually uses display screen equipment as a significant part of normal work.

Further guidance on the Regulations is given in the HSE booklet L26 – Display Screen Equipment.

MANUAL HANDLING OPERATIONS REGULATIONS 1992 (S.I. 1992/2793)

The Manual Handling Operations Regulations 1992 require employers to take reasonably practicable steps to avoid manual handling activities where there is a risk of injury. Where such manual handling cannot be avoided, the employer should make an assessment and take appropriate measures to reduce the risk of injury to the lowest level reasonably practicable.

The assessment will form part of the overall risk assessment required by the Management of Health and Safety at Work Regulations 1992.

Further guidance on the Regulations is given in the HSE booklet L23 – Manual Handling.

PERSONAL PROTECTIVE EQUIPMENT AT WORK (PPE) REGULATIONS 1992 (S.I. 1992/2966)

The Personal Protective Equipment at Work Regulations 1992 require employers to make sure that suitable personal protective equipment is provided and used by employees wherever there is a risk to Health and Safety that cannot be adequately controlled by other means. This includes, for example, the provision of safety footwear where there is a risk of foot injuries, headgear where there is a risk of head injuries or suitable outdoor clothing if the job involves working outside in adverse weather conditions that could prejudice the Health and Safety of employees.

Further guidance on the Regulations is given in the HSE booklet L25 – Personal Protective Equipment at Work.

PERSONAL PROTECTIVE EQUIPMENT REGULATIONS 2002 (S.I. 2002/1144)

The regulations place a duty on any responsible person who places PPE on the market to comply with certain minimum Health and Safety requirements that are applicable to the class or type of PPE. It also requires that conformity assessment procedures have been carried out and that CE marking has been correctly affixed. Details are set out in the comprehensive set of schedules.

CONSTRUCTION (HEAD PROTECTION) REGULATIONS 1989 (S.I. 1989/2209)

Every duty holder in charge of a site has a duty to ensure that all persons who are at work on operations or works on that site are wearing suitable head protection.

HEALTH AND SAFETY (SAFETY SIGNS AND SIGNALS) REGULATIONS 1996 (S.I. 1996/341)

Safety signs must be provided where the risk assessment indicates that risks cannot be avoided or adequately controlled in other ways.

HEALTH AND SAFETY (FIRST AID) REGULATIONS 1981 (S.I. 1981/917)

Under the Health and Safety (First Aid) Regulations 1981, all workplaces should have first aid material in a clearly identified box and an appointed person(s) to ensure the proper management of injuries or illnesses at work. The first aid provision will depend on a variety of factors including: the nature and degree of the hazards at work, whether there is shift-work, what medical services are available, and the number of employees. The HSE booklet L74 – First Aid at Work explains the requirements and provides guidance to help employers meet their obligations.

REPORTING OF INJURIES, DISEASES AND DANGEROUS OCCURRENCES REGULATIONS 1995 (S.I. 1995/3163)

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) require employers, people in control of premises and, in some cases, the self-employed to report certain types of injury, occupational ill health and dangerous occurrences to the appropriate enforcing authority.

There are several cases in which injuries and incidents have to be reported to an enforcing authority, and these depend on the severity and the potential for harm. If:

- (a)
 - i.) an employee or visitor dies or suffers a major injury in an accident arising from or in connection with work; or
 - ii.) someone who is not at work, e.g. member of the public, suffers an injury as a result of an accident and is taken to hospital for treatment; or iii.) there is a dangerous occurrence, then the employer should notify the enforcing authority forthwith by the quickest practicable means, normally by telephone, and within ten days send a written report using Form 2508 (available from HSE Books). Reports are required whether or not the person concerned is an employee.
- (b) anyone at work is off work or cannot carry out their normal duties for more than three consecutive days as a result of an accident at work, this is also reportable and the employer has ten days in which to send a report to the enforcing authority.

Further information, including the definition of ‘serious injury’, is given in the HSE booklet L73 – A Guide to the Reporting of Injuries, Diseases, and Dangerous Occurrences Regulations 1995 and on the HSE website (<http://www.hse.gov.uk/riddor/>).

OCCUPIER’S LIABILITY ACT 1957 and 1984

The Occupier’s Liability Act 1957 and 1984 is a civil (not criminal) piece of legislation, and requires employers to make provision for both lawful and unlawful visitors. Employers must protect the rights of individuals’ Health and Safety whilst they visit the site. Security measures should be sufficient to prevent access to any unlawful visitors, but without causing them harm.

