Appendix S – Safety Management System Requirements

Virginia Offshore Wind Technology Advancement Project (VOWTAP)

Safety Management System Requirements

Prepared for:

Dominion

5000 Dominion Boulevard
Glen Allen, VA 23060

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Submitted by:

KBR

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VOWTAP Contributors:

KBR

ALSTOM

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Virginia Department of Mines Minerals and Energy

Newport News Shipbuilding
A Division of Huntington Ingalls Industries

TETRA TECH

VirginiaTech

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List of Acronyms

VOWTAP	Virginia Offshore Wind Technology Advancement Project
SMS	Safety Management System
HSE	Health and Safety Executive
ALARP	As Low as Reasonably Practicable
LOTO	Lock Out Tag Out
EEOC	Equal Employment Opportunity Commission
JSA	Job Safety Analysis
PTW	Permit to Work
PPE	Personal Protective Equipment
JHA	Job Hazard Analysis
FRC	Flame Resistant Clothing
OHS	Occupational Health & Safety
BOEM	Bureau of Ocean Energy Management
OSHA	Occupational Safety and Health Administration
USGC	United States Coast Guard
USACE	United States Army Corp of Engineers
EPA	Environmental Protection Agency
HAZOP	Hazard and Operability
SCADA	Supervisory Control and Data Acquisition
SPCC	Spill Prevention Control and Countermeasure
MOC	Management of Change
KPI	Key Performance Indicators

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1.0 INTRODUCTION

The VOWTAP project provides a necessary step towards cost effective commercial scale offshore wind deployment. The ultimate objective of the project is to design, develop, and demonstrate a grid-connected 12 megawatt (MW) offshore wind facility off the coast of Virginia. The team has proposed deploying two Alstom HALIADE™ 150 direct drive gearless, 6 MW turbines combined with other significant innovations, such as integrated substructures, installation techniques, and advanced wind farm controls, to make this a world-class demonstration facility.

The US Department of Energy (DOE) announced in 2012 seven technology demonstration projects in the offshore wind sector. The primary goals of these projects are to achieve large cost reductions over existing offshore wind technologies and to develop viable and reliable options for demonstration in the US. Each project was granted funding for the preliminary engineering and planning phase to take place between February 2013 and May 2014, defined as the 50% FEED. On completion of the 50% FEED study, the DOE will select up to three projects to take further into FEED design, Detailed Design, fabrication and deployment phases with the aim to achieve commercial operations by 2017. Ultimately, there is potential in the Virginia Wind Energy Area (WEA) for a full scale wind farm development of more than 1.5 Gigawatts.

Dominion Virginia Power of Richmond has been awarded one of the seven demonstration projects and plans to install two 6 Megawatt wind turbines approximately 45km off the coast of Virginia Beach, Virginia. There are no other contenders for the Demonstrator Project in this area.

This document outlines the status of the overall project in terms of the engineering solutions. It explains the process adopted and range of designs that have been investigated during the 50% FEED phase of the demonstrator project. It also covers where the project will undertake a program of monitoring and testing to inform the design process and reduce uncertainty.

This document provides a series of executive level summaries to describe the progress through the 50% FEED. During the 50% FEED many internal and external reports have been generated and these are included within the volume of appendices. Most of these reports are presented in their original and native format. The Design report draws together all of these individual pieces of work.

1.1 Purpose

The purpose of this document is to describe the requirements of the Safety Management System (SMS).

The ultimate responsibility for health and safety lies with Dominion and as a sign of that commitment, the project will implement a Policy and set aside resources that are integrated into the Safety Management System (SMS). The goal of the SMS is to identify and mitigate hazards associated with the activities undertaken by employees on the Project.

The senior leadership for the Project ensures active participation and communication for the implementation, monitoring and reviewing of the SMS.

This Safety Management System is required to manage activities in respect to:

- Hazard Identification
- Risk Management and Control Measures
- Protection of employees, contractors and the public

The SMS describes:

- Leadership Commitment
- Health and Safety responsibilities of the Project employees
- Health and Safety Project execution

This system is applicable to the activities performed in relation to:

- Project offices
- Project travel
- Other work locations (vessels, ports, construction sites, etc.)

2.0 LEADERSHIP AND COMMITMENT

A safe and healthy work environment for all employees is a fundamental consideration within the management system. The Project will provide active leadership and support of Safety, Security, Occupational Health, Environment, Fire Prevention, Incident Management, and other loss related control activities.

Incident Free Philosophy

The Project is dedicated to the concept that all accidents are preventable. No task is so important as to justify injuring employees, damaging property or harming the environment. Employees, customers, and vendors engaging in work on the VOWTAP project will be provided a work environment that will strive to eliminate all injuries and illnesses, from recognized hazards, through designing, planning, training, and executing work. Protection of people is a management responsibility and it is expected that all subcontractors will adopt the *Incident Free Philosophy*. Each contractor's management is responsible to ensure that their respective employers, subcontractors, and employees engaged on the project comply with applicable regulatory requirements, as well as individual company and project specific requirements.

2.1 HSE Policy Review

To ensure that the objectives set forth by the HSE Policy are continually monitored and improved upon as needed, the HSE Policy shall be reviewed annually through cooperation between all Companies associated with the VOWTAP Project. A copy of the Policy shall be kept as part of the Project HSE Plan as well as posted conspicuously in areas that are commonly frequently by employees involved with the Project. Common areas for the HSE Policy to be posted include employee break rooms, dining facilities, and office areas.

2.2 HSE Strategic Objectives and Targets

The Project is committed to being recognized for world class safety performance on the offshore wind demonstrator project. This SMS is used to manage and clearly demonstrate and implement the commitment to the Health, Safety, and Security of all persons associated with the project and the protection of the environment.

During the execution of this project this means:

- Being the "Project of Choice" by the industry tradesmen
- Selection of "Best in Class" subcontractors
- Creating a work environment where people know and expect that work can be completed without incidents or injuries
- Ensuring no one gets seriously injured while working within the Project area of responsibility
- Fully integrating HSE into every phase of the Project
- Nurturing a safety culture where employees accept first person ownership of the safety process, both for themselves and their fellow workers
- Prevent all property damage and environmental incidents
- Set achievable targets and report on performance
- Employ only competent personnel and conduct training to achieve this objective
- Create positive perceptions and raise HSE awareness on the project

- Implement meetings and opportunities to communicate and obtain feedback on HSE and security issues and concerns
- Fulfill all actions arising from the environmental, social, security, safety, or health assessments, and monitor potential impacts during construction and pre-commissioning
- Remaining accessible to stakeholders
- Expanding the knowledge base regarding the path of construction versus the path of risk
- Maintaining a high level of senior line management visibility and involvement in HSE whether in the field or office
- Ensuring line supervision provides all necessary safety tools to maintain compliance to the Project goals and management system objectives
- Conducting ongoing perception surveys to verify successes/opportunities for improvement
- Collecting, analyzing, and communicating data from craft behavior observations and perception surveys and providing timely solutions and feedback to stakeholders
- Ensuring HSE program compliance requirements are in place and apply equally to all subcontractor and subcontractor control processes
- Avoiding negative project related impacts to the operating facility through proper pre-task planning and safe construction execution
- Heightening environmental awareness across the project team
- Initiating a proactive return to work program which recognizes that employees are assets and therefore, their recovery and return to work after an injury is a critical organizational success
- Conducting regularly scheduled evaluations to measure the effectiveness of management system procedures implementation.

2.3 Project Organisation and Responsibilities

The staff and resources in the organization responsible for managing and reviewing HSE strategies, policies, and performance are shown on the project organization chart. The project organization chart shall be kept up to date and made available through the Project HSE Plan.

All key positions shall be identified and at a minimum (typically) shall include:

- Project Director
- Project Manager
- HSE Manager
- Engineering Manager
- HSE Specialist
- HSE Training Coordinator
- Employee
- Any/All other Project Lead/Vessel Lead positions
- Safety Committee

Typical Responsibilities

Project Director:

The Project Director takes ultimate responsibility for HSE performance of the project under his/her control and will:

- Direct and prioritize HSE issue management within the Project
- Ensure project HSE policies and objectives are understood and adhered to within the project
- Provide leadership and set expectations to promote a positive, pro-active HSE culture throughout the project team
- Ensure contractors, subcontractors, vendors and suppliers have HSE systems and procedures and adopt safe working practices that are aligned with the project objectives.

Project Manager:

The Project Manager is responsible to:

- Customize the Project HSE Management System Procedures to address area specific SMS needs
- Verify Subcontractor compliance to SMS Procedures requirements
- Liaise with Subcontractor managers
- Take ownership, support implementation and actively participate in the HSE process
- Know and understand role within an emergency response
- Use the SMS Procedures in the planning of the work
- Develop and use a Path of Construction / Path of Risk in the planning process
- Through individual contacts and group meetings, communicate HSE objectives to employees and Subcontractors
- Ensure all supervision attend site supervisory training
- Ensure area employees know and understand their HSE responsibilities and are held accountable for compliance
- Conduct quarterly HSE evaluations on direct reports
- Maintain a process of integrated safety planning
- Emphasize to project team that HSE issues must be given attention equal to cost, schedule and quality
- Support HSE Manager(s) and Specialist(s)
- Visibly demonstrate commitment to the incident free culture by conducting formal and informal inspections of work area and taking action on observed non-compliance
- Verify area compliance to HSE Management System Procedures requirements
- Positively recognize individuals, or groups of individuals, for outstanding HSE performance

- Implement a system that ensures identified corrective actions are followed-up to completion
- Verify Subcontractor compliance to the established HSE Management System Procedures and take corrective action on non-compliance
- Lead by positive example
- Advise the Construction Manager of incidents as soon as practicable after an event
- Participate in area planned inspections and chair HSE communication meetings
- Monitor and commend/correct the safety performance of individual members of line supervision
- Verify that each Subcontractor has a system in place to ensure identified corrective actions are followed up to completion
- Lead investigations of major incidents within the area of responsibility.
- Depending on the degree of involvement with a specific incident or trend, participate in weekly HSE incident review.

HSE Manager:

The HSE Manager has overall responsibility for SMS Procedures coordination and is accountable to the Project Manager.

The HSE Manager will:

- Develop and implement an SMS and incorporate environmental procedures
- Ensure that HSE risks for project activities are identified and assessed and that control and recovery systems have been put in place including all emergency arrangements
- Establish and maintain the collection/collation/communication of project performance data
- Develop HSE procedures, auditing programs, HSE induction training and guidance
- Ensure contractors, subcontractors, vendors and suppliers have HSE systems and procedures
- Coordinate project specific HSE Management Systems Procedures, direct activities of environment, safety, and health and security staff
- Coordinate Project and Subcontractor HSE staff
- Develop and implement HSE training, environment, security, emergency response plan and occupational health services plans
- Advise construction management team on HSE issues
- Prepare and issue monthly HSE performance report
- Participate in the field level risk assessment and observation safety process
- Monitor compliance to project, client and regulatory requirements, initiate corrective action through line supervision or Management System refinement
- Interface with management, line supervision craft workers, Subcontractors and other project stakeholders on HSE issues

- Serve as resource person to interpret HSE legislation
- Administer project HSE record keeping system
- Administer incident information management system
- Participate in Subcontractor selection process
- Maintain positive relationships with line supervision, customer, Subcontractors and regulatory enforcement representatives
- Liaise with regulatory authorities
- Promote the Incident Free philosophy
- Assist in facilitating and/or conducting accident/incident investigations
- Assist in incident investigations, regulatory compliance audits, project health surveys, and insurance audits
- Verify and update all required HSE postings, warnings and signs applicable to the project work/hazards
- Review, inspect, and inventory all the types of monitoring equipment to be used and review the calibration, use, and documentation requirements
- Verify that emergency numbers, including physicians and hospital locations, are valid and posted, and these emergency services have access to the field site
- Verify utility clearances are in place and excavation permits are approved
- Represent the project during any governmental agency inspections
- Stop work in imminent danger situation or conditions having adverse environmental impact.
- Conduct periodic HSE assessments.

Engineering Manager:

The Engineering Manager will:

- Provide assurance that technical and operational risks have been identified and assessed and that risk reduction has been effectively achieved such that risks are tolerable, and ALARP with control measures are identified and specified
- Provide assurance that technical and operational risks have been identified and assessed for the construction of facilities by pro-actively specifying the essential controls to be taken by contractors
- Oversee design reviews, risk analyses and formal hazards and effects management process studies
- Ensure compliance with appropriate regulations for design and construction.

HSE Specialist:

The HSE Specialist has overall responsibility for HSE management system coordination within a construction area and provides HSE support to the HSE Manager and Project Manager. This position reports directly to the project HSE Manager.

The HSE Specialist is responsible to:

- Coordinate area specific SMS Procedures, making adjustments as necessary in response to area specific requirements
- Identify actions required to implement HSE training, environment, security, emergency response and occupational health services plans within the construction area
- Advise the management team on HSE issues
- Administer area HSE record keeping system
- Participate in field level risk assessment and observation safety and attend crew pre-job meetings, field level risk assessment reviews as required
- Monitor compliance to project, client and regulatory requirements and initiate corrective action through line supervisor or management system refinement
- Prepare and issue monthly HSE performance reports
- Interface with area construction management, line supervision and Subcontractors on HSE issues
- Establish a system to ensure all actions identified during planned inspections, incident investigations and HSE communications are tracked to completion
- Participate in Subcontractor compliance monitoring process
- Maintain positive relationships with area management, Subcontractors and employees
- Coordinate area HSE effort and advise area management on HSE issues
- Serve as a resource person with respect to HSE legislation interpretation
- Conduct area compliance inspections, provide feedback to area supervision
- Interface with other project HSE personnel regarding HSE issues
- Monitor daily work practices utilized by project site and Subcontractors
- Stop work in imminent danger situation or conditions having adverse environmental impact
- Assist in incident investigations, regulatory compliance audits, project health surveys, and insurance audits
- Monitors project compliance with project Environmental Control Plan
- The field HSE Specialist spends 80% of the time in the field.

HSE Training Coordinator:

The HSE Training Coordinator has overall responsibility for HSE training system coordination within a construction area and provides HSE training support to the HSE and Project Manager of that project.

The HSE Training Coordinator is responsible to:

- Coordinate area training specific in SMS Procedures, making adjustments as necessary in response to area specific requirements
- Identify actions required to implement HSE training, environment, security, emergency response and occupational health services plans within construction area
- Advise the management team on HSE training issues
- Administer area HSE training record keeping system
- Participate in field level risk assessment and observation safety and attend crew pre-job meetings, field level risk assessment reviews, etc.
- Monitor compliance to project, client and regulatory requirements and initiate corrective action through line supervisor or management system procedure refinement
- Prepare and issue monthly HSE training reports
- Interface with area construction management, line supervision and Subcontractors on HSE training issues
- Establish a training system to ensure all actions identified during planned inspections, incident investigations and HSE communications are tracked to completion
- Participate in Subcontractor compliance monitoring process
- Maintain positive relationships with area management, Subcontractors and employees
- Coordinate area HSE training effort and advise area management on HSE training issues
- Serve as a resource person with respect to training and HSE legislation interpretation
- Conduct training compliance evaluations, provide feedback to area supervision
- Interface with other project HSE personnel regarding HSE issues
- Monitor daily work practices utilized by the project and its Subcontractors
- Stop work in imminent danger situation or conditions having adverse environmental impact
- Assist in incident investigations, regulatory compliance audits, project health surveys, and insurance audits.

