GUIDELINES FOR

HEALTH & SAFETY

IN THE WIND ENERGY INDUSTRY

THE BRITISH WIND ENERGY ASSOCIATION

Acknowledgements

The British Wind Energy Association wishes to acknowledge the encouragement, time, effort and invaluable advice given by David Left, Utilities National Interest Group, Health and Safety Executive, together with specialist contributions from his colleagues Richard Boland and Dave Chaplin. BWEA is particularly grateful for the work of consultant Dr Joe Gray of Chartwell Health & Safety Ltd in the drafting and revisions of the guidelines, and to Matt Britton of Powergen Renewables, the driving force behind the project.

Among the dozens who contributed to the production of these guidelines, BWEA would like to acknowledge the help of the following companies and individuals:

Rod Blunden (National Wind Power Ltd), Alan Chivers (PMSS), Peter Clarke (Powergen Renewables Ltd), James D'Alessandro (Powergen Renewables), Niels Damm (Bonus Energy A/S), Richard Evans (Warwick Energy Ltd), David Gardner (Scottish & Southern Energy), Bill Grainger (AMEC Wind), Rupert Harris (Econet), Alison Hill (BWEA), Peter Langcake (Consultant for Shell International Renewables Ltd), Steve Macken (ScottishPower plc), Ian Ord (Setter & Associates), Simon Powles (Renewable Energy Systems Ltd), Anna Sturdy (Vestas – Danish Wind Technology A/S) and David Walton (Scottish & Southern Energy plc).

The final wording of these guidelines is entirely the responsibility of the British Wind Energy Association.

PREFACE

Back in 1994 the British Wind Energy Association showed its commitment to health and safety by starting work on the first edition of the "Guidelines for Health and Safety in the Wind Energy Industry".

Since then we have seen the development of the first offshore wind farms which bring additional health and safety risks, from development through to construction and operation.

I therefore welcome this initiative by BWEA to update the Guidelines for Health and Safety in the wind industry and feel that they can make a significant contribution to improving health and safety on wind farm sites.

I hope that members of the British Wind Energy Association and their contractors use the guidelines and strive to improve health and safety for those working in the industry and those affected by its work activities - the spirit of Best Practice.

This is particularly important at a time when we are all working together to drive down accidents and occupational ill health under the Revitalising Health and Safety initiative.

David Left
Head of the Utilities National Group
Health and Safety Executive

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GUIDELINES FOR HEALTH AND SAFETY IN THE WIND ENERGY INDUSTRY

1 INTRODUCTION

1.1 The British Wind Energy Association (BWEA) was established in 1978 as a professional association for those involved in wind energy research and development. It now also acts as the trade association for the wind energy industry. One very important aspect of its work is the promotion of high standards and commitment to continuous improvement of the management of health and safety within the industry.

1.2 Members are expected to adhere to the highest standards and ensure that contracts for procurement and operation are written so as to promote safe practices and avoid clauses that may compromise health and safety.

1.3 BWEA recognises the importance of the client in establishing high standards for health and safety at every stage of a wind energy project. It is the responsibility of the client to promote high standards through the selection and management of the whole of their supply chain, including designers, manufacturers, contractors and operators.

1.4 BWEA also wishes to promote experience transfer between members so that best practice can be disseminated through learning from accidents, incidents and operating experience. It is recognised that significant costs to operators, designers, manufacturers and suppliers can occur as a result of workplace accidents.

1.5 It is further recognised by BWEA that the designer and manufacturer of the plant and equipment installed as part of a project will have significant impact on health and safety throughout the life of the development. As such they have a major influence in promoting improvements in health and safety within the wind industry.

1.6 BWEA members also understand that best practice means that throughout all phases of the life cycle of a wind farm, steps are in place to ensure that the workforce is involved in improving health and safety standards as far as reasonably practicable through appropriate consultation.

1.7 These best practice guidelines have been drawn up with the support of a range of external organisations and in consultation with the Health and Safety Executive (HSE) with the aim of establishing a standard for health and safety on wind energy developments. These guidelines are part of BWEA's contribution towards the Revitalising Health and Safety strategy launched jointly by the Government and Health and Safety Commission on 7 June 2000. The Revitalising Health and Safety initiative aims to inject new impetus into the health and safety agenda and to identify new approaches to reduce further rates of accidents and ill health caused by work. BWEA believes that these guidelines can assist the industry in meeting the aims of this initiative.

2 THE NATURE OF THE GUIDELINES

2.1 This guidance is primarily intended for senior management within organisations operating or considering operating wind farms. It is 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. However, it does 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 the highest standards of health and safety within this industry.

The guidance in this document has been formulated for both land based and offshore wind farm sites. Much of the guidance is common to both types of site. Therefore, in each following section, guidance relevant to both types of site is dealt with first, followed by additional guidance, where necessary, in relation to the circumstances particular to offshore sites. (Material specific to offshore wind farms is printed in blue for ease of identification.) Appendix 1 provides more detailed guidance specific to offshore wind farms.

STATUS OF THE GUIDANCE

3.1 Organisations involved with the wind energy industry are reminded that they may have statutory duties under health and safety law. The purpose of this document is to offer some advice on health and safety issues that are specific to the wind energy industry. Satisfying the requirements of this guidance 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.

FURTHER INFORMATION

4.1 Appendix 2 contains a brief explanation of the main areas of legislation applicable to the wind energy industry and a list of some useful publications can be found in Appendix 3.

4.2 Further advice is available directly from the Health and Safety Executive (HSE) and some contact points are provided in Appendix 4.

4.3 For small organisations that do not have the necessary knowledge, competence or resources available to them, specialist advice can be sought from an independent Health and Safety Consultant. It is suggested that reference is made to the HSE free leaflet 'Selecting a Health and Safety Consultancy' which will help in deciding when this is the best option. It also contains a comprehensive list of useful addresses.

PRINCIPLES OF SUCCESSFUL HEALTH AND SAFETY MANAGEMENT

5.1 High standards of health and safety within any organisation are dependent on an effective health and safety management system. HSE's publication HS(G)65 'Successful Health and Safety Management' sets out the principles for successful health and safety management based on the practices of those organisations with effective management systems and low accident rates. Underlying this philosophy, best practice will be achieved by recognising the following safety hierarchy:

1. The primary activity is to achieve inherent safety as far as is reasonably practicable through design, safe manufacture, construction and operation
2. Appropriate risk assessments and method statements should be developed for all activities to minimise personal exposure to risk
3. Finally, personal protective equipment (PPE) should only be considered as the last resort for minimising risk to personnel.

5.2 BWEA members recognise that best practice throughout the wind industry will be achieved through all participants playing an active role in improving health and safety standards and in particular by co-operating with the client or site owner in order to achieve higher standards by influencing design, manufacture, construction and operation.

5.3 High standards of health and safety will only be achieved where relevant responsibilities are formally specified and the client or owner has a strong health and safety culture. This shall include at each stage of the wind farm life cycle formal health and safety training for personnel, regular checks and audits of health and safety procedures and practices, formal records and follow up of the outcomes.

RISK ASSESSMENT

6.1 Risk Assessment is a key activity in the management of health and safety and is a legal requirement under legislation such as the Management of Health and Safety at Work Regulations 1999. Various techniques are available and some are more suited than others to different phases of the design, manufacture, construction, commissioning, operation and removal of wind farms. It is the responsibility of the client to ensure that the appropriate risk assessment techniques are deployed in a systematic manner and the outputs from such risk assessments used to reduce risks to as low as reasonably practicable during all phases of the life cycle of a wind farm. It is essential that the risk assessments are carried out by competent personnel. The risk assessments should address all health, safety and environmental risks, including those to members of the public as well as personnel working on site. As far as possible, risks should be designed out with the emphasis on achieving high standards of health and safety by design. BWEA members, as clients, are in a strong position to influence designers and manufacturers in this area.

SITE DEVELOPMENT AND PLANNING

7.1 Introduction

7.1.1 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.

7.2 Legislative Requirements

7.2.1 All work on wind farms is subject to the Health and Safety at Work etc. Act 1974 and relevant statutory provisions made under that Act where applicable.

The Application Outside Great Britain Order 2001 extended the application of the Health & Safety at Work etc. Act 1974 to offshore wind farms with effect from 11 July 2001.

7.2.2 The Construction (Design and Management) Regulations 1994 (CDM) place duties on the client, designer and others in relation to notifiable construction activities.