HEALTH AND SAFETY (MISCELLANEOUS AMENDMENTS) REGULATIONS (S.I. 2002/2174T)

These Regulations include various amendments to current UK legislation, which includes:

- The Health and Safety (First Aid) Regulations 1981
- The Manual Handling Regulations 1992
- The PPE Regulations 1992
- The Health and Safety (Display Screen Equipment) Regulations 1992
- The Provision and Use of Work Equipment Regulations 1998

COAST PROTECTION ACT 1949 AS AMENDED BY THE MERCHANT SHIPPING ACT 1988

Section 34 – Restriction of Works Detrimental to Navigation:

No person shall without the consent of the Secretary of State for Transport, Local Government and the Regions:

- a) construct, alter or improve any works on, under or over any part of the seashore lying below the level of mean high water springs;
- b) deposit any object or any materials on any such part of the seashore; or
- c) remove any object or any materials from any part of the seashore lying below the level of mean high water springs, if the operation causes or is likely to result in obstruction or danger to navigation. The Secretary of State may, as a condition of considering an application for consent under this section, require to be furnished with such plans and particulars of the proposed operation as he may consider necessary.

If the Secretary of State is of the opinion that any operation will cause or is likely to result in obstruction or danger to navigation, he may refuse consent or give his consent subject to conditions, having regard to the nature and extent of the obstruction or danger.

FACTORIES ACT 1961

The majority of this Act has been repealed by the Health and Safety at Work etc. Act 1974 and subsequent EC directives. Section 123 of the Act regarding Electrical Stations still applies.

Also, a number of sets of regulations were made under this Act, which are still needed to cover particular industries and workplaces that have specific hazards and associated risks that need to be regulated and controlled. These regulations include The Docks Regulations 1988 (S.I. 1988/1655) (see above) and the Breathing Apparatus, etc. (Report on Examination) Order 1961 (S.I. 1961/1345).

NOTE: The full text of most Statutory Instruments from 1987 onwards can be browsed or purchased from the HMSO website at www.hmso.gov.uk.

APPENDIX 3

References

The following publication references have been provided to allow readers who wish to understand more about the application and interpretation of specific areas of UK Health & Safety legislation, approved codes of practice and guidance to do so.

NOTE: all publications are available from HSE Books, The Stationary Office (TSO) or most large book stores.

HSE Books catalogue – free from HSE Books

HSG65 – Successful Health and Safety Management – ISBN 978 0 7176 1276 5

L21 – Management of Health and Safety at Work – Management of Health and Safety at Work Regulations 1999 Approved Code of Practice and Guidance – ISBN 978 0 7176 2488 1

INDG275 – Managing Health and Safety – Five Steps to Success (HSE free leaflet) - ISBN 978 0 7176 2170 5

HSG48 – Reducing Error and Influencing Behaviour – ISBN 978 0 7176 2452 2

HSC13 (rev 1) – Health and Safety Regulation – A Short Guide (HSE free leaflet)

INDG417 – Leading Health and Safety at Work (HSE free leaflet) – ISBN 978 0 7176 6267 8

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HSG263 – Involving Your Workforce in Health and Safety – ISBN 978 0 7176 6227 2

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INDG291 – Simple Guide to the Provision and Use of Work Equipment Regulations 1998 (HSE free leaflet) – ISBN 978 0 7176 2429 4

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HSG221 – Technical Guidance on the Safe Use of Lifting Equipment Offshore (Second Edition) – ISBN 978 0 7176 6229 6

INDG290 – Simple Guide to the Lifting Operations and Lifting Equipment Regulations 1998 (HSE free leaflet)

L122 – Safety of Pressure Systems – Pressure Systems Safety Regulations 2000 Approved Code of Practice – ISBN 978 0 7176 1767 8

L26 – Work with Display Screen Equipment. Health and Safety (Display Screen Equipment) Regulations 1992 As Amended – Guidance on the Regulations – ISBN 978 0 7176 2582 6

OTO 1999 052 – Effective Collision Risk Management for Offshore Installations. Offshore Technology Report (www.hse.gov.uk/research/otohtm/1999/oto99052.htm)

HSG150 – Health & Safety in Construction – ISBN 978 0 7176 6182 4

L103 – Commercial Diving Projects Offshore – Diving at Work Regulations 1997 Approved Code of Practice – ISBN 978 0 7176 1494 3

L104 – Commercial Diving Projects Inland/Inshore – Diving at Work Regulations 1997 Approved Code of Practice – ISBN 978 0 7176 1495 0

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INDG258 – Safe Work in Confined Spaces (HSE free leaflet) – ISBN 978 0 7176 1442 4

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L141 – Whole Body Vibration – The Control of Vibration at Work Regulations 2005 – Guidance on Regulations – ISBN 978 0 7176 6126 8

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HSG250 – Guidance on Permit-to-Work Systems – ISBN 978 0 7176 2943 5

HSG61 – Health Surveillance at Work – ISBN 978 0 7176 1705 0

HSG137 – Health Risk Management – ISBN 978 0 7176 0905 5

INDG355 Reduce Risks, Cut Costs - ISBN

L74 – First Aid at Work: Health and Safety (First Aid) Regulations 1981 Approved Code of Practice and Guidance – ISBN 978 0 7176 6260 9

L65 - Prevention of fire and explosion, and emergency response on offshore installations – ISBN 978 0 7176 1386 1.