Employee:

This section applies to all personnel. The employee is accountable to their manager/supervisor and is responsible to:

- Integrate HSE into all activities, exercise necessary steps to protect health and safety of self and others
- Maintain a proactive role in the implementation of the Safety Management System, HSE Execution Plan and the Incident Injury free philosophy
- Conduct pre-task hazard assessments through the field level risk assessment process prior to executing work
- Promptly report all injuries and near misses to their supervisor and HSE representative
- Know and comply with HSE rules, regulations and procedures
- Report all incidents and hazards to immediate supervisor in a timely manner
- Stop all unsafe work and take corrective action
- Maintain and use personal protective and safety equipment and use the correct tools for the job
- Communicate frequently with immediate supervisor on HSE issues
- Suggest ways and means to reduce risk
- Arrive in proper mental and physical condition to perform assigned duties in a safe, efficient manner
- Actively participate in the following:
    - Job planning activities
    - Safety meetings
    - Project behavior based safety process
    - Inspections (when invited)
    - Incident investigations (when required)
    - Project initiated training sessions

Safety Committee:

Project leadership recognizes the need for employees and management to meet to discuss and resolve items of concern with regards to safety. Therefore on a periodic basis, senior project supervision meets with the employees to discuss and resolve safety issues.

By encouraging a strong safety committee, issues concerning safety may be resolved prior to their becoming disruptive to the project. This not only promotes a safer job but raises the level of safety consciousness and encourages the employees to be constructive rather than critical.

The Project will respond quickly to legitimate HSE concerns and also reject unworkable solution; thus, trust and confidence will be gained by allowing free and open discussions. Safety will be achieved by employees and management working together.

The committee meets at a regular time and place designated by the project. Minutes of attendance and action items are maintained and circulated.

The meeting also focuses the attention of the employees toward improvements within crews in which they work. It is strongly emphasized that each employee has experience and the ability to reduce incidents by following good HSE practices at all times.

Project leadership recognizes the value of open communications in the creation of an effective operative HSE program. The function of the Safety Committee is to develop a situation in which its members have a strong sense of group unity and as its common goal the creation of an incident and injury free worksite.

3.0 SUBCONTRACTOR AND SUPPLIER HSE MANAGEMENT

Subcontractor/Supplier HSE compliance is a major loss prevention goal. There is a legal and moral responsibility to use reasonable care in selecting Subcontractors/Suppliers with acceptable records of safe performance and established capabilities and systems for safely managing the work.

Project leadership shall make certain that Subcontractors/Suppliers recognize and accept their responsibility to perform safely, by requiring the Subcontractor/Supplier to actively participate in a formal HSE program. The Project Manager, in conjunction with the HSE Manager is responsible for determining the appropriate degree of involvement and control necessary to promote safe Subcontractor/Supplier performance. The determination is based on the size and hazards of the subcontracted work and the potential impact of unsafe practices on employee HSE, job costs, and schedule.

3.1 Pre-bid HSE Process

As part of the bidding process, the Subcontract Administrator is to explain to potential Subcontractors/Suppliers the HSE standards that will be expected of them, through a pre-qualification process, which includes:

- Past HSE Performance (Incident rate data for past 3 years)
- Attitude toward HSE and ability to meet all of the Project success criteria
- Current and active programs and practices
- Ability to achieve expected HSE performance
- If awarded a subcontract, the conditions of award include:
    - Participation in the project HSE management process
    - Presenting a site HSE program for review that incorporates site HSE rules and the minimum loss prevention requirements set forth for the Project.
    - Designation of a responsible, knowledgeable supervisor to coordinate HSE on site.

- Attending and participating in joint Project/Subcontractor/Subcontractor HSE meetings to be held during construction.
- Participation in HSE audits during Project.
- Establishment of lines of communication at all levels so that safe work practices are understood and implemented by both parties.
- Participation in the Site HSE Program at site.

3.2 Subcontractor Standards of Performance

Standards of performance for pre-qualification and ongoing evaluation of Subcontractors/Suppliers at each stage will be established by the Project Team but must equal or exceed the requirements set forth in Section 3.3 and 3.4. These goals and requirements will be addressed with each Subcontractor/Supplier to ensure they will be fully prepared to comply before a contract is awarded.

3.3 General HSE Requirements

Prior to the start of work, each Subcontractor/Supplier management representative is required to meet with the Project Subcontract Administrator and the HSE Manager. During the meeting, they will outline, to the Subcontractor/Supplier representative the Project HSE policies and procedures. Each Subcontractor/Supplier must actively promote HSE work performance on the part of all employees. Site supervisors shall participate in and implement such activities as HSE meetings, HSE inspections, and HSE recognition programs. The Subcontractor/Supplier will have written HSE procedures and conduct its own HSE programs best suited to their particular needs. The Subcontractor/Supplier must ensure that all employees will be equipped with all personal protective equipment as required by the governing authorities, regulations and codes or by the Project HSE Plan (life jackets, hard hats, safety glasses with side shields, etc.). Subcontractor/Suppliers shall have their own regular system of inspection to detect and correct hazardous conditions, HSE rule violations and unsafe working practices in their own areas. Project leadership shall conduct periodic inspections of the Subcontractor/Supplier's work and issue written results for action by the Subcontractor/Supplier. Good housekeeping and orderliness is a basic requirement for all jobs and must be maintained at all times. Special attention must be given to maintaining clear walkways, removal of trash, slipping and tripping hazards, and proper storage of materials.

3.4 Program Requirements

Subcontractor/Supplier shall have an established, written HSE program that includes their lower-tiered Subcontractors. The program must be submitted to the Project representative for review and comment prior to contract execution. The program shall contain their HSE policies and procedures. In addition, their procedures for implementing the Project's HSE minimum requirements shall also be included. The program shall address the particular HSE hazards of the work to be performed, and meet all Federal, Provincial and Project requirements for a comprehensive Injury and Illness Prevention Program. The HSE program must meet the following minimum criteria and contain the information indicated:

- A HSE Policy and Procedures for implementation of the Policy
- Assignment of responsibility for HSE to Subcontractor/Supplier senior site representative and to all line supervisors

- Designate (by name) an HSE officer to administer the program, conduct regular inspections of the work area for HSE hazards and participate in Project audits of Subcontractor/Supplier work areas
- Selection and placement of personnel to ensure they will be capable of safely performing all assigned tasks
- Maintain a jobsite free of illegal drugs, alcohol and abuse of any substance that affects on-the-job HSE and performance. Subcontractor/Supplier shall be required to initiate a pro-active effort toward a zero tolerance policy equivalent to the Project program to ensure that the above goal of an alcohol/drug free environment is achieved.

4.0 PROJECT EXECUTION

4.1 Orientation and Training

The Project requires that each employee and supervisor be trained in the potential hazards that may exist on a jobsite, the known hazards that exist and the procedures to be followed to perform all work safely. The following are typical (although not all-inclusive) training requirements, but may not be inclusive of requirements for jobsite:

<u>New Employee Orientation</u>
HSE Policy
Project mission statement
Identification and reporting of hazards
Offshore working hazards
Types of PPE required and their effectiveness
Project site rules of personal safety and conduct
Project HSE rules and regulations, including smoking regulations
Field level risk assessment
100% Fall Protection/Prevention
Back injury prevention
Barricades
Basics electrical safety awareness
Basic work week
Compressed gas cylinders
Fire prevention
Confined space entry requirements
First aid and workers compensation procedures
Medical emergency information
Employee access to medical records
Toolbox safety meetings
Emergency warning and evacuation signals
Emergency response, accounting, evacuation
Employee responsibilities
Environmental awareness
Excavation awareness
Hand and Portable Tools
Hazard communication
Hearing conservation/protection

Heat stress awareness
Housekeeping
Incident reporting
Ladders/Scaffolds
Lead awareness
LOTO (Lock Out Tag Out – Hazardous Energy Control)
Material handling
Notice of search Policy
Open door policy
Permitting
Prohibited items
Project specific policies
Observation safety program
Welding/Burning/Cutting
Work Process requirements
Employee disciplinary practices
Alcohol and drug policy
EEOC and Other employment information
HSE recognition program

NOTE: All personnel will receive a HSE Orientation before they start.

Compliance/Specialized Training
Workplace Hazardous Materials Information System (WHMIS)
Field level risk assessment
Trade licenses (Electrical, Pipe-fitter, Instrumentation, Millwright, etc.)
Basic job skills (maintenance, operator, loader, driver, etc.)
Orientation for regulatory license requirements (air, water, etc.)
Legislative OH and S regulations
Safe work procedures
Permitting procedures
Site specific standard operating procedures (SOPs) and rules
First Aid/CPR (Electricians)
Aerial lift
Bloodborne pathogens
Confined space
Crane operator certification
Crane signal qualification
Excavation competent person
Fire watch
Forklift
LOTO
NFRA70E for Electrical Personnel
Offshore working
Powder actuated tools
Respiratory training
Scaffold user
Small tool training
Sea survival and transfer training
Helicopter underwater escape training
Diving safety/operations

Loss Control Training
Security issues
Emergency Response Management, (Incident Command System - ICS)
Emergency Response Tactical, (fire extinguisher, fire hose handling, oil spills)
Event Management

Management Training
Management and supervisory techniques
Behavioral management
Risk communications and community relations awareness
Lock, Tag Try Training
Toolbox Safety Meeting
First Aid
Emergency Procedures
Drug and Alcohol Training
Employees are required to submit proof of training to the Project HSE Manager before the start of any work activity. Competency records shall be kept for each employee involved on the Project or made available upon request.

4.2 Fitness for Work Program

The Project is committed to the health and safety of all employees associated with the Project. This includes ensuring that no person commences or continues to work if it is known that they are not fit for the start of the work shift.

The Project recognizes that a workers health plus other factors, including fatigue, psychological stress, illness and the use of medication, illicit drugs and alcohol, may influence an individuals' ability to perform their work safety.

Fit for work means that: "An individual is in a physical, mental and emotional state which enables the individual to perform their assigned tasks competently and in a manner which does not compromise or threaten the safety or health of themselves or others".

Final determination of "Fit for Work" is based on the assessment of the Project Manager and, where appropriate, in conjunction with other assessment procedures.

4.3 Drug and Alcohol Program

The Project shall develop and implement a Policy - "Drug and Alcohol Substance Abuse Policy" - as the foundations for the project drug and alcohol substance abuse plan. The plan shall establish the compliance goals on drug, alcohol and substance abuse in the workplace and on the use of drug, alcohol and substance abuse testing. The Policy forms a standard from which the Project, in conjunction with local laws and local regulations, are to develop specific practices and procedures. This document shall establish the policy concerning drugs, alcohol and substance abuse in the workplace in order to maintain a drug free work environment safe for employees and conducive to high work standards.

All personnel while on Project property and/or site, vessel, etc. or while operating equipment, at a minimum, are required to comply with the provisions of this Policy as well as any applicable individual company, regional alcohol and controlled substances procedures, applicable local law and local regulatory agency policy.

General Requirements

Drugs or alcohol will not be permitted on the project or in the Parking Lot. Any employee under the influence of either or found to have either in his/her possession or in measurable quantities in their body while on the Project will be SUBJECT TO TERMINATION. Employees under a doctor's care and taking a prescription drug must report to the HSE office and First Aid Office to identify all medications prescribed by the physician prior to beginning work. Prescription(s) must show the attending physician's name, name of medication and prescribed dosage.

The use or possession of prohibited drugs or unauthorized alcohol beverages, and/or being under the influence of prohibited drugs or alcoholic beverage is prohibited on any Project work location and Project sites. Employees at Project work locations are also prohibited from having a measurable presence of prohibited drugs or alcoholic beverages in their body as determined by urine, blood, and/or other accepted testing procedure.

As a condition of employment or continued employment, all prospective and actual employees consent to the collection of bodily fluids from them to be submitted for drug or alcohol testing. Employees may be requested to sign forms documenting such consent, but the employee's continuation in employment evidences in itself the employee's consent and a signed consent form is not required.
Entry into any work location, including project site, offices, vehicles, vessels, and aircraft, is conditional on the Project right to search entrants and their personal effects and vehicles for prohibited drugs and paraphernalia, alcoholic beverages, or unauthorized property or equipment in their possession. Authorized Project representatives may make periodic and unannounced searches of this project work location or of anyone entering this project work location. Work location includes vehicles, offices, rooms, and lockers. Personal searches may be made of Project employees and employees of Subcontractors doing business on behalf of the Project. Prohibited drugs and paraphernalia, alcoholic beverages, or unauthorized property discovered during searches may be taken into custody and may be turned over to appropriate law enforcement authorities.

4.4 Project Safety Meetings

HSE meetings are important for educating, training, and stressing to the workers the importance of safety as an integral part performing the work.

A safety meeting schedule shall be developed and followed for the duration of the Project. The safety meeting schedule shall be kept up to date, and an attendance record shall be kept for each safety meeting.

4.5 Job Safety Analysis and Field Level Risk Assessments

For high risk activities, a JSA (Job Safety Analysis) will be conducted prior to the work commencing, involving all management and supervisors who carry out the work.

Maintaining an incident free work environment requires the dedication of management, front-line supervision, and the workers performing the tasks. To achieve this, an instructional and safety communication approach shall be implemented and made an integral part of the overall HSE program.

The instructional and communicative driven approach shall be designed to maximize safety awareness on the project by providing an environment of total participation by both the person assigning the task and the task performer. By involving the task performers, the approach shall

encourage personal commitment and teamwork, and places accountability for HSE performance on the workers themselves.

4.6 Safe Work Practices, Standards and Procedures

The Project shall develop specific safe work practices, standards and procedures for the use during the Project execution. Typically, development of these items shall be conducted by completing a gap analysis of the standard practices of all companies involved with the Project, as well as the required legislative procedures, **and ensure the strictest standards are implemented for Project use.**

The following are various (but not all) safety standards/ procedures for specific tasks and functions:

4.6.1 Permit to Work Process

VOWTAP requires a safe system of work incorporating a Permit-to-Work (PTW) process on both, routine and non-routine activities to ensure the hazards and risks involved in the activity are identified and safeguarded.

The PTW process shall be fully comprehensive to prevent incidents and shall be more than a simple authoritative permission granting document.

Typical activities, while not all-inclusive, that will require a permit to work include:

- Confined Space Entry
- Hazardous Energy Control (Lockout/Tagout)
- Hot Work
- Radiological Processes
- Excavations
- Lifting Operations
- Work at Heights
- Simultaneous Operations

Work permit are written documents issued daily and/or at any shift change or any major change in job assignment. The permit document authorized the identified personnel to conduct the work activity within a given area and dictates the time, work steps, and required protective measures including PPE.