7.2.3 The responsibilities of the client, designer and planning supervisor are:

Client

1. Appoint a planning supervisor
2. Provide information on health and safety to the planning supervisor
3. Appoint a principal contractor
4. Ensure that the planning supervisor and the principal contractor are competent and have adequate resources to carry out their health and safety responsibilities
5. Ensure the competence and adequate resources of any designer or contractor whom the client may arrange to prepare a design or carry out or manage construction work
6. Ensure that a suitable Health and Safety Plan has been prepared by the principal contractor before construction work starts
7. Obtain the Health and Safety File from the planning supervisor at the end of the project and keep it available for future use.

Designers

1. Alert clients to their duties
2. Consider, during the development of designs, the hazards and risks which may arise to those constructing and maintaining the structure
3. Design to avoid risks to health and safety so far as is reasonably practicable
4. Reduce risks at source if avoidance is not possible
5. Consider measures which will protect all workers if neither avoidance nor reduction to a safe level is possible
6. Ensure that the design includes adequate information on health and safety
7. Pass this information on to the planning supervisor, principal contractor, or others who might need it, so that it can be included in the Health and Safety Plan and Health and Safety File. Ensure it is given on drawings, in specifications, outline method statements, etc.

8. Co-operate with the planning supervisor and, where necessary, other designers involved in the project.

Planning Supervisor

1. Ensure that HSE is notified of the construction project if it is within the scope and application of the CDM Regulations and is notifiable
2. If requested, be in a position to give adequate advice to the client on:
   (a) Issues of competence
   (b) The adequacy of the provision made for health and safety by any designer whom the client arranges to prepare a design
3. Take reasonable steps to ensure co-operation between designers so that the health and safety aspects of design are properly considered and co-ordinated. To achieve this, the planning supervisor needs to ensure so far as is reasonably practicable that:
   (a) Relevant information flows freely between the different designers
   (b) Designers take proper account of health and safety in their design work and comply with their duties under the CDM Regulations
   (c) Designers co-ordinate their work to see how the different aspects of design interact with each other and affect health and safety.

7.2.4 Further details of the duties under CDM are contained within the Approved Code of Practice, see Reference 27 of Appendix 3.

7.2.5 Other important legislative requirements to consider at this stage will include:

- Health and Safety at Work, etc. Act 1974 (Sections 3, 4 and 5)
- Electricity at Work Regulations 1989
- Safety, Quality and Continuity Regulations 2001
- Noise at Work Regulations 1989
- Provision & Use of Work Equipment Regulations 1998
- The Coast Protection Act 1949, as amended by the Merchant Shipping Act 1988 (Section 34)

7.2.6 See Appendix 2, Know the Law, for the key points of relevant legislation.

7.3 Wind Farm Layout

7.3.1 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 cables*
- 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. to allow safe access and egress and to reduce the need to reverse vehicles in the site layout*
- Shipping lanes
- Fishing grounds
- Dredging areas
- Pipelines
- Telecommunication cables
- Wrecks
- Explosive and other dumping grounds
- Military activity zones
- Coastal erosion
- Factors relating to consents.

7.3.2 The following site specific weather conditions should be considered:

- Mean and maximum wind speeds in relation to the survival wind speed of the turbine
- Temperature and the likely incidence of icing
- Susceptibility to lightning strike
- Excessive precipitation, *e.g. causing difficult site access or flooding*
- Any requirements for continued collection of meteorological data
- Salt burdens in the atmosphere on coastal/offshore sites
- Any requirements for collection of oceanographic data
- Oceanographic conditions, *e.g. tides and likely wave conditions.*

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

- Contamination from previous land use
- Strength requirements of foundations
- Stability of excavations
- 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*
- Stability of sandbanks.

7.3.4 Requirements for the site electrical system will include:

- Consultation with Distribution Network Operators (DNOs)
- 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 arrangements to prevent damage to sub-sea cables.

7.3.5 Satisfactory arrangements will be needed for site access:

- Checking vehicle weights, size and ground clearance
- Liaison with Local Authority, Police and notification of local inhabitants
- Maintenance of public access requirements, *e.g. parking, passing places, public highway*
- Establishing sustainable site ground pressures, *e.g. requirements for specialist vehicles*
- Ensuring vehicle stability on steep slopes and possible collapse of old mine workings
- 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
- Taking account of poor weather
- Providing adequate means for traffic control, passing places and parking
- Segregation of vehicles and pedestrians
- Access by specialised vessels, *e.g. barges and lifting vessels,* during the construction of foundations and erection of turbines
- Access by vessels and suitable arrangements for transfer of personnel and equipment to and from the vessel to the wind turbines for maintenance operations
- Likely sea states.

7.3.6 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
- Presence of children.

7.3.7 Ensure that the site is not affected by aviation by:

- Taking account of local civil/military airfields; notifying the appropriate bodies where necessary using the pro-forma consultation document supplied by BWEA (Reference: www.bwea.com/aviation)
- Checking that it is not subject to low flying aircraft, or
- Pursuits such as ballooning, parachuting or micro-light aircraft
- Providing records to Military and Ordnance Survey.

7.3.8 Consult with landowners regarding:

- Existing and likely future land usage
- Crops and livestock
- Recreational shooting
- Location and marking of buried services.

7.3.9 Make provision for members of the public by:

- Establishing a procedure to control visitors
- Establishing whether the land has any Commoners rights
- Taking security measures against unauthorised access and vandalism.

8 DESIGN, ASSEMBLY, MANUFACTURE AND SPECIFICATION

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 manufacture, assembly, specification 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, within their capabilities, 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, operated and maintained. BWEA recognises that it is best practice to continually 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 during the design and commissioning phases.

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 the Construction (Design and Management) Regulations 1994.

8.2 Legislative Requirements

8.2.1 The most important legislative requirements covering the design phase include:

- Health & Safety at Work etc. Act 1974 (Section 6)
- Supply of Machinery (Safety) Regulations 1992
- Provision & Use of Work Equipment Regulations 1998
- Lifting Operations and Lifting Equipment Regulations 1998
- Workplace (Health, Safety and Welfare) Regulations 1992
- Electricity at Work Regulations 1989
- Construction (Design and Management) Regulations 1994
- Construction (Health, Safety and Welfare) Regulations 1996
- Electricity Supply Regulations 1988
- Ionising Radiation Regulations 1999
- Confined Spaces Regulations 1997

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*
- 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
- Details of tides and currents
- Detailed analysis of historical data with respect to wave height and periodicity.

8.3.2 Continuing needs for information about site conditions may require:

- Installation of meteorological instruments
- Installation of instrumentation for the recording of oceanographic conditions.

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*
- Voltage/frequency regulation.

8.4.2 Reference to British and European Standards will be required to:

- Ensure compliance with current 'best practice'
- 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:

- Earthing and protection
- Interfaces between turbine mechanical, LV and HV activities
- Turbine overspeed control
- Manufacturers turbine certification
- The need for fire detection/protection
- Provision of safe work areas
- Provision of safe working access, *e.g. striving to minimise the use of vertical ladders, safety harness anchor points, providing rest platforms, lighting, including emergency lighting*
- Provision of a safe means of escape
- Safe isolation of mechanical and electrical equipment for maintenance, *e.g. locking off devices, clamping of rotating parts*
- Safe remote control/operation, *e.g. preventing remote control when a machine is being maintained*
- Preventing unauthorised access and control of the equipment, *e.g. security and passwords, only allowing control by personnel in the nacelle during maintenance*
- Guarding of 'dangerous parts of machinery'
- Controls, *e.g. for starting or changing operating conditions, stopping, emergency stop*
- Provision of clear and unambiguous markings and warnings
- Insulation of electrical equipment and cables
- Potential damage from waves and weather
- Potential damage from ship collisions
- Access to the base of the wind turbines from a vessel, whether by mooring alongside a landing stage or via a personnel transfer system
- Practicality of access by helicopter
- Provision of accommodation and emergency rations
- Storage for survival suits and buoyancy aids
- Precautions for working on, near or over water
- Provision of rescue/recovery arrangements for persons falling into the water
- Provision of appropriate navigation aids, *e.g. lights and foghorn*
- Access to navigation aids for maintenance
- Provision of appropriate systems for communication between the wind farm and attendant vessels, with the shore and with the Maritime and Coastguard Agency in case of emergency
- The need to undertake diving operations either during the construction or operational phases
- The need to undertake under sea remotely operated vehicle (ROV) operations during the construction or operational phases.

