



Appendix E

Safety Management System





CAPE WIND PROJECT

SAFETY MANAGEMENT SYSTEM

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1 ABBREVIATIONS

Term	Explanation
ANSI	American National Standards Institute
API	American Petroleum Institute
ATON	Aids to Navigation
BoP	Balance of Plant
BOEMRE	Bureau of Ocean Energy Management, Regulation, and Enforcement
BWEA	British Wind Energy Association
CFR	Code of Federal Regulations
COLREGS	International Regulations for Preventing Collisions at Sea 1972
COP	Construction and Operation Plan
CVA	Certification Verification Agency
CWA	Cape Wind Associates LLC
H&S	Health & Safety
EMI	Energy Management, Inc.
ESP	Electrical Service Platform
FAA	Federal Aviation Administration
HAZID	Hazard Identification
HAZOP	Hazard and Operability Study
HV	High Voltage (Typically 600 Volts or greater)
KPI	Key Performance Indicators
LOTO	Lockout Tagout
MC	Marine Coordinator
MOB	Man Over Board
MOC	Management of Change

Term	Explanation
MOU	Memorandum of Understanding
NEC	National Electric Code (NFPA 70)
NFPA	National Fire Protection Association
NSTAR	NSTAR Electric and Gas Corporation
O&M	Operation and Maintenance
OSHA	Operational Safety and Health Administration
OSRP	Oil Spill Response Plan
PATON	Private Aids to Navigation
PLB	Personal Location Beacons
PPE	Personal Protective Equipment
RTA	Road Traffic Accident
SCADA	Supervisory Control and Data Acquisition
SMS	Safety Management System
SOLAS	Safety of Life At Sea
SWL	Safe Working Load
TSA	Turbine Supply Agreement
TP	Transition Piece
USCG	United States Coast Guard
WTG	Wind Turbine Generator

2 INTRODUCTION

CWA has developed a SMS that describes:

- How CWA will ensure the safety of personnel and others near the facilities.
- Remote monitoring, control, and shut down capabilities [with reference to the O&M Plan included in the COP].
- Emergency response procedures [with reference to the COP].
- Fire protection equipment [with reference to the plant design and O&M Plan included in the COP].
- Testing of the SMS.
- Personnel training.

However, it is important to note that the SMS is a living document that will continue to evolve as CWA finalizes contracts for engineering, procurement, construction, and operation of the project. The SMS will also be updated as CWA contractors conduct engineering, construction and operations of the project. Detailed methods and procedures implementing the SMS will be developed in consultation with BOEMRE and the relevant health and safety regulatory agencies.

This SMS plan describes the approach to safety management to be adopted through the engineering, construction, and operation of the Cape Wind offshore wind farm. The plan details the SMS elements including specific safety practices and procedures to be adopted, based on good practice on offshore wind projects in Europe, and other pertinent offshore experience and regulatory requirements in the USA.

3 SAFETY MANAGEMENT SYSTEM ELEMENTS

The SMS elements will comprise:

- Overall policies and objectives.
- Organization and responsibilities.
- Methods to identify and assess hazards (HAZOP, HAZID, risk assessment).
- Methods to control and mitigate hazards (risk management, defined procedures and method statements for specific activities, training).
- Emergency response procedures.
- Monitoring and auditing of compliance with the SMS, good practice and regulations.
- Continuous improvement.

At high level the SMS elements will address the following key aspects of the project:

- All permanently installed offshore structures which will be unmanned, specifically the WTGs and ESP, and their foundations and substructures. The SMS will focus on the procedures for working on these components, and access and egress with a prescribed range of conditions, the main precedents for good practice being set by European projects and experience gained in the US offshore oil and gas sector.

- Construction vessels and jack-up barges which will be used during construction, and potentially during planned and unplanned maintenance should the need for heavy lift operations be required. The SMS will focus on the suitability of vessels to perform the tasks required operating under the site conditions. This will need to recognize US experience and governmental statutory requirements.
- Access and service vessels used during both construction and operational phases which should operate under SOLAS and US regulations, for example 46 CFR 109.
- Emergency evacuation procedures, for example taking into account 33 CFR 146.210 and any other applicable procedures dictated by the regulatory agencies.
- Elements of the SMS will reflect US electric utility industry best practices especially with respect to the high voltage electrical systems on the ESP. Standards and practices set forth in the National Electric Code (NEC), ANSI, and other applicable US standards identified in the COP for the power industry will be considered.
- Onshore transportation and marshalling activities.

3.1 SMS DEVELOPMENT

Methods and procedures will be developed from high level to detailed level as the project progresses through the following stages:

- Appointment of contractors for the engineering, procurement, construction and operation of the project, and the CVA.
- Detail engineering design and specification, HAZOP and risk assessment stages, and regulatory review.
- Pre-construction safety planning including preparation and approval of detailed method statements and procedures for specific activities.

First stage HAZOP and risk assessment is expected early in 2011, following selection of preferred bidders for the main contracts, as this will require their involvement to be meaningful and specific to the project.

Specification of detailed method statements and procedures will be dependent on the specification of the plant to be installed and the equipment to be used to install it, which will necessarily follow appointment of the contractors.

Different detailed method statements and procedures may be adopted for similar activities, for example during construction or operational phases, depending upon the contract strategy and responsibilities for performance and safety management of the particular activity. However, what will be common is the need to robustly demonstrate that proposed methods and procedures adequately assess all safety concerns and that safety training occurs before each activity commences.

Furthermore, the SMS will be developed to incorporate lessons learned as the project progresses through construction and operation.

It should be acknowledged that the offshore wind industry is just emerging in the US and Cape Wind may be the first utility scale offshore wind project constructed. Thus, many method statements and procedures will be initially developed from the experiences of a mature offshore wind industry in Europe.

In preparing the SMS, CWA intends to work with regulators to leverage lessons learned from other industries and address specific safety concerns regulators may have for the US offshore wind industry.

While the majority of best European offshore wind practices may be emulated in the SMS, the Cape Wind project team will consider the lessons learned from US unmanned offshore oil and gas facilities and the requirements of the USCG's regulations in 33 CFR Subchapter N and OSHA Occupational Safety and Health Standards 29 CFR 1910, 1915, 1917, 1918 & 1926 . Relevant sections of the following regulations relating to unmanned facilities may include the following:

- Workplace Safety and Health – 33 CFR Part 142.
- Design and Equipment – 33 CFR Part 143.
- Lifesaving Appliances – 33 CFR 144.10.
- Firefighting Equipment – 33 CFR Part 145.
- Operations – 33 CFR Part 146.

Additionally, CWA will consider studies commissioned by BOEMRE, especially TAR Project #633, "Wind Farm/Turbine Accidents and the Applicability to Risks to Personnel and Property on the OCS, and Design Standards to Ensure Structural Safety/Reliability/Survivability of Offshore Wind Farms on the OCS" – and the proposed SMS template provided with this study.

3.2 REGULATORY JURISDICTIONS

CWA is committed to providing the most comprehensive and highest quality Health and Safety Plan for all of its employees and contractors by complying fully with all the regulatory requirements and policy applicable to the Cape Wind project. It is understood by Cape Wind that BOEMRE has full authority for regulating the working conditions directly associated with offshore renewable energy production activities on the OCS. The USCG will be responsible for working conditions associated with personal protective equipment (PPE), means of escape, housekeeping, guarding of decks areas, life saving devices and equipment, fire extinguishers and systems emergency communication equipment and commercial diving on the OCS. CWA is committed to working closely with the USCG, BOEMRE and OSHA to define areas where there is potential for some overlap as to which standards or jurisdiction apply as a result of the projects various scopes of work. Throughout the SMS structure we have worked to address the areas of uncertainty by referencing our intention to comply with BOEMRE, the USCG and OSHA as required and will seek guidance from all agencies involved to alleviate any potential conflicts or lack of clarity.

4 CAPE WIND PROJECT ORGANIZATION STRUCTURE

4.1 AREAS OF CONTROL

This SMS shall cover the project activities in several geographical locations, which make up the project site. Overall the geographical area of management control related to the H&S responsibility and reporting has been defined as follows:

- "Construction Staging Area" located at Quonset Point, North Kingston, RI or New Bedford Harbor, New Bedford, MA.

- “Offshore Wind Farm Site” area located on Horseshoe Shoal within Nantucket Sound off of Cape Cod, MA.
- “Construction Operations Facilities” means the temporary Owner provided facilities where the contractor operations will likely be based located in Falmouth MA.
- O&M Staging Area” The facility is anticipated to be located in the town of Falmouth, MA, with approximately 550’ of quay within the harbor, and docking facilities on site for two service vessels of approximately 50’ in length. This site may also include the “O&M Warehouse Area” and “Onshore Control Center”. When heavy lifting or repair activities are needed during the O&M phase, these will be staged out of New Bedford, MA
- “O&M Warehouse Area” is the location where the operational spare parts and supplies will be stored. The facility is anticipated to be located in [Falmouth, MA].
- “Onshore Control Center” means the Cape Wind onshore control center which is anticipated to be located in Cape Cod, MA.
- “Cable Installation Zone” meaning the zone in which the export cable is to be installed stretching from the “Offshore Wind Farm Site” to the boundary of the Barnstable Switching Station located in Barnstable, MA.

The activities at the following locations are excluded from the geographical area of management control related to H&S responsibility and reporting, and the appropriate contractors should ensure that they have an appropriate SMS system in place to cover their activities relating to the Contract. The loading and transportation of goods to areas defined above are excluded until the load arrives at an area under the Cape Wind project’s control.

- “TSA Contractor’s Factory” is the fabrication facilities of the TSA Contractor and its subcontractors.
- “Shipping Port” location for transporting the wind turbine generators by the TSA Contractor located at Esbjerg Harbor in Denmark.
- “ESP Fabrication Site” means the site at which the ESP is fabricated.
- “Monopile and TP Fabrication Site” means the fabrication facility for the monopiles and TP’s.
- Onshore utility substation. Any access to the Barnstable Switching Station would be by special arrangement with NSTAR.

On completion of the construction phase the area of main control will be contracted to cover only those areas that are required for continuing operation.

4.2 CAPE WIND ASSOCIATES ORGANIZATION

The CWA management team has direct experience managing the development, construction and operations of innovative power projects. The team is employed by the project manager, EMI. While at EMI, the same individuals developed, financed and managed the construction of a number of new and noteworthy electric generating facilities, including cogeneration projects, the first merchant power project in the United States, early air cooled power projects in New England, the first inlet chilled power project in New England and the largest biomass power project in the United States. As individuals, the members of the CWA team have tremendous experience managing the development, construction of large infrastructure projects and operations of such facilities.

CWA has assembled an interdisciplinary team to manage the development and construction of the project. CWA will also utilize the assistance of proven technical advisors and consultants in developing detailed project management and safety management plans.

CWA will require all contractors and project participants have a strong safety culture and safety first philosophy. It is paramount that all parties involved in the construction and operations of the facility emphasize a strong commitment to safety from the Senior Management level down through all levels of employees. Contractors will be required to integrate safety into all lines of their business. CWA will mandate a commitment by Senior Management to provide the necessary resources in support of safety initiatives and endorse a continued improvement philosophy that encourages employee involvement at all levels while implementing a best practice and personal ownership/accountability culture.

The project is to be organized to ensure that there is a clear chain of command and responsibility between CWA, its contractors and their subcontractors. This chain of command will be essential to ensuring the safe construction and operation of the wind farm. This will be further developed as the project progresses and the contractors are appointed.

CWA and EMI are well aware of the challenges associated with developing, constructing and operating an offshore wind farm. The selected contracting and project management strategy is aimed at mitigating the safety risks normally associated with delivering and operating offshore wind projects. A strong and focused project management team will be formed for the construction phase by CWA, and will include staff with direct offshore wind and marine construction experience.

Experience, skills and resources of the key contractors required for the construction and maintenance of the project is also of considerable importance to the project's successful delivery, and only companies with proven track records have been invited for consideration to participate in construction and maintenance services.

The main contractors for the project are anticipated to be:

- BoP Contractor who will supply the WTG foundations and substructures, electrical cables, and construction vessels; and will be assigned overall responsibility for H&S on the site during the construction phase.
- TSA Contractor or WTG supplier - Siemens Energy.
- ESP supplier, who may be the same as the WTG supplier
- Operations and Maintenance (O&M) Contractor who will undertake O&M during the operational phase, including provision of access vessels; and will be assigned overall responsibility for H&S on the site during the operational phase.

Further contractors or third parties will include:

- The Owner's technical advisors, including construction monitoring team and specific safety advisors anticipated to be SgurrEnergy and others to be determined.
- Foundation designers
- The CVA.
- Environmental Consultant - ESS Group.

Regarding the construction phase, the CWA team, with the assistance of Sgurr Energy and specialists in marine operations, are developing an organizational structure which is presented in Table 1, overleaf.

Regarding H&S, the project team includes:

- Health and Safety Coordinator whose role is to advise CWA on H&S issues during the design and planning phases of construction work. They will coordinate H&S aspects of design work and cooperate with others involved with the project to facilitate good communication between client, designers and contractors.
- The BoP Contractor whose role it is to manage, plan and coordinate the overall H&S compliance for the project. The BoP Contractor will plan, manage and monitor the construction and commissioning phases in liaison with all contractors participating in the project. They will prepare develop and implement a written SMS plan, and distribute the relevant parts of the plan to the other contractors. They will also coordinate with the CWA Project Director and the Health and Safety Coordinator regarding the ongoing compliance with all matters related to H&S. It is the responsibility of all contractors involved in the project to ensure their direct reports comply with their individual company safety policies and overall site policies. The BoP Contractor will have a dedicated H&S Manager to ensure compliance with all H&S and associated regulatory requirements.
- During the operational phase the organizational structure will change and be simplified with the O&M Contractor taking the main responsibility for the development, maintenance and compliance with the SMS system for the project. The O&M Contractor will have a dedicated H&S Manager to ensure compliance with all H&S and associated regulatory requirements.

Project Director							
Overall Project Management	Risk Management	Contract Management	Engineering Management	Construction Management	Quality Assurance	Document Control	Asset Management
Project Director	Health and Safety Coordinator	Contracts Manager	Engineering Manager	Construction Supervisor	Quality Assurance Manager	Document Control Manager	Asset Manager
Assistant Project Director	Security Coordinator	Project Controller	Mechanical Engineer	Construction Inspectors (7)	Quality Inspectors (5)	Office Supervisor	Assistant Asset Manager
Project Admin Assistant	Environmental Protection Coordinator	Project Accountant (2)	Electrical Engineer	Logistics Supervisor		Construction Admin Assistant (2)	
	Marine Coordinator	Insurance Coordinator	Civil Engineer	Logistics Assistant			
	Public Relations Manager		Junior Engineer				
			Engineering Admin Assistant				

4.2.1 PROJECT DIRECTOR

The Project Director will lead the project and be responsible for the implementation of the project with respect to work scope, budget, and schedule. Equally important is that the Project Director will work to ensure that the project is constructed safely, in accordance with the environmental permits, and to proper quality standards.