The work permit shall typically include:

- Date and Time of start and finish of work activity
- Handover procedure for activities that exceed the permitted time
- Permit holder
- Work area
- Description of work activity including tasks and equipment used
- Safeguarding considerations

- Hazards
- Applicable standards, procedures and guidelines
- Contingency plan
- Actions to be taken in the event of an incident including contact names and numbers
- Reference to other work activities that may be an impact
- Employee signatures
- Final handover/completion method for identifying that no incidents occurred
- Ability to be displayed

4.6.2 Job Hazard Analysis

JHA (Job Hazard Analysis) ensures precautions and procedures are consistently and adequately used to prevent and/ or minimize incidents. The JHS shall be used to document the discussion surrounding the steps needed to execute the work activity and all hazards associated with each step as well as the mitigating measures employees shall follow.

JHA shall be used in addition to work permit use and also when work does not require a permit.

4.6.3 Hazard Communication Program (Safety Data Sheet Management System)

Employees have a right to know about chemicals they are working with, around, or can come in contact with. The Hazard Communication Standard is used to ensure that the hazards of chemicals located in the workplace are evaluated and that information concerning physical and health hazards is transmitted to potentially exposed employees.

A successful Hazard Communication Program will reduce potential incidents, injuries and illnesses caused by exposure to hazardous chemicals.

Required components of a Hazard Communication Program are as follows:

1. Method of hazard determination
2. Safety Data Sheets (SDS's)
3. Labels and other forms of warning
4. Employee information and training
5. Hazardous Substance Inventory

SDS’s are required for each hazardous chemical used in the work place. A single SDS may apply to complex mixtures having similar hazards and composition. SDS must be available in case of an emergency.

An SDS shall be requested from the manufacturer or distributor prior to ordering a chemical product. The Project Manager or Superintendent (or individual responsible for ordering a material) shall forward a copy of the SDS to the Site HSE Representative.

SDS's will be accessible to all employees during each work shift when they are in their work areas. The location where they may be reviewed shall be made available to all employees during orientation and posted on the project/facility bulletin board.

A full Hazard Communication and SDS Management System shall be developed for the Project.

4.6.4 Personal Protective Equipment

Employees are accountable to wear appropriate work clothing required by his/her particular job assignment.

In particular, the following is a minimum guideline for PPE. The full PPE procedure shall be implemented as part of the Project Safety Reference Manual.

- Safety Hats and Safety Boots – ANSI approved boots covering the ankle ANSI approved hard hats must be work.
- Eye Protection – ANSI approved safety glasses complete with side shields are required while working on the Project at all times. Additional eye and face protection (such as goggles, face shields, etc. may be required per the job activity.
- Hearing Protection – Where noise levels exceed 85 decibels (dBa), the area shall be marked with appropriate signage stating hearing protection is required. When noise levels exceed 105 dBa, double hearing protection shall be required including ANSI approved earplugs and ANSI approved earmuffs.
- Flame Resistant Clothing (FRC) – FRC is required to be worn when an employee is in any area where PPE is to be worn. FRC would not typically be required on barges, ships unless required by specific work related requirements. Garments under FRC shall be 100 percent natural fibers and includes shorts/ t-shirts, etc.
- Fall Protection – Fall protection shall be worn in accordance with the Project Fall Protection/ Working from Heights procedures and guidelines. 100 percent fall protection is required for all work taking place 6-feet or more above a lower level.
- Hand Protection – All personnel are accountable for identifying and wearing the appropriate protection for gloves which may include chemical resistant, cut-resistant, leather, shock absorbing, latex or insulated gloves per the specific job activity.
- Jewelry – Jewelry is not allowed to be work outside living quarters on the facility. Rings shall be removed when operating equipment on the Project location or associated facilities. Neck chains, tie strings or other jewelry articles that could encounter moving parts shall also be removed. Facial rings and earrings are not allowed.
- Non-FRC Clothing – Long sleeve shirts and full length pants in good condition shall be worn. Pants and other clothing shall not be loose and baggy.
- Contact Lenses – Contact lenses shall not be worn when working in industrial environments subject to dust and vapors or UV radiation from welding operations. This includes the task performer and those that may encounter the condition.
- Facial Hair – Facial hair can cause a hazard in the event a mask needs to be worn or other situations. Personnel shall remain clean shaven including the area immediately below the bottom lip.

- Scalp Hair – Shall be maintained in a neat, trimmed appearance. Long hair can become entangle in machinery and can also interfere with proper sealing of respiratory protection equipment.

4.6.5 Lockout/Tagout

When performing work on air, gas, diesel, electrical, hydraulic, steam driven, etc. equipment, use an approved lockout device in conjunction with other blocking devices, as necessary, to ensure that all equipment is in a zero-energy state.

No one is allowed to remove another worker's lock without approval of the Project Management representative.

Use a secure lock and chain on valves. An alternative or additional safeguard may be to double block and bleed system.

Always "try" the on/off switch to verify the equipment is locked out before starting work.

A combination of lock AND tag is required. Place Do Not Operate tags on all necessary valves and engagement devices used in isolating or locking out the equipment.

Activate the proper blocking, braking and securing devices of all equipment when servicing or repairing.

4.6.6 Confined Space Entry

Confined spaces exist in areas where the configuration hinders the activities of an employee who must enter, work in and exit them. Typical confined spaces include: vaults, tanks, voids, storage bins, man ways, pits, vessels, pipelines, excavations, etc.

Suitable procedures must be in place when employees must enter confined spaces and include the proper training. The Confined Space Entry Plan shall include: engineering controls, permit, testing (periodic and continuous), training verification, LOTO safeguards, retrieval methods, communications, emergency response and rescue plans.

4.6.7 Diving Safety

General duties of Diving Contractors on the VOWTAP Project include:

- Ensuring the dive project is carried out safely
- Particulars of each diving operations are maintained
- Risk assessment is completed
- Diving plan is prepared and followed
- Sufficient competent persons available to carry out work safely and take action in the event of an emergency
- Appoint competent, suitable person in charge of the diving operation
- Make a written record of person in charge appointment and make available to each person
- Ensure person in charge has a copy of all relevant portion of the diving plan

- Utilize full face mask and line fed breathing gasses only – NO SCUBA
- Have a recompression chamber ready and available for use.

The diving person in charge must ensure that diving operations do not pose a risk to the health and safety of those carrying out work activities or others.

Divers must have approved valid qualifications for any activities they may be expected to carry out. A daily log shall be kept. Workers shall have a valid certificate of medical fitness.

All records and plans must be provided to the VOWTAP HSE Management team prior to commencing any dive operation.

4.6.8 Noise and Vibration

The effects of noise and vibration will be kept to the minimum while working on the VOWTAP Project. Personal radios are not allowed to be used on site.

Noise assessments must be made if an employee is likely to have exposure to noise exceeding 85 dBa. Areas where this limit is met or exceeded should be marked as a hearing conservation zone. Wearing proper ear protection shall be mandatory.

Noise levels shall be monitored during construction and notification shall be distributed in the event of unusual noise generating circumstances.

Horn use shall be avoided when approaching or departing from onshore construction areas.

Siren use is not permitted except in the event of an emergency.

Equipment emitting high noise levels will be situated to maximize the distance to the nearest residence.

4.6.9 Working at Height

All elevated work shall be properly planned and supervised which includes emergency rescue planning. The risk assessment for work at any heights and the appropriate hazard/ risk mitigation measures shall be put in place before taking place.

All employees working at heights shall be competent to do so. Employees being trained to work at a height shall be supervised by a competent person.

Training shall include use of safety equipment, elevated working platforms, and safe work practices, equipment maintenance, and work planning.

All considerations for the work shall be taken and may include but not be limited to:

- Overall working conditions
- Access/ Egress
- Fall distance/ Consequence of falls
- Duration and frequency of the equipment in use
- Rescue or evacuation
- Work method planning (i.e. equipment availability for tasks)

- Equipment/ material/ facility protection
- Others employees in work area

The VOWTAP Fall Protection Program is intended to provide the general guidelines for protecting workers working at heights. All contractors involved in work at height shall be involved in the program.

When fall hazards cannot be eliminated or prevented, personal fall arrest systems shall be used where there is a fall hazard at 6-feet or more. Employees working at heights shall secure their lanyards to a secure anchorage point. The fall arrest systems shall be capable of supporting 5,000 lbs. and have a full-body harness and shock absorbing lanyard system. The snap hooks attached to the lanyards shall be double action locking type. Employees working at heights shall be required to wear the harness and lanyard system at all times.

The aforementioned items do not represent the VOWTAP Project Fall Prevention Program in its entirety, which shall be fully developed for Project implementation before any work at height shall take place.

The program shall also include training requirements, inspections requirements, documentation requirements, fall hazard recognition training, primary/ secondary fall prevention systems, work platforms, guardrails, ladders, covers/ barricades, floor openings, warning lines, restraint systems, anchorage points, positioning device systems, lifeline systems, safety net systems, employee lifts, roof work, excavations, and dangerous equipment application.

4.7 **HSE Reference Manuals**

HSE Reference Manuals shall be developed for use on the Project and include the following:

- Safety Reference Manual
- Occupational Health and Industrial Hygiene Manual
- Environmental Reference Manual

The Project HSE Manuals can be combined as the discretion of the Project Manager, and additional manuals (i.e. Best Practice Manual, etc.) may be determined to be required.

See Appendix A for typical Tables of Contents for the above mentioned reference manuals.

4.8 **Transportation and Logistics**

Personnel Tracking

A system shall be developed for tracking personnel for all contractors associated with the VOWTAP Project. A travel plan for each person shall indicate when and where a transfer at sea occurs. Personnel will sign as they board and disembark a vessel.

Vehicles

All employees working on VOWTAP Project will comply with the Project driving policy which includes: having and maintaining a valid driving license, defensive driving techniques, obey posted signage, park in safe areas, avoiding leaving the vehicle running after exiting the vehicle, reporting any vehicle deficiencies, wearing seat belts at all times, not using any mobile or electronic communications devices while operating the vehicle.

Vessels

Employees shall follow all instructions by the vessel captain for loading/ unloading, cargo storage, seating, and smoking arrangements. The captain has the authority to refuse admittance onboard the vessel should they feel the individual poses a threat or is considered to be unsafe. Running is not allowed on the boat deck and personal floatation devices must be worn at all times. All boats operating for the VOWTAP Project must meet the US Coast Guard regulations.

All vessels shall follow an agreed upon inspection schedule.

Life Saving Appliances

All vessels working in conjunction with the VOWTAP Project shall be appropriately equipped with lifesaving appliances and PPE. A comprehensive, updated Person on Board manifest shall be made available upon request by VOWTAP Project request.

Life rafts shall be provided so that the capacity of the life raft will accommodate no less than 100 percent of the total number of persons on board. All rafts shall be fitted with hydrostatic releases.

All lifesaving appliances shall be properly maintained including appropriate documentation of said inspections and maintenance.

Notice to Mariners

The Project will prepare a Notice to Mariners informing of weekly construction activities. The notice will be provided to the USCG and filed in accordance with the Project's documentation filing protocol.

4.9 Periodic Inspections

Periodic inspections are a mandatory part of the Project HSE activities. A typical list of required inspections is presented below. Additional inspections may be required and should be planned for during the Project HSE planning prior to beginning any work.

- Project Work Areas - Daily
- Project Loss Prevention Inspections - Daily
- Fire extinguishers – visual daily; monthly & annual inspection (Tag for verification)
- Small tools / Equipment inspections – before entry to job-site, visual daily prior to use, monthly (documented)
- Rigging – Daily prior to use, monthly
- Scaffolding – Daily (Tag for verification)

- Trucks, loaders, etc. – before entry to site, monthly (documented)
- Electrical tools; cords & equipment – Assured grounding program; documented and color coded monthly

4.10 Behavioral Based Safety Program

Project leadership believes that the only way to achieve an incident free workplace is to utilize a behavioral based safety process to engage every person involved in the project execution.

To this end, the Project shall demonstrate commitment to a safe workplace by following a behavioral based safety program that is centered on developing an incident and injury free culture.

The Project shall implement and execute a formal behavioral safety observation program. In this program, personnel with the support of their supervisors are taught to perform effective behavioral observations and provide positive feedback.

4.11 Life Critical Activities

Project leadership shall identify the activities considered to be critical to life within the scope of the Project. Examples of typical activities may include:

- Housekeeping
- Heavy Equipment Operations
- Confined Space
- Hazardous Energy Control
- Working at Heights
- Lifting Operations
- Vehicle/Vessel Operations

4.12 Recognition, Motivation and Incentives

It shall be a Project practice to provide a positive, safe environment for the workforce.

Employees are motivated by various forces and situations in their lives. There are strong internal motivations and external forces propelling each of us.

The key is achieving full participation of the workforce in the HSE process and this is attained through proper communication of requirements, timely feedback and information necessary for employee job satisfaction.

It is also achieved through positive recognition and reward for achievements, outstanding efforts and meeting of HSE targets and Project goals.

The use of HSE incentives, employee/crew of the month recognition, the participation of employees in suggesting improvements to the HSE program and the work processes are all used to help motivate employees to do their best.

The performance recognition needs to be planned and then implemented during, and at the completion of the project.

4.13 Disciplinary Procedure

It is the duty and responsibility of Project employees to detect safety violations and unsafe situations and provide necessary correction.

The Project leadership team will clearly develop the processes to be followed, and the sanctions that may be imposed on violators, in the event of deliberate, negligent, or repeated breaches of HSE standards.

5.0 RISK EVALUATION AND MANAGEMENT

5.1 Hazard Identification and Assessment

HSE hazards and their effects on people, environment, assets, and reputation shall be systematically identified for the full lifecycle of the project / facility / operation (including risks resulting from organizational change).

The Risk Analysis Matrix shall be used to evaluate the risks associated with the HSE hazards identified. The Incident Potential Severity Table is used to assess the potential reasonable outcome (consequence) against the probability of occurrence. The Incident Potential Severity is measured as High, Medium or Low.

See Appendix B for a typical Risk Analysis Matrix and Risk Register Form. These forms would be populated during the 100% FEED and be a live document throughout the duration of the project.

5.2 Control and Recovery

The following hierarchy shall be used when selecting the control and recovery measures to be implemented to manage HSE risks:

- Elimination of HSE hazards by implementing inherently safer/lower impact options
- Substitution by safer/lower impact products and/or processes
- Isolation/separation of hazards
- Engineering controls
- Administrative and Procedural controls
- Personal Protective Equipment

The reliability of the control and recovery measures shall be commensurate with the magnitude of the risk. The greater the HSE risk, the greater the reliability of the control and recovery measures must be. The applicable Emergency Response Plan(s) must be reviewed to ensure that they address any significant risks identified.

5.3 Documentation and Review

The implementation of the hazard identification and risk assessment process is to be documented. The adequacy of process is to be reviewed and updated (if appropriate) when there are changes to the organization or scope of the operation, significant plant/equipment changes, findings from various Job Safety Analysis techniques, audits, inspections, incident investigations, reviews of emergency response exercises, safety alerts, etc.

5.4 Hazard Management Study and Safety Assessment

A key element of effective business risk management is a systematic approach to the identification of HSE hazards and the assessment of the associated risk. This provides information to aid decision-making with respect to risk-reduction measures. The purpose of this performance standard is to ensure that hazard identification is implemented consistently throughout the Project and that the HSE risks associated with the work activities are reduced to a level that is 'as low as reasonably practicable' (ALARP).