8.4.4 The design should take account of health and safety during:

- Erection and construction, *e.g. sequence of erection or stability of partially built structures*
- Commissioning
- Normal operation and maintenance
- Dismantling and demolition.

8.4.5 Designers should aim to maximise the work, such as fabrication, commissioning and testing, which can be done onshore in order to minimise the work to be undertaken offshore.

8.4.6 Navigation aids will need to be fitted and commissioned at the earliest opportunity to turbines and site monitoring masts.

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

- Either humans or animals
- Third party protection when carrying out maintenance on site
- Cables (overhead and buried), insulators, substation and wind turbines
- Specifying adequate safety clearance from exposed electrical conductors
- Provision of devices such as anti-climbing guards
- Unauthorised access from vessels
- Ship collision
- Pollution
- The need for exclusion zones (The Geneva Convention on the Continental Shelf 1958 establishes a 500m exclusion zone around offshore installations, including wind farms).

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
- Take account of any relevant 'design' risk assessments.

9

CONSTRUCTION, COMMISSIONING, DISMANTLING AND DEMOLITION

9.1 Introduction

9.1.1 This section highlights the considerations that should be given to health and safety in the construction phase of a wind farm. The term 'construction' includes commissioning, dismantling and demolition and the term 'contractor' includes those persons/organisations undertaking such work.

9.1.2 One way in which those with responsibilities on site can be sure that work is proceeding safely is to appoint someone with specific responsibility for Health and Safety on site who can monitor progress and provide regular updates. Any such person should possess a relevant health and safety qualification and/or experience. They should hold a position with sufficient seniority to be able to exert influence over the project when necessary.

9.2 Legislative Requirements

9.2.1 The following statutory requirements will apply to most construction works:

- Health and Safety at Work, etc. Act 1974
- Construction (Design & Management) Regulations 1994 (detailed guidance is available in the HSE publication 'Managing Construction for Health and Safety' Approved Code of Practice for the Construction (Design and Management) Regulations 1994)
- Construction (Head Protection) Regulations 1989
- Construction (Heath, Safety and Welfare) Regulations 1996
- Lifting Operations and Lifting Equipment Regulations 1998
- Provision & Use of Work Equipment Regulations 1998

9.2.2 Other relevant legislation includes:

- Management of Health and Safety at Work Regulations 1999
- Control of Substances Hazardous to Health Regulations (COSHH) 1999
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995
- Confined Spaces Regulations 1997
- Diving at Work Regulations 1997

9.2.3 In the majority of cases the project will be subject to the Construction (Design & Management) Regulations 1994. The roles of the client, designer and the planning supervisor defined in Section 7 will continue, actively managing and monitoring the health and safety performance of the principal contractor and other contractors. The health and safety responsibilities of the principal contractor and other contractors are:

Principal Contractor

1. Develop and implement the Health and Safety Plan in a format that can be developed and integrated into the operational Health and Safety Management System for the project
2. Be reasonably satisfied that when arranging for a contractor to carry out construction work, they are competent and have made adequate provision for health and safety
3. Obtain and check safety method statements from contractors
4. Ensure the co-ordination and co-operation of contractors, particularly under the Management of Health and Safety at Work Regulations 1999 and the Provision and Use of Work Equipment Regulations 1998
5. Ensure training for health and safety is carried out
6. Have appropriate communication arrangements between contractors on site for health and safety
7. Make arrangements for discussing health and safety matters with people on site
8. Allow only authorised people on to site
9. Display notification details
10. Monitor health and safety performance and have an operating audit system
11. Pass information to the planning supervisor for the Health and Safety File.

Contractors

1. Identify the hazards of their work, assess the risks arising from these hazards and tell the principal contractor how the risks are to be controlled
2. Inform the principal contractor of any death, injury, ill-health or dangerous occurrence
3. Provide the principal contractor with information to be included in the Health and Safety File
4. Co-operate with the principal contractor and other contractors
5. Comply with the rules in the Health and Safety Plan
6. Follow any directions of the principal contractor so that the latter can comply with his duties under the CDM Regulations
7. Provide information to employees.

9.2.4 Further details of the duties under CDM are contained within the Approved Code of Practice, see Reference 27 of Appendix 3.

9.2.5 It is important that:

- The roles of client, designer, planning supervisor and principal contractor are clearly defined
- A Health and Safety Plan is prepared
- Any notification required is given to the HSE
- A Health and Safety File is established
- Adequate resources have been made available for health and safety
- A person is appointed to be in charge of the site and responsible for all operations with a clear mandate for dealing with any eventualities. It should also be made clear to everyone on site who this person is and their role and responsibilities.

9.2.6 The client should ensure that the principal contractor and any sub-contractors appointed to undertake construction activities are competent. It is important that appropriate policies, standards and procedures for the assessment of contractors are established prior to the award of a contract. Selecting a competent contractor is not in itself sufficient to discharge the responsibilities imposed on an employer under the Health and Safety at Work Act, etc. 1974. Appropriate arrangements must be instituted and implemented to monitor, on a regular basis, the performance of the contractor. In order to do this effectively, the client should identify appropriate items to measure and establish and agree with the contractor suitable performance standards. Furthermore, in the event of failure to achieve these performance standards, there should be a mechanism for agreeing and tracking necessary corrective actions.

9.2.7 It is important when selecting contractors to choose those who can demonstrate competence in the construction, operation, maintenance and removal of offshore structures with a strong health and safety culture.

9.2.8 Communication links will be required:

- Between client, designer, planning supervisor, principal contractor and other contractors
- With statutory bodies, *e.g. HSE, Environment Agency*
- With Emergency Services, *e.g. Police, Fire Brigade, Ambulance*
- To ensure relevant information is provided to sub-contractors and the self-employed
- Which take account of foreign organisations and workers
- With the Maritime and Coastguard Agency and shore bases.

9.3 Method Statements and Risk Assessments

9.3.1 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
- Training can be provided.

9.3.2 Method Statements should be prepared for all activities in sufficient detail so that:

- A safe system of work can be established
- The principal contractor can develop the Health and Safety Plan

- High risk activities can be properly monitored and controlled.

9.4 Emergency Arrangements

9.4.1 Procedures should be established for the following, based on suitable and sufficient risk assessments:

- All foreseeable emergency situations relevant to the site, 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)
- Monitoring work areas for good standards of housekeeping
- Abnormal weather conditions, *e.g. extreme cold, floods, lightning*.

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

- Means of raising the alarm
- Suitable means of escape
- Portable fire fighting equipment
- Means to dispose of scrap and waste materials
- Fixed fire detection and extinguishing systems, where appropriate.

9.4.3 Ensure that persons working on site:

- Are familiar with emergency arrangements
- Are trained and know what to do
- Know who will take charge in emergency situations.

9.5 Temporary Facilities

9.5.1 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 'site transport'
- First aid facilities and trained first aiders
- Communication links on and off site, *e.g. temporary land lines, mobile phones, radios*
- Safe unloading, storage and laydown of materials
- Preventing unauthorised access to quarrying or borrow pits
- Adequate and safe installation of temporary services, *e.g. electricity, LPG supplies.*

9.5.2 Temporary facilities should be:

- Regularly maintained
- Securely fenced and contained against vandalism or leaks to environment, *e.g. fuel oil.*

9.5.3 Welfare arrangements for workers should include:

- Protection against extremes of climate
- Toilets and washing facilities
- Mess facilities
- Storage for personal protective equipment
- Changing/drying rooms
- Sleeping accommodation (if there is a possibility of being stranded overnight).

9.6 Site Access

9.6.1 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
- Be 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*
- Avoid or warn against the presence of overhead services, *e.g. electricity cables*
- Take account of the risks to pedestrians from site vehicles and segregate pedestrians from vehicles.

9.6.2 Areas of 'hard standing' should be established:

- Allowing vehicles to be parked off the public highway

- Which are reinforced and marked
- To support crane outriggers without settlement
- For laydown or storage areas.

9.6.3 Transport on site should be:

- Assessed for suitability to deal with site conditions *e.g. rough terrain*
- Subject to proper maintenance
- Only driven or operated by suitably trained persons.

9.6.4 Temporary fences and 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
- Indicate rights of way or landowners boundaries.

9.6.5 Offshore, the following needs to be taken into account:

- Site access by vessel will be dependent on the state of the tide and other factors
- The transport, storage and handling of materials will involve the use of various vessels
- Careful thought will have to be given to their choice, taking into account
  - Water depth
  - Currents
  - Likely sea states.