The Project Director will be CWA's authorized representative during the engineering and construction period for all matters related to the project. To oversee the project and meet his responsibilities, the Project Director will organize and direct the CWA management team to manage the TSA and BoP Contracts and monitor construction activities.

The Project Director will have ultimate responsibility for administering all the contractual obligations of the Cape Wind Project as well as coordination with government authorities, first-responder emergency agencies, and coordination between contractors.

4.2.2 HEALTH AND SAFETY COORDINATOR

The Health and Safety Coordinator will report to the Project Director and will have a staff to monitor compliance with the approved Construction and Operations Plan SMS and overall health and safety conditions for the project. While day to day responsibility for carrying out compliance with the Safety Management Plan will be a function of the turbine equipment supplier and BoP Contractors for their direct hire employees, the Health and Safety Coordinator will review the contractor's safety management plans for compliance with the COP SMS, law and contract requirements. The Health and Safety Coordinator will be tasked to establish a "safety first" working mentality at the project sites and on vessels involved in transport and construction.

Regularly schedule safety meetings will be held with contractors and their staff on health and safety aspects pertinent to the activities underway or about to be started. The Health and Safety Coordinator will confirm and document that the TSA and BoP Contractors have completed appropriate Health and Safety training prior to the start of construction activities. The Health and Safety Coordinator will also establish a system for all project team members to immediately report any unsafe conditions or practices observed and track corrective measures.

Special attention will be paid to actual and forecast weather conditions as these can significantly impact offshore construction and marine activities. Additionally, the Health and Safety Coordinators will be well versed in crane and heavy lifting safety protocols.

The Health and Safety Coordinator will collect contractors' safety reports and monitor for trends or other areas of concern. The Project Safety Coordinator shall be responsible for responding to health and safety incidents.

The Health and Safety Coordinator will also be responsible for ensuring the appropriate emergency response protocols are in place for interaction with the federal, state and local government first responders.

4.2.3 SECURITY COORDINATOR

The Security Coordinator will report to the Project Director. While primary responsibility for security will be assigned to the BoP Contractor, the Security Coordinator will liaise with all contractors and subcontractors on the project to address security provisions. In addition to the physical security of the onshore project staging area and port areas, the Security Coordinator will work closely with the Health and Safety Coordinator to ensure that appropriate agency notification plans are in place with federal, state, and local government first responders.

The Security Coordinator will become responsible for security of the offshore WTGs and ESP once these are commissioned.

4.2.4 ENVIRONMENTAL COORDINATOR

The Environmental Coordinator will report to the Project Director and will ensure that all local, state and federal permit requirements and laws relating to environmental protection and reporting are adhered to. CWA has worked with its Environmental Consultant, ESS, to produce a table of applicable permits and permit conditions for the Cape Wind project. Flow-down from these overall permit requirements have been assigned to the TSA and BoP Contractors. The Environmental Coordinator will monitor contractors for compliance with these project specific environmental requirements.

The project Environmental Coordinator shall be responsible for verifying compliance with environmental protection programs and protocols for environmental incident response.

The Environmental Coordinator will coordinate deployment of certified marine mammal observers and other environmental resource observers on the vessels as required by the conditions of the Cape Wind project permits and approvals.

The Environmental Coordinator will ensure contractors have compliant oil spill response plans, hazardous waste plans, and waste management plans in place.

4.2.5 *MARINE COORDINATOR*

The Marine Coordinator will report to the Project Director and will ensure compliance with permit requirements and applicable laws relating to the Cape Wind project vessel activities (including installation vessels, transport vessels, service vessels, tugs, rescue boats, etc.). The Marine Coordinator will be kept informed of all planned vessel deployment each day. The Marine Coordinator will be the primary liaison with the USCG, port authorities, state and local law enforcement, marine patrol, and commercial operators (including ferry, tourist, and fishing boat operators).

The Marine Coordinator will be responsible for all marine updates such as coordination with USCG regarding any required Notice to Mariners.

It will be the Marine Coordinator's responsibility to be knowledgeable of weather forecasts and have a communications plan in place with all contractors and vessels involved in the project.

The Marine Coordinator will be kept informed of all diving and dredging activities.

The Marine Coordinator will coordinate with the USCG and local law enforcement authorities for planning in the event of trespassing vessels within any safety zone established for the offshore project construction activity.

The Marine Coordinator will conduct daily/weekly meetings with contractors to discuss vessel operation and deployments as appropriate for the level of marine activities scheduled.

4.2.6 *ENGINEERING MANAGER*

An Engineering Manager will be assigned to direct the project's engineering team. The Engineering Manager will report to the Project Director.

The engineering team will review the TSA and BoP Contractor drawings, documents, and reports for compliance with the contract requirements. Additionally, the engineering team will undertake factory inspections and support the site project team as necessary.

4.2.7 *CONSTRUCTION SUPERVISOR*

A Construction Supervisor will be assigned to the project and will be in charge of all on-site activities. The Construction Manager will be a senior staff person with previous experience in offshore wind project construction. The Construction Supervisor will report to the Project Director.

The Construction Supervisor will be responsible for the coordination of the Cape Wind site staff and construction monitors. The Construction Supervisor will serve as the primary contact to the TSA and BoP Contractors for day to day construction activities and planning.

4.2.8 *QUALITY ASSURANCE MANAGER*

The Quality Assurance Manager will report to the Project Director and will have staff to monitor quality assurance for the project.

Primary responsibility for implementing quality assurance programs rests with the TSA and BoP Contractors. The Quality Assurance Manager shall be responsible for reviewing and confirming compliance with the specified quality assurance programs and performing inspections and tests.

The Quality Assurance Manager shall employ a team of quality assurance inspectors to review documents and perform inspections and tests.

The Quality Assurance team members will also undertake quality inspections at factories and key subcontractors facilities, especially relating to the foundation and transition piece fabrication and welding.

4.2.9 ASSET MANAGER

The Asset Manager will take control of the Cape Wind Project upon reaching Commercial Operation Status. The Asset Manager will be the primary CWA representative at that time.

The Asset Manager will be ultimately responsible for compliance with the lease obligations and the approved COP SMS, finances of the project, business transactions and reporting, coordination with ISO New England for power forecasts and production scheduling, and coordination with Siemens regarding the O&M of the facility.

4.2.10 ASSISTANT ASSET MANAGER

The Assistant Asset Manager will support the Asset Manager and will focus primarily on compliance with the SMS, along with the day to day dispatch and O&M of the Cape Wind Project. It is anticipated that the Assistant Asset Manager will be the point of contact for the Siemens O&M staff in day to day operation of the project.

4.2.11 RESPONSIBILITIES

CWA considers leadership in offshore activity to be of paramount importance in ensuring a “top-down” view is firmly instilled within its project team and that SMS policies and practices are made available and accessible to all management and operatives engaged on the project, and to its client, contractors, subcontractors and consultants. CWA requires a very high standard of H&S leadership principles to be adopted for this project. The responsibility for implementing the management system is a line management function. It is led by the Project Director and executed by the senior managers, line managers, engineers, supervisors and the people making up the staff of all participating contractors.

Directors, managers and supervisors need to have a keen awareness of US construction, BOEMRE, USCG, OSHA and maritime health, safety and environmental legislation in order to successfully lead on H&S matters.

CWA believes that “visible leadership” by senior management is essential to achieve full commitment by personnel and contractors at every level. Measures to demonstrate this include:

- Leadership by example – including H&S in all presentations and discussions, goal setting, review and audit, analyzing high risk, demonstrating personal engagement and responsibility, seeking H&S participation.
- Leadership by implementing effective and efficient systems, making sure competence and resources match the task, analyze incidents and ensure that learning points are identified and implemented, ensuring clear lines of responsibility, managing change, ensuring reviews are meaningful.
- Encourage a positive safety culture – decisive action when appropriate, maximize learning from industry incidents and near misses, H&S outside the workplace, promote idea that safety yields greater productivity in the long run and reduces risk from latent failures.

- Involve workforce – the projects biggest resource, tapping knowledge, champion forums, involve in system updates, and empower and encourage the workforce to raise H&S issues, such as hazard and near miss reporting schemes.

Contractors and subcontractors are encouraged to take time out for an “H&S Moment” within all agendas and forums to create an early H&S focus in any day-to-day proceeding.

4.2.12 SENIOR MANAGEMENT RESPONSIBILITIES

The CWA Project Director will lead the project and be responsible for the implementation of the project with respect to work scope, budget, and schedule. Equally important is that the Project Director will work to ensure that the project is constructed safely, in accordance with the COP approved SMS plan, environmental permits and to proper quality standards.

The Project Director will be CWA’s authorized representative during the engineering and construction period for all matters related to the project. To oversee the project and meet his responsibilities, the Project Director will organize and direct the CWA management team to manage the TSA and BoP Contracts and monitor construction activities.

The Project Director will have ultimate responsibility for administering all the contractual obligations of the Cape Wind Project as well as coordination with government authorities, first-responder emergency agencies, and coordination between contractors.

Each contractor on the Cape Wind Project will assign a project manager to coordinate directly with the CWA Project Director or his designee. The contractor’s project managers will have responsibility for their own firm’s SMS specific to their activities, and its integration into the overall project approved COP SMS plan as it pertains to Cape Wind’s responsibilities under the lease agreement. Ultimately CWA takes overall responsibility for the implementation of the SMS.

4.2.13 LINE MANAGEMENT RESPONSIBILITIES

Management responsibilities and reporting specific to the Cape Wind Project have been identified above. Line management, including that of all contractors shall be knowledgeable of the Project safety management requirements and ensure that personnel working on the Project comply with the COP approved SMS.

4.2.14 SAFETY CRITICAL ROLES

All roles that are critical to safety within each contractor’s scope of work will be clearly highlighted within their health and safety plans; including employee names, telephone numbers and their safety related responsibilities. This information will be collated within the project health and safety plans and procedures.

4.2.15 INDIVIDUAL RESPONSIBILITY

Safety shall be the top priority of every member of the project team. Every member of the project team shall fully comply with all applicable safety programs at all times. Every member of the project team shall have a duty to notify the contractors of any observed project safety hazards and require that corrective actions be initiated in a timely manner to ensure compliance with contract and regulatory requirements. Project team members shall instill a “safety first” philosophy with each member of the Cape Wind work force that emphasizes that every worker is empowered to stop work when an unsafe act is witnessed.

4.3 POLICY PURPOSE AND OBJECTIVES

The purpose and intent of this SMS is to prevent personal injury, harm to the environment and property damage along with promoting good practice for the health, safety and well-being of all persons in the workplace and others affected by the project activities.

CWA is committed to undertaking the construction activities that will deliver an installation which has been designed and constructed safely and enables safe commissioning and operation using methods and arrangements which effectively eliminate hazards where reasonably practicable and minimize and manage any health, safety and environmental risks that remain.

The objectives of this SMS are:

- Effective identification of all hazards which may reasonably be expected to be present in any situation or operation that is carried out during the construction, and subsequent operation of the project.
- Carrying out of suitable and sufficient assessments of the risks to the H&S of anyone who may be affected by the hazards.
- Determining the control measures required to reduce to as the extent possible the risk to health, safety and the environment from any hazard that cannot be eliminated.
- To provide a safe place of work integrated with the essential engineered safety systems and necessary operating procedures. Such operating procedures shall make up a coherent safe system of work.

4.4 TARGETS AND KEY PERFORMANCE INDICATORS (KPI'S)

The following specific targets have been set by Cape Wind for the project:

- Zero OSHA reportable work related injuries or illnesses.
- Zero USCG reportable incidents.
- Zero Environmental Impact Incidences.
- Zero reportable Dangerous Occurrences.
- Zero tasks undertaken without a suitable and sufficient risk assessment in place.

The above are reactive indicators. CWA, through its Health and Safety Coordinator, will also monitor the following actions taken by the BoP / O&M Contractor:

- Number of safety walks undertaken, and the close out of actions arising from such safety walks.
- Number of behavioral audits undertaken.
- Percentage of incident investigations completed and closed out within an acceptable timeframe of occurrence.
- Number of hazard spotting, unsafe act, and near miss reports received and closed out within an acceptable timeframe of report submission.

Targets may be modified and agreed with the relevant contractor and set by the BoP / O&M Contractor in order to drive performance where appropriate.

4.5 PLANNING AND RISK MANAGEMENT

There is a planned and systematic approach to implementing the Health and Safety policy through an effective SMS. The goal is to minimize risks. Risk assessment methods are used to decide on priorities and to set objectives for eliminating hazards and reducing risks. Wherever possible, risks are eliminated through selection and design of facilities, equipment and processes. If risks cannot be eliminated, they are minimized by the use of physical controls, or as a last resort, through operating procedures and personal protective equipment.

4.6 DOCUMENTATION PLAN

The SMS is supported by a series of documents that are used throughout the project to provide additional information and provide the basis for the compliance with this SMS. This documentation will be developed during the pre-construction phase and maintained during the construction and operational phases of the project. An outline of the process and the documentation required for successful implementation can be seen in Figure 1, overleaf.

The Safety File forms a key part of the supporting documentation for the SMS, and shall be in a readily updated format, which can be copied and distributed throughout the site for easy reference by the contractors.