5.5 Risk Management and Demonstration of ALARP

ALARP (As Low As Reasonably Practicable) is the process used to establish guidelines that define the expectations, responsibilities and outputs of all project participants when managing risk throughout the project life cycle. Beginning with business prospect development and continuing through to contract close-out, this guideline provides a framework to assist in a team's successful communication and management of risk.

5.6 Legislation Register

The purpose of this procedure is to ensure that the Project is aware of the existence of and changes to applicable Occupational Health and Safety (OHS) and Environmental legislation in each legislative jurisdiction (e.g. state or country) so that the Project is able to manage/operate within these legal requirements. Currently the following regulatory agencies exercise authority for Projects such as the VOWTAP Project:

BOEM (Bureau of Ocean Energy Management) – Lead authority to regulate offshore wind in federal waters. US federal waters begin at three nautical miles from the coast in most states.

OSHA (Occupational Safety and Health Administration) – Currently has jurisdiction over safety standards and enforcement for the onshore elements of offshore wind projects and portions of the projects within three nautical miles. This includes port facilities, onshore maintenance facilities, and onshore electrical infrastructure.

USGC (United States Coast Guard) – Currently has jurisdiction and authority to exercise control or supervise vessel traffic and to protect navigation and the marine environment. Also, the USCG has jurisdiction for pollution prevention, contingency planning and response activities within the 200 mile Exclusive Economic Zone for oil and hazardous substances. The USCG also possesses authority to respond to and investigate spills of hazardous substances and oil in the coastal zone including all US waters subject to the tide and deep water ports. The USCG has jurisdiction over all vessels including construction/installation vessels, crew transport vessel, and maintenance vessels.

USACE (United States Army Corps of Engineers) – Currently has jurisdiction over the review and regulation of certain structures and work that are located in or can affect navigable waters. Their jurisdiction includes submarine cabling systems utilized by offshore wind facilities for electricity collection and export.

This procedure also outlines the process for reviewing and documenting legislative requirements in the form of a legislation register.

6.0 SAFETY ENGINEERING AND CONTROL SYSTEMS

6.1 Work Operations

The aim of safety engineering work operations is to ensure that work complies with relevant procedures, uses agreed upon Work Methods where appropriate, and complies with any project-specific requirements provided in documents such as Statement of Requirements, client engineering standards, etc.

A safety engineering work operations matrix shall be developed to cover required operations.

The safety engineering work operations will typically cover, as deemed appropriate:

- Design Basis
  - Safety Engineering Work Plan
  - Job Notes
  - Safety Philosophies
- Design Drawings
  - Fire Protection
  - Safety Equipment Layout
  - Hazardous Areas
  - Escape Route
  - Safety Sign Layout
- Fire Protection and Safety System Design
  - Firewater Demand and Design Report and Calculations
  - Specifications
  - Passive Fire Protection Schedule
  - Hazardous Area Schedule

- Safety Studies and Assessments
  - Safety Studies
  - Quantitative Risk Assessment
  - Explosion Overpressure and Design Accidental Loads
  - HAZOP
  - Safety Integrity Level Report
  - Action Tracking Report
  - Safety Case
- Environmental
  - Environmental Impact Assessment
  - Environmental Reports
  - Noise Studies
- Working Environment and Health
  - Working Environment Report
  - Ergonomics Report
  - Occupational Hygiene Report
  - Chemical Catalogue and SDS Summary
- Procurement
  - Technical Reviews

6.2 Fire Suppression

All necessary fire suppression equipment and detection equipment shall be maintained to the proper and approved standards. The equipment is required to be inspected according to the developed inspection schedule and records filed for periodic review.

Fire suppression equipment shall be appropriate for the scope of activity (i.e. on board vessels, land, etc.) and shall not be tampered with or altered in any way. Employees shall be familiar with the equipment location and the emergency response plan. This includes employee participation in drills.

Approved fire, smoke and heat detection equipment (visual and audible) shall be installed in accommodation areas, machinery spaces and other high risk areas. Fire extinguisher equipment shall be clearly labeled. All equipment shall be strategically placed for employee use in the event of an emergency.

6.3 Control Systems

Remote monitoring, control and shut down capabilities will be part of the SCADA (Supervisory Control and Data Acquisition) system that will provide the operator the ability to remotely monitor, control and shut down the facility if necessary.

SCADA continually monitors and assesses the turbine and subsystem status through the use of embedded sensors and other instrumentation. The operator has the ability to observe this data and can modify the systems remotely when needed.

6.4 Fail Safe Systems

The units shall utilize a fail-safe mechanisms (i.e. mechanical brakes, etc.) and protocols in addition to SCADA capabilities should the units lose communications capabilities with the operations facility. These fail-safe systems ensure a safe shutdown procedure. The system shall not be iniated prior to verification that the system integrity is fully verified.

7.0 MONITORING AND IMPLEMENTATION

7.1 Key Performance Indicators

HSE performance and success of the project activities shall be measured using a combination of leading and lagging (proactive and reactive) indicators with the main focus on leading indicators. The proposed measurement metrics will be agreed upon with Project Leadership prior to commencing any works.

A monitoring program shall be developed upon award but as a minimum, typically will cover the following elements:

- Total working hours for all personnel
- Overview of all reportable injuries and near misses
- Overview of environmental incidents, spills, wastes, emissions
- Effectiveness of the HSE Plan
- HSE improvement initiatives
- Behavioral Observation Process
- Leading Indicators – Absenteeism and Turnover Rates
- Safety Meetings and Tool Box Talks
- Field Level Risk Assessments
- Perception Surveys

The Project HSE Manager will provide a summary HSE report covering metrics, significant HSE activities, and any incident summaries in accordance with the Project requirements.

Subcontractors will also be required to provide a HSE report in accordance with the Project requirements.

8.0 TRAVEL MANAGEMENT

Movement of personnel represents a significant area of concern and the full development of a Travel Management protocol shall be implemented before the start of any work.

Each contractor shall be required to develop a comprehensive travel management plan. The plan should include personnel logistic management for on and off shore travel.

Personnel Movements

A record of all personnel movements is maintained offshore. Upon arrival at any installation or vessel, personnel must report to the appropriate area. Personnel must not proceed to any other part of the installation or vessel until their arrival has been recorded and they have received a full safety induction including installation or vessel orientation, the position of life saving appliances, and emergency procedures.

Marine Travel and Helicopter Travel

In the event personnel are to be transported using helicopter, an appropriate helicopter travel management plan shall be developed that identifies the required training, hazards, etc. associated with that means of transport.

Currently, travel via helicopter is not anticipated.

9.0 EMERGENCY RESPONSE PROCEDURES

An Emergency Response Plan will be developed in alignment with Project requirements. The plan will be subject to development and periodic review.

The plan will typically include the following:

- Medical emergency, including medical evacuation, transfer to hospitals
- Emergency building/structure/vessel evacuation
- Site mustering requirements
- Fire response
- Vehicle incident response
- Rescue from height, depth, confined spaces
- Hurricane response
- Lightening/thunder storm response
- Bomb threats
- Search and Rescue
- And others deemed necessary per Project requirements

Emergency Response exercises shall be conducted in accordance with the pre-determined schedule and detailed in the Emergency Response Plan.

See Appendix C for a typical emergency response plan from a previous project. This plan will be developed during the 100% FEED.

10.0 ENVIRONMENTAL COMPLIANCE AND STEWARDSHIP

There will be compliance with all environmental pollution controls, and any spills will be controlled/ disposed of according to Project and legislative environmental protection requirements.

Environmental pollution control and environmental compliance shall be addressed in the Environmental Management Plan. Every effort will be made to minimize the amount of non-reusable waste generated by the project activities. A major contributor to this will be the accurate identification of materials required so as to minimize excess.

The following philosophy will be applied (ordered by priority, next step to be considered after completing the previous):

- Eliminate or minimize the waste stream by choice of procedure or technology.
- Re-use, recycle, recovery as material.
- Re-use, recycle, recovery as fuel.
- Treatment to reduce toxicity.
- Incinerate and re-use or landfill the ash.
- Landfill (not applicable to waste water).

Waste will be appropriately segregated and disposed of in labeled containers by type, including metal, wood, plastic, hazardous and non-hazardous. Efforts will be made to find innovative ways to maximize the reuse and recycling of waste materials.

10.1 Environmental Management System

All work activities shall comply with the Clean Water Act and all other rules, regulations and guidelines (regulatory or Project).

A Spill Prevention Control and Countermeasure (SPCC) shall be developed and submitted.

At a minimum, the following safe and environmentally sound guidelines shall be followed:

- Comply with all environmental law and local requirements
- Adopt practices to prevent pollution and other adverse environmental occurrences
- Implement an effective project environmental plan to control, monitor, audit, review and report on environmental performance in accordance with ISO14001 principles
- Report all environmentally related incidents as soon as possible.

An environmental risk assessment shall be conducted to evaluate:

- Do activities generate new discharges to the air, water, land
- Do activities require permits
- Do activities affect existing discharges
- Do existing discharges exceed the permit limits

- Do activities lessen the effectiveness of existing barriers to protect from an oil and chemical spill

All waste materials shall be disposed of in the appropriate manner. All personnel are responsible for taking the necessary precautions to prevent pollution and minimize waste generation.

The Project is responsible to develop and implement a hazard communication program.

A list of the hazardous chemicals known to be present shall be kept on file and readily accessible via the safety data sheet management system.

The Project shall develop a SPCC (Spill Prevention Control and Countermeasure Plan) that identifies a proper clean up technique as well as all other legislative requirements. Spill prevention measures shall be followed while handling or transferring substances that poses a threat or create a hazard for individual's health and safety or the environment.

11.0 INCIDENT REPORTING AND INVESTIGATION

All incidents (including near misses), no matter how insignificant, will be reported and investigated in an attempt to prevent further incidents from occurring.

The Project will implement a project specific incident reporting procedure as agreed upon by the Project team.

As per the project guidelines an appropriate incident and injury investigation will be conducted upon notification of any such required event. Personnel will be required to use and implement a Project specific method of investigating incidents and other events.

11.1 Injury and Incident Reporting

Project HSE will be responsible for the maintenance of safety records throughout the project and for final compilation of HSE documentation in accordance with Project requirements.

11.2 External Legislative Reporting Requirements

External incident reporting will be in accordance with the relevant legislative and stakeholder requirements and the requirements of the project plan. The Project Manager (or designee) will be responsible for reporting all incidents to management.

Particular reporting requirements shall be identified for:

- USCG (United States Coast Guard)
- BOEM (Bureau of Ocean Energy Management)
- OSHA (Occupational Safety and Health Administration)
- EPA (Environmental Protection Agency)
- USACE (United States Army Corps of Engineers)

12.0 CHANGE MANAGEMENT

A MOC (Management of Change) process shall be implemented for control of major changes.

One purpose of the process is to ensure that the hazards and risks associated with the changes are identified and tracked.

Typical changes for the MOC process may include, but are not limited to:

- Equipment changes (physical)
- Operating procedures
- Personnel
- Materials
- Operating and weather conditions
- Design
- Equipment/Structural additions
- Software

13.0 SAFETY MANAGEMENT SYSTEM MONITORING

A proactive system shall be implemented to ensure that the SMS is effectively being implemented.

The system shall be monitored to ensure that:

- Leadership remains committed
- SMS documentation is prepared for the plan and remains accessible
- The Project safety message is communicated actively communicated
- The SMS is effectively implemented by all personnel
- Systems remain in effect that assures personnel responsibilities are known.

The Project shall establish an effective system for monitoring the HSE performance. The system may include:

- Monitoring input of HSE targets and KPIs
- Statistical communication
- Incident reports
- Exposure hours
- Environmental reports
- Awards and other positive recognition

14.0 AUDITING

Audits will be performed as a part of Project quality protocols and will be carried out to ensure compliance with project specific plans and any implemented corporate standards such as ISO 9001, ISO14001, OHSAS 18001, and the Bureau of Safety and Environmental Enforcement (See Appendix D for the BSEE SMS Auditing Criteria and Checklist.

A schedule for audit completion will be put into place for the appropriate phase of the Project. The purpose of these audits is to ensure systematic assessment for the consistent and effective implementation of the Safety Management System as well as assist in the continuous improvement of HSE performance.

15.0 SECURITY

The Project Leadership Team shall develop and implement a Project Security Policy and make all Project personnel aware of the of the required security elements.

The security element of project planning for the Project will be the subject of a Security Plan (if required), but will typically address the following topics as a minimum:

- Hazards of the worksite
- Security threats, likely to impact as risks on the project
- Access Control
- Contingency Plans

APPENDIX A - REFERENCE MANUAL TABLE OF CONTENTS (TYPICAL)

Sample Table of Contents

(Representative List of Typical Procedures Needed, Not All-Inclusive)

Each Contractor shall provide a manual consisting of their safe work procedures.

Part I – Safe Work Promotion

01 HSE Policy
02 Drug and Alcohol Policy
03 Workplace Violence and Harassment Policy
04 Project Organization and Responsibilities

Part II – Standards and Procedures

01 Abrasive Blasting
02 Aerial Work Platforms
03 Altered, Job Made Tools
04 Barricades, Signs and Signals
05 Compressed Gas Cylinders
06 Confined Space Work Requirements
07 Lock Out Tag Out
08 Crane Use
09 Electrical Safety
10 Diving Safety
11 Excavations
12 Fall Protection
13 Fire Prevention/Protection
14 Guardrails/Covers/Warning Line Systems
15 Hazard Communication
16 Scaffolding
17 Ladders
18 Personnel Platforms
19 Work Practices
20 Aerial Lifts
21 Access/Egress
22 Turbine Access Method (Vessel to Turbine)
23 Marine Safety
24 Shore to Vessel

25 Vessel to Vessel
26 Hand/Power Tools
27 Hot Work
28 Permit to Work Process/ Program
29 Power Lines
30 Equipment Operations
31 Painting
32 Personal Protective Equipment
33 Forklift/Backhoe Safety
34 Office Safety
35 Safety off the Job
36 Transportation and Logistics
37 Drinking Water
38 Welding/Burning Operations
39 Working Alone
40 Noise and Vibration

Part III – First Aid Medical Services

01 Evacuating Seriously Ill or Injured Personnel
02 Reporting
03 Medical Facilities
04 Occupational Injuries/Illnesses
05 Serious Injury/Catastrophe Procedures

Part IV – Accident Investigation

01 Initial Reporting
02 Investigation Process
03 LTI/Serious Incident Investigation
04 Third Party Liability Investigation

Part V – Recordkeeping

01 First Aide Register
02 Occupation Injury/Illness Log
03 Safety Summaries
04 Employee Medical Information

Environmental Reference Manual

Part I – Compliance

01 Waste Management

02 Spill Prevention and Management

03 Environmental Reporting

04 Environmental Surveys

Occupation Health and Industrial Hygiene Reference Manual

Part I – Program Elements

01 Identification of Health Hazards

02 Analysis of Hazards

03 Control Measures

04 Review

05 Training

06 Medical Monitoring

07 Fatigue Management

08 Fit for Duty

09 Hearing Conservation/ Noise and Vibration

10 Respiratory Protection

11 Heat Stress/Cold Stress

12 Ergonomics

APPENDIX B - RISK REGISTER AND RISK ANALYSIS MATRIX

Project VOWTAP
Date: Oct 2013

likelihood H > 50%, M > 20%, L< 20%

impact H > $5m, M > $1m, L < $1m

Identifying Information					Risk Statement				Scoring			Scoring (Current Score)							PI / PIM Scores (No input required)				Scoring (Target Score)							PI / PIM Scores (No input required)								Mitigation overview		PRE-RESPONSE PLAN Current Ranging		
Risk ID	Category:	Originator	Risk Short Title	Risk phase	Cause (Facts) *"Due to...."*	Risk (Uncertainties) *"There is a threat of [or opportunity for]..."*	Effect *"Which could result in..."*	Risk Owner	Likelihood	Cost Impact	Rating	Probability	Manageability	Cost Rating	Schedule	Environmental Rating	Safety Rating	Reputation Rating	Standard PI	Standard PIM	Cur Alternate	Alternate	Probability	Manageability	Cost Rating	Schedule	Environment	Safety Rating	Reputation	Schedule PI	Cost PI	Alternate PI	Alternate	Action # during current Phase	Client Category Level 1	Client Category Level 2	Internal/External	Risk Mapping	Treatment Method Action	Schedule Range	Cost Range	Likelihood

APPENDIX C - EMERGENCY RESPONSE PLAN (TYPICAL)

This appendix is derived from a typical UK project example and references European agencies and procedures. For the VOWTAP project, references to MCA and HM coast guard would be changed to the US Coast Guard etc.