L73 – Guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 – ISBN 978 0 7176 6290 6

HSG245 – Investigating Accidents and Incidents – ISBN 978 0 7176 2827 8

HSE33 (rev 1) – RIDDOR Offshore (HSE free leaflet)

APPENDIX 4

Useful Contacts

Health & Safety Executive (HSE)

Online: www.hse.gov.uk

Your local HSE Inspector's address and telephone number can be found in the local area telephone directory listed under Health & Safety Executive.

HSE – Offshore Division

Online: www.hse.gov.uk/offshore

Health and Safety Executive
Hazardous Installations Directorate
Offshore Division

Lord Cullen House Fraser Place Aberdeen AB25 3UB

Tel: 01224 252500

Health and Safety Executive
Hazardous Installations Directorate
Offshore Division

Redgrave Court Merton Road Bootle, Merseyside L20 7HS

Tel: 0151 951 4000

Health and Safety Executive
Hazardous Installations Directorate
Offshore Division
1st Floor, Lakeside 500 Old Chapel Way Broadland Business Park Norwich

Tel: 01603 828000

Enquiries relating to diving operations should be directed to the appropriate Diving Inspection Teams:

Plymouth (01752 276313) Dealing with all English counties west/south of and including Lancashire, Greater Manchester, Cheshire, Shropshire, Hereford and Worcester, Gloucester, Berkshire, Greater London, Kent and Wales.

- Norwich (01603 828013) Dealing with all English counties east/north of and including Cumbria, Yorkshire, Derbyshire, Staffordshire, West Midlands, Warwickshire, Oxfordshire, Buckinghamshire, Hertfordshire and Essex.; and

- Aberdeen (01224 252589) for Scotland.

HSE Infoline

General Health and Safety advice is available from the HSE by contacting:

Tel: 0845 345 0055

Fax: 0845 408 9566

e-mail: hse.infoline@connaught.plc.uk

Or write to:

HSE Infoline

Caerphilly Business Park

Caerphilly CF83 3GG

Employee Medical Advisory Service (EMAS)

EMAS is an integral part of the HSE and is staffed by specialist occupational health professional (doctors and nurses) who provide expert advice on medical matters relating to work. A directory of regional EMAS offices may be found at the following online link: www.hse.gov.uk/forms/health/emasoffices.htm.

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Suffolk
CO10 2WA
Tel. 01787 881165
Fax. 01787 313995
e-mail: hsebooks@prolog.uk.com
online: www.hsebooks.co.uk

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Maritime and Coastguard Agency (MCA)

Spring Place
105 Commercial Road
Southampton

Hampshire
UK
SO15 1EG
Offshore renewable energy contact number: 02380 329316
e-mail: infoline@mcga.gov.uk
online: www.mcga.gov.uk

MCA – Wales and West of England Regional Office
Tutt Head
Mumbles
Swansea
County of Swansea
SA3 4HW
Tel: 01792 368 472
Fax: 01792 363 125

MCA – East of England Regional Office
Humber MRSC
Limekiln Lane
Bridlington
YO15 2LX
Tel: 01262 607 355
Fax: 01262 670 613

MCA – Scotland and Northern Ireland Regional Office
Marine House
Blaikies Quay
Aberdeen
AB11 5EZ
Tel: 01224 597 900
Fax: 01224 571 920

International Maritime Organization (IMO)

Official Headquarters address:
4 Albert Embankment
London
SE1 7SR
United Kingdom
Tel: 020 7735 7611
Fax: 020 7587 3210
online: www.imo.org

Civil Aviation Authority

CAA House
45–59 Kingsway
London
WC2B 6TE
Tel: 020 7379 7311
online: www.caa.co.uk

Office of Public Sector Information

Provides records of all legislation (Acts, Statutory Instruments, etc.) back to 1987
online: www.opsi.gov.uk

Institute of Occupational Safety and Health (IOSH)

The Grange
Highfield Drive
Wigston
Leicestershire
LE18 1NN
Tel: 0116 257 3100
Fax: 0116 257 3101
online: www.iosh.co.uk

IOSH practitioners can be contacted via the IOSH Register of Consultancy Services.

Association for Project Safety (APS)

Stanhope House
12 Stanhope Place
Edinburgh
EH12 5HH
Tel: 08456 121 290
Fax: 08456 121 291
online: www.associationforprojectsafety.co.uk

British Standards Institute (BSI)

389 Chiswick High Road
London
W4 4AL
Tel: +44 (0)20 8996 9001
Fax: +44 (0)20 8996 7001
online: www.bsi-global.com

RenewableUK

Greencoat House
Francis Street
London
SW1P 1DH
Tel: +44 (0)20 7901 3000
Fax: +44 (0)20 7901 3001
e-mail: info@renewable-uk.com
online: www.renewable-uk.com

RenewableUK

Greencoat House, Francis Street
London SW1P 1DH, United Kingdom

Tel: +44 (0)20 7901 3000

Fax: +44 (0)20 7901 3001

Web: www.renewable-uk.com

Email: info@renewable-uk.com