9.7 Weather Conditions

9.7.1 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*
- Lack of visibility, *e.g. fog and low cloud*
- Work on metal structures when there is a risk of lightning
- Dry weather increasing the risk of heath/moorland fires
- A clear definition of when work will cease due to either wind and weather or sea state.

9.8 Communication

9.8.1 When persons are at work it should be ensured that:

- Contact can be maintained with 'key personnel', *e.g. by mobile phones or radios*
- Procedures are established for persons working alone or in small groups
- Workers from foreign companies can understand instructions and information
- Appropriate systems for communication between the wind farm and attendant vessels, with the shore and with the Maritime and Coastguard Agency in case of emergency, are provided.

9.9 Excavation

9.9.1 Before any excavation is carried out:

- A proper assessment is made of local ground conditions
- Clearly establish that no 'services' exist in the locality.

9.9.2 As excavations are carried out:

- The sides should be supported or 'battered' back
- They should be kept free of water
- They should not be allowed to deteriorate as a result of bad weather.

9.10 Existing Services/Previous Land Usage

9.10.1 Before starting work on site, the following actions should be taken:

- Contact all 'public utilities'
- Identify existing 'services' and mark on drawings
- Ensure the availability of suitable detection equipment, *e.g. cable locators*
- Ensure the land is not contaminated from previous dumping or tipping
- Check that no old mine workings exist
- Check for previous military use, *e.g. unexploded ordnance.*

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

- Check for buried services before excavation takes place
- Treat all services as live
- Expose buried services by appropriate means, *e.g. hand digging*
- Place 'goalposts' to warn of overhead services
- Use of buoys to mark existing pipelines and undersea cables.

9.11 Chemicals and Substances

9.11.1 A suitable COSHH assessment should be made for:

- All chemicals and other substances used on site
- Processes causing dust or fume, *e.g. welding.*

9.12 Lifting and Handling

9.12.1 Before carrying out any manual handling operation ensure:

- Compliance with the Manual Handling Operations Regulations 1992
- A relevant risk assessment has been carried out
- Persons are trained and adopt correct manual lifting practices.

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

- Appointment of competent person to be in control of lifting operations
- Valid test certificates exist, including those for slings, lifting chains etc.
- Only competent personnel trained in the use of specific equipment are involved
- Proper risk assessments are made for the work
- 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
- Proper care during use of elevated access platforms or man riding platforms
- All lifting operations are properly planned and lifting devices are of adequate capacity
- When selecting cranes, account should be 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 should also be taken into account when assessing the competence of those involved, *e.g. crane drivers and banksmen*
- Loads to be sent offshore need to be 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 should also be addressed.

9.13 Information, Training and Supervision

9.13.1 It should be ensured that:

- Persons appointed to work on site posses the necessary level of skills and competence
- Statutory notices and posters are displayed
- Employees are able to express their views about health and safety
- Employees are provided with information about health and safety, *e.g. tool box talks*
- Site induction training is provided
- Information is displayed on site specific hazards, *e.g. warning notices*
- Sufficient supervision of appropriate experience is provided.

9.13.2 Before and during work on site:

- Endeavour to make a check that personnel are competent
- Make an assessment following any training provided on site
- Provide any specialist or refresher training
- Ensure details of training are recorded
- Employers should provide and exchange health and safety information
- Provide training in offshore survival techniques
- Ensure appropriately trained and competent crew are manning any vessels used to transport personnel and equipment.

9.14 Notification/Records/Registers

9.14.1 The Construction (Design & Management) Regulations 1994 require:

- Notification to the HSE
- That a Health & Safety Plan is prepared and maintained
- That a Health & Safety File is drawn up.

9.14.2 During site work ensure that:

- All statutory and non-statutory records are maintained
- Establish who is responsible and where the records will be kept
- A daily record is established of all persons at work.

9.15 Safe Systems at Work

9.15.1 Permit to work systems should be considered for:

- High risk activities, *e.g. excavations, hot work (the application of heat, including welding, burning or grinding on plant containing flammable materials), entry into confined spaces*
- Working on installed equipment as soon as it becomes 'energised'.

9.15.2 Procedures should be established:

- For high risk activities, *e.g. working at height, working over water*
- 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
- 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 to the wind farm
- To track personnel between the wind farm and an accommodation vessel
- For unloading and back loading supply vessels.

9.16 Personal Protective Equipment (PPE)

9.16.1 Persons working on site should be provided with:

- PPE to protect against risks that cannot be controlled by other means.

9.16.2 When assessing the requirements for PPE, take account of:

- The remoteness of the site and climatic conditions
- The need to work outside, *e.g. exposure to ultra violet light*
- The problems of access, *e.g. the need to work at height*
- The need to work on, near or over water
- The mode of transport to and from offshore.

9.17 Security

9.17.1 Before construction work is allowed to proceed:

- Make provision to prevent unauthorised access to any part of the site
- Ensure materials are stored without risk to health and safety
- Ensure construction plant is secure against unauthorised operation
- Establish procedures for control of visitors.

9.18 Reporting of Accidents/Dangerous Occurrences

9.18.1 To comply with statutory requirements:

- Details of all accidents must be recorded in an 'accident book'
- Reports under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 must be made to the enforcement authority.

9.19 Occupational Health

9.19.1 Establish procedures that define:

- Any requirements for a pre-employment medical
- Any legal requirements for health surveillance, *e.g. ionising radiation*
- Requirements for health surveillance identified by a risk assessment
- Any local minimum standards, *e.g. fitness, eyesight, hearing*
- Proper arrangements for health records, *e.g. confidentiality*
- Appropriate medicals for personnel working offshore.

9.20 Completion of Works

9.20.1 Before leaving site:

- Remove all unused materials, plant and equipment
- Restore all temporary workings to a safe condition
- Carry out a thorough site inspection
- It may be necessary to undertake a seabed survey, using divers or remotely operated vehicles, in order to ensure that the site is free of debris.

10. OPERATION AND MAINTENANCE

10.1 Introduction

10.1.1 This section highlights the considerations 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, Dismantling 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.

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. It should also be made clear to everyone on site who this person is and their role and responsibilities.

10.1.4 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 The most important legislative requirements to consider include:

- Health & Safety at Work, etc. Act 1974
- Management of Health & Safety at Work Regulations 1999
- Electricity at Work Regulations 1989
- Electricity Supply Regulations 1988
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995
- Control of Substances Hazardous to Health Regulations 1999
- Provision and Use of Work Equipment Regulations 1998
- Workplace (Health, Safety and Welfare) Regulations 1992
- Personal Protective Equipment at Work Regulations 1992
- Manual Handling Operations Regulations 1992
- Confined Spaces Regulations 1997
- Fire Precautions (Workplace) Regulations 1997

Normal maintenance and repair work will not usually be subject to the Construction Design and Management Regulations (1994), however for complex repairs or refurbishment the client should consider the CDM approach to ensure the work is well planned and co-ordinated.

10.2.2 Some basic points to consider in complying with the law are:

- Is a written health and safety policy statement required?

- Who is responsible for health and safety on site?

10.3 Safe Systems of Work

10.3.1 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*
- Monitoring and reviewing of requirements.

10.3.2 Special controls may be required when:

- Visitors attend the site
- People are working at heights
- Excavation work takes place
- Hot work (the application of heat, including welding, burning or grinding on plant containing flammable materials) is required
- People are working in confined spaces
- People are working alone
- Equipment can be operated remotely
- Working, including testing, on live electrical equipment
- Working over water.

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

- Segregation of vehicles and pedestrians
- Speed limits for vehicles
- The wearing of personal protective equipment, *e.g. hard hats*
- Control of access to work areas
- Working in inclement weather.

10.4 Method Statements and Risk Assessment

10.4.1 Site specific hazards should be identified so that:

- Written assessments can be completed for significant risks
- Workers can be made aware of risks
- Control measures can be put in place
- Training needs can be identified.

10.4.2 Reference should be made to the Health and Safety File if the project has been subject to the Construction (Design and Management) Regulations 1994.

10.4.3 Consider the need for any specialist risk assessment techniques:

- To cover plant failure, *e.g. ejection of foreign bodies*
- Where non-workers could be affected, *e.g. landowners, public.*

10.4.4 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 can be devised
- Contractors can demonstrate adequate controls and compliance with their legal responsibilities.