XXXX OFFSHORE WIND FARM

JOINT VENTURE

PROJECT

EMERGENCY RESPONSE PLAN

THIS DOCUMENT IS SUPPORTED BY THE FOLLOWING PLANS;

HSE& E PLAN

N3416P0216 (AREVA REF) XXXX-XXX-PLN-0197 (XXXX REF)

HS&E BRIDGING DOCUMENT

MPIL/224B/S/O/3078 (MPI REF) XXXX-XXX-410-PLN-0416 (XXXX REF)

EMERGENCY COMMUNICATION PLAN FLS-006471_2_002 (BOW REF)

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1. SCOPE OF DOCUMENT 3
2. PROJECT OVERVIEW 10
3. REFERENCE DOCUMENTS 10
4. OVERVIEW OF WIND FARM OPERATIONS 10
5. CONSIDERATION OF POSSIBLE SCENARIOS 11
6. SUMMARY OF EMERGENCY SCENARIOS AND RESPONSE PROCEDURE 12
7. COMMUNICATIONS WITH USCG IN THE EVENT OF AN INCIDENT 14
8. EMERGENCY SERVICE CONTACTS 14
9. SUMMARY, CONCLUSION & NEXT ACTIONS 14

INTRODUCTORY DETAILS

PROJECT NAME	LOCATION / ADDRESS	ESCALATION LOCATION
OFFSHORE WIND FARM		LEATHERHEAD

POTENTIAL INCIDENTS OFFSHORE		ONSHORE	
Fire	☑	Fire	☑
Injured person	☑	Accident	☑
Stranded by weather	☑	Road Traffic accident	☑
Man overboard	☑	3rd Party injury	☑
Terrorist activity	☑	Electrocution	☑
Stranded vessel	☑	Arson	☑
		Terrorist activity	☑

KBR SYSTEM ESCALATION CRITERIA	LEVEL 1 – LOCAL *1	LEVEL 2 – REGIONAL *2	LEVEL 3 – GLOBAL *3
Environmental Incident	Potential for minor environmental impact - localised	Potential for significant environmental impact	Potential for major environmental impact
Extortion (kidnap/hostage etc.)		Life threatening exposure	Life threatening+ major financial exposure
Fatality		1-2 people including 3rd party/sub-contract	>2 people including 3rd party/sub-contract
Image/Reputation threat		Significant impact possible	Significant impact probable
Injury(serious requiring hospitalisation)	1-3 people	4-10 people	> 10 people
Media Presence/Interest		On scene of incident	On scene of incident
Regulatory Presence/ Interest		On scene of incident	On scene of incident

*1 = Local Emergency Response to be initiated in accordance with relevant subcontractors HSE / Emergency Response Plans

*2 = Regional (KBR) Emergency Response requires contact with KBR Head Office (Leatherhead) Security who in turn will contact the duty Incident Commander for the period

*3 = Global (KBR) emergency response will be initiated under control of the KBR duty Incident Commander for the period

INCIDENT MANAGEMENT PHILOSOPHY

The following flow indicates the outline philosophy to be adopted with all emergency response. This philosophy is applied through the response measures set out in subcontractor emergency response / HSE plans.

INCIDENT

SUBCONTRACTOR ACTIONS

- Initial response to follow Subcontractor Emergency Response / HSE Plan / this plans requirements
- Subcontractor forms emergency response team under the host company system
- Subcontractor notifies VKBR Project Director / Deputy and QHSE Manager by quickest possible means
- Subcontract summons emergency services as necessary
- Subcontractor notifies third parties for response support as necessary
- Subcontractor notifies owners / operators of third party facilities (i.e. HRL pipelines / NGT)
- **NO MEDIA CONTACT BY SUBCONTRACTOR ALL MEDIA INTEREST TO BE DIRECTED TO VKBR**

VKBR ACTIONS

- Project Director / Deputy notify Client
- Project Director / Deputy forms emergency response team to support subcontractor
- Project Director / Deputy notify VKBR board if warranted by the incident nature
- Project Director / Deputy initiate KBR regional Crisis Management Process if escalation criteria is met
- Project Director / Deputy monitor situation for potential escalation
- Project Director / Deputy ensure ongoing client liaison
- **MEDIA COMMUNICATION TO BE MANAGED WITH CLIENT**

KBR ACTIONS

- KBR regional Crisis Management Team monitor situation and provide support as appropriate

It is key that accurate records are maintained of all emergency response activities in order to facilitate implementation of corrective / preventive action and lessons learned processes.

CONTACTS

The following tables provide contact details for reference as required during emergency response activities. Each table indicates the purpose of the contact.

LEVEL 1 (PROJECT LEVEL) EMERGENCY RESPONSE TEAM CONTACTS –		
ALL INCIDENTS ARE TO BE REPORTED TO; RELEVANT PACKAGE MANAGER, QHSE MANAGER **PROJECT / DEPUTY PROJECT DIRECTOR**		
Name	**Responsibilities**	**Contact Details**
	Project Director	
	Deputy Project Director	
	Project HSE Manager	
	Electrical Package Manager	
	Offshore Installation Manager (Emergency Team Leader)	
	Foundations Package Manager	
	Cable Package Manager	
	Operations & Maintenance Package Manager	
Head Office Security	(a) For outside office hour guidance (b) Potential Crisis Management Team (Level 2) mobilisation	

LEVEL 1 (PROJECT LEVEL) EMERGENCY RESPONSE TEAM CONTACTS – BOARD		
FOR HEAD OFFICE REFERENCE		
Name	**Responsibilities**	**Contact Details**
	Director	
	Operations Director	
	Vice President	
	Project Director Offshore	

LEVEL 1 (PROJECT LEVEL) EMERGENCY RESPONSE TEAM CONTACTS – XXX DUTY OFFICERS		
FOR REFERENCE		
Name	**Responsibilities**	**Contact Details**
	Project Manager	
	Director	
	Board Chairman	

LEVEL 1 (PROJECT LEVEL) EMERGENCY RESPONSE TEAM CONTACTS – XXXXXX		
Name	**Responsibilities**	**Contact Details**
Offshore Installation Manager, Central Production Complex (CPC)	INITIAL OFFSHORE CONTACT	
Security Lodge	ONSHORE EMERGENCIES OR OUT OF HOURS CONTACT - provide caller name, contact number and brief incident nature	
Base Switchboard	Automated Response	

LEVEL 1 (PROJECT LEVEL) EMERGENCY RESPONSE TEAM CONTACTS		
REFER HSE PLAN N3416P0216 (XXXX REF.) XXXX-ARE-PLN-0197 (XXXXREF.)		
PROJECT MANAGEMENT		
Name	**Responsibilities**	**Contact Details**
	Project Manager	
CABLE ROUTE MANAGEMENT		
Name	**Responsibilities**	**Contact Details**
	Site Manager (onshore)	
	Site Representative (Emergency Team Leader)	
	Site representative (onshore)	
XXXX PLATFORM BUILD		
Name	**Responsibilities**	**Contact Details**
	XXXX Site Manager	
	XXXX Site Representative (Emergency Team Leader)	
	XXXX Site Representative	

LEVEL 1 (PROJECT LEVEL) EMERGENCY RESPONSE TEAM – XXX		
KEY PERSONNEL ONLY XXXX/224B/S/O/3078 (XXX REF.) XXXX-MPI-410-PLN-0416 (XXXX REF.)		
XXX PROJECT MANAGEMENT		
Name	**Responsibilities**	**Contact Details**
	Project Manager	
	HSEQ Manager	
Emergency Response Centre	Conference Room	
XXX		
	Onshore Base Manager	
	Onshore Base Manager	
	Onshore Marine Controller	

Continued …….

RESOLUTION		
	Master	
	Bridge	
	Chief Engineer	
	Deck Superintendent	

EXTERNAL EMERGENCY CONTACTS				
Emergency Services			**Other**	
Police/Fire/Ambulance			Port	
Fire & rescue			City Hospital	
Fire & rescue			Environment Agency	
Ambulance				
Police -				
Police -				
Police -				
U.S. Coastguard				
Maritime Rescue Co-ordination				

XXXXEMERGENCY CONTACTS

XXXX DUTY OFFICER	(Project Manager)	
	(Director)	
	(Board Chairman)	
	(Chief Financial Officer) (Secretary)	
	(Director Power Generation & Renewables) (Secretary:XXXX)	
	(Head of Electricity Supply) Secretary:	
	(Head of Projects)	
	(Duty Manager)	

1. SCOPE OF DOCUMENT

The scope of this document is to consolidate emergency response arrangements for operations stage of the project.

This document is owned by XXXX, held live for update and revision as work progresses and protocols mature.

2. PROJECT OVERVIEW

30 No. x 3MW Wind Turbine Generators (WTG) interconnected by submarine transmission cables which are then routed from the Farm to the shore along an agreed route to interface with onshore cabling separately procured by XXXX to connect to the Grid at the 24Seven 33kV substation.

3. REFERENCE DOCUMENTS

Attention is drawn to the following reference documents

Document Reference	Document Title	Status
XXXX-115-PLN-0064	Construction Stage Health and Safety Plan	Live
N3416P0216 (XXXX ref.) XXXX-ARE-PLN-0197 (XXXX ref.)	XXXX HSE Plan	Live
XXXX/224B/S/O/3078 (XXX ref.) XXXX-MPI-410-PLN-0416 (XXXX ref.)	XXXX HSE Plan	Live
Attached	Evacuation Plan V90 Offshore	Live
FLS-006471_2_002 (BOW Ref)	Emergency Communication Plan	Live

4. OVERVIEW OF WIND FARM OPERATIONS

The aspects of operations relevant to emergency response are summarised as follows:

(i) Operations Base. The operations base is where the Control Room is situated.
(ii) Wind Turbine Servicing. The wind turbines are scheduled to have two services per year, at six-monthly intervals.
(iii) Cable testing. Part of the commissioning procedure is the testing and approval of all cables within the wind farm
(iv) The Vessel Resolution and other crew vessels will also visit the wind farm for ad-hoc situations, for example the failure of a minor component,
(v) Replacement of components in excess of the capability of Vessel Resolution will be performed on an as-required basis using vessels with larger crane capacity.

5. CONSIDERATION OF POSSIBLE SCENARIOS

The possible scenarios that may require intervention / support of emergency services are numerous, and therefore is it considered prudent to analyse worse case scenarios.

Examination of the list of work activity yields the following possible scenarios, split in to internal and external issues.

DURING OPERATION		
Substation	Fire, Accident, Electrocution involving O&M staff.	Arson, terrorist activity.
Land cable route	Accident / Electrocution through maintenance work involving O&M staff.	Accident / Electrocution through interference or future road excavation.
Sub-sea cable route	Accident / Electrocution / vessel incident through maintenance work involving O&M staff.	Accident / Electrocution / vessel incident through maintenance work involving sea users, anchors etc. Failure of BHP pipeline affecting sea cable.
Turbines	Fire, Accident, Electrocution or stranding in turbine involving O&M staff.	Vessel collision with turbine, unauthorised access related injury, arson, terrorist activity.

Collision risk has been fully analysed and a comprehensive plan put in place both for the Barrow activity and at the wind farm site. However, in the event of a collision, emergency services would be required to respond, and communications protocols require to be established with the wind farm operator to cover such isues as switching off power.

6. SUMMARY OF EMERGENCY SCENARIOS AND RESPONSE PROCEDURE

The Offshore Wind Farm emergency procedures will comprise the following:

- Summary of Emergency Response Procedures

The summary of emergency response procedures presumes that vessels / sites have their own emergency response procedures, and that the procedures are in accordance with procedures.

SUMMARY OF ONSHORE EMERGENCY SCENARIOS

Hazard	**Risk Scenarios**	**Procedure**
Fire	Switchroom Fire Cable Fault	• Evacuate Staff • Call 911
Accident	Switchroom Accident Electrical Fault Cable Route	• Person on site performs own assessment of situation • Call 911
Road Traffic Accident	Cable Route College Car Park	• Person on site performs own assessment of situation • Call 911
3rd Party Injury	Trespass into Switchroom Tampering with Cable	• Person on site performs own assessment of situation • Call 911
Electrocution	Tampering with Cable	• Person on site performs own assessment of situation • Call 911
Arson	Generic Risk	• Call 911
Terrorist Activity	Generic Risk	• See Bomb Threat Management • Call 911

The risk scenarios for the onshore works would be covered by conventional onshore call-out procedures, ie call 911. In all cases the O & M Manager must be informed on Follow up calls should be made to all contacts as listed on page 20.

SUMMARY OF OFFSHORE EMERGENCY SCENARIOS

Hazard	Risk Scenarios	Procedure
Fire	• Fire – No personnel on WTG. • Fire – Personnel on WTG.	• Appendix C • Appendix D
Injured Person	• Walking Casualty • Stretcher Casualty	• Appendix E • Appendix F
Stranded by Weather	• Weather conditions turning rapidly severe	• Appendix G
Man in water	• Man Overboard	• Appendix H
Terrorist Activity	• Bomb Threat	• Appendix I •
Stranded Vessel	• Incapacitated Vessel	• Appendix J
Diving Operations	• Decompression Sickness	• Appendix L

In any of the above circumstances, contacts should be kept fully aware of situation. (see Emergency Contacts – Duty Officers)

7. COMMUNICATIONS WITH USCG IN THE EVENT OF AN INCIDENT

Communications will be via an agreed single point of contact within the operations team – this has been identified as the Work Vessel Co-ordinator. Further consultations are required with XXXX to complete the process during operations.

8. EMERGENCY SERVICE CONTACT

Refer to the tables within Section 0 for contact details of the Emergency Services

9. SUMMARY, CONCLUSION & NEXT ACTIONS

The full support of the U.S. Coast Guard and associated emergency services is required for the wind farm project during operations.