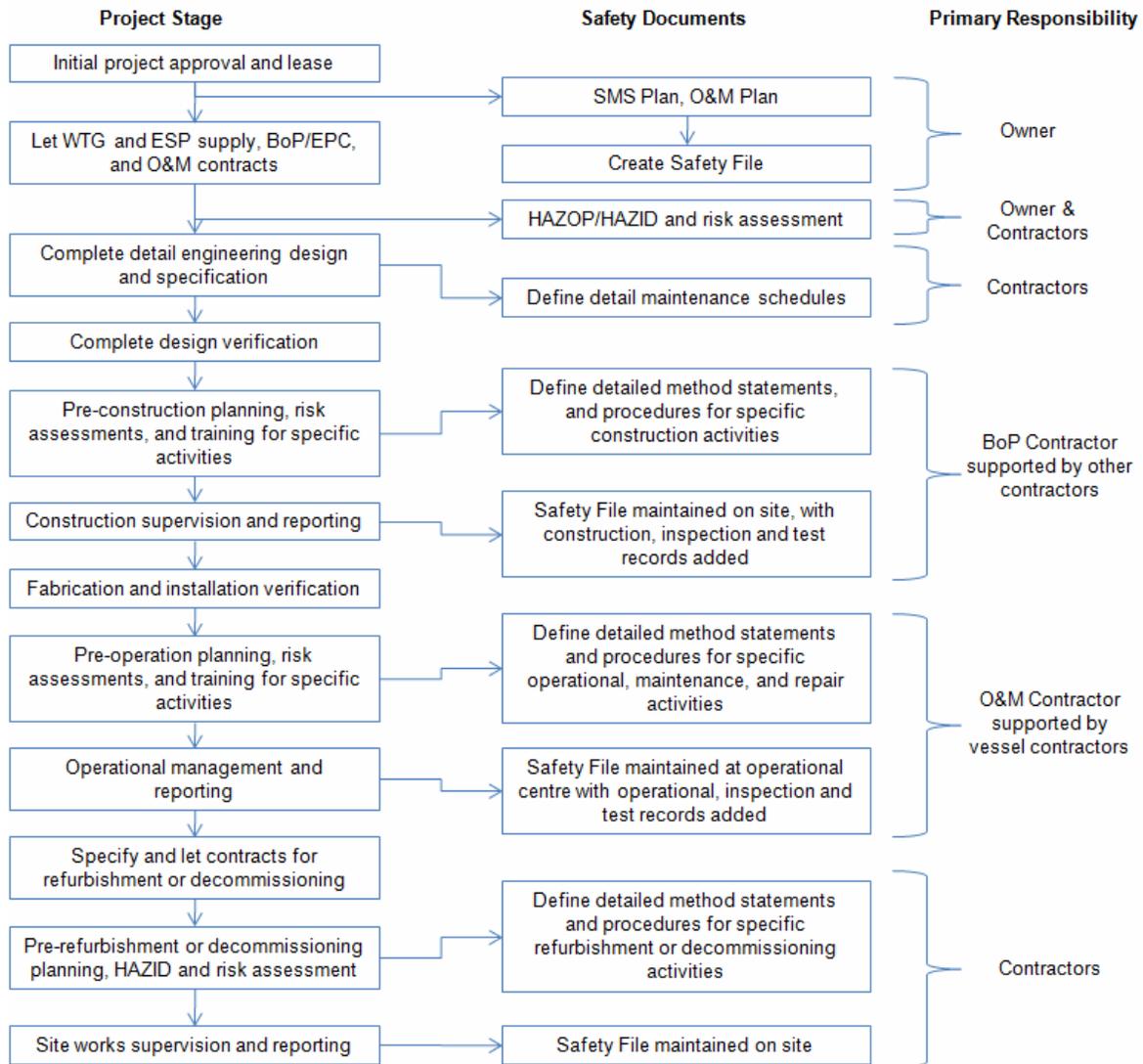


Figure 1: SMS Development Procedure

The Safety File will contain but not be limited to:

- Description of the Organizational Structure.
 - Contact information for; Owner, BoP / O&M Contractor, project coordinators and managers, Corporate and Management emergency contacts.
- Site Information:
 - Location of site.
 - H&S site specific plans.
 - First Responder and medical emergency information.
 - Emergency evacuation plans.
 - Applicable USCG logs
 - OSHA 300 Logs.
 - H&S Training records.
 - Safety System test records.
 - Contractor Records and EHS plans.
 - Regulatory Audit findings.
 - Emergency Contacts.
 - Regulatory Contacts.
 - Emergency Response and Evacuation Drill records.
 - Safety Policies and Procedures.
 - Vessel inspection records.
 - Hazard Communication, Right to Know files.
 - Visitor safety orientation records.
 - Accident investigation records.
 - Health surveillance and monitoring requirements.
 - Fire equipment and maintenance/test records.
- Work Plans:
 - Risk Assessments.
 - Training records.
 - Method Statements.
 - Operating Procedures.
 - Work Instructions.
- As-Built Documentation.
 - Jack-up footprint coordinates.
 - Subsea cable routing.
 - Vessel specifications.

- ESP General Arrangement and egress drawings.
- WTG General Arrangement and egress drawings.
- Plant registers, health and safety manuals, inspection and test plans and records.
- O&M information as listed in the O&M Plan.

4.7 MANAGEMENT OF CHANGE

Work arising from temporary and permanent changes to organization, personnel, systems, process, procedures, equipment, facilities, products, materials, substances, and laws and regulations will proceed only when a MOC process is completed.

CWA shall establish procedures for managing and controlling changes, with a view to minimizing any risks to project safety, health and environment. The procedure will require all contractors involved in any aspect of the project to implement a robust MOC policy to manage change and minimize risks associated with change. This policy will establish as a minimum, procedures for tracking, evaluating, implementing and documenting all changes from original design documents. A change is also considered a deviation from the specifications or practices, as specified for the process or facility, if it can be defined in one or more of the following categories:

- A **physical change** or addition made to process facilities either by type, design or specification.
- A **software** or **program change**, which impacts process controlling equipment; such as changing operating actions and / or the addition, removal, or modifications of control logic and interlocks.
- A **procedural change** that can alter process technology, process chemicals (including those used for maintenance), materials, or equipment.

Where applicable, the MOC process will include:

- A risk assessment conducted by all impacted by the change.
- Development of a work plan that clearly specifies the timescale for the change, and any control measures to be implemented regarding;
 - Equipment, facilities and process.
 - Operations, maintenance, safety and inspection procedures.
 - Training, personnel and communication.
 - Documentation.
- Authorization of the work plan by the responsible person(s), and management of change through to completion.

4.8 INSPECTIONS AND TESTS

4.8.1 INSPECTIONS

Regular Health and Safety inspections will be undertaken at intervals decided to be sufficient by the BoP / O&M Contractor. As a guide it is anticipated that these would take place generally every week. All inspections by the BoP / O&M Contractor shall be recorded and reported to the Cape Wind Health and Safety Coordinator. The format of such inspections

will be tailored to suit the work in progress. Where a contractor or subcontractor working area or work procedures are unsatisfactory a “Safety Warning Notice” or “Stop Work Notice” may be served by the BoP / O&M Contractor.

Health and Safety inspections of the site will be undertaken and reports issued by the Health and Safety Coordinator. The basis of such inspections will include this SMS plan, relevant regulations and conformance to the contractor’s SMS Policy. Contractors shall fully cooperate with this activity and provide any information that may be requested. Contractors are to be given copies of reports and shall comply with any corrective actions requested in the time frame required by the inspection report.

Desktop and random physical checks will be carried out across all areas of the project that have regulatory requirements relating to routine inspections, re-certification, re-validation or re-calibration, including such areas as listed below:

- Personnel competency certification (for example, crane operators).
- Lifts and winches.
- Vessel certifications and inspections
- Fire extinguishers and first aid kits.
- Fall arrest systems, personnel harnesses and anchor points.

The results of such inspections shall be recorded on specific forms. Any resulting instructions are to be passed in writing to the relevant contractor or subcontractor and are to be complied with by the action date stated. All such reports shall be made available on site and maintained within the Safety File.

4.8.2 TESTING EMERGENCY RESPONSE PLANS AND EVACUATION PLANS

Detailed procedures for how the Emergency Response Plans and evacuation plans for the overall project will be tested will be incorporated within the project health and safety plans as well as the time schedules for undertaking these tests. Lead persons and their responsibilities with respect to these plans will also be highlighted and clearly documented. All contractors are expected to participate in any exercises or initiatives undertaken to test and validate the project’s emergency plans.

Emergency Response Plans and evacuation plans shall be prepared, implemented, maintained and regularly tested by all contractors, for all activities within their work scope. Contractor emergency response and evacuation plans shall form part of each contractor’s health and safety plan, and will interface appropriately with the overall emergency plan for the project.

Contractors shall document within their health and safety plans the details of how they will test their emergency procedures throughout their scopes of work, along with time schedules for undertaking these tests. Lead persons and their responsibilities with respect to these plans will also be highlighted and clearly documented. The contractor is responsible for ensuring their plans are adequate and meet all required US regulations, and that they interface effectively with the overall emergency plan for the project, in addition to any external organizations and emergency services that may be involved in the plans.

The tests of project and contractor emergency plans will include the simulation of typical scenarios that have been identified within the HAZOP / HAZID. These simulations will incorporate all relevant personnel, project organizations, external organizations and emergency services, and will be carried out as close to anticipated real-life events as

reasonably possible, encompassing dry runs to assess response / travel times and to highlight any significant issues with current procedures. All emergency scenarios to be tested will be highlighted, and documented within the relevant health and safety plans.

Envisioned typical scenarios include:

- Emergency response relating to injured personnel within a WTG nacelle.
- Emergency response and evacuation relating to injured personnel and an ESP fire.

The results of such tests shall be recorded on specific forms. Any resulting instructions are to be passed in writing to the relevant contractor or subcontractor and are to be complied with by the action date stated. All such reports shall be made available on site and maintained within the Safety File.

4.8.3 INSPECTION / TEST RESULT INTEGRATIONS AND CONTINUOUS IMPROVEMENT

The conclusions, recommendations and actions from all inspections and test results will be fully integrated into project procedures. This information will be communicated to relevant project organizations through the creation and distribution of work orders, which will assign the required work and set a schedule for completion. Findings and actions will also be discussed verbally during the project tool box talks. All actions to be implemented will be followed up, and verified as complete during subsequent inspections, at which time the relevant work orders will be closed out.

The project will support a framework for continuous improvement, which will primarily be centered around the project tool box talks and pre-job briefings. This topic will be discussed during these regular meetings. An open forum session will also be implemented during this meeting, which will allow ad hoc improvements to current operations to be suggested by project employees. Each contractor will be responsible for fostering and managing this system within their organizations, and providing resultant contributions to the meeting for discussion. Documentation will be maintained for this, which will stipulate agendas, lists of suggestions and resultant recommendations or actions.

5 INCIDENT REPORTING AND EMERGENCIES

All contractors will be required to provide detailed information relating to accidents, near misses and injuries to the BoP / O&M Contractor and the other contractors. The timing of this and a list of injury definitions used by the BoP / O&M Contractor can be found in Section 5.4. Contractors are required to nominate a person or persons within their organization who will be responsible for the coordination of information and creation of documents in respect of accident, incident and near miss reporting. This person(s) name will be recorded in the contractors' H&S plans. Where suitable and subject to a review, the BoP / O&M Contractor may adopt contractors' accident, incident and near miss reporting forms and supporting documents. Where statutory governmental requirements are placed on persons to report injuries, incidents and dangerous occurrences, contractors will be expected to cooperate with the BoP / O&M Contractor's representative to fulfill these obligations. Incident reporting will comply with 30 CFR 285.830 – 285.833.

5.1 IN THE EVENT OF AN ACCIDENT

Contractors are expected to supervise their own operatives and subcontractors, and in the event of an accident the appropriate parts of the Emergency Response Plan are to be enacted depending on the type and severity of the accident.

First response first aid should be administered by trained personnel and emergency services should be contacted in line with standard first aid practice and the Emergency Response Plan.

5.2 ACCIDENT REPORTING AND INVESTIGATION PROCEDURE

Contractors shall ensure that all accidents are recorded within their own accident book following any injury to their personnel. All incidents that involve medical treatment and by OSHA definition are considered a recordable injury shall be brought immediately to the attention of the BoP / O&M Contractor. Contractors will report all accidents and incidents to the site Health and Safety Coordinator, in the first instance within 24 hours, and subsequently by formal report within 72 hours. . Any accidents or incidents directly resulting from the production activities of renewable energy on the OCS will follow the reporting requirements of 30 CFR 285.830-285.833. All accident and incidents occurring outside of jurisdiction of 30 CFR 285.830-285.833 shall comply with the applicable regulatory requirements of the USCG or OSHA. The BoP / O&M Contractor will inspect accident books on a regular basis.

The relevant contractor shall investigate accidents within his work activity scope, and a suitable accident report shall be submitted to the BoP / O&M Contractor. Investigation of all incidents involving medical treatment, injury or worse shall be performed according to the standard US methodology and regulatory requirements for investigating accidents and incidents.

Statutory report forms must be used to notify the relevant government body of accidents as required by the relevant US regulations.

All incidents, whether a near miss or an actual injury-related event, will be investigated. Near miss reporting and investigation allow for identification and control of hazards before they cause a more serious incident. Accident / incident investigations are a tool for uncovering hazards that either were missed during the hazard assessment phase or have managed to slip out of the controls planned for them. It is useful only when done with the aim of discovering every contributing factor to the accident/incident in order to prevent future occurrences. In other words, the objective is to identify root causes, not to primarily set blame.

5.3 PLAN FOR LIAISON WITH REGULATORY AGENCIES

The public authorities liaison plan will encompass routine and emergency project actions, and will comply with the provisions issued by all regulatory authorities, including but not limited to BOEMRE, USCG, OSHA, and MA State jurisdiction for onshore activities.

[Details of the public authorities liaison plan will be defined within the SMS at the pre-construction stage of the project.]

5.4 CATEGORIES OF INJURY AND EVENTS

The recording of injuries and events that occur on areas or under the rights granted by the lease will follow the requirements, and definitions of 30 CFR Part 285.830 through 833, events that occur under areas not covered by the lease with comply with 29 CFR Part 1904.

At a minimum the following injuries and events will be recorded and notifications made to the appropriate agency per reporting requirements of 30 CFR Part 285.832

- Fatalities;
- Incidents that require the evacuation of person(s) from the facility to shore or to another offshore facility;
- Fires and explosions;
- Collisions that result in property or equipment damage greater than \$25,000 (Collision means the act of a moving vessel (including an aircraft) striking another vessel, or striking a stationary vessel or object. Property or equipment damage means the cost of labor and material to restore all affected items to their condition before the damage, including, but not limited to, the OCS facility, a vessel, a helicopter, or the equipment. It does not include the cost of salvage, cleaning, dry docking, or demurrage);
- Incidents involving structural damage to an OCS facility that is severe enough so that activities on the facility cannot continue until repairs are made;
- Incidents involving crane or personnel/material handling activities, if they result in a fatality, injury, structural damage, or significant environmental damage;
- Incidents that damage or disable safety systems or equipment (including firefighting systems);
- Other incidents resulting in property or equipment damage greater than \$25,000; and
- Any other incidents involving significant environmental damage, or harm.

When applicable the following injuries and illnesses will be reported in compliance with 29 CFR 1904 requirements:

Recordable occupational injuries or illnesses are defined as any occupational injuries or illnesses which result in:

- Fatalities, regardless of the time between the injury and death, or the length of the illness.
- Lost workday cases, other than fatalities, that result in lost workdays.
- Nonfatal cases without lost workdays which result in transfer to another job or termination of employment, or require medical treatment (other than first aid) or involve: loss of consciousness or restriction of work or motion. This category also includes any diagnosed occupational illnesses which are reported to the BoP / O&M Contractor but are not classified as fatalities or lost workday cases.

The recording of Occupational Injuries and illness shall include the completion of the relevant OSHA forms:

- OSHA 300 - Log of Work Related Injuries and Illnesses.

- OSHA 300-A - Summary of Work Related Injuries and Illnesses.
- OSHA 301 - Injury and Illness Incident Report.

In addition to the OSHA requirements for reportable illnesses and injuries, any accident or near miss incident should be reported by the BoP / O&M Contractor to CWA to ensure prompt investigation. The urgency of reporting of these events is dependent on the severity of the event, and has been categorized as:

- Category A events - Reportable Immediately using channels specified in Emergency Response Plan.
- Category B events - Reportable Immediately to Health and Safety Coordinator and Project Director.
- Category C events - Reportable within 24 hours to Health and Safety Coordinator and Project Director.

The reportable events are described in Table 2.