10.4.5 Consider special conditions associated with remoteness and climate:

- The risk of lightning
- Extremes of temperature, *e.g. ice, snow, risk of exposure*
- Exposure to ultra violet radiation
- Working at height
- Access at height
- Working on, near or over water
- Exposure to salt spray.

10.5 Emergency Arrangements

10.5.1 Based on suitable and sufficient risk assessments, ensure that procedures are established for:

- All foreseeable emergency situations, including evacuation, escape and rescue
- Accident/incident reporting
- Rescue from the site
- Rescue from the sea.

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

- Suitable means of escape, *e.g. emergency descent devices*
- Portable fire fighting equipment
- Reasonable access to basic first aid equipment.

10.5.3 The Emergency Services should be made aware of:

- The location and access points to site
- What they might encounter
- Who to contact.

10.5.4 Ensure that all persons working on site:

- Are familiar with emergency arrangements
- Are trained and know what to do
- Know who will take charge and who to contact.

10.5.5 Make sure that fire risks are minimised by:

- Control of smoking and hot work (the application of heat, including welding, burning or grinding on plant containing flammable materials)
- Provision of appropriate fire detection
- Establishing high standards of housekeeping
- Control and storage of flammable substances
- Taking account of dry conditions with increased risks of heath/moorland fires.

10.5.6 An emergency response plan for dealing with all foreseeable emergency situations, *e.g. persons falling into the water,* will need to be drawn up:

- It should be subject to regular desk top exercises and drills
- It should clearly set out the roles and responsibilities of everyone
- It should describe the actions to be taken to deal with all reasonably foreseeable scenarios requiring an emergency response
- All personnel should be briefed on the emergency procedures and
- Should be trained in the use of any emergency evacuation, escape or rescue equipment.

10.6 Site Access

10.6.1 Site access roads and hard standing areas should:

- Be adequately maintained
- Be provided with means of restricting access, *e.g. gates and fences*
- Be properly identified, *e.g. signs, notices, drawings and plans.*

10.6.2 Transport on site should be:

- Assessed for suitability to deal with site conditions, *e.g. rough terrain*
- Subject to proper maintenance
- Driven or operated by suitably trained and competent persons.

10.6.3 Special care must be taken:

- To control access of specialist vehicles to site, *e.g. cranes, excavators, access platforms*
- In poor weather conditions
- To segregate pedestrians from vehicles
- With free roaming livestock
- When visitors and members of the public are encountered.

10.6.4 Adequate provision must be made to:

- Prevent unauthorised access to installed equipment, *e.g. transformers, substations*
- Prevent theft and vandalism
- Control or restrict public access
- Safeguard landowners
- Check the integrity of security measures.

10.6.5 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 to and from a vessel to the 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).

10.7 Communication

10.7.1 When persons are at work ensure that:

- They know exactly what they are permitted to do
- Installed equipment cannot be remotely started
- Someone knows when work is taking place on site
- Procedures are established for 'lone workers'
- Proper levels of 'supervision' are established
- Workers can be contacted in an emergency
- Appropriate systems for communication between the wind farm and attendant vessels, with the shore and with the Maritime and Coastguard Agency in case of emergency, are provided.

10.8 Site Services

10.8.1 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
- 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.

10.9 Lifting and Handling

10.9.1 Before carrying out any manual handling operations ensure that:

- They comply with the Manual Handling Operations Regulations 1992
- They are really necessary
- They have been properly assessed
- Any available mechanical aids to lifting and handling are provided
- Persons are trained and adopt correct manual lifting practices
- The work can be safely carried out in the space available.

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

- Valid test certificates exist, including those for slings, lifting chains, etc.
- Only trained and competent people are involved
- Proper risk assessments are made of the work
- 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 operating in poor weather conditions are clearly identified
- Safe practices are adopted during the use of elevated access platforms or man riding platforms
- All loads are suitably packed and secured for transport and clearly marked with their weight and position of centre of gravity
- All lifting operations are properly planned and lifting devices are of adequate capacity
- 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 should also be taken into account when assessing the competence and training requirements of those involved, *e.g. crane drivers and banksmen*
- Loads to be sent offshore need to be 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.

10.10 Information, Training and Supervision

10.10.1 It should be ensured that:

- Sufficient supervision of appropriate experience is provided
- Statutory notices and posters are displayed
- Signs, notices and labels are fixed on items of equipment

- Induction training is provided
- Workers know and understand any site rules and procedures
- Workers have an opportunity to discuss health and safety issues.

10.10.2 Before and during work on site:

- Establish that workers have the necessary skills and experience
- Ensure that any specialist or refresher training is provided
- Make an assessment following any training
- Record details of information and training
- Proper maintenance procedures/instructions are issued to workers
- Workers know of requirements to report accidents
- Ensure that basic first aid can be provided.

10.10.3 Establish procedures for non-workers such as:

- Providing information to landowners, *e.g. location of buried cables*
- Providing information for members of the public, *e.g. designated rights of way*
- Ensure statutory warning notices are in place.

10.11 Record Keeping

10.11.1 Ensure that:

- A health and safety policy statement is written, if required
- All relevant statutory records are maintained
- The Health and Safety File is amended, including drawings, following any modification
- Written schemes of examination are available for relevant pressure systems
- Any 'health' records are properly maintained
- An accident book is available to workers.

10.11.2 Establish appropriate records such as:

- Maintenance/inspection of PPE, *e.g. safety harnesses*
- Testing of fire alarms and drills
- Maintenance/inspection of fixed and portable fire fighting equipment
- Written risk assessments, *e.g. COSHH, manual handling*
- Training
- Auditing, monitoring, checks or inspections carried out
- Tests on any installed safety feature, *e.g. overspeed devices, emergency lighting*
- Portable electrical appliance testing
- Significant events such as high voltage switching.

10.12 Personal Protective Equipment (PPE)

10.12.1 Persons working on site should be provided with:

- PPE to protect against risks that can not be controlled by other means
- Training in the correct use of, and any maintenance requirements for, PPE.

10.12.2 When assessing the needs for PPE take account of:

- The work process, *e.g. hot work (the application of heat, including welding, burning or grinding on plant containing flammable materials), work at height, work on, near or over water, confined spaces*
- COSHH assessments
- Remoteness of the site and climatic conditions
- The need to work outside, *e.g. exposure to ultra violet light.*

10.13 Chemicals and Substances

10.13.1 A suitable COSHH assessment should be made for:

- All chemicals and other substances used on site, *e.g. epoxy based materials*
- Processes causing dust and fumes, *e.g. welding, grinding, etc.*

10.13.2 Ensure that proper arrangements are made for:

- Correct handling of chemicals/substances
- Correct storage of chemicals/substances
- Correct transport arrangements

- Provision of suitable first aid
- Containment of spillages.

10.14 Reporting of Accidents/Dangerous Occurrences

10.14.1 To comply with statutory requirements:

- Details of all accidents must be recorded in the accident book
- Reports under RIDDOR must be made to the enforcement authority
- Ensure that reports under the Safety, Quality and Continuity Regulations 2001 are made.

10.14.2 Ensure that local procedures exist for:

- Accident/incident reporting for **all** workers, including contractors.

10.15 Occupational Health

10.15.1 Establish procedures that define:

- Any requirements for a pre-employment medical
- Any legal requirements for health surveillance
- Any local minimum standards, *e.g. fitness, eyesight, hearing*
- Proper arrangements for health records, e.*g. confidentiality*
- Appropriate medicals for personnel working offshore.

10.16 Safety Equipment

10.16.1 Assess the requirements for safety equipment such as:

- 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*
- Survival/immersion suits, lifejackets, buoyancy aids, throwing lines and personal location beacons.

10.16.2 In addition to providing this equipment ensure that:

- It is recorded on a register
- Persons are trained and competent in its use
- It is properly stored, regularly maintained and tested.

10.17 Maintenance Programmes

10.17.1 Periodic maintenance/inspection/testing procedures 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 back up
- Portable electrical appliances
- Electrical earthing and lightning conductors
- Equipment installed with high integrity, *e.g. blade fixings*
- Access plant and equipment
- Mechanical handling equipment
- Cathodic protection and coating systems
- Foundation integrity
- Seabed scour, etc.

OFFSHORE WIND FARMS

Introduction

The design, construction, operation, maintenance and removal of offshore wind farms requires consideration of a number of matters over and above those for onshore ones. Offshore wind farms are at the mercy of wind, wave and weather, and present difficulties in terms of access, work and emergency response. The safety and survival of personnel working offshore is of paramount importance. When work is being carried out on unmanned structures a vessel must always be in attendance with good communication links between weather stations, vessel and personnel to enable speedy evacuation should there be an adverse change in the sea state. This appendix discusses in more depth some of those factors identified in the main text as particular to offshore operations.