Continuity of search and rescue services for wind farms offshore generally has not reached maturity, and this project is a testing ground for systems and procedures.

Fire fighting onboard construction vessels and at at turbine site requires further more detailed investigation and training for the emergency services.

Good lines of communications between vessels and the coastguard are required to ensure good coordination during emergency actions.

Emergency services require familiarisation, training and for risk assessments to be prepared to enable then to provide continuity of service at the project site.

A set of proposed call-out procedures has been drafted, and is with the Emergency Services for comment.

APPENDICES

1 Wind Farm Location
2 Support Vessel
3 Fire – No Persons on WTG
4 Fire- Personnel on WTG
5 Walking Casualty
6 Stretcher Casualty
7 Stranded by Weather
8 Man Overboard
9 Bomb Threat Management
10 Incapacitated Vessel
11 Emergency Supplies
12 Emergency Services Contacts
13 Emergency procedures

Appendix 1 – Wind Farm Location

Appendix 2 – Transport Vessel

Vessel SPECIFICATION

Vessel Make :Alnmaritec Wave-Train 1300

Vessel Name :Celtic Challenger

Length :14.9 m

Beam :5.0 m

Draught :0.60m

Engines :Two Cummins 6CTA 8.3m 430 BHP Jet Drive

Vessel construction :Aluminium alloy catamaran

Vessel is certified to 10 passengers up to 60 miles from Safe haven.

Vessel is covered by a USCG licence.

Vessel has full first aid kit and life saving equipment as required by the above code

All skippers and crew members have full qualifications in:-

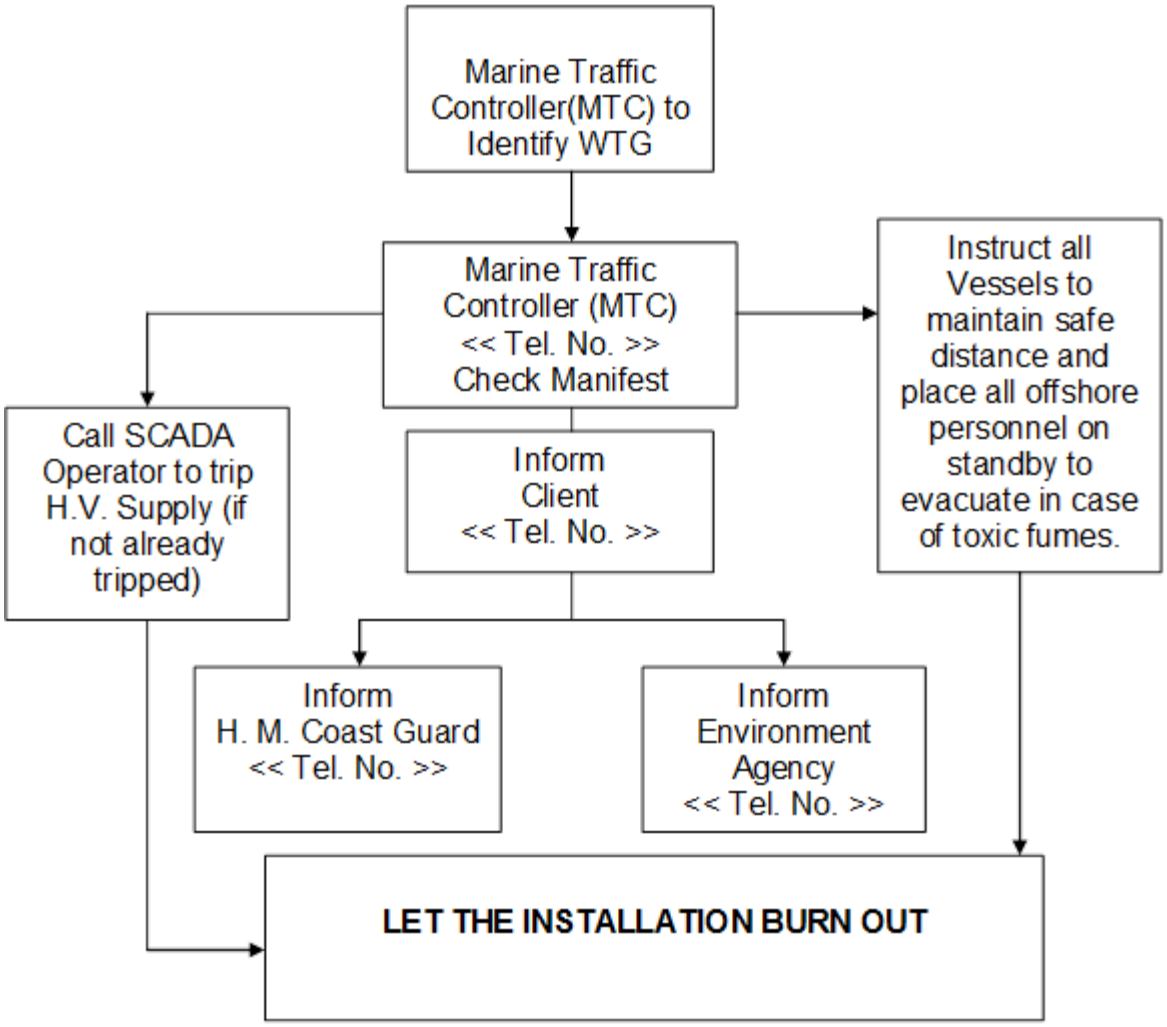
- First aid
- Fire fighting
- Sea survival
- Full skippers licence to pilot the vessel.
- Current in date Personal Medical

The Service Vessel is equipped with the following:-

- 4 Life Jackets
- 1 x 12 man life raft
- 1 Offshore First Aid Kit
- 5 Fire Extinguishers (1 x Water, 2 Dry Powder, 2 CO^2
- 1 Heaving Line
- 1 Offshore Flare Pack
- 2 Boat Harnesses
- 2 Life rings with lights
- 1 Scramble net
- 1 Grab Bag (Contents Appendix K.)
- Emergency Marine VHF Radio (Hand Held)
- Additional set of full personal climbing equipment (for use of medic if required)

Appendix 3 - Emergency Procedure: Fire – No Personnel on WTG

If you see signs of fire on a WTG, the following procedure must be followed.



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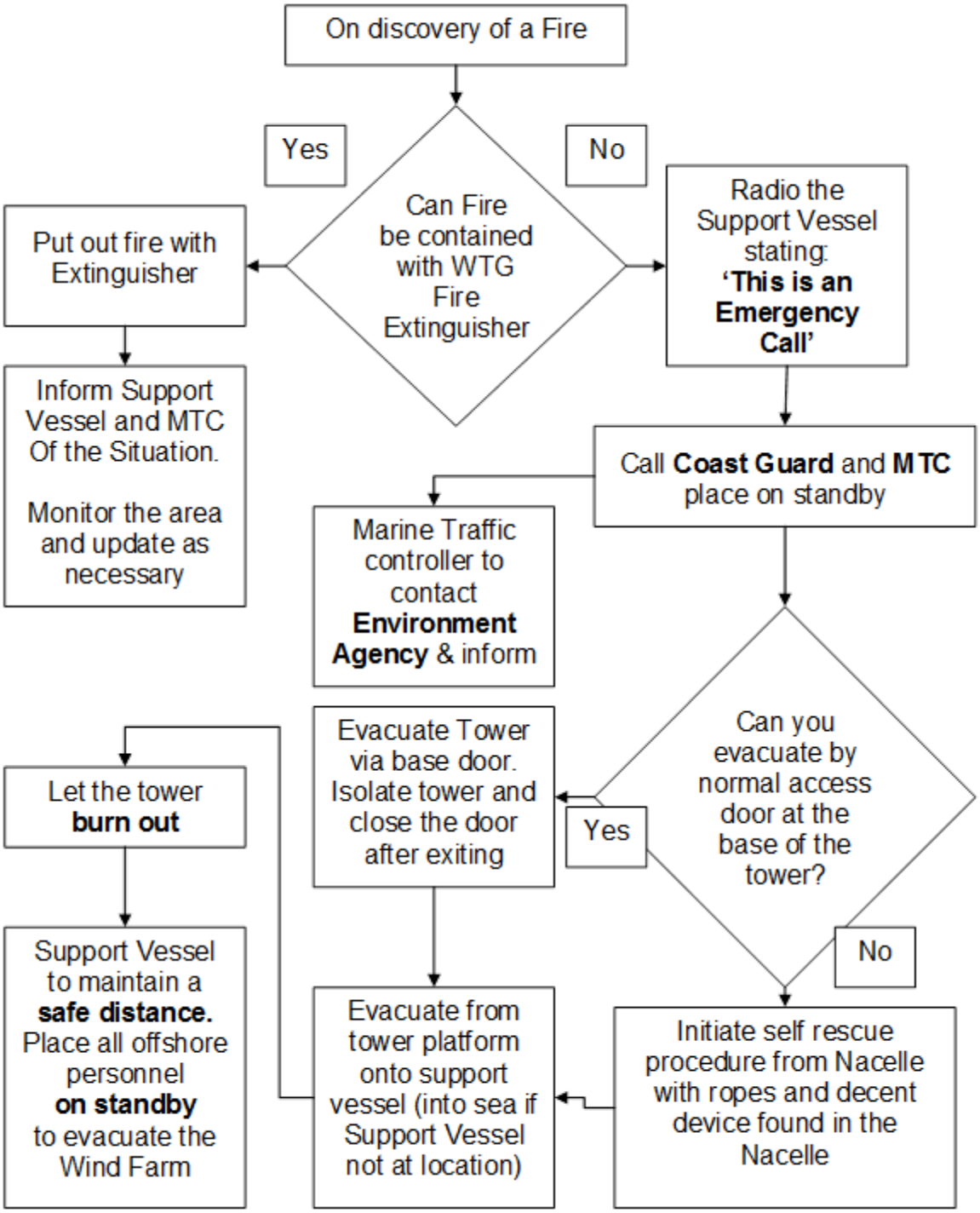
BEWARE OF TOXIC FUMES AND FALLING DEBRIS.

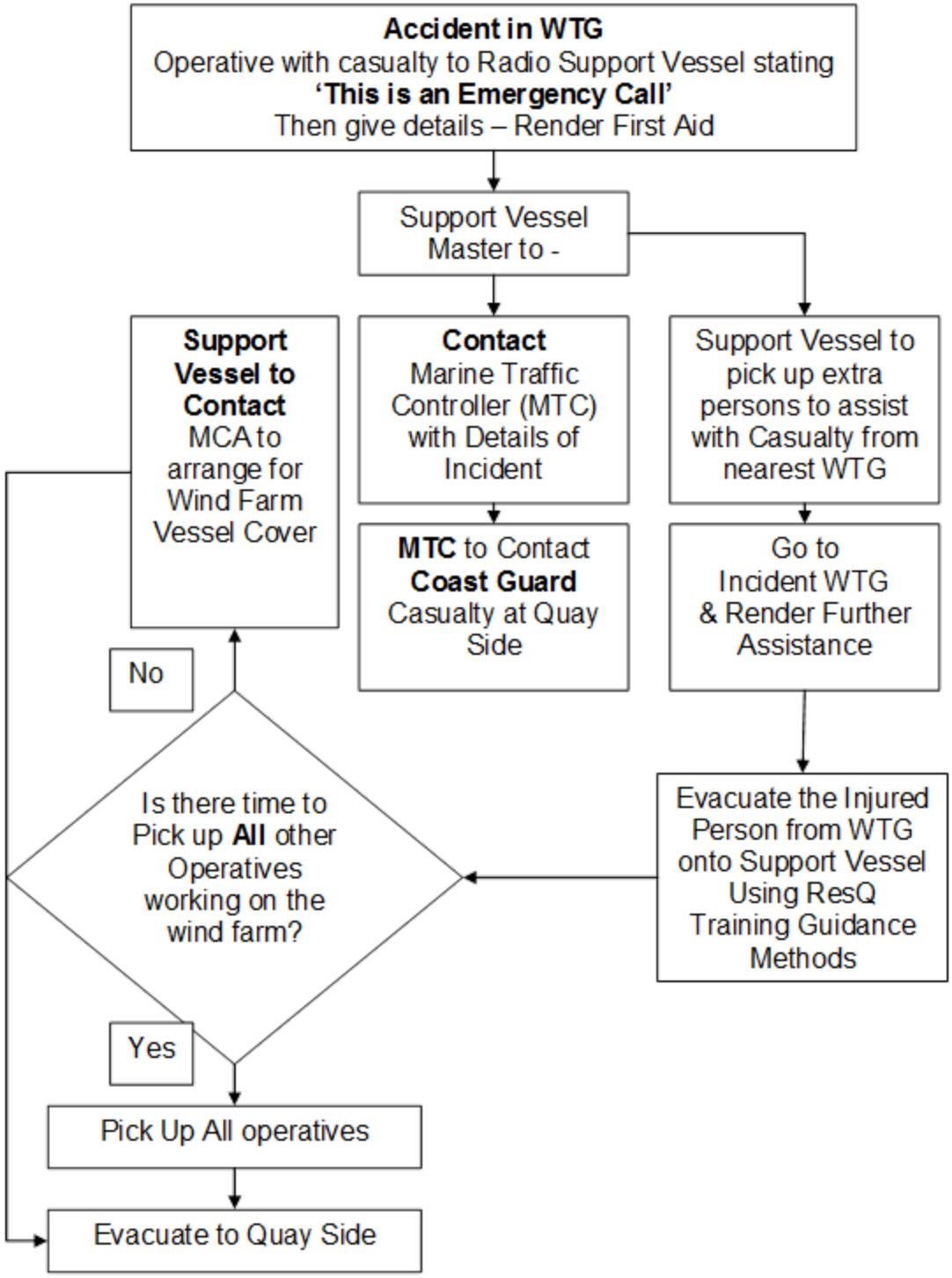
KEEP OTHER VESSELS CLEAR AND UP-WIND OF FIRE.