Category	Event	Description
A	Fatalities	Any fatalities connected with the Cape Wind Project or fatality within one year of an incident in which the injuries were sustained. Any fatality arising out of a RTA involving vehicles or road going mechanical equipment owned by any of the contractors or subcontractors when they are within the area of control of this SMS, or engaged on business relating to the Cape Wind Project.
A	Major Injury or Multiple Injuries	Any injury suffered to an employee or contractor arising out of work being carried out as part of the Cape Wind Project which results in more than three lost workdays.
B	Injury	Any injury suffered to an employee or contractor arising out of work being carried out as part of the Cape Wind Project which results in between one and three lost workdays.
A	Accidents	An undesired event arising out of work being carried out as part of the Cape Wind Project that results in personal injury or property damage.
B	Incident	An incident is an unplanned, undesired event that adversely affects completion of a task that is part of the Cape Wind Project.

C	Near Miss	Near misses describe incidents where no property was damaged and no personal injury sustained, but where, given a slight shift in time or position, damage and/or injury easily could have occurred.
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5.5 VESSEL COLLISION PLAN

The Vessel Collision Plan will be defined within the SMS following the contracts award stage and prior to start of construction of the project.

5.6 EMERGENCY RESPONSE PLAN

Details / workflow of the plan will be incorporated within the SMS following further discussions with the USCG and consulting agencies and upon final agreement with the emergency response services.

An Emergency Response Plan will be defined for the overall wind farm site. There are several types (and combinations) of emergency that may occur on the project, including:

- Fire.
- Accident to operatives.
- Search and rescue.
- MOB.
- Medical emergency
- Chemical spill.
- Stranded operative.
- Barge instability.
- Sudden unexpected storm event during personnel deployment offshore.

Emergency procedures are designed to give warning of imminent health, safety and / or environmental danger, and provide guidance on the correct actions to be carried in order to minimize risks to personnel and the environment. Each manager / supervisor is responsible for ensuring that all their employees and visitors within his area of responsibility are informed of, and are fully conversant with, emergency procedures. Each contractor on site will develop their own specific Emergency Response Plan for the area under their control, which must be appropriately communicated throughout the contractor's organization. These plans will be incorporated into the overall project plan. Contractors shall nominate a person or persons from their organization to provide the interfaces to the overall project plan. These individuals shall be identified in the contractor's health and safety plans or documents and shall be trained such that they understand and can implement the Emergency Response Plan.

Emergency Response Plans, including evacuation and rescue, are to be drilled on a regular basis. All contractors are expected to participate in the exercises or initiatives undertaken to test and validate the project's emergency plans.

A schedule of emergency response exercises are to be prepared and implemented which will cover key hazard events identified from the HAZOP / HAZID, as far as is practicable without entailing disproportionate risks in the exercises themselves. Risk assessments, method

statements and procedures for such exercises are to be prepared and recorded in accordance with the SMS.

Further guidance and regulations include the following:

- Personnel requirements for marine and lifesaving operations: 46 CFR 109.
- Emergency Evacuation plans: 33 CFR 146.
- Drill - fire, abandon, and lifeboat: 46 CFR 109.
- Emergency Response 29 CFR 1910.120

5.7 EVACUATION PLAN

Details / workflow of the overall Evacuation Plan will be incorporated within the SMS prior to start of construction following BoP / vessels contract(s) award and in parallel with updating the Emergency Response Plan. The Evacuation Plan for all facilities on the OCS will be implemented to comply with 33 CFR Subchapter N 146.140

5.7.1 WTG

Emergency evacuation will be undertaken via the access and egress route through the WTG tower. In the unlikely event that this is not possible, for example if the escape route is blocked and / or very rapid evacuation is necessary, evacuation may be undertaken outside the tower. Each WTG is provided with emergency escape equipment to enable escape from the nacelle and controlled descent outside the tower to the Transition Piece (TP) platform or directly to a vessel.

[The emergency evacuation plan for the WTGs will be further developed in parallel with detailed design and specification of the plant and conducting the HAZOP].

5.7.2 ESP

[The emergency evacuation plan for the ESP will be further developed in parallel with detailed design and specification of the plant and conducting the HAZOP].

6 COMMUNICATIONS PLAN

CWA will be responsible for normal communications with regulatory authorities, but the plan will allow and encourage immediate contacts from contractors and operators should the situation warrant.

During the construction and operation phases of the project, capabilities must be maintained by the control center and staging areas to communicate with the USCG and mariners within the vicinity of the project. Communications capability shall, at a minimum, include VHF marine radio, landline and wireless for voice and data and must include the ability to communicate with private vessels, USCG vessels and aircraft while underway, and Coast Guard Sector Southeastern New England. Further guidance will be included from 33 CFR 104.245.

During construction the project is mandated to avoid use of specific radio frequencies listed in the FEIS on VHF marine radios. The project shall ensure that VHF radios used in construction are tested for output to ensure they are not inadvertently tuned to any of the restricted frequencies and to confirm they have no spurious emission within +/-50 KHz. Cape Wind will also communicate to water craft to respect a two wavelength distance from the

construction cranes at the lowest frequency of interest which would be approximately 1,219.5 meters on 500KHz.

During the operation phase the control center will have the capability to monitor in real time the marine traffic within the vicinity of the Wind Farm and to monitor the status of all PATON's. Cape Wind will report any issues pertaining to PATON's to the USCG. Also the project will provide monthly reports to the USCG describing any navigational safety issues, complaints from mariner and correspondence from any other regulatory agencies regarding navigational safety issues.

Cape Wind will also be required to communicate to the public by reporting at the quarterly Southeastern Massachusetts Port Safety Forums.

6.1 WRITTEN AND VERBAL COMMUNICATIONS

The BoP / O&M Contractor and the other contractors will ensure that all verbal and written communications are in English.

6.2 ARRANGEMENTS FOR COMMUNICATION BETWEEN PARTIES

Ongoing consultation between the BoP / O&M Contractor, contractors, and subcontractors will be maintained via regular meetings. Minutes of these meetings shall be recorded and appropriately distributed.

6.3 OVERLAP WITH OTHER CONTRACTORS UNDERTAKINGS

A detailed interface matrix will be defined for the project, which will detail the responsibilities of the BoP / O&M Contractor and the contractors. Identified interfaces will be an ongoing subject of discussion at the regular meetings, with a view to mitigating any perceived risks, minimizing project delays, and maintaining expected project quality levels.

6.4 COMMUNICATION WITH THIRD PARTIES

The BoP / O&M Contractor or his representative will attend meetings as required with external authorities. The outcome of these meetings will be briefed to the contractors as necessary.

Unless instructed by the BoP / O&M Contractor or his representative, contractors and subcontractors are not permitted to liaise with any third parties.

6.5 PROJECT SAFETY MEETINGS / CONSULTATIONS

Health and Safety issues shall be reviewed at project safety & progress meetings. It will be recognized that there will be major interface issues to deal with, and these forums will provide a basis for "solving" potential conflicts before they arise.

Examples of such conflicts could include:

- Interface at port / vessel during loading / unloading.
- Transfer of personnel between vessels operated by different contractors.
- Conflicting loyalties in the event of an emergency (e.g. vessel sailing away from an occupied turbine causing stranding).
- Changes in "ownership" during lifting and landing operations.

In order to reduce the chance of conflict OSHA regulations require daily safety meetings. CWA will require contractor safety programs to include procedures for holding daily safety meetings of this type as well. Daily safety meetings are a proven practice for reducing the frequency and severity of injuries.

Because of the changeable nature of offshore wind farm work it is not possible to conduct formal classroom training in advance that will address every possible set of work environments and hazards. Instead the easiest way to comply with this requirement is to provide general training in the classroom and address specific details at the sites, each day, as they arise.

The policy for the Cape Wind Project shall include at a minimum:

- A safety meeting will be held at all work locations before the start of each shift.
- Attendance at these meetings is mandatory for all personnel on site. This includes the project manager/engineer, lead/shift engineers; other engineers, technicians, clerks and craft labor, subcontractors, and where appropriate, CWA representatives.
- Safety meetings shall be documented using a Daily Safety Log.
- The information discussed and purpose of these safety meetings shall be to:
 - Communicate information, expectations, and good work practices relating to health and safety.
 - Get feedback on conditions affecting health and safety and encourage participation in the health and safety process by employees.
 - Describe the day's tasks and their potential hazards.
 - Coordinate activities.
 - Identify methods and precautions to prevent injuries.
 - Plan for emergencies.
 - Describe any changes in established safety plans or procedures relating to the work being performed.
- There should be an opportunity for questions and answers from site personnel at the end of the meeting.
- Leadership of the meeting should be rotated among the various site personnel in order to give everyone on the site a chance to conduct the meeting. We want to encourage ownership of this process (and safety in general) among all employees. Safety is not just the supervisor's responsibility. Make the leadership assignment at least one day in advance to allow the leader time to prepare.
- A set of general topics on good work practices can be used as a general guideline for preparing meetings. More specific job related topics will be emphasized depending on specific site requirements.

6.6 PROJECT TOOL BOX TALKS

The BoP / O&M Contractor will prepare and issue safety briefings as appropriate but will invite and expect active contribution from contractors in their development. These briefings deliver topical safety information to contractors (e.g. lessons learnt from accident investigations or from inspection / test results). Contractors will be expected to hold tool box

talks at the beginning of each day and at the commencement of a task with new risks or risk control measures. More wide ranging meetings will be arranged on a weekly basis, which will involve more in depth discussions on continuous improvement. Records of tool box talks, including attendance lists, will be maintained by the BoP / O&M Contractor.

Topics for toolbox talks should include, but are not limited to, the following dependant on program:

- Emergency procedures.
- Permit to work system.
- Working at heights.
- Lifting operations.
- Site rules.
- Correct use of PPE.
- Crew Transfers.
- Manual handling.
- Safe handling of hazardous substances.
- Working near to or over water.
- Quayside / vessel interface rules.
- Status of open safety observations and near misses.
- Audit / test result integrations.
- Continuous improvement focus / open forum / suggestions.

6.7 H&S NOTICE BOARDS

Contractors shall establish H&S notice boards at their work locations or sites. Regular checks will be undertaken to ensure that all information is current and up to date. The information presented should include as a minimum:

- Statutory H&S Notices pertinent to the location.
- Copy of the contractors' Owner liability insurance certificate.
- Safety procedures.
- Emergency Response Plan details.
- Accident and incident reporting information.
- List of first aiders.
- Project H&S policy.
- Site rules.
- Site H&S statistics.

7 REMOTE MONITORING, CONTROL AND SHUT DOWN

SCADA systems will monitor the project WTGs and all other wind farm infrastructure. The WTG SCADA will be capable of fully interfacing with the wind farm SCADA system. The systems will be capable of providing real-time information on all WTG and wind farm data and communications.

The SCADA systems will also be capable of remotely controlling and shutting down the WTGs and the wind farm, as and when required, including for health, safety and environmental purposes.

SCADA terminals will be placed on the offshore ESP and Onshore Control Center. Local control is also provided in each WTG. The project will be monitored 24/7 in the Onshore Control Room. Additionally, WTG specialists at Siemens will monitor operation of the project remotely at international control centers and can take routine and emergency control actions if needed.

The project's O&M Plan will cover normal operating procedures and emergency procedures, including emergency shutdown of the WTG and ESP if requested by regulatory authorities such as the USCG.

Project O&M staff will be fully trained in normal and emergency operations. All staff will be trained and familiar with the SMS.

8 ARRANGEMENTS FOR SECURITY AND ACCESS

8.1 SITE SECURITY AND SURVEILLANCE

CWA is currently engaged in discussions with the USCG to address a protocols identified in the Lease and other permitting documents, such as the USCG Terms & Conditions document, to mutually develop the final arrangements and plans for site security, surveillance, emergency operations, etc. From these discussions, and based on agreements reached with the USCG, a detailed plan for site security and surveillance will be prepared. The Cape Wind project will have the capabilities from the control center to monitor real time marine traffic within the vicinity of the wind farm.

8.2 SITE ACCESS AND EGRESS

All access / egress routes shall be removed or made inoperable whilst not in use in order to prevent access / egress by unauthorized persons. Adequate signage must be provided at all times. During work, the normal safety signs must be displayed. Access and Egress compliance for the various project locations will follow the applicable BOEMRE, USCG and OSHA requirements. Primary Guidance and recommendations for the Site Security Plan will utilize 33 CFR 103-106.

The following must be adhered to at all times:-

O&M Site and Construction Staging Areas:

- Where possible one way traffic systems will be implemented.
- All Entry / Exit points will be signed.
- Entry / Exit points will be clearly signed for No Parking / Obstruction.
- Car Parks will be sited away from Entry / Exit points.

- Sufficient signage will be displayed at all times to warn members of the public that the installation is private property and potentially dangerous.

Foundation or Quay Ladders:

- When quay or foundation ladders are used, it is important to be aware, that they can be slippery and at times icy, and that there can be a long distance to climb due to tidal height. Ladders can be slippery and over-grown with weed, algae or barnacles. Gloves must be worn at all times.
- When climbing Foundation ladders, self-retracting lifeline systems must be attached to person climbing / descending.
- Only one person must be on any ladder section at any one time.
- No person shall climb / descend any ladder whilst lifting/lowering operation is being carried out.

WTG Access:

- WTGs will be secured at all times when unmanned.
- WTGs shall be signed, 'Danger No Unauthorized Entry'.
- WTG ladders will only be used for access / egress by persons wearing a harness and attached to the fall arrest safety wire.

ESP Access:

- The ESP will be secured at all times when unmanned.
- The ESP shall be signed, 'Danger No Unauthorized Entry'.
- Any ESP ladders presenting a risk of falls from height will only be used for access / egress by persons wearing a harness and attached to fall arrest safety wires.
- Within the ESP, areas containing HV equipment shall have relevant signage displayed such as 'Danger High Voltage'.
- Only suitably competent and authorized persons will enter any areas containing critical or high voltage electrical equipment.

Sea going Vessels:

- All persons at a minimum must wear a life vest and locator beacon when:
 - Accessing any sea going vessel.
 - Transferring from vessel to vessel.
 - Transferring from vessel to shore.

Emergency Exits:

- All emergency exits will be kept clear of any obstruction at all times.
- All emergency exits will be signed.

Only authorized persons, or those persons who are authorized and in the company of an authorized CWA employee or a person authorized on behalf of CWA, shall enter any site, staging area, offshore substation or WTG and only after receiving relevant safety orientation training.

9 CONTRACTOR'S RESPONSIBILITIES

This section describes the minimum H&S standards expected from contractors working on the site.

Where a contractor wishes to substitute its own procedures and they exceed these minimum requirements, the BoP / O&M Contractor may, subject to a review, accept them for use during the works.

9.1 PLANNING AND EXECUTION OF WORK

The contractor will co-ordinate and manage all its work activities within the site. To facilitate this process, the contractor will appoint a person to act as a point of contact with the BoP / O&M Contractor, which shall be identified in the contractor's H&S plans and method statements.

9.1.1 METHOD STATEMENTS AND RISK ASSESSMENTS

For each work activity, contractors will prepare written method statements and risk assessments for all work tasks.