Site Development and Planning

When identifying potential offshore sites for wind farms, particular attention may need to be paid to oceanographic and meteorological factors. Areas with large tidal ranges or severe currents will present problems in terms of access for normal operations and also when dealing with an emergency. Such conditions may well severely restrict the size of 'working windows' and should be taken into account when selecting a site and/or the design of equipment to be used. Any vessels used for access and transport of material will need to be assessed for their ability to hold position and the size of such vessels may be restricted by available water depth. Strong currents may also make the seabed prone to scour problems.

The proximity of shipping lanes will also have to be taken into account, together with the possibility of vessel collision, whether from passing vessels or in-field craft servicing the wind farm. Under the Geneva Convention on the Continental Shelf 1958, a 500m exclusion zone is established around any offshore structure, including a wind farm.

Design, Assembly, Manufacture and Specification

Due to the nature of the environment, the design of the wind turbines and ancillary equipment needs to take into account not only wind and weather but also the potential corrosion problems not usually found at inland sites.

Fire offshore is potentially much more serious than onshore. It is not possible to run away from a fire offshore. Therefore, a fire risk assessment should be performed for every installation, including the identification of appropriate prevention, detection, control and mitigation measures. A fixed fire fighting system may be necessary in order to provide an appropriate level of protection for personnel when working offshore.

The design phase is particularly important for offshore wind farms since the cost of retrofitting equipment is much greater than for onshore sites.

Designers should aim to maximise the work, such as fabrication, commissioning and testing, which can be done onshore in order to minimise the work to be undertaken offshore.

During design, the means of access and egress from the turbines needs to be addressed. Specialised commercial access systems and craft are available for this type of operation and fitting such a system should be considered at the design stage.

Offshore wind farms should be designed to minimise the need to work at height in exposed positions. As far as possible, the use of vertical ladders should be eliminated not only to reduce the risk of falls but also fatigue and making the rescue of casualties easier.

Consideration should be given to the potential need to interrupt the offshore operations because of weather or sea state. The design should include an erection sequence which allows the partially erected structure to be left in a safe condition whilst waiting on weather. It is best to avoid the need for a prolonged weather window, which may be difficult to obtain during much of the year at many sites around the UK.

Construction, Commissioning, Dismantling and Demolition

During these phases, it is assumed that personnel will be accommodated either onshore or on a suitable

vessel. Where on site accommodation is not provided, a vessel must be in attendance throughout the period work is taking place to ensure that personnel can be promptly recovered from the work place should the sea state change.

One of the key issues which needs to be addressed during this and the operation and maintenance phase is that of emergency response. Any offshore emergency will have to be dealt with using the resources available offshore or on an attendant vessel.

It is recommended that a site specific evacuation, escape and rescue risk assessment be performed for individual sites and individual construction operations. Such a risk assessment will provide the basis for the development of an appropriate emergency response plan.

The emergency response plan should address all foreseeable emergency situations, *e.g. persons falling into the water,* and should be the subject of regular desk top exercises and drills. The emergency response plan will need to clearly set out the roles and responsibilities of everyone together with the actions to be taken to deal with all reasonably foreseeable scenarios requiring an emergency response. The plan should also address the need for the taking of persons to a place of safety, which means somewhere where medical treatment and other facilities are available. Everyone working offshore will need to receive appropriate basic training supplemented by more specialised training for those given specific roles in an emergency. Refresher training will be required at appropriate intervals.

Careful consideration will need to be given to the provision of appropriate means of evacuation and rescue, taking into account the need to handle casualties. The most appropriate arrangement may well be an attendant vessel which can deploy groups of men on a number of turbines within the site but be within easy reach in order to take personnel off in the event of a deterioration in the weather or as a result of illness or injury. Such a vessel needs to be of such a design that it can reach all the turbines in a particular site and be capable of taking people off safely, including any casualties. It will also need to be manned by a competent crew who have received appropriate training and are exercised regularly in the emergency scenarios with which they may be involved. Appropriate means of communication between the vessel and the turbines and the shore will need to be available.

When planning work, it will be necessary to take into account accurate weather forecasts, preferably from at least two sources, and organise the work on the basis of the attendant vessel's performance in terms of its ability to take off personnel, especially casualties, in relation to the weather and sea state.

Any pollution risks will need to be identified and appropriate procedures established to deal with any pollution incident.

Operation and Maintenance

Appropriate policies and procedures need to be devised and implemented with respect to site visits, distinguishing between planned maintenance visits and unplanned intervention visits in the event of a breakdown. The former can be carefully planned to ensure that such activities are undertaken during the summer when weather and sea conditions are likely to be at their most benign and more daylight is available. However, intervention visits may be necessary during the winter months and the policies and procedures should clearly reflect the adverse weather policy for the particular site to ensure that such visits are properly planned and only undertaken when conditions are considered to be safe and personnel, including casualties, can be recovered by the attendant vessel.

If there is the possibility of personnel being marooned on a turbine overnight due to weather or sea conditions, suitable sleeping accommodation may have to be provided. Such accommodation will need to include shelter, heating, emergency power and supplies of food and drinking water.

INTRODUCTION

The following information is a summary of UK health and safety legislation that is relevant to wind farm developments. It is **not** a legal interpretation and does not cover every detail. It is incumbent on all persons with legal responsibilities to ensure that they are aware and fully understand **all** current legal requirements.

THE HEALTH AND SAFETY AT WORK, ETC. ACT 1974

1. 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 which is safe, without risks to health, and which has adequate facilities and arrangements for employees' welfare at work.

2. Under the HSW Act, employees also have a legal duty to take reasonable care of themselves and others and to co-operate with their employers regarding their legal obligations. In addition, the Act applies to all contractors hired to work on the wind farm. They are required to ensure that their activities are not a danger to themselves or others.

3. Employers will also have a responsibility for the health and safety of visitors, *e.g. members of the public, self-employed people or contractor's employees working with them*, who may be affected by work activities under the contractor's control. This may entail co-operating and exchanging information with all those employers working on the wind farm about each others' undertakings.

4. 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.

5. 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, *e.g. 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.

MANAGEMENT OF HEALTH AND SAFETY AT WORK REGULATIONS 1999

1. The Management of Health and Safety at Work Regulations 1999 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.

2. 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.

3. 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.*

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

HEALTH AND SAFETY (FIRST AID) REGULATIONS 1981

1. 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 *First Aid at Work* explains the requirements and provides guidance to help employers meet their obligations.

THE REPORTING OF INJURIES, DISEASES AND DANGEROUS OCCURRENCES REGULATIONS 1995

1. 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 enforcing authority.

2. 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:

(a) i. an employee or a 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 seven 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) where *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 seven days in which to send a report to the enforcing authority.

3. Further information, including the definition of 'serious injury', is given in the HSE booklet *A Guide to the Reporting of Injuries, Diseases, and Dangerous Occurrences Regulations 1995.*

THE WORKPLACE (HEALTH, SAFETY AND WELFARE) REGULATIONS 1992

1. 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.

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

PERSONAL PROTECTIVE EQUIPMENT AT WORK (PPE) REGULATIONS 1992

1. 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 the employees.

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

THE MANUAL HANDLING OPERATIONS REGULATIONS 1992

1. 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.

2. Further guidance on the Regulations is given in the HSE booklet *Manual Handling.*

THE PROVISION AND USE OF WORK EQUIPMENT REGULATIONS 1998

1. 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 *Safe Use of Work Equipment.*

LIFTING OPERATIONS & LIFTING EQUIPMENT REGULATIONS 1998

1. In the main the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) replaces 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 & Use of Work Equipment Regulations 1998.

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

HEALTH AND SAFETY (DISPLAY SCREEN EQUIPMENT) REGULATIONS 1992

1. The Regulations impose minimum health and safety requirements for work with display screen equipment where there is a 'user', that is, an employee who habitually uses display screen equipment as a significant part of normal work.

2. Further guidance on the Regulations is given in the HSE booklet *Display Screen Equipment Work.*

CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS 1999

1. The Control of Substances Hazardous to Health Regulations 1999 (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.

2. The employer is required to carry out an assessment of the health risks which 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.