Appendix 4 - Emergency Procedure: Fire – Personnel on WTG

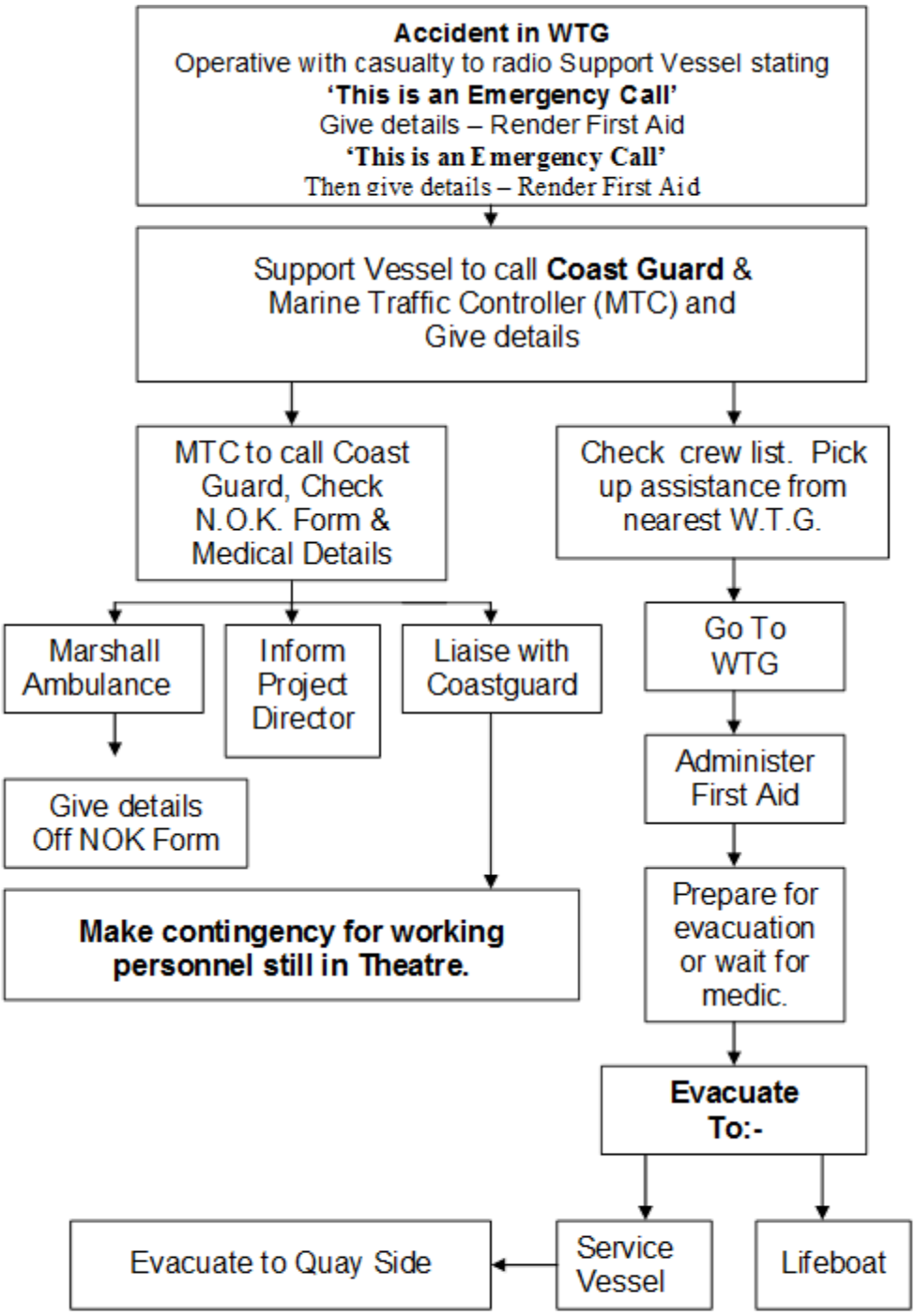


Coast Guard **999** _____

Appendix 5 - Emergency Procedure: Walking Casualty

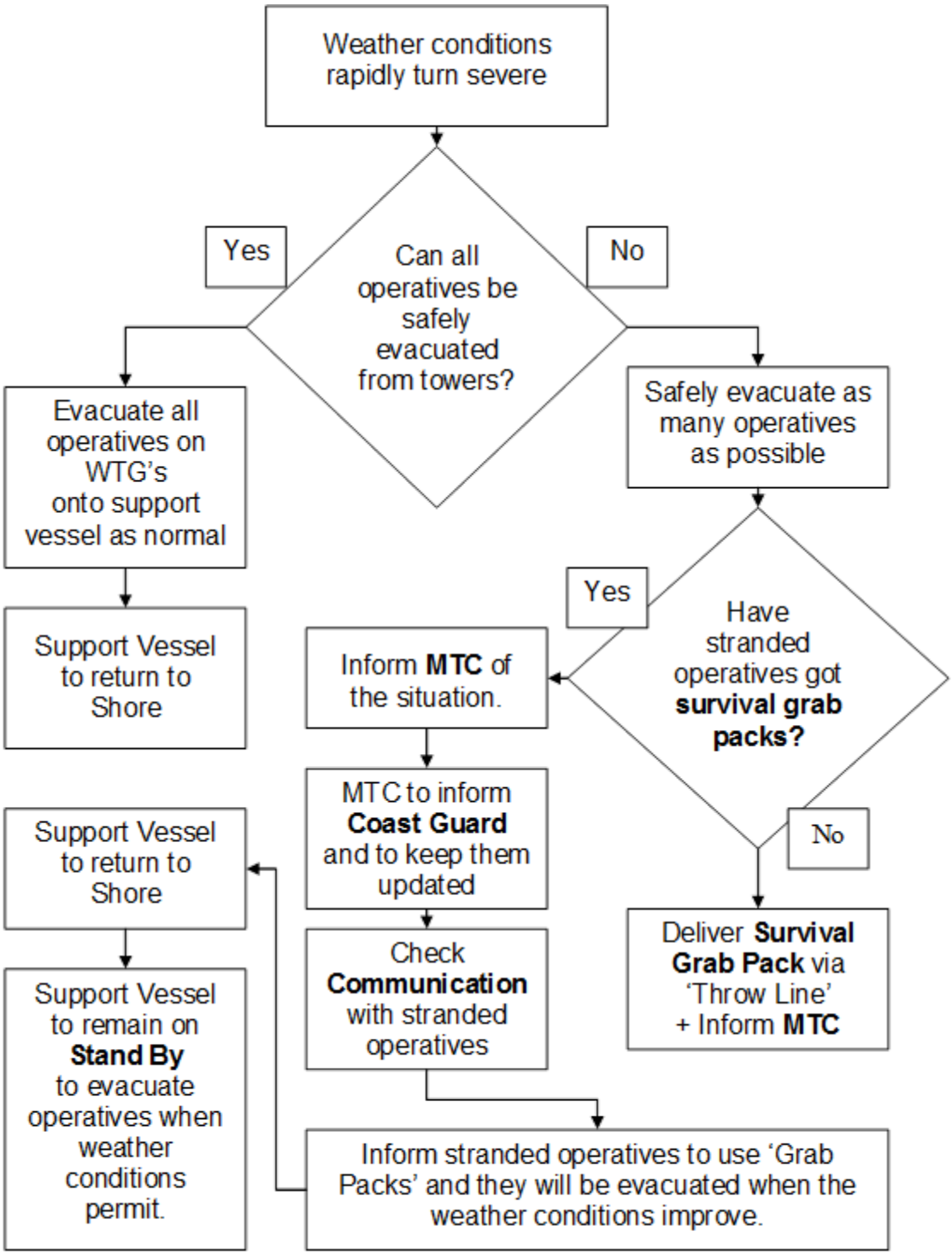


Appendix 6 - Emergency Procedure: Stretcher Casualty

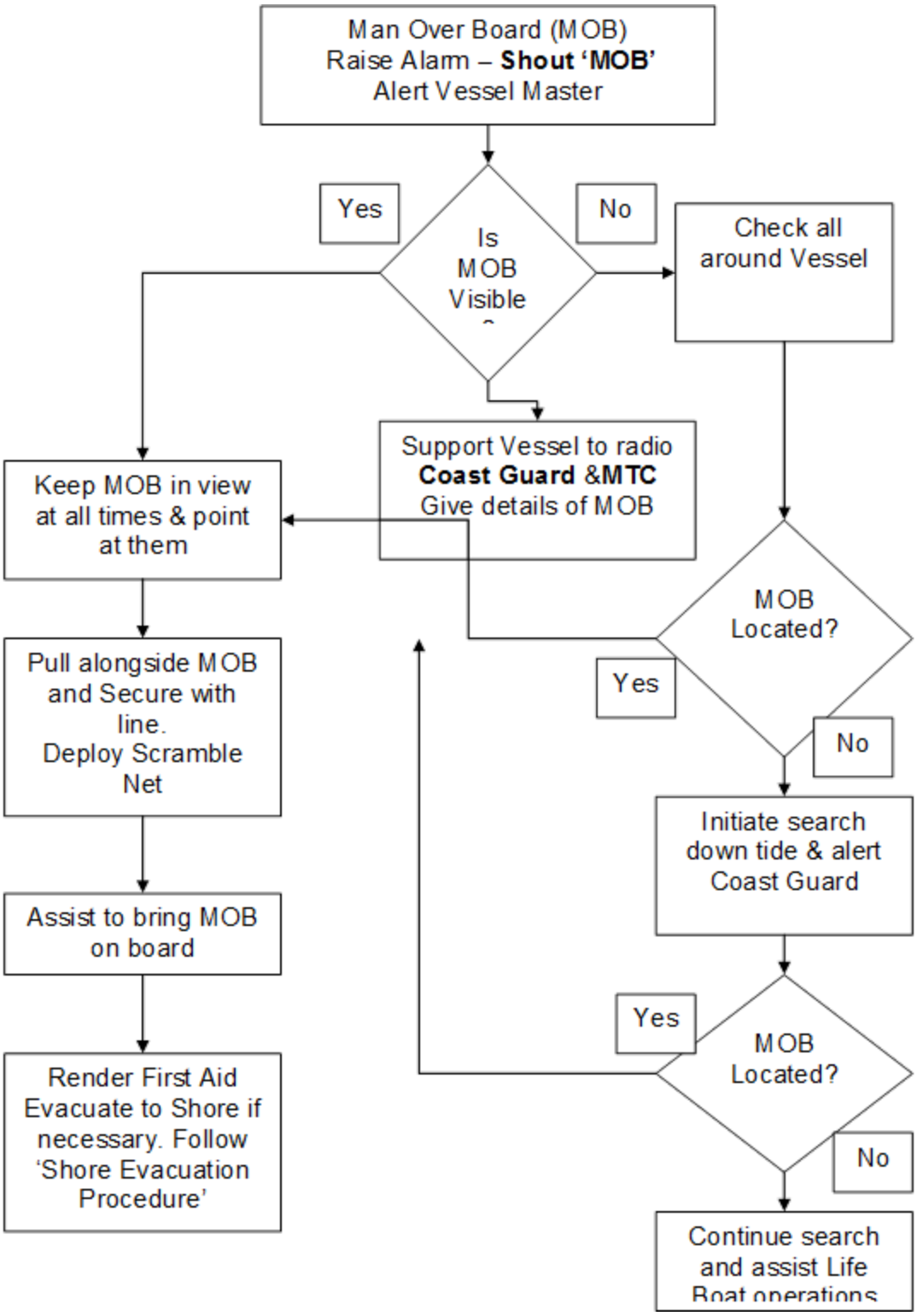


U.S. Coast Guard **TBA**

Appendix 7 - Emergency Procedure: Stranded by Weather

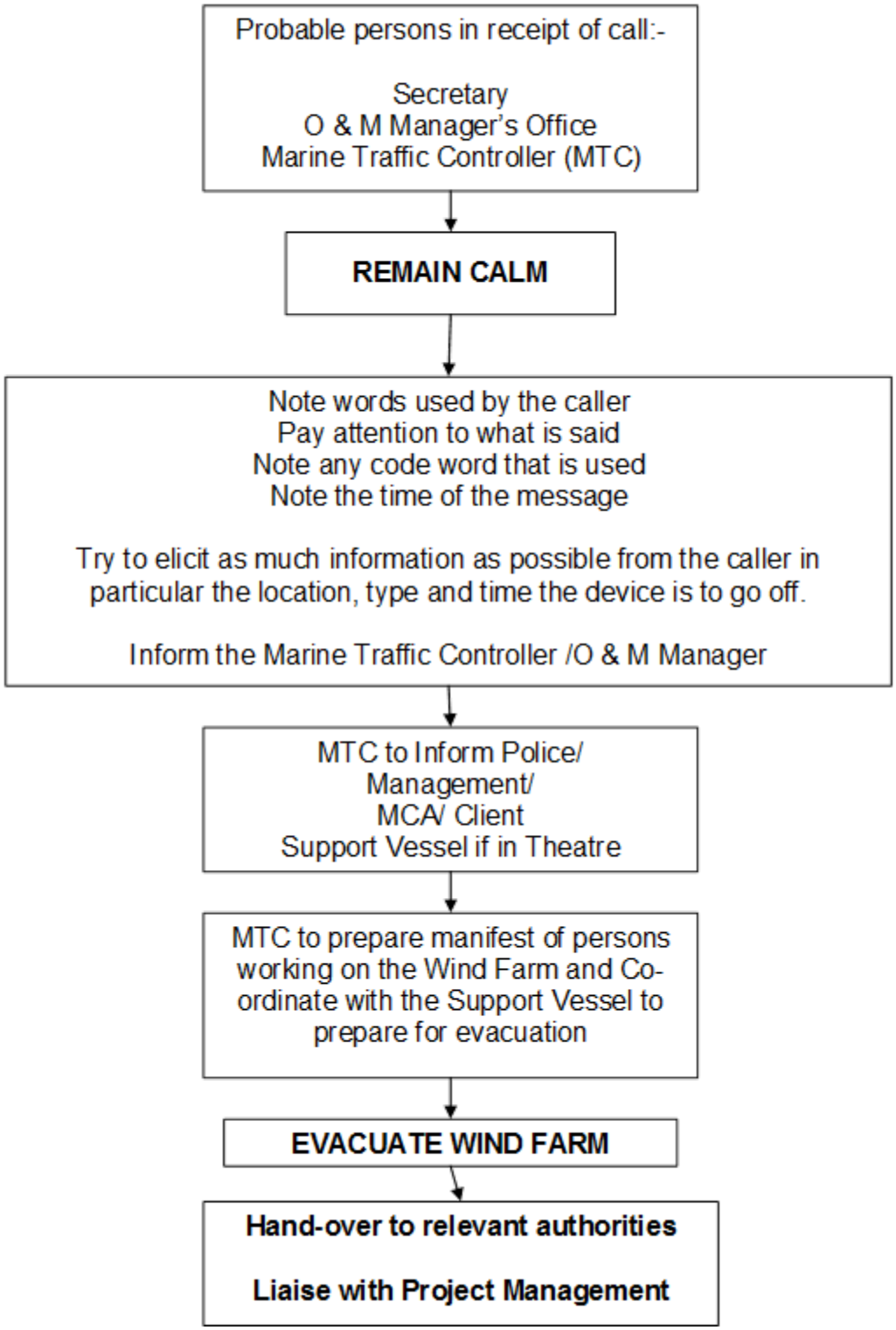


Appendix 8 - Emergency Procedure: Man Overboard



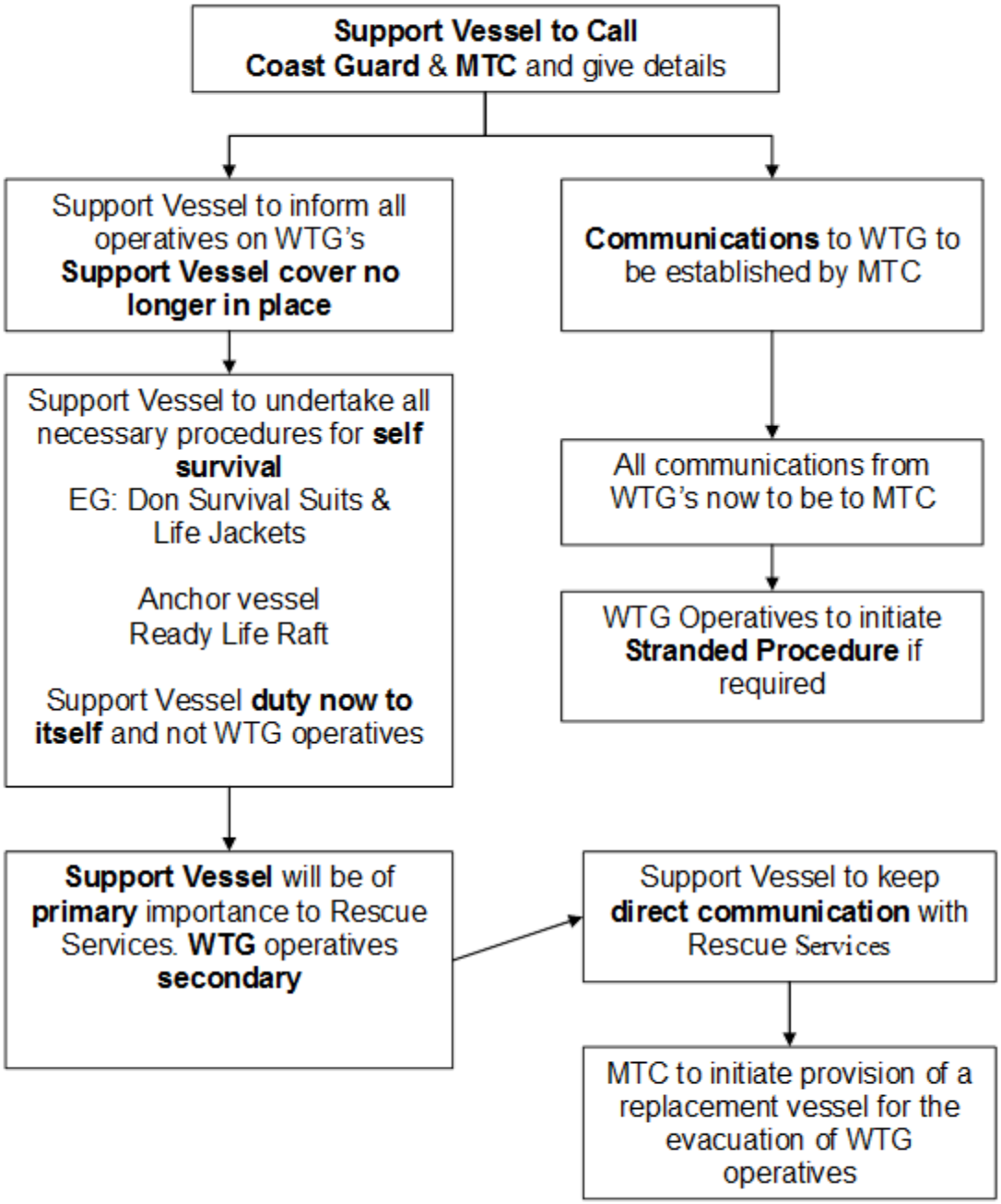
U.S. Coast Guard **TBA**

Appendix 9 - Emergency Procedure: Bomb Threat Management



Appendix 10 - Emergency Procedure: Incapacitated Support Vessel

Support Vessel incapacitated – engine failure – hull holed – props fouled



U.S. Coast Guard **TBA**

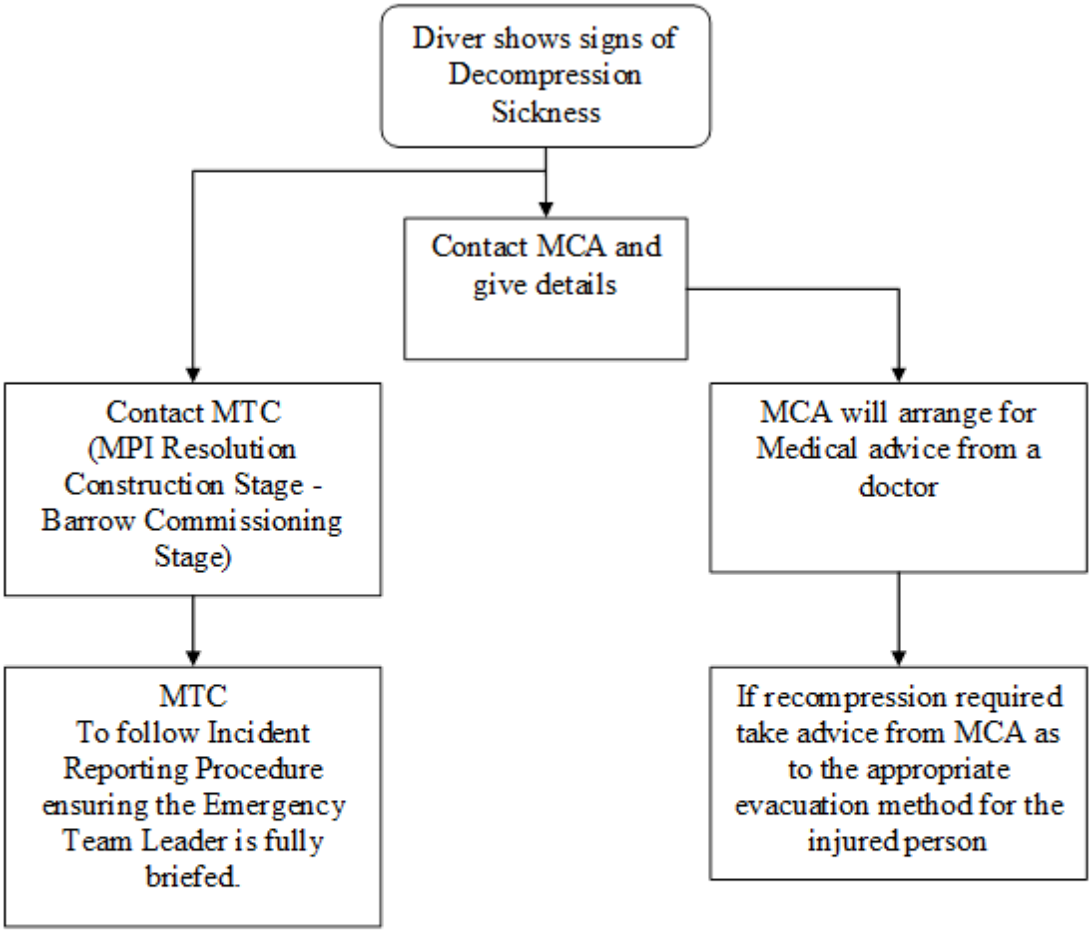
Appendix 11 - Emergency Procedure: Emergency Supplies

The Service Vessel will be equipped with three Grab Bags containing the following:-

Item	Q	Unit
Sleeping Bags (Vango Q300)	3	Nr
Foam Mattresses	3	Nr
Head Lamp - NiCad & Shoulder Strap	3	Nr
Kettle - 240v / 12v	1	Nr
2 litre bottles water	2	Nr
Eating Utensils, mugs, bowls	3	Sets
Hot Can Food and Drinks	1	Lots
Orange Throwing Rope	50	m
Life Jackets	3	Nr
Hauling Line - 11mm prestretched	50	m
Aluminium Screw Gate Karabiners	4	Nr
Rope Protectors	4	Nr
Spare Batteries for VHF & Mobile	2	each

Each Turbine will have 24 x 2 litre bottles available, which will be changed at regular intervals.

Appendix 12 – Decompression Sickness



Appendix 13 – Emergency Procedures: Evacuation from Turbine Offshore

EVACUATION PROCEDURE

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APPENDIX D – BSEE CHECKLIST

Bureau of Safety and Environmental Enforcement Safety Management System Auditing Criteria and Checklist

Bureau of Safety and Environmental Enforcement Safety Management System Auditing Criteria and Checklist

Introduction

Safety Management System Auditing Criteria and checklist was requested to be provided by the Bureau of Safety and Environmental Enforcement (BSEE) as part of the contract to develop an example Safety Management System (SMS) for a hypothetical wind farm.
The purpose of the SMS Audit Program is to provide a systematic assessment of the consistent and effective implementation of the SMS and to confirm that the SMS itself meets BSEE expectations.

Auditees should ensure that potential or actual weaknesses in the SMS, or in its implementation, identified in the audit are remedied through effective follow up of the audit findings and assure compliance with applicable laws and regulations.

Audit team Competency

Personnel assigned to carry out audits will have sufficient experience, knowledge or training of the standards applied and lease owner specific requirements to enable proper examination of the activities to be carried out. He/she will also have had completed an internal auditor training course to demonstrate that an acceptable level of understanding has been achieved. Auditors should have 3 years EHS work experience or 5 years of operational work experience, and be proficient in the core competencies of technical, analytical, and communications (interviewing).

Reporting and Documentation of Audit

SMS audits conducted by BSEE will assess the scope, content and effectiveness of implementation of the local SMS assessed against 30 CFR 585.10. The audit shall cover SMS aspects of the company or location and interfaces with authorities, contractors (e.g. maintenance, projects, waste), customers, and the public. All elements of the SMS will be assessed to assure that they comply with BSEE guidelines and are fit for purpose. A key element will be verification that an adequate internal audit system is being operated. Special key programs will be assessed for compliance with regulations, permits and/or standards.

SMS documents, files and records will be reviewed as well as interviews of personnel at facility/business to verify implementation of the management system and associated procedures.

The Auditor(s) will examine objective evidence to establish compliance and identify potential areas for improvement. The audits conducted will examine the company SMS against 30 CFR 585.810 which specifically requires the following:

a) How you will ensure the safety of personnel or anyone on or near your facilities;

b) Remote monitoring, control, and shut down capabilities;

c) Emergency response procedures;

d) Fire suppression equipment, if needed;

e) How and when you will test your Safety Management System; and

f) How you will ensure personnel who operate your facilities are properly trained.

The auditor will note observations made when carrying out the audit on the "Audit Checklist" making reference to the appropriate procedure or process.

All non-conformities identified are recorded on corrective action reports to establish root cause(s) and corrective actions required to prevent recurrence. Corrective actions will address systemic errors. Timescales are to be agreed between the auditee and the auditor.

The auditor will assess the defined corrective action through to satisfactory conclusion. Evidence of follow up is recorded on the corrective action request and observation sheet as appropriate.

All audit records will be retained.

General Expectations and Corrective Actions

At the conclusion of the each SMS audit a draft report identifying the audit findings and noteworthy efforts will be prepared. The Findings should begin with an opening statement that is the 'bottom-line message'. The finding statement should be supported by observations and/or examples of facts. Provide the regulatory citation or reference to company standard to the lowest level of detail possible. Either quote or briefly paraphrase the part of the requirement that shows a clear link to the observed non-conformance. Provide a recommendation that incorporates systematic processes that will prevent reoccurrence.