Where generic method statements are used, these will be made site and work activity specific. Method statements will be submitted to the BoP / O&M Contractor or his representative for review six weeks before the planned work activity is due to commence (or as may be agreed in the contract).

Method statements will be supported where required, by attaching any risk assessments, lifting plans, diving plans, rescue plans, confined space entry arrangements, work at height assessments, safety rules and any permits required for the work activity.

A procedure for assessing and managing the risks, and hazards involved in the construction and operation process will be developed and maintained throughout the project using the following basic method:

- Identify the work activity or situation
- Identify the hazards.
- Decide who might be harmed and how.
- Evaluate the risks and decide on precautions to eliminate or mitigate those risks.
- Record findings, communicate and implement them.
- Review assessment and update if necessary.

Where;

- A **hazard** is anything that may cause harm, such as chemicals, electricity, working at height, and confined spaces.
- The **risk** is the chance that someone could be harmed by these and other hazards, together with an indication of how serious the harm could be.

The results of the risk assessment will be recorded in a common format and kept within the Safety File.

Minimum standards and key considerations for preparing method statements and performing risk assessments will be incorporated within the SMS prior to start of construction and developed during the detailed design phase.

9.1.2 *HOURS OF WORK*

All work activities on the project site will be undertaken in accordance with the relevant US working time regulations.

9.1.3 *SELECTION AND CONTROL OF SUBCONTRACTORS*

Only subcontractors approved by contractors, and notified to the BoP / O&M Contractor or his representative, are permitted to undertake work on this project. The contractors must notify the BoP / O&M Contractor of all approved and appointed subcontractors.

9.1.4 *CONTRACTORS SUPERVISION AND COORDINATION OF THEIR WORK*

Contractors are wholly responsible for the provision of an organization that will ensure that works within their scope are adequately supervised and coordinated. Details of these arrangements will be recorded in their H&S plans and / or method statements.

9.1.5 *TEMPORARY WORKS*

Where a contractor has to undertake any “temporary works”, they shall describe these works in their method statements, together with any H&S arrangements required ensuring that the “temporary works” are undertaken without risks to personnel. Contractors shall implement sufficient control measures that ensure risks are adequately controlled. These control measures shall also be described in their method statements.

10 OFFSHORE OPERATIONS AND MANAGEMENT

The construction and operation of the project will require the contracted parties to use various vessels for the delivery of goods to the offshore site, for the installation and commissioning of equipment within the offshore site, and the subsequent maintenance of the offshore equipment.

The coordination of movements of all vessels is of paramount importance in ensuring a safe working environment for all personnel who use such vessels, or who come into contact with such vessels when carrying out their work. The BoP / O&M Contractor shall appoint a Marine Coordinator to carry out the coordination of the vessel movements. Further guidance for offshore vessel operation will be included from 33 CFR subchapters D, E, F, H, I & K.

10.1 WORKING FROM VESSELS

Contractors must submit all required information to the BoP / O&M Contractor regarding any vessel intended for use on the site as part of the installation manual. All vessels must be approved for operation on the site by the BoP / O&M Contractor and subject to inspection by the USCG and, for this purpose, contractors must forward all required certificates, information and documentation before the vessel arrives at the site. The contractor will nominate the vessel to undertake specified works. The vessel details, name, owner, contracted party (if different from owner) and all relevant information required for the assessment of the vessel will be made available to the BoP / O&M Contractor. These will include, but are not limited to, type approval, insurances, operational procedures, safety

procedures, communication procedures, environmental procedures and emergency procedures.

The contractor will detail the works to be undertaken by the vessel, such as transportation of personnel, transportation of goods, installation of items on site, offshore accommodation for personnel, or combinations thereof. Particular details will be given with regard to the vessel's limitations relevant to sea conditions (including, but not limited to, wave height and wind conditions). The above information should demonstrate to the BoP / O&M Contractor that the vessel is "fit for its intended purpose".

Operational procedures will be drafted and distributed to all vessel operators. [CWA is in discussions with USCG on final details].

10.2 NOTICES TO MARINERS

Cape Wind will be responsible to post Notices to Mariners. The protocol is now being discussed and finalized with USCG and a procedure will reflect the agreed upon approach with the USCG.

10.3 OFFSHORE PERSONNEL AND VESSEL TRACKING PLAN

Further details on the Offshore Personnel and Vessel Tracking Plan will be defined within the SMS following the contracts award stage and prior to start of construction of the project.

10.4 SEA FASTENINGS AND STORAGE OF MATERIALS OFFSHORE

The offshore site does not hold facilities for storage of materials and equipment. Unless authorized by the BoP / O&M Contractor, all materials and equipment will be returned to the jack-up or vessel after each working shift. Materials and equipment must not be left or stored on the seabed unless by specific agreement with the BoP / O&M Contractor in conjunction with the terms of the USCG and BOEMRE.

Where storage is approved, it is the responsibility of the contractor to ensure that any such storage is equipped with proper navigational signals, and that the items stored are properly anchored and able to resist adverse environmental conditions. CWA will be notified to ensure proper Notice to Mariner protocol has been established.

10.5 VESSEL LOADING INSPECTION

For items to be transferred to the offshore site, the BoP / O&M Contractor may carry out an inspection of the loaded vessel prior to sailing and on arrival back from work on site. The BoP / O&M Contractor's Marine Warranty Surveyor may inspect the vessel and the contractor will demonstrate how the loading of the vessel adheres to the contractor's vessel loading procedure, previously nominated and approved by the client during the vessel approval process. Movement and installation of goods should be in accordance with the approved method statements for such activities.

10.6 VESSEL TRANSPORT

Transport of persons or equipment between the onshore management site and the offshore site must be via a defined transport corridor and using the vessels approved by the BoP / O&M Contractor for the project. Personal Locator Beacons (PLB's) and tracking hardware are a mandatory requirement for all personnel and on ALL vessels. PLBs are to be used by all personnel during transfer between vessels, offshore units and offshore installations.

Where a vessel is to enter the transport corridor or the offshore site directly from a port other than the nominated port facility, the contractor in charge of the vessel must adhere to the same procedures for logging the intended sailing and have the movement identified within their project plan. Acceptance of the vessel movement within the area will be approved by the BoP / O&M Contractor in the same way as movements initiating from the nominated port facility. Contractors carrying personnel to the offshore site will allow personnel from other contractors or the BoP / O&M Contractor to travel on his vessel when there is spare capacity. The contractor will at all times cooperate with this principle and advise the BoP / O&M Contractor during site meetings when such capacity is available.

10.7 COORDINATION WITH THIRD PARTY VESSELS

The Marine Coordinator will instruct the vessel captain of their allotted time to enter and leave the port or the offshore site, such that the vessel movement will not affect the operation or movement of any third party vessel. If instruction to proceed is received from the Marine Coordinator but the captain identifies a safety risk to either his own vessel or any third party vessel by starting or continuing such movements he should take avoidance action as defined within applicable maritime law. Any potential safety hazard known by the captain must also be communicated immediately to the Marine Coordinator.

10.8 NAVIGATION

Working vessels restricted in their ability to maneuver must exhibit the correct navigation lights and shapes as prescribed in the international regulations for preventing collisions at sea (COLREGS).

Irrespective of whether they are used for the transport of persons, materials or equipment, all vessels must continuously log positions and date and time electronically. The equipment and details of logging will be approved by the site management. It is the responsibility of each contractor to ensure that each of its vessels on site is fitted with a fully functioning Class A Automatic Identification System (AIS). Such a system must be operational at all times while the contractor's vessel is on site.

The contractor is responsible for proper navigation signals for his own working sites inside the offshore site, wherever it is required. The signaling must be in accordance with directions from the USCG, the FAA and the requirements of the lease agreement and local by-laws as applicable, and must be advised to the BoP / O&M Contractor in advance.

All anchor areas will be pre-agreed upon and proper notification given to USCG so they can decide on appropriate construction safety zone and implement a Notice to Mariners notification.

10.9 COORDINATION OF NAVIGATION

All activities involving vessels at the offshore site will be coordinated by the Marine Coordinator who will coordinate the navigation of the vessels and transport of persons to, from and within the offshore site. The contractor will plan his vessel movements and activities with respect to any possible exclusion zones surrounding any wrecks and archaeological items or similar as described in the environmental statement and archaeological protocol. The MC will inform the contractor of the agreed lines of communication to be used for the project.

10.10 AIDS TO NAVIGATION AND AVIATION LIGHTING

Temporary Aids to Navigation and aviation lighting provisions for the offshore site during construction will be defined within the SMS following the contracts award stage and prior to start of construction of the project in agreement with the USCG, along with all associated inspection and control measures.

The permanent Aids to Navigation and aviation lighting requirements are defined in the Lease and the O&M Plan. Further guidance will be included from 33 CFR subchapter C.

10.11 ANCHORAGE AND USE OF JACK-UPS

It is the contractor's responsibility to clarify potential requirements if anchorage outside the offshore site or other USCG-agreed upon anchorage areas is necessary. No anchorage will take place outside of offshore site without prior notification to CWA and approval from the proper regulatory authority. Anchorage of jack-ups, platforms or vessels inside the offshore site must only take place according to directions from the Marine Coordinator. The BoP / O&M Contractor will advise the contractor of existing cables or other items located on (or below) the sea bed. The site management should be informed by the contractor when any unknown item is discovered on the sea bed. The MC will be the focal point for information relating to items on the sea bed. The exact location of new cables installed for the project will be advised to the site management. The MC will inform contractors about how the installation of cable sections will affect their ability to conduct work. It is the responsibility of the contractor to ensure that anchors and legs from vessels and jack-ups are not positioned in such a way that they may cause damage to installed items. This requires as a minimum:

- Use of an on-board survey package to monitor vessel locations and anchor / leg drop co-ordinates.
- Use of side scan sonar - respect of indicated exclusion zones for cables and J-tubes.

The BoP / O&M Contractor will issue a plan with a clear marking of each WTG foundation, setting out the zones around the foundation in which the contractor is not allowed to jack up or drop anchor. Consequently anchor patterns and jacking locations are to be submitted to the BoP / O&M Contractor for approval prior to commencement of operations.

10.12 SAFETY VESSEL

If deemed necessary the BoP / O&M Contractor will provide a security vessel to be used only for observing vessel traffic and preventing unauthorized vessels from entering the offshore site. The MC will inform the contractors when a security vessel is in use and will instruct them of the communication procedure.

10.13 COLLISION RISK

It is expected that vessels chartered by or operated by contractors, shall adhere to:

- International Regulations for Preventing Collisions at Sea, 1972 (COLREGS).
- Federal Navigation Regulations 33 CFR Navigation Rules (International – Inland).
- USCG Navigational Rules and special restrictions imposed by the permit documents.

Lighting and warning markers must be displayed. There shall be a safe system of management of service boats. Notice to Mariners must be issued, and the relevant USCG and FAA protocols adhered to.

The BoP / O&M Contractor shall ensure that the lighting requirements for the Cape Wind Project as specified in section 12 of the Cape Wind lease agreement are complied with. Further details are given in the lease document and the O&M Plan which is included in the COP.

10.14 ADVERSE WEATHER PLAN AND WEATHER WINDOWS

An adverse weather plan along with weather window details will be developed during the detailed design phase subsequent to HAZOP and defined within the SMS following the contracts award stage and prior to start of construction of the project.

This plan will be included in the project Safety File.

10.15 ACCESSIBILITY AND EMERGENCY SHELTER

Accessibility and emergency shelter details will be developed during the detailed design phase subsequent to HAZOP and defined within the SMS following the contracts award stage and prior to start of construction of the project.

These details will be included in the project Safety File.

10.16 HELICOPTER OPERATIONS

Helicopter operation details will be developed during the detailed design phase subsequent to HAZOP and defined within the SMS following the contracts award stage and prior to start of construction of the project. Per the terms of the Lease there will be helipad located on the ESP with capabilities to land a USCG helicopter if requested to do so by the USCG.

These details will be included in the project Safety File.

10.17 COMPETENCE & TRAINING

Education and training is not an 'add on' to work practices, but an integral component of a person's ability to carry out tasks in a safe and risk free manner by ensuring that individuals have the relevant information and training to ensure that they are able to perform work in a risk free environment. The BoP / O&M Contractors will continually strive to improve the competence levels of the Company's Managers, Employees and Contractors.

These requirements will be reviewed following HAZOP / HAZID and risk assessment. This assessment will give due regard to statutory regulations and industry guidance. Specific training will be determined during detailed engineering design and specification / pre-construction planning phase by the WTG and ESP supply contractors / BoP Contractor / or the Cape Wind project's Health and Safety Coordinator.

Details of implementation of these requirements through the construction phase are to be confirmed by the WTG and ESP supply contractors / and BoP Contractor (as applicable).

Details of the implementation of these requirements through the operational phase are to be confirmed by the O&M Contractor.

All individual employee competence will be documented through a personal employee record, which lists all education and training courses the person has completed. These records will be available in the site safety file.

10.18 QUALIFICATIONS

Contractors are required to provide the BoP / O&M Contractor or their representative with documentary evidence of their employees (or subcontracted employees) qualifications and training.

10.18.1 CONTRACTORS SELECTION AND CONTROL OF SUBCONTRACTORS

Contractors are to ensure that any subcontractors appointed by, and under their control, are appropriately competent, experienced and suitably resourced to undertake the work they are contracted to do.

The BoP / O&M Contractor or his representative will require contractors to provide written evidence that this assessment has been undertaken, before any subcontractor can be authorized to work on site.

Contractors shall ensure that the contents of their H&S plans, and any supporting plan, method statements and risk assessments are brought to the attention of their subcontractors.

10.18.2 HEALTH AND FITNESS

The contractor is required to have his own medical fitness policies in place at the site. All health and fitness policies will comply with the applicable regulatory requirements.

10.18.3 DRUGS AND ALCOHOL

The use, possession, transportation, promotion or sale of illegal drugs, controlled substances, drug paraphernalia, and the consumption of alcohol during the works is absolutely prohibited.

CWA and the BoP / O&M Contractor reserve the right to conduct random checks to confirm that persons working or seeking admission to the site are not under the effects of alcohol or drugs. Any person who in the opinion of CWA or the BoP / O&M Contractor is found to be under the influence of drugs or alcohol will not be allowed on the site.

The contractor is required to have its own drugs and alcohol policies at their work place.

10.19 TRAINING

As a minimum, persons working on the project offshore must have completed training in the areas listed below:

- Marine survival training.
- CPR and First Aid training.
- Vessel or site specific induction.
- Emergency escape training / confined space rescue training.
- Knowledge of the H&S conditions at site.
- Wind Turbine rescue from height training (if job includes WTG access).
- Turbine tower lift rescue / recovery training.
- Electrical awareness including a basic understanding of electrical safety and the electrical safety rules in place on the project.
- Fire safety awareness.

- Medical fitness certificate to the appropriate US standard.

These must be supplemented by specialist training where applicable, with respect to the job that each individual will carry out, and the areas of the project that they will be authorized to access.

Contractors must ensure that persons under their control have the relevant skills and competency for the work they are expected to undertake. These requirements will be recorded in contractor's method statements.