3. 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 are they handled; what harmful effects are possible; who is likely to be affected
- Introduce appropriate measures to prevent or control the exposure to those substances where a risk has been identified which needs to be controlled, such as substitution by a safer product
- Ensure that control measures are used and that equipment is properly maintained and procedures observed
- 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.

4. Practical guidance on COSHH is given in HSE publications *COSHH - New Brief Guide for Employers (IND(G)136L); Introducing COSHH (IND(G)65L); COSHH - Hazard and Risk Explained (IND(G)67L); COSHH - Introducing Assessment (IND(G)64L)* and in some detail in the Approved Code of Practice to the Regulations.

THE NOISE AT WORK REGULATIONS 1988

1. These Regulations are intended to reduce hearing damage caused by loud noise. They require employers to take action when noise exposure reaches an 85 dB(A) 'First Action Level' and further action if it reaches 90 dB(A) 'Second' or 140 dB(A) 'Peak' Action Levels. At the First Action Level, employers have to provide ear protectors to any employees who want them. Control of levels above 90 dB(A) has to be by means other than ear protectors where reasonably practicable.

2. Further information is given in the HSE publication *Introducing the Noise at Work Regulations: A Brief Guide to the Requirements for Controlling Noise at Workplaces.*

ELECTRICITY AT WORK REGULATIONS 1989

1. 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.

2. 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.

3. 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.

4. Further information is given in HSE publications *GS24 Electricity on Construction Sites; HS(G)85 Electricity at Work - Safe Working Practices* and in the *Memorandum of Guidance on the Electricity at Work Regulations 1989.*

THE 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.

CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 1994

1. These Regulations apply to construction projects and everyone associated with them: clients, designers, professionals, contractors and site workers. The Regulations are about the management of health and safety on construction projects. They may not apply to every project or to everyone all of the time, but most significant projects will be affected.

2. The Regulations place duties on clients, planning supervisors, designers and contractors to plan, co-ordinate and manage health and safety throughout all stages of a construction project.

3. Anyone who appoints a designer or contractor has to ensure that they are competent for the work and will allocate adequate resources for health and safety.

4. Guidance on the Regulations is given in *Managing Construction for Health and Safety* and *Construction (Design and Management) Regulations 1994 Approved Code of Practice.*

CONSTRUCTION (HEALTH, SAFETY AND WELFARE) REGULATIONS 1996

1. The Construction (Health, Safety and Welfare) Regulations 1996 impose requirements with respect to the health, safety and welfare of persons carrying out 'construction work' and others who might be affected by such work.

2. The Regulations only apply to construction work carried out on a "construction site where the principle activity is construction work". They would not, therefore, apply to routine maintenance activities on an operational wind farm but the principles applying to Falls, Fragile Material and Falling Objects are commended to all work sites.

3. Guidance on the Regulations is given in *Health and Safety in Construction.*

CONFINED SPACES REGULATIONS 1997

1. These Regulations apply to all work situations in Great Britain except for diving operations and mining.

2. The key duties are:

- Avoid entry to confined spaces, *e.g. by doing the work from outside*
- If entry to a confined space is unavoidable, follow a safe system of work
- Put in place adequate emergency arrangements before the work starts.

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

FIRE PRECAUTIONS (WORKPLACE) REGULATIONS 1997

1. The main requirement under the Fire Precautions (Workplace) Regulations is to make an assessment of workplace fire risks. The regulations provide for minimum fire safety standards in places where people work.

2. The regulations do not apply to some 'excepted' workplaces. Details of the 'excepted' workplaces and other guidance can be found in *Fire Precautions in the Workplace* produced by the Home Office.

DIVING AT WORK REGULATIONS 1997

1. The Diving at Work Regulations 1997 require 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, to take such measures as it is reasonable for a person in his position to take to ensure that these Regulations are complied with.

2. Such people include:

- The client who placed a contract with a diving contractor to deliver a diving project
- The principal contractor carrying out work for the client and overseeing the work of the diving contractor
- A consultant acting for the client, owner, contractor or agent
- A master of a vessel or floating structure from which diving is to take place who controls the vessel or floating structure and all personnel on it
- Any other person whose actions or activities may affect the safety of the diving project.

3. These people need to carefully consider the actions required of them to comply with these Regulations. They should, where appropriate:

- Take reasonable steps to ensure that any diving contractor selected is capable of complying with the Regulations
- Make available to the diving contractor the results of any risk assessments undertaken by other persons under other statutory legislation that could affect the health and safety of the dive team
- Agree 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
- Consider whether any known underwater or above-water items of plant under their control may cause a hazard to the dive team
- Consider whether other activities in the vicinity may affect the safety of the diving project
- Ensure they have a formal control system in place to cover diving activities
- Provide the diving contractor with details of any possible substance likely to be encountered by the dive team that would be a hazard to their health
- Keep the supervisor informed of any changes that may affect the supervisor's diving operation in so far as they have control or knowledge of such changes.

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

5. Further information is available in the *Diving at Work Regulations 1997 Commercial Diving Projects Offshore* Approved Code of Practice and the *Diving at Work Regulations 1997 Commercial Diving Projects Inland/Inshore* Approved Code of Practice.

OTHER RELEVANT LEGISLATION

- The Pressure Systems and Transportable Gas Containers Regulations 1989
- The Safety Signs Regulations 1980
- The Safety Representatives and Safety Committee's Regulations 1977
- Fire Precautions Act 1971
- The Safety, Quality and Continuity Regulations 2001
- The Electricity (Overhead Line) Regulations 1970
- The Construction (Head Protection) Regulations 1989
- The Factories Act 1961
- Offices, Shops and Railway Premises Act 1963
- Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997

REFERENCES

1. Successful Health and Safety Management: HS(G)65. HSE
ISBN 0 7176 1276 7

2. Memorandum of Guidance on the Electricity at Work Regulations 1989: HS(R)25. HSE
ISBN 0 11 883963 2

3. Electricity at Work Safe Working Practices: HS(G)85. HSE
ISBN 0 11 882081 8

4. Essentials of Health and Safety at Work
ISBN 0 7176 0716 X

5. Guide to the Health and Safety at Work, etc. Act 1974 - Guidance on the Act
ISBN 0 71 760441 1

6. BS 7671:1992 Requirements for Electrical Installations. Institution of Electrical Engineers 16th Edition 1992.
ISBN 0 85 296557 5

7. Avoidance of Danger from Overhead Electrical Power Lines GS 6 (rev) 1991. HSE
ISBN 0 7176 13488

8. BS 5304:1988. Safety of Machinery 1988.
ISBN 0 58 016344 X

9. Management of Health and Safety at Work Regulations 1999. Approved Code of Practice L21. HSE
ISBN 0 7176 2488 9

10. First Aid at Work: Health and Safety (First Aid) Regulations 1981. Approved Code of Practice and Guidance L74. HSE
ISBN 0 7176 1050 0

11. Guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995. L73. HSE
ISBN 0 7176 10128

12. Workplace (Health, Safety and Welfare) Regulations 1992. Approved Code of Practice and Guidance L24. HSE
ISBN 0 7176 0413 6

13. Personal Protective Equipment at Work Regulations 1992. Guidance on Regulations L25. HSE
ISBN 0 11 886334 7

14. Manual Handling Operations Regulations 1992. Guidance on the Regulations L23. HSE
ISBN 0 7176 2415 3

15. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice & Guidance on the Regulations L22. HSE
ISBN 0 7176 1626 – 6

16. HSE free leaflet INDG291 – Simple Guide to the Provision and Use of Work Equipment Regulations 1998

17. Health and Safety (Display Screen Equipment) Regulations 1992. Guidance on the Regulations L26. HSE
ISBN 0 11 886331 2

18. General COSHH ACOP (Control of Substances Hazardous to Health), Carcinogens ACOP (Control of Carcinogenic Substances) and Biological ACOP (Control of Biological Agents). Control of Substances Hazardous to Health Regulations 1999. L5. HSE
ISBN 0 7176 1308 9

19. HSE free leaflets:

IND(G)136L	COSHH A New Brief Guide for Employers
IND(G)65L	Introducing COSHH
IND(G)67L	COSHH - Hazard & Risk Explained
IND(G)64L	COSHH – Introducing Assessment

20. HSE free leaflet: IND(G)75L (rev) 1989. Introducing the Noise at Work Regulations – A Brief Guide to the Requirements for Controlling Noise at Work