Corrective action must be taken to address the findings if applicable. Within 30 calendar days from the date of the closing conference, the auditee should develop a "Detailed" Corrective Action Plan (CAP) for all findings. Actions resulting from Findings identified during the must be tracked to completion.

a) How you will ensure the safety of personnel or anyone on or near your facilities			
Health and Safety Policy	Check if yes	Section of SMS where located	Comments
Does the organization have a health and safety policy statement that is clear and unambiguous?			
Does it make a clear commitment to meeting all relevant and current standards?			
Does it make a clear commitment to continually improving standards?			
Has the head of the organization signed the policy?			
Is there a commitment to review the policy and keep it up to date?			
Is there evidence that the policy has been reviewed within the specified time frame?			
Organization, Roles and Responsibilities	Check if yes	Section of SMS where located	Comments
Is there evidence that health and safety role and responsibilities are delegated to appropriate levels in the organization?			
Has a senior member of the management team been designated to lead on health and safety?			
Is there a clear organizational structure that is capable of implementing the health and safety responsibilities of the organization?			
Is it stated that appropriate resources will be utilized?			

Communication	Check if yes	Section of SMS where located	Comments
Is there a process to communicate health and safety information to relevant staff?			
Are there criteria setting out when and how managers are expected to formally discuss health and safety matters with their staff?			
Is there evidence that tool box talks occur regularly and that a H&S committee exists?			
Hazard Identification and Risk Management	**Check if yes**	**Section of SMS where located**	**Comments**
Are there systems in place to identify hazards and assess risk in the organization?			
Is there evidence that hazards are identified and risk assessed throughout the organization?			
Is there evidence that the risk assessment process feeds into control measures and safe systems of work?			
Are there systems in place to monitor the effectiveness of the controls?			
Is there evidence that the effectiveness of the controls is monitored?			
Is there evidence that risks identified are influential during the making of key decisions at senior management level?			
Management of Change	**Check if yes**	**Section of SMS where located**	**Comments**
Is there evidence that changes in health and safety information are identified and communicated to relevant staff?			

Is there evidence of documentation of communication of change?			
Safe Work Practices	Check if yes	Section of SMS where located	Comments
Are safe work practice procedures outlined in the SMS?			
Is there evidence that other documents cover the work procedure in a thorough and simple manner?			
Environmental Management	Check if yes	Section of SMS where located	Comments
Is there a separate document that outlines the policies and procedures that outline management of permitting and spills?			
Measuring Performance	Check if yes	Section of SMS where located	Comments
Does the organization have key performance indicators (KPIs) for health and safety performance?			
Is there evidence that KPIs are used to improve health and safety performance?			
Is there evidence of bench marking performance?			
Is there evidence of reactive monitoring of health and safety performance?			
Is there evidence of pro-active monitoring of health and safety performance?			
Is there evidence that deficiencies in arrangements identified by monitoring are acted on?			

Are work related health trends monitored?			
b) Remote monitoring, control and shutdown capabilities			
	Check if yes	Section of SMS where located	Comments
Is there a description of how the wind farm will be operated remotely and provisions for control and shutdown procedures?			
c) Emergency response procedures			
Is there a section of the SMS that describes the emergency response procedure?			
Is search and rescue referred to and is there evidence of a second, separate procedure that was developed in conjunction with the USCG?			
d) Fire suppression equipment, if needed			
Is there a description of any fire suppression equipment located on the turbines and substations?			
e) How and when you will test your SMS			
Reviewing and Auditing	Check if yes	Section of SMS where located	Comments
Are there arrangements for reviewing the organization's health and safety policy?			
Are there arrangements for reviewing the organization's health and safety performance?			

Is there evidence that senior managers review the health and safety performance of the organization?			
Is there evidence that the review feeds into future plans and strategies?			
Is there evidence that a review of an individual's performance includes consideration of their health and safety performance?			
Are there arrangements for reviewing the adequacy of the health and safety organizational structure?			
Are there arrangements for reviewing the adequacy of the health and safety planning arrangements?			
Are there arrangements for reviewing the adequacy of the implementation of health and safety policies and procedures?			
Are there arrangements for reviewing the adequacy of the measuring/monitoring of performance arrangements?			
Are there arrangements for reviewing the adequacy of the organizations health and safety audit arrangements?			

f) How you will ensure personnel who operate your facilities are properly trained

Training and Competence	Check if yes	Section of SMS where located	Comments
Are health and safety competencies identified and built into job profiles?			
Is there evidence that health and safety training needs are being identified and met?			

Is there evidence that health and safety training outcomes are evaluated?			
Is there evidence that the requirements for "information, instruction and training" are being met?			
Are records of individual training/competency held?			