Confirmation certificates must be produced. Access will not be permitted to individuals who have either not completed the required training, or whose certificates have lapsed, or who cannot produce certificates.

10.19.1 SITE TRAINING

A site specific induction training package will be prepared by CWA and the BoP / O&M Contractor, and a works specific induction training package will be prepared by the contractor. The contractor will be expected to deliver both training packages to all persons working within or visiting the site. Records of all inductions must be maintained, and refreshers should be carried out where significant changes to operating procedures have occurred, such as following the takeover of the works.

Induction training on the project site must, as a minimum, consist of the following:

Visitors

- Site safety rules for moving around on the site.
- Safety equipment for moving around on the site.
- Restricted areas.
- Emergencies.

Site workers

- Site safety rules for moving around on the site.
- Safety equipment for moving on site.
- Restricted areas.
- Emergencies & associated procedures.
- Driving rules (on site and off site).
- Hazardous substances.
- Waste, dust emission and noise on site.
- Permit systems.
- Welfare arrangements.
- PPE requirements.
- Working hours.
- The importance of conformance with the H&S procedures.
- Employee's role and responsibility in general.

- Accident reporting procedure.
- Security arrangements.
- First Aid.
- Fire fighting.

Where personnel are to travel on or work on board a vessel, but are not part of the vessel crew, they shall receive a vessel safety induction which details the safety requirements and essential information for the vessel.

Where a new activity is to commence, a work pre-job briefing must be conducted and attended by all staff and field operatives involved in the activity. At the pre-job briefing, the H&S responsibilities and requirements relevant to the activity shall be explained in detail. Additional specific briefings may be required when a new field operator joins the team.

Personnel who are new to the offshore environment shall wear a high visibility over jacket with the words "New to Offshore" printed on the back in large letters. This will allow those persons requiring additional guidance and supervision to be easily identified. This over jacket should be worn until a period of at least 2 weeks of active duty has been gained offshore, or until the vessel master is confident that the person no longer requires the heightened level of supervision and care.

11 SIGNIFICANT CONSTRUCTION AND OPERATION HAZARDS

Each contractor must provide details of how they intend to manage hazards on site. The main hazards are identified below. The omission of a hazard from this section is not a declaration that the hazard will not be encountered during the project, and all contractors should carry out their own assessments and address the risks accordingly. As a minimum, all project work will be carried out according to the standards within Title 29 of the Code of Federal Regulations (29 CFR).

All risk assessments should be in line with USCG, OSHA, or other applicable regulatory requirements, and will be reviewed and approved by the BoP / O&M Contractor prior to work commencing on site. Copies of such assessments will be maintained in the Safety File by the BoP / O&M Contractor and reviewed as necessary.

The results of any such assessment shall be communicated to any affected personnel. The BoP / O&M Contractor are to ensure that full cooperation and coordination is facilitated between all relevant parties.

11.1 ELECTRICITY

Only personnel who are suitably trained, qualified and experienced, and who have been duly appointed by the BoP / O&M Contractor as an 'authorized person', will undertake switching activities on high voltage (HV) systems including the establishment of points of isolation and the application of circuit earths.

All works on the HV system shall be controlled by issue and receipt of a the applicable Work Permit in compliance with OSHA 1910.147, 1910.269, 1910.1377, 1910.331-335, 1926 subpart K and any legislation or applicable USCG regulation. Testing of HV systems shall be controlled by a control of hazardous energy safety document.

Access for works adjacent to live HV systems shall be controlled by a Limitation of Access document. At all times HV control, switching and work shall be in accordance with the relevant OSHA or other applicable standard.

All equipment will be required to comply with the most recent NFPA 70E and US Occupational Safety and Health Administration (OSHA) regulations related to Arc Flash compliance. CWA will require an Arc Flash Hazard Analysis (AFHA) be performed by the electric service platform (ESP) supplier for the complete project. The WTG and ESP equipment shall be capable of accommodating appropriate signage as determined by the AFHA indicating the rating in compliance with NEC section 110 and ANSI Z535.4 to identify Arc-Flash Incident Energy (AFIE) and appropriate Personal Protective Equipment classes.

Live working on electricity systems is prohibited. If situations arise where it is considered that live working or testing is unavoidable, exemption will only be sanctioned where justification under the relevant USCG or OSHA Electrical Safety-Related Work Practices Standard has been fully met, and the approval of the Senior Authorized Person is given in writing. Any sanction for live working shall be notified without delay to the site Health and Safety Coordinator.

All electrical design and installation work will comply with the relevant US regulatory electrical code, and be in line with other applicable standards identified in the COP. The contractor is responsible for ensuring that any electrical system is installed to the appropriate standards identified in the COP.

For fixed or portable electrical equipment, contractors must:

- Maintain equipment in a safe condition by carrying out regular inspection and testing.
- Promote and implement a safe system of work for maintenance, inspection and testing.
- Ensure that employees who carry out electrical work are qualified, suitably experienced (competent) and authorized to do so.
- Maintain detailed records of inspection and testing programs.

The risk of injury from electricity is strongly linked to where and how it is used. The risks are greatest in wet conditions, out of doors and in cramped spaces, and contractors must recognize and address these risks. For portable electrical equipment, contractors should use tools which operate on a grounded 110 volt supply, or preferably where possible, cordless low voltage rechargeable battery powered equipment. If a higher voltage is deemed unavoidable, contractors will undertake a risk assessment to demonstrate that suitable control measures are in place.

Portable electrical equipment and hand held tools should be tested at suitable intervals, depending on the equipment type and the environment in which it will be used, and the records of testing should be kept. Portable appliances should be marked to show they have been tested and are in a condition that is safe for use, and defective equipment should be quarantined, repaired or safely disposed of. Portable electrical equipment should only be used by personnel suitably qualified and competent to do so.

A program for conducting arc flash studies will be developed during the detailed design phase subsequent to HAZOP and defined within the SMS following the contracts award stage of the project.

11.2 CONTROL OF HAZARDOUS ENERGY (LOCK OUT/TAG OUT)

The purpose of a lockout tagout (LOTO) program is to prevent the release of hazardous energy (electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or any other form of energy) during the construction, servicing or maintaining of equipment.

Contractors will be required to implement a detailed LOTO program that includes all the elements required by USCG 33 CFR Subchapter N 142.90 for work on the OCS and 29 CFR 1910.147, 1910.269; 29 CFR 1926 subpart K for work within OSHA's jurisdiction.

The required elements of the program will include.

- Develop, implement, and enforce an energy control program.
- Providing instruction in the use of this procedure to all employees, contractors and offsite personnel as required.
- Convey the seriousness of violating the procedure will result is disciplinary action including up to removal from the site.
- Identifying the personnel who are authorized to administer the program and to request LOTO's as defined in the procedure.
- The program shall establish procedures that include specific instructions for the lockout of mechanical and electrical equipment, de-pressuring potentially dangerous systems and installing blinds where applicable. This shall also include a test start of electrical equipment, controlled from a remote station to ensure equipment may not be started.
- Lockout devices shall be attached in a manner that will hold the energy isolating devices in a "safe" or "off" position. Tagout devices shall be affixed directly to energy isolating devices in such a manner as will clearly indicate that the operation or movement of them from the "safe" or "off" position is prohibited. Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate it.
- Ensure that new or overhauled equipment is capable of being locked out.
- Use only lockout/tagout devices authorized for the particular equipment or machinery and ensure that they are durable, standardized, and substantial.
- Ensure that lockout/tagout devices identify the individual users.
- Provide effective training as mandated for all employees covered by the standard.
- Comply with the additional energy control provisions in OSHA standards when machines or equipment must be tested or repositioned, when outside contractors work at the site, in group lockout situations, and during shift or personnel changes.

11.3 WORKING AT HEIGHT

Contractors will be expected to avoid working at height where possible, but where it cannot be avoided it must be carried out in a safe manner in accordance with ANSI/ASSE 2-359.2 or

any additional applicable USCG or OSHA work at height standard. A place is “at height” if a person could be injured falling from it, even if it is at or below ground level. Consideration must be given to the hierarchy of protection measures detailed in the regulations, and preference to collective means of prevention given where reasonably practicable.

Contractors will ensure that any work at height, including use of access aids or fall arrest equipment (i.e. scaffolding, mobile elevating work platforms, ladders, harnesses, etc.), is properly planned and appropriately supervised. Contractors must ensure that all equipment used for work at height is appropriately inspected (e.g. before each use) and safe for use. All personnel engaging in activities in relation to work at height must be suitably qualified and competent, and records of training must be kept up to date.

Any fall arrest equipment utilized, either temporarily or permanently installed, involving rails or steel ropes and sliders, must have passed all tests in accordance with ANSI/ASSE 2-359.2 or other applicable fall arrest standard.

As part of the planning process, suitable emergency response and rescue procedures must be put in place to evacuate personnel from a place of work at height, and rescue a person injured whilst working at height. Where a man riding basket is used for access, the contractor must demonstrate that the associated risks have been assessed and reduced to as low as reasonably practicable, and that fixed access methods such as staging or scaffolding could not be used as an alternative.

11.4 WORKING OVER WATER AND SAFETY HARNESES

Contractors are required to carry out their own risk assessments for individual cases, to assess the PPE requirements for their personnel when working over, or near water. This will be dependent upon the nature of the work, the location, environmental conditions, daylight etc. and is likely to result in specifying that lifejackets or safety harnesses should be worn or used.

For day to day vessel operations where there is a risk of falling overboard, all personnel are required to wear lifejackets. Where appropriate thermal protective clothing should also be worn e.g. transit / transfer suits. Where safety harnesses are required, they are to be used as when working at height with the overriding principle being to prevent anyone falling, regardless of whether over water, land or the deck of a vessel. Safety harnesses with suitably positioned safety attachment points, should be provided on all vessels that provide a working platform for persons working over water, or where there is a danger of them either falling or being dragged overboard.

Where safety harnesses are provided they should meet with required standards and have leg and arm straps. The maximum free-fall distance must not exceed applicable standards. Life jackets and suitable man over board procedures should be implemented by any contractor who is required to work over water, including the provision of personal locator beacons. The following standards will apply to working over water and fall protection 33CFR Sub. N 142.45 & 144; 33CFR Sub. N 142.42; 29CFR 1910 subparts D, F, I, R; 29CFR 1915.158; 29CFR 1926.106.

11.5 OFFSHORE TRANSFERS

During transfers from the port to the WTG location, or for transfers between vessels or structures offshore, contractors’ personnel are required to wear life jackets, and where deemed necessary by risk assessment, thermal protective clothing and / or additional PPE including personal locator beacons.

All contractors will be expected to tabulate and submit to the BoP / O&M Contractor and the site Health and Safety Coordinator their own risk assessment for drowning / hypothermia / heat exhaustion / MOB capability / PPE for review prior to any work commencing. It is the responsibility of the individual contractor to establish the USCG, OSHA, marine or other applicable standards that are relevant to their specific activity, and assess risks to those standards and apply appropriate controls.

11.6 LIFTING OPERATIONS

Cranes and lifting equipment will be certified, maintained and operated in accordance with the relevant BOEMRE, USCG, OSHA, or other applicable lifting operations and lifting equipment standard, and the relevant BOEMRE, USCG, OSHA, or other applicable provision and use of work equipment standard. Records of inspections and tests will be made available to the BoP / O&M Contractor and be included within the method statement / lifting plan where such equipment is required. Lifting equipment will be color coded in accordance with the chosen scheme for the test period, and signs will be posted to show this designation.

Lifting equipment will be tested annually, or every 6 months for equipment used for man riding, and should be clearly marked with the safe working load (SWL). Where necessary, detailed lifting plans should be prepared for single lifting operations including details of lifting beams / spreader beams, strap capacity, shackles required etc. and taking into account surrounding structures and environmental limits. The contractor should provide all lifting plans to the BoP / O&M Contractor prior to undertaking lifting operations.

Where multiple lifts of a similar nature are conducted, it will be acceptable for a generic lifting plan to be prepared for the series of lifts. All contractor lifting operations will be supervised by a suitably qualified and experienced supervisor or vessel captain's designee present on site or vessel for the contractor, who has responsibility for the planning and execution of all lifting operations.

When planning and executing lifting operations, all contractors should undertake consideration of the following:

- Ensure that qualified persons are used for the planning and supervision of lifting operations, and that documented background information has been gathered. Make use of experienced crane drivers.
- Ensure personnel are fit for duty and not fatigued.
- All approved plans should be made known to the installation supervisor, vessel captain, crane operator and all others involved in the lifting operation.
- Undertake risk assessment and prepare method statement. Include detailed lifting plans presenting the full geometry of the lift (with reasonable tolerances regarding distances to foreign obstacles such as other vessels / jack-ups, and other fixed structures such as WTG foundations and towers etc), use of accurate lifting diagrams, the right lift weights and apply the relevant dynamic amplification factor.
- It is normal for a contractor to consult with the Health and Safety Coordinator on these issues and obtain some degree of consensus that the calculated contingency falls within their view of reasonable. It is the responsibility of the individual contractors to make such consultations.
- Prepare contingency plans with provisions for unpredictable circumstances, focusing, for instance, on bad weather.

- Specify and use the right lifting equipment for the job, and check that all certificates are available.
- Prepare procedures to cope for out-of-service crane loading, for example securing the boom, procedure for locking or unlocking the slew ring.
- Prepare an evacuation procedure, tested by means of evacuation drills.
- Have a good weather forecasting system available.
- Select the crane and the vessel using sound principles, and not compromise on quality.
- Ensure that the crane manufacturers' documentation is available when preparing the method statement.
- Prepare a risk assessment and check that the procedures are implemented and followed with good communication procedures.

11.7 TOOLS AND EQUIPMENT

This covers any equipment which is used by an employee at work, including things such as hand tools, power tools, machines, lifting equipment, motor vehicles and mobile cranes. Contractors must ensure that all tools and equipment they provide to their employees is suitable for the intended use and has a valid test certificate. This also applies if employees provide their own equipment for use at work.

Contractors have the responsibility to ensure that all equipment is safe for use from the start of the project, and is maintained in a safe condition throughout the term of its use. This includes carrying out inspections at regular intervals, as appropriate to the type of equipment and the type of use, and any other conditions that may be a factor. Contractors should implement maintenance schedules to ensure all plant and equipment is properly maintained, cleaned and repaired as is required during the course of the project. Records should be kept and made available to the BoP / O&M Contractor on request.

Any repair and maintenance required is only to be carried out by suitably competent personnel, and must conform to risk assessments and method statements drawn up by the contractor to cover such operations. Contractors will ensure that all equipment under their control is only used by personnel who have received adequate information, instruction and training in its use. It must be operated safely with consideration to others in the vicinity and only as intended. Where necessary, contractors must provide suitable safety measures appropriate to the equipment such as warning signs, special markings and protective guards. These should be kept in good order at all times and repaired or replaced if damaged or lost.