21. HSE leaflet (single copies free, otherwise priced): IND(G)163 5 Steps to Risk Assessment

22. HSE free leaflet: IND(G)98 Permit to Work Systems

Appendix 3

23. HSE free leaflet: IND(G)76L Safe Systems of Work

24. HSE free leaflet: IND(G)133L Selecting a Health & Safety Consultancy

25. HS(G)96 The Costs of Accidents at Work
ISBN 0 7176 1343 7

26. Managing Construction for Health and Safety
ISBN 0 7176 0792 5

27. Construction (Design and Management) Regulations 1994. Approved Code of Practice. HSE
ISBN 0 7176 2139 1

28. Designing for Health and Safety in Construction – A Guide for Designers on the Construction (Design and Management) Regulations 1994. HSE
ISBN 0 7176 0807 7

29. HSE free leaflet: C750 PML 54 CDM Regulations. How the Regulations Affect You!

30. HS(G)130. Health and Safety for Small Construction Sites
ISBN 0 7176 0806 9

31. A Guide to Managing Health and Safety in Construction. Construction Industry Advisory Committee. HSE
ISBN 0 7176 0755 0

32. HSE free leaflet: IND(G)199(L) Managing Vehicle Safety at the Workplace
ISBN 0 7176 0982 0

33. Fire Precautions in the Workplace. Information for Employers about the Fire Precautions (Workplace) Regulations 1997. The Stationery Office.
ISBN 0 11 341169-3

34. Safe Use of Lifting Equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and Guidance L113
ISBN 0 7176 1628 2

35. HSE free leaflet INDG290 - Simple Guide to the Lifting Operations and Lifting Equipment Regulations 1998

36. Safe Work in Confined Spaces. Approved Code of Practice, Regulations and Guidance L101
ISBN 0 7176 1405 0

37. HSE free leaflet INDG258 – Safe Work in Confined Spaces

38. Health and Safety in Construction HS(G)150
ISBN 07176 1143 4

39. Diving at Work Regulations 1997. Commercial Diving Projects Offshore. Approved Code of Practice
ISBN 0 7176 1494 8

40. Diving at Work Regulations 1997. Commercial Diving Projects Inland/Inshore. Approved Code of Practice
ISBN 0 7176 1495 6

41. CAP 437 Offshore Helicopter Landing Areas: A Guide to Criteria, Recommended Minimum Standards and Best Practice. Civil Aviation Authority

42. Effective Collision Risk Management for Offshore Installations. Offshore Technology Report - OTO 1999 052

Appendix 4

HEALTH AND SAFETY EXECUTIVE CONTACT POINTS

1. HSE Priced and Free publications are available from:

HSE Books
PO Box 1999
Sudbury
Suffolk
CO10 6FS

Tel. 01787 881165
Fax. 01787 313995

HSE priced publications are also available from good booksellers

2. General advice is available by:

Writing to: HSE Information Centre
Broad Lane
Sheffield
S3 7HQ

Telephoning: HSE InfoLine 08701 545500

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

4. Enquiries relating to diving operations should be directed to the appropriate Diving Inspection Teams in London (020 7717 6000) for London, Southern England and Wales, Norwich (01603 828000) for Central and Northern England and Aberdeen (01224 252500) for Scotland.

5. HSE website http://www.hse.gov.uk

BWEA Company Directory
as at April 2002

Amec Wind, Bonus Energy A/S, Enron Wind, National Wind Power Ltd, Powergen Renewables Ltd, Renewable Energy Systems Ltd, Scottish Power, Shell International Renewables Ltd, TXU Europe, ABB Zantingh Ltd, AEA Technology Environment, Aegis Rubber Engineering, B9 Energy (O&M) Ltd, Babtie Group Limited, Bond Pearce Solicitors, British Energy plc, Brodies W.S., Solicitors, Clarke Energy Ltd, Conoco Global Power U.K. Ltd, Corus, CTC Marine Projects, D.N.V.Consulting, Dowding & Mills Engineering Services, Dresdner Kleinwort Wasserstein, Econnect Ltd, Edison Mission Energy Limited, Edmund Nuttall Limited, ELSAM A/S, Energiekontor (AG), ENERTRAG UK Ltd, Entergy Wholesale Operations, Ernst & Young, Force 9 energy Ltd, Fugro Limited, Garrad Hassan & Partners Ltd, GREP A/S, Halliburton KBR, Hyder Consulting Limited, Hydro Soil Services, Ingenco Ltd, John Brown Hydrocarbons Ltd, John Mowlem & Company plc, Keliston Engineering Ltd, Kier Construction Limited, London Power Company, M & N Wind Power Ltd, Masons, Mayflower Corporation plc, Met Office, Miller Insurance Group, Morgan Cole, Nabarro Nathanson, Natural Power Consultants Ltd, NEG Micon UK Ltd, Nordex UK Ltd, Northern Electric Generation Ltd, Norton Rose, Nsure Renewables, Offshore Energy Resources Limited, Pirelli Cables Ltd, QinetiQ Ltd, R.D.C. Ltd, Renewable Solutions Ltd, Repower Systems AG, RJ McLeod (Contractors) Ltd, Royal & SunAlliance, Schneider Electric, Scottish & Southern Energy plc, Seacore Ltd, SLP Energy Ltd, SP Dataserve Ltd, Tomen Power Corporation UK Ltd, Triodos Bank, United Utilities Green Energy, Vestas - Danish Wind Technology A/S, Warwick Energy Limited, Wind Prospect Ltd, Windelectric Ltd, Windforce Energy Development Ltd, Windjen Power Limited, Wragge & Co, Yorkshire Windpower Ltd, Your Energy Ltd, A2Sea A/S, ABP mer, AEI Cables Ltd, Agrilek Limited, Airtricity Development Ltd, Allen & Overy, Ambient Energy Ltd, Andaray Engineering Ltd, Anglesey Wind & Energy Ltd, Baywind Energy Co-operative Ltd, Bendalls Engineering, Bomel Limited, Bosch Rexroth Ltd, Brooks Ltd, Compact Orbital Gears, Brown McFarlane Ltd, Cable Installation Management Ltd, Casella Stanger Ltd , Cambrian Engineering (Cymru) Ltd, Charles W. Taylor & Sons Ltd, Chris Blandford Associates, Collett Transport Ltd, Cornwall Light and Power Co Ltd, Coupe Foundry Ltd, Cumbria Windfarms Ltd, Cwmni Gwynt Teg Cyf, Dansteel Ltd, DM Energy, DP Energy Ltd, DSB Offshore Limited, Dulas Ltd, E4environment Limited, Eclipse Energy, EcoGen Ltd, eeegr, East of England Energy Group, EMU Ltd, Energy for Sustainable Development, Enviros Aspinwall, ESB Power Generation, Renewables, Fairfield Mabey Ltd, Farm Energy Ltd, Global Marine Systems Ltd - Energy Services, GPA Partnership, GreenPower, Halcrow Group Ltd, Hammond Suddards Edge, Heath Lambert Group, Hedley Purvis, HR Wallingford, Impax Capital Corporation, Inframan Ltd, IT Power Ltd, Landscape Design Associates, Marlec Engineering Co Ltd, Martineau Johnson, Mersey Docks & Harbour Company, Metoc plc, Nicholas Grimshaw & Partners, North Energy Associates Ltd, Oceans Engineering Ltd, Oceantecs Limited, ODE, Offshore Design Engineering Ltd, Orga Suisse S.a.r.l, Osborne Clarke, PMSS Ltd, Posford Haskoning Ltd, Proven Engineering Products Ltd, Renew North, RenGen Ltd, ReSoft Ltd, RMB Engineering Services, RSK Environment Limited, Ruston Wheb, Seabed Scour Control Systems Ltd, Stephenson Halliday, Strategic Alliance Services, Thales Geosolutions, The Stewart Group Limited, Theodore Goddard, Titan Environmental Surveys Ltd, Titan Maritime (UK) Ltd, TLT Solicitors, TMEnvironmental Power, Toby Manning Limited, unit[e], Vector Instruments, Wavegen, West Coast Energy Ltd, Western Windpower, Wichita Co. Ltd, WindGeneration Ltd, WKN Offshore Tech. GmbH, Wrigleys Solicitors, Centre for Economic Renewable Power Delivery, Centre for Sustainable Energy, CLRC, Rutherford Appleton Laboratory, CREST, Heriot-Watt University, National Energy Foundation, Open University, UMIST, University of Durham, University of the West of England,

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ISBN 1 870064 30 5