Written risk assessments and method statement for tasks to be carried out using specific equipment should be drawn up by the contractor. They should clearly identify the measures necessary to control any potential hazards and risks which may arise. Plant operating areas and pedestrian areas will be clearly segregated by appropriate signs and barriers.

11.8 CONFINED SPACES

All work will be carried out to the relevant BOEMRE, USCG or OSHA confined spaces standards 29 CFR 1910.146, 29 CFR 1915 Subpart B, 29 CFR 1926.21, 1926.651, 1926.956. Contractors must carry out suitable and sufficient assessment of the risks for all work activities for the purpose of deciding what measures are necessary for safety for

working in confined spaces. This means identifying the hazards present, assessing the risks and determining what precautions to take. The assessment should include consideration of:

- The task.
- The working environment.
- Working materials and tools.
- The suitability of those carrying out the task.
- Arrangements for emergency rescue.
- The following are key duties with regards to confined spaces:
 - Avoid entry to confined spaces, i.e. do the work from outside, use remote tools and equipment where possible.
 - If entry to a confined space is unavoidable, develop and follow a safe system of work. A safe system of work should include details of the appointment of a supervisor, training and experience requirements for the persons carrying out the work, isolation of equipment, cleaning before entry, ventilation, testing of air quality, provision of special tools and lighting, provision of breathing apparatus, preparation of emergency rescue arrangements, provision of rescue harnesses, communications, how to signal the alarm, and details of permit to work systems.
 - Put in place adequate emergency arrangements before the work starts, including contingency plans, methods of communication, training for rescuers, and provision of appropriate rescue and resuscitation equipment.

Contractors will identify all work that requires entry into confined spaces. The BoP / O&M Contractor will require notice of any working or entry into a confined space, whether for new work or for inspection activities.

11.9 EXCAVATIONS

Where contractors are required to prepare excavations as part of their work they must ensure that precautions are taken to prevent:

- Collapse of the sides. The sides must be battered to a safe angle or supported with timber, sheeting or support systems.
- Materials falling onto people working in the excavation. Materials must not be stored close to excavations, and the edges of excavations must be protected against falling materials.
- Vehicles and people falling into the excavation. Appropriate barriers, guard rails and toe boards must be provided.
- People being struck by excavating equipment.
- Undermining / collapse of a nearby structure.
- Danger from underground services and water ingress. Contractors must consult with "Dig Safe" and utility companies for plans and information and, where necessary, dig trial pits and use locators to trace services.
- Access to the excavation by unauthorized personnel.
- Dangers posed by fumes.

Suitable access to and egress from the excavation must be provided. A competent person must supervise the installation, alteration or removal of excavation support, and must carry out regular inspections of the excavation. Work requiring excavation will comply with provisions of 29 CFR 1926 Subpart P.

11.10 HAZARDOUS SUBSTANCES

A Hazardous Substances Plan for the project will be included within the COP.

Substances and materials used may present H&S hazards requiring the contractor to carry out assessments and to introduce control measures. The contractors must comply with the relevant BOEMRE, USCG, OSHA, or other applicable standard on the control of toxic and hazardous substances. Contractors must follow the steps detailed below:

- Assess the risks – Assess the risks to health from hazardous substances used in or created by workplace activities.
- Decide what precautions are needed – contractors must not carry out work which could expose employees to hazardous substances, without first considering the risks and the necessary precautions. Task specific Job Safety Analysis will be performed to ensure compliance with the standard.
- Prevent or adequately control exposure – contractors must prevent employees being exposed to hazardous substances. Where preventing exposure is not reasonably practicable, it must be adequately controlled.
- Ensure that control measures are used and maintained properly, and that safety procedures are followed.
- Monitor the exposure of employees to hazardous substances, as necessary.
- Carry out appropriate health surveillance where hazard assessment has determined it is necessary, or where the standard sets specific requirements.
- Prepare plans and procedures to deal with accident, incidents and emergencies involving hazardous substances, where necessary.
- Ensure employees are provided with suitable and sufficient information, instruction, training and supervision.
- Comply with OSHA Hazard Communication standards 29 CFR 1910.1200

A listing of hazardous substances must be maintained by each contractor. For each hazardous substance, a material safety data sheet and risk assessment will be obtained or produced by the contractor, and be made available for easy reference. Copies of each contractor's material safety data sheets and risk assessments should be readily available for reference and reviewed as necessary.

Diesel fuel, when stored onshore, will be located in a secure bermed containment area. The bermed area will be constructed to allow safe entry and storage of a mobile tanker, and the containment berm will be capable to contain at 110% of the maximum volume of the tank. The contractors' emergency procedures must address spillage, and any other emergency presented from the storage and use of hazardous substances. No fuel storage facilities (either mobile or stationary) are to be installed at the site without prior approval from the BoP / O&M Contractor and comply with all local and state statutory requirements. All hazardous substances brought onto the site must be approved by the BoP / O&M Contractor. The contractor is required to take steps to control the emission of dust and fumes, for example by

providing screens and / or using dust suppressing equipment. Where creation of dust or fumes is unavoidable, appropriate PPE must be worn.

11.11 MATERIAL HANDLING

The contractors must comply with the relevant BOEMRE, USCG, OSHA, or other applicable material handling standards. Contractors must take suitable steps to control the risks to the H&S of their employees from manual handling activities such as lifting, lowering, pushing, pulling or carrying. This will include the preparation of material handling risk assessments in consultation with all employees involved firsthand with the process. The contractors will be required to:

- Avoid the need for hazardous material handling as far as is reasonably practicable. Use handling aids or engineering solutions that eliminate material handling.
- Assess the risk of injury from any hazardous material handling that cannot be avoided. Draw up risk assessments, update them as necessary and communicate them to employees.
- Reduce the risk of injury from hazardous material handling as far as possible. Provide training in handling techniques and use of handling aids.

Contractors must ensure that their employees do the following with regard to material handling:

- Follow appropriate handling systems safety procedures.
- Make proper use of equipment provided for their safety.
- Inform the BoP / O&M Contractor if they identify hazardous handling activities.
- Take care to ensure that their activities do not put others at risk.

11.12 NOISE AND VIBRATION

All contractors must comply with the relevant BOEMRE, USCG, OSHA, or other applicable standard on noise control and mitigation. All construction work equipment and machinery are to be assessed by the contractor before use to ensure that noise levels comply with the occupational noise exposure standards (29 CFR 1910.95) and the contractor has implemented a hearing conservation program.

The contractors will be required to:

- Assess the risks to employees from noise at work.
- Take action to reduce noise exposure that produces those risks.
- Provide hearing protection to those affected if the noise exposure cannot be reduced by other means.
- Ensure the OSHA permissible noise exposure limits are not exceeded.
- Implement hearing conservation and testing policy.

Where the level of noise reaches, or exceeds, the exposure action values identified in the OSHA standard, the contractor shall implement the appropriate measures and mitigation to protect employees from excessive noise exposure.

Warning signs must be used to show where hearing protection is required, and contractors must ensure all personnel use hearing protection in these designated areas. Contractors

must make hearing protection available for use in these areas and provide adequate training for the proper use of the various hearing protection available.

11.13 HOUSEKEEPING, SLIPS AND TRIPS

Working areas must be kept free of obstacles which are likely to cause trips and falls. Where necessary, walkways on vessels will be provided with non-slip surfaces to prevent falls. Suitable arrangements will also be implemented by contractors to ensure that work areas are cleared of obstacles after each shift.

Contractors' arrangements must describe the actions relating to housekeeping and the removal of waste from the work site. When work is performed, materials and tools must be kept in good order. The site must always be kept neat and free of clutter. Nothing must be positioned or dumped in a manner that will cause an inconvenience or danger. It is not permitted to store any light weight materials in places where they may be blown around or into the sea.

No waste shall be dumped at sea at any time.

11.14 BURIED, GROUND LEVEL AND OVERHEAD UTILITY SERVICES

All buried, ground level or overhead utility services in the vicinity of the onshore or offshore project works will be identified prior to any on site works commencing. All works will be carried out in accordance with OSHA or other applicable guidelines.

11.15 LOSS OF PERSONNEL AT SEA

Detailed recording procedures for vessel and personnel movement will be established. Robust marine co-ordination and 'persons on board' procedures are of great importance. Automatic identification system tracking shall be a requirement on all vessels to enable marine coordination to maintain a record of vessel tracks and positions.

11.16 SITE BOUNDARY ACCESS RESTRICTIONS / LIMITATIONS

Temporary exclusion zones will be set up during various phases of construction, and will be marked in accordance with directions and approval from the USCG and harbor authorities during cable export work near shore. Third parties would be excluded from any safety zone during the construction period.

11.17 SEA TRANSPORT

There is a requirement for risk assessment during sea transportation, and contractors should provide the BoP / O&M Contractor with documentary evidence of transport /sea fastening / shipping / loading / unloading method statements and risk assessments prior to work commencing.

11.18 HOUSEKEEPING - OFFSHORE SITE

Any item lost overboard, or left in the sea or on the seabed that may pose a danger to other vessels will be removed immediately, or if this is not possible, marked according to the relevant US shipping authority regulations. The site management must be informed immediately with date, time and coordinates. As soon as possible, the contractor must initiate measures to find and recover the item. Documentation for removal of the item must be forwarded to the site management. At each working site, the contractor will document the clearing and re-establishment of the seabed after completion of the work.

11.19 UNDERWATER HAZARDS

Detailed seabed features, obstructions and archaeological exclusion zones are described in the Final Environmental Impact Statement (FEIS), which will cover both the offshore wind farm site and the export cable route to shore.

This information along with any other relevant information will be provided to the relevant contractors and regulatory authorities.

11.20 USE OF JACK-UP VESSELS

Contractors shall ensure that jack-up vessel operators are competent to work in the specified project environment, and that the vessels are suitable for the task. Factors including tidal streams, water depth and scour will be considered when evaluating all aspects of operational risk (for example, platform leg stability).

The risks associated with jack-up vessel leg penetration due to soils instability, and the effects of scour are well documented, as well as a number of other hazards associated with the use of this type of vessel. A minimum standard for all jack-up operations on this project will be developed in consultation with the relevant contractors and the applicable Regulatory Agencies.

11.21 DIVING OPERATIONS

Every effort will be made through design and planning to eliminate diving operations from the project, and wherever practical remotely operated vehicles (ROV's) will be utilized as an alternative. However, work that will require the services of a competent diving company can arise. Anticipated tasks will be as follows:

- Assisting with vessel problems – below waterline.
- Installation of J-tubes.
- Inspection of Scour protection zone.
- Inspection of electrical cable and installation works at shore termination.
- Inspections of foundations, substructures, or burying of electrical cables.
- Recovery of dropped objects.
- Other Ad-hoc duties.

The works will as a minimum standard be carried out to meet the requirements of OSHA "Commercial Diving Operations" 29 CFR 1910 subpart T, USCG Commercial Diving Operations 46 CFR Part 197 Subpart B.

There shall be no diving operations carried out if pile installation (specifically hammering) is in progress.

In accordance with the regulatory requirements, adequate and easily accessible diving platforms shall be provided at all diving locations.

A minimum of two escape means must be in place for the diver under all dive operations.

A standby diver must be available at all times during a dive. It is not acceptable for a second diver to act as the standby diver.

All operatives engaged in the diving / confined space operation, and rescue procedure, must be “single-tasked”

The Contractor will provide to the BoP / O&M contractor Dive Plans, Risk Assessments, Emergency Plans and Rescue Procedures before any diving can be performed at site.

11.22 DIRECTIONAL DRILLING ACTIVITIES

A competent and experienced horizontal directional drilling (HDD) contractor shall be engaged to undertake the cable installation works. HDD activities shall be adequately supervised, and suitable protection shall be afforded against hazards associated with the HDD drilling process. The HDD contractor will provide the BoP contractor with method statements, risk assessment and emergency mitigation plans.

11.23 NO WEAPONS ON SITE

No firearms, knives, or any weapons of any kind are permitted in the project areas.

11.24 HEALTH RISKS

The project policy requires zero health incidents, which means the control of issues that could give rise to short and long term health problems. These issues will be considered within risk assessments for each activity.

11.24.1 WORKING WITH IONIZING RADIATION

Arrangements will be put in place to ensure the availability of competent people to adequately assess the risks and ensure appropriate control measures are put in place regarding activities such as x-ray welding or non destructive testing.

11.24.2 ENVIRONMENTAL POLLUTION

The Cape Wind project’s Environmental Coordinator shall confirm that during offshore construction activities contractors shall apply the requirements of the USCG including the implementation of spill controls, containment berms, appropriate stowage and sea fastening, and the minimization of substances carried. During operations contractors shall be trained to properly address spills in accordance with Cape Wind’s Oil Spill Response Plan (OSRP).

Contractors shall have plans for preparedness for environmental pollution emergencies.

11.24.3 SMOKING

Smoking will only be permitted in designated areas that are clearly designated as such. All other external areas, and all enclosed spaces within the project site will be designated as no smoking areas. Contractors are required to enforce these requirements within the scope of their working responsibility.

12 FIRE SYSTEM

12.1 FIRE PREVENTION

Fire prevention is of paramount concern at the wind farm site. The use of flammable materials, chemicals, and other hazardous materials calls for increasingly sophisticated

procedures. CWA will require that all contractor supervisor / leads and employees are well trained in fire prevention/practices and emergency procedures.

The site safety procedures will address specific fire protection and prevention requirements so that sites are adequately protected. The basic methods of fire prevention are similar regardless of type, size or nature of operation of site facilities. The methods used will involve a combination of engineering, education, and enforcement:

- Engineering provides built-in safeguards that help prevent and limit the spread of fires.
- Education keeps employees informed about the danger of fires and how to prevent them.
- Enforcement is used as a last resort to administer fire safety guidelines.
- Housekeeping.
- Adhering to the requirements of the Hot Work procedure.
- Location of flammables, combustibles, and potential sources of ignition, and means for control.

The BoP Contractor / O&M Contractor are responsible for the development and implementation of a site fire plan; this shall be communicated to all employees through training, inductions, signage, and through inclusion in the Safety File. The fire plan will include the following:

- Plant procedures on fire, notification, inspection, alarms and evacuation.
- Location of extinguishers, fire hoses or other equipment.
- Fire watch procedures during Hot Work.
- Fire equipment requirements and fire protection requirements for specific work assignments, and locations.
- Proper storage of combustible materials and flammable products.
- Familiarization with the classes of fires, extinguishers and instructions on what to do in the event of a fire.
- Fire Safety Checklist.
- Designation of specific zones, including smoking and non-smoking areas, hot work areas requiring a hot work permit and areas not requiring a permit. These zones will be subject to routine inspections.

The fire plan will make reference to applicable US standards for fire prevention and protection including:

- 29 CFR 1926.24 (Fire Protection and Prevention).
- 29 CFR 1926 Subpart F (Fire Protection and Prevention).
- 29 CFR 1910 Subpart L (Fire Protection).
- 33 CFR Part 145 Firefighting Equipment.
- NFPA 1, 10, 12, 13, 17, 30 & 72 or any other applicable standard.

12.2 HOT WORK

A hot work permit will be required for any process that can be a source of ignition when flammable material is present, or can be a fire hazard regardless of the presence of flammable material in the workplace. This includes welding, soldering, cutting and brazing, and also grinding and drilling where flammable material is present, and any works that have the possibility of leaving hot slag in the work area.

The definitions and recommendations for hot work in the following standards will be complied with:

- 29 CFR 1915.14 (Hot Work).
- 29 CFR 1910.252 (welding, cutting, brazing, General Requirements)
- 29 CFR 1917.152 (Welding, cutting and heating (hot work)).
- 29 CFR 1917.23 (Hazardous atmospheres and substances).
- 29 CFR 1926 Subpart J (Welding and Cutting).
- 33 CFR Part 142 Subchapter N - Workplace Safety and Health
- 33 CFR Part 145 Subchapter N– Fire Fighting Equipment

The BoP / O&M Contractor will develop a process for controlling hot works as part of the fire plan and the work permit system. This process will as a minimum ensure;

- Compliance with and use of the hot work procedures by all contractors and subcontractors on the site where hot work is to be carried out.
- Correct training in fire prevention for all personnel engaged in hot work.
- Where normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire during hot work and for a sufficient time after completion of the work to ensure that no fire hazard remains.
- Appropriate fire suppression equipment is available prior to starting any hot work.
- Welding shields or screens are available when other personnel in the area may be exposed to flash burns.
- Combustibles shall be controlled within a suitable radius of the hot source, with particular attention paid to areas below the work area.

12.3 FIRE BOUNDARIES AND SEPARATION

The ESP Superstructure is to be designed to provide support, protection and access to all of the installed equipment. The layout of the ESP structure and spaces shall be configured to provide fire boundaries between major electrical equipment or plant rooms, storage areas, and occupancy areas. This purpose should be to enhance life safety and minimize damage and impact to long-term operation of the wind project should a fire or other significant event be experienced

Areas with equipment feeding the two export cables shall be physically segregated to minimize the threat of a fire damaging equipment/connections for both export cables. Likewise, equipment receiving power from the array cabling areas shall be segregated to minimize the threat of a fire disabling a large quantity of WTG's.

The superstructure shall be totally enclosed with metal panels and shall include all ventilation openings, access doors, vents etc.

12.4 FIRE DETECTION SYSTEMS

The ESP and WTGs will have a fire detection system fitted; this will include a local audible alarm and be tied into the SCADA system to provide remote notification of an alarm, and automatic shutdown and isolation.

The WTG smoke detection system and location and type of fire extinguishers are detailed in the Siemens specification sheet Fire Protection, SWT-3.6-107, [to be] included in the Safety File.

The Fire Detection, Alarm, Actuation and Signaling System for the ESP shall be designed and constructed in accordance with NFPA 72. The alarm and detection system shall be zoned and coded and shall utilize Class A circuits exclusively. Loss of signal in the fire detection system shall initiate a trouble alarm. All fire and trouble alarms shall be transmitted to the remote onshore operations center via the central control system and SCADA connection. Automatic Fire Detection shall be provided in various areas. Manual alarm boxes shall be installed at critical points and along escape routes. Detectors shall also be provided for actuation and/or alarm for the Suppression Systems on the ESP. Upon detection of fire or initiation by manual alarm, the fire alarm and detection panel shall automatically shut by failsafe logic all intakes and exhaust ventilation dampers of the affected zone.

12.5 FIRE SUPPRESSION

The following rules pertaining to portable fire extinguishers shall be followed:

- Fire extinguishers must be recharged immediately after use.
- Any fire extinguisher removed from service shall be replaced immediately with a spare unit.
- A certified fire protection contractor shall complete an annual inspection of all portable fire extinguishers per NFPA 10 standard.
- A portable fire extinguisher preventative maintenance shall be completed at each visit to the WTG not to exceed interval greater than [X] months to:
 - Determine that all portable extinguishers are in their designated places, have not been activated, and have no apparent physical damage or corrosion.
 - Replace any damaged or depleted fire extinguisher with a proper model.

Portable fire extinguishers and fire blankets will be located within the WTGs, ESP, the vessels and the onshore site as per 33 CFR 145 Subchapter N and NFPA 10 standards. The locations of portable fire extinguishers and fire blankets will be clearly identified within each of the project structures and vessels, and will be included in a master inspection document.

A fire risk evaluation will be conducted with the contractor and insurance underwriter as the ESP design is finalized and the recommendations will be addressed in the FDR. Areas with oils, flammable liquids, storage locker and areas, electrical equipment rooms, and cable spreading rooms will be considered for fixed fire suppression systems. Egress, separation, fire barriers, emergency power system, etc. will be also considered within the fire risk evaluation.

All fixed fire suppression systems required on the ESP will utilize guidance from IEEE 979-1994 (R2004) Guide for substation fire protection and the applicable NFPA standards.

- NFPA 11 Standard for low, medium and high expansion foam systems
- NFPA 12 Carbon Dioxide extinguishing systems
- NFPA 15 Fixed water extinguishing systems
- NFPA 16 Installation of Foam water sprinkler and spray systems
- NFPA 20 Installation for stationary pumps for fire protection.
- NFPA 22 Standards for water storage tanks
- NFPA 30 Flammable and Combustible Liquids
- NFPA 70 & 70E National Electric Code and electrical safety in the work place
- NFPA 72 National Fire Alarm Code

Smoke detectors and alarms will be installed within the WTGs, ESP, and the onshore site as per NFPA standards and local fire codes.

All structures on site will be designed and installed with a focus on passive fire prevention, will a view to minimizing the possibility of a fire starting, and increasing in intensity and also spreading.

Further details on fire suppression will be developed during the detailed design phase subsequent to HAZOP and defined within the SMS following the contracts award stage and prior to start of construction of the project.

12.6 FIRE FIGHTING

12.6.1 TRAINING PROJECT STAFF

Wind Farm personnel will receive annual training on the Fire Protection Program. Training shall include the function and proper use of fire extinguishers. New employees, upon initial assignment, shall be trained in those parts of the fire prevention plan that the employee must know to protect the employee in the event of an emergency. Personnel responsible for inspections and / or maintenance of fire suppression systems must be trained initially and annually on proper inspection and maintenance procedures.

Associated training includes:

- Hazard Communication Training: Site personnel are apprised of the fire hazards associated with the materials and processes with which they are involved.
- Emergency Response Training: Site personnel will be trained on the Emergency Response Procedures.
- Fire extinguisher training.

12.6.2 EXTERNAL RESOURCE

Details of external fire fighting resource will be defined within the SMS on development of the Emergency Response Plan and at the pre-construction stage of the project.

12.6.3 MARINE VESSEL FIRE FIGHTING CAPABILITY

Marine vessel fire fighting capability details will be defined within the SMS following the contracts award stage of the project.

13 OTHER SITE SAFETY PROVISIONS

13.1 FIRST AID

Appropriate first aid facilities and provisions shall be available within each WTG structure, and within onshore and offshore project infrastructures, as is reasonable, and in accordance with relevant US standards.

Contractors working on site shall provide their own first aid facilities and provisions in accordance with the relevant US standards, including their own first aid trained personnel.

Details of first aid facilities and provisions provided by contractors shall be included in the contractor's method statements and risk assessments, or within their H&S plans for the project.

Contractors must advise the BoP / O&M Contractor of any trained first aid personnel working within the site, with a view to these skills being utilized in the event of an emergency.

The first aid facilities and provisions on site shall be regularly inspected and maintained in a fit for purpose condition, with provisions replenished to stipulated requirements as necessary.

13.2 PERSONAL PROTECTION EQUIPMENT

Where possible, a working hazard will be eliminated through design, engineering, or through changes to work practices and procedures. The provision of Personal Protection Equipment (PPE) is always the least preferred course of action.

Modern PPE can be extremely effective, but usually requires a high level of supervision, information, instruction and training in use, and a degree of self-discipline. It only provides protection for those wearing it.

The minimum project requirements for the use of PPE when undertaking certain tasks are described in the matrix in Table 3. This matrix shall be used as a guide to identify appropriate PPE requirements throughout the site. It will be the requirement of Cape Wind that contractors comply with the more stringent BOEMRE, USCG or OSHA standard.

Table 3: Personal Protective Equipment		
Item	Use	Standards
Safety Boots	To be worn on construction sites, or where there is a mandatory sign displayed.	33CFR Sub. N 142.33 (ANSI Z41) 29CFR 1910.136 29CFR 1926.96 29CFR 1915.156 29CFR 1918.104
Hard Hats	To be worn on all construction sites, or where there is a	33CFR Sub. N 142.30 (ANSI Z89) 29CFR 1910.135

	mandatory sign displayed. Also to be worn where there is a risk of striking of falling objects.	29CFR 1926.100 29CFR 1918.103 29CFR 1915.155
Hi Vis	To be worn on OCS construction sites	33 CFR Sub N 146.20
Safety Harness	To be worn when persons are working at height and likely to fall, or where a risk assessment identifies the need.	ANSI/ASSE Z359 33CFR Sub. N 142.42 29CFR 1910 subparts D, F, I, R 29CFR 1926 subparts E & M
Life Jacket	To be worn when working over water or where there is a risk of falling into water. Where appropriate life jackets will be fitted with personal locator beacons.	33CFR Sub. N 142.45 & 144 29CFR 1926.106(a) 29CFR 1915.158
Survival Suit	To be worn on vessel transfers, and where persons work over water and there is no Fast Rescue Craft on standby.	33CFR Sub N 144.20 & 144.30
Hearing Protection	To be worn in noisy environments (when using road breakers, drills, generation equipment, pile hammering operations or where there is a mandatory sign displayed).	29CFR 1910.95 29CFR 1926.101 & 52
Safety Goggles / Glasses	To be worn where there is a hazard from airborne dust and flying particles, or where a mandatory sign is displayed. Goggles should also be worn where there is a risk of eye contact with chemicals.	33CFR Sub. N 142.27, (ANSI Z87) 29CFR 1910.133 29CFR 1926.102 & 103 29CFR 1915.153
		Same as above
Sun Screen	To be used on exposed skin.	OSH Act General Duty Clause 5(a)(1)
Bump Cap	To be worn on all occasions where accidental head strikes on fixed objects may occur. For example tight spaces on vessels, wind turbines and substations.	33CFR Sub. N142.30 (ANSI Z89) 29CFR 1910.135 29CFR 1926.100 29CFR 1918.103 29CFR 1915.155
Chemical Resistant Nitrile	To be used when or where there is a risk of acid or caustic	29CFR 1910.132-138 29CFR 1910.138

Gloves	soda splashing. These gloves should also be used where there is a risk of oil splash.	29CFR 1915.156
General Purpose / Riggers Gloves	These gloves are to be used where there is a risk of the hands being cut or receiving abrasions. They also offer limited flame and heat protection.	29CFR 1910.132-138 29CFR 1910.138 29CFR 1915.156
Dust Masks	A dust mask is to be worn in dusty atmospheres, where a mandatory sign is displayed, or where there is a risk of inhalation of oil mist, paints etc. There are many types of dust masks available, so it is important that the correct dust mask is selected.	33CFR Sub. N 142.39 29CFR 1910.134 29CFR 1926.103 29CFR 1915.154 29CFR 1918.102

Table 4: Electrical Safety PPE & Equipment		
Item	Use	Testing and Standard
Nonconductive Head protection	Protection against head injury from electric shock, burns or objects	29 CFR 1910.135 Subpart I 33CFR Sub. N142.30 (ANSI Z89) Most recent ANSI Z89.1 Class E or Class G standard
Protective Clothing	Arc flash protection, non-melting garments	NFPA 70E 33 CFR Subchapter N 142.36 29 CFR 1910 Subpart S Manufacturers recommendations
Rubber Insulating Gloves	Electrical Switching	OSHA CFR 29 1910.137(a)(b) ASTM D 120-87, ASTM F 496 Before each use and every 6

		months thereafter.
Sleeves	Electrical Switching	OSHA CFR 29 1910.137(a)(b) ASTM D 1051, ASTM F 496 Before each use and every 12 months thereafter.
Rubber Blankets & Matting	Insulating maintenance Switching	OSHA CFR 29 1910.137(a)(b) ASTM D 1048-93, (blanket) ASTM D 178-93, (matting) Before each use and every 6 months thereafter.
Hot Stick	Voltage testing	IEEE 978-1984 Before each use and every 24 months thereafter.

In addition to these requirements, contractors shall have in place their own H&S manuals that include procedures and arrangements that relate to the selection, use and replacement of PPE that comply with the requirements of the relevant US standards.

Contractors shall assess their work activities and select appropriate items of PPE in accordance with these standards. The contractors and their nominated subcontractors are responsible for ensuring that all employees and visitors to the site are provided with the correct PPE.

The PPE equipment shall be appropriately certified, and regularly inspected and maintained in good condition or routinely replaced, and shall be worn on all relevant occasions as indicated by notices, instructions and good practice. Failure to wear mandatory PPE could result in disciplinary action or individuals being removed from the site.

14 ENVIRONMENTAL PLANS

14.1 OIL SPILL RESPONSE PLAN

The Cape Wind project Oil Spill Response Plan (OSRP) has been prepared in accordance with the Department of the Interior Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) regulations at 30 CFR 254, "Oil Spill Response Requirements for Facilities Located Seaward of the Coastline." These regulations require owners/operators of oil handling, storage, or transportation facilities located seaward of the coastline to submit a spill response plan to BOEMRE for approval prior to facility operation.

In accordance with the requirements of 30 CFR 254, the OSRP demonstrates that Cape Wind can respond quickly and effectively in the unlikely event that oil is discharged from the

facility. As recommended by the BOEMRE, this OSRP is consistent with BOEMRE Notice to Lessee No. 2002-G09, dated October 1, 2002, which includes the Guidelines for Preparing Regional and Subregional Oil Spill Response Plans.

The Cape Wind facility will be in the lowest potential worst-case discharge rating (Rating A: 0 to 1,000 barrels as defined in the regulations at 30 CFR 254 and associated Guidelines). In the event of a release of oil to the ocean, CWA employees, its contractors, and its responders will refer to the OSRP to ensure that the appropriate spill response actions are taken in a timely manner to prevent impacts to sensitive receptors.

The OSRP for the project is included as an appendix to the Cape Wind project COP. Details of the OSRP will be incorporated within the SMS following BOEMRE's approval of the COP.

14.2 MATERIALS MANAGEMENT AND DISPOSAL PLAN

The Materials Management and Disposal Plan has been prepared to provide a basic inventory of materials that may be used on Cape Wind project site during construction and operation. In addition, the Plan serves as the guidance document for standard operating procedures associated with the safe management and disposal of anticipated waste streams for the Project. The Materials Management and Disposal Plan describes procedures that CWA and its subcontractors will employ at the site of the Project to ensure that all non-hazardous and hazardous materials used on site are controlled, maintained and disposed of in an environmentally compliant manner.

The Materials Management and Disposal Plan for the project is included as an appendix to Cape Wind project COP. Details of the Plan will be incorporated within the SMS following BOEMRE's approval of the COP.