U.S. Department of Homeland Security

United States Coast Guard

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NVIC 01-19
01 AUG 2019

NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 01-19

Subj: GUIDANCE ON THE COAST GUARD'S ROLES AND RESPONSIBILITIES FOR OFFSHORE RENEWABLE ENERGY INSTALLATIONS (OREI)

Ref: (a) Marine Planning to Operate and Maintain the Marine Transportation System (MTS) and Implement National Policy, COMDTINST 16003.2B
(b) National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, 83 Stat. 852)
(c) Chapter 700 of 46 U.S. Code, Ports and Waterways Safety

1. PURPOSE. The purpose of this Navigation and Vessel Inspection Circular (NVIC) is to provide guidance on information and factors the Coast Guard will consider when reviewing an application for a permit to build and operate an Offshore Renewable Energy Installation (OREI). This Circular identifies information that the Coast Guard will use to evaluate the potential impacts of an OREI on the Marine Transportation System (MTS) (reference (a)), navigation safety, the traditional uses of waterways, and Coast Guard missions as identified in enclosure (1). This will assist the Coast Guard in providing input to the Lead Agency (LA) as defined in enclosure (1) for environmental review and decision making purposes. Additionally, this Circular provides guidance to members of industry, port safety and security stakeholders, and the general public on the Coast Guard's role and responsibilities in the OREI application process.

2. ACTION.

a. The Coast Guard may serve as a cooperating agency under the National Environmental Policy Act (NEPA) (reference (b)) with the LA considering the issuance of a lease, right of use and easement, or right of way for an OREI. The Coast Guard will serve as a subject matter expert for its 11 missions. As such, the role of the Coast Guard is limited to providing an LA with an

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evaluation of the potential impacts of the proposed facility on the MTS, safety of navigation, the traditional uses of the particular waterway and other Coast Guard missions in order for the LA to prepare its required NEPA documentation. The Coast Guard will develop recommendations that address navigation safety and mitigate potential adverse impacts on other Coast Guard missions in and around the proposed installation and provide them to the LA for consideration. The Coast Guard does not have the authority to approve, disapprove, permit nor in any way authorize an OREI application.

b. Developers planning to build an OREI are encouraged to refer to this Circular to better understand the Coast Guard review process, to provide information that will assist the Coast Guard and expedite this process, and for guidance on addressing marine safety and security issues when preparing submissions to the LA.

c. Developers planning to build an OREI may be required by the LA to perform certain assessments to support an Environmental Impact Statement (EIS) or other environmental reviews as required by NEPA. One such assessment may be a Navigation Safety Risk Assessment (NSRA), which may be used to determine the potential impacts to navigation. Recommended guidance for developing an NSRA is provided in enclosures (2) through (6) of this NVIC. The Coast Guard may use the checklist as guidance in its analysis of the NSRA.

3. DIRECTIVES AFFECTED. Navigation and Vessel Inspection Circular No. 02-07 is hereby cancelled.

4. BACKGROUND.

a. OREI History: Offshore wind is a viable electricity source. As of December 2017, the United Kingdom had 30 offshore wind farms generating over 5.1 gigawatts (GW) of operational capacity over the last seven years. Europe has more than 13 GW of installed capacity from 21 projects since 2009. The United States (U.S.) has abundant and high quality offshore wind energy resources, over 40,000 GW as reported by the National Renewable Energy Lab. The Energy Policy Act (EPAct) of 2005 (Pub.L. 109–58) amended the Outer Continental Shelf (OCS) Lands Act (43 U.S.C. 1337) to authorize the Bureau of Ocean Energy Management (BOEM) to issue leases, easements, or ROWs (right-of-ways) on the outer continental shelf for activities that produce or support the production, transportation, or transmission of energy from sources other than oil and gas. The first US offshore wind project, Block Island Wind Farm, began operations in 2016. It consists of five turbines totaling 30 megawatts (MW). Additionally, there are several projects on the Atlantic and Pacific coasts at various stages of the permitting process with the potential to generate 17 GW. Given the wind farm sizes, locations and configurations, offshore wind has the potential to impact navigation safety for all users.

b. Coast Guard Authority: The Ports and Waterways Safety Act (PWSA) (Public Law 92-340, 86 Stat. 424, as amended) requires the Coast Guard to conduct studies necessary to provide safe access routes for vessel traffic in the waters under the jurisdiction of the United States. In addition, the Coast Guard must take into account all possible uses of

the waterways to reconcile the need for safe access routes with the needs of all other uses of the waterways. The Coast Guard plays an important role in assisting the LA, whose licensing or permitting activities may affect Coast Guard missions. The Coast Guard will evaluate applications and make recommendations to the LA concerning the potential impacts of the OREI.

c. Lead Agencies (LAs): Currently BOEM, the Federal Energy Regulatory Commission (FERC), the United States Army Corps of Engineers (USACE), and the National Oceanic and Atmospheric Administration (NOAA) have been identified as possible LAs for offshore projects. Under the EPAct, BOEM is the LA for the issuance of leases, easements, or ROWs for offshore wind proposals and marine hydrokinetic projects more than three nautical miles seaward of the baseline of the territorial sea. FERC has jurisdiction to issue licenses for all marine hydrokinetic projects regardless of location. Within the three nautical mile line, the USACE is the LA for wind farms and has permitting responsibilities for all other projects as well. These LAs work together to ensure the proper leases, easements, ROWs, and licenses are issued as required. Regardless of who the LA is, the Coast Guard's role remains that of assisting the LA as described in paragraph 2.b by providing recommendations necessary to reduce the potential impacts of an OREI on the MTS, navigation safety and Coast Guard missions.

d. Involvement of Other Departments and Agencies: Other Federal departments and agencies that may be involved in the process include the Departments of Commerce, Defense, Energy and Transportation, and the Environmental Protection Agency. In addition, state and tribal entities may also be involved.

5. DISCUSSION.

a. General: The primary concerns with the construction and location of OREIs are related to their impacts on marine navigation safety. Installations may physically affect commercial shipping, fishing and recreational boating operations, or other traditional uses of the waterway. In addition, the OREI may affect the performance of electronic navigation systems used in the maritime environment, including radars and communications systems.

b. The Navigation Safety Risk Assessment (NSRA):

(1) As a cooperating agency, the Coast Guard may recommend to the LA that the developer conduct an NSRA.

(2) The NSRA is a targeted analysis for individual structure locations based on recent marine traffic information as derived from Automatic Identification System (AIS data); consultation with the Coast Guard, pilots' associations, maritime industry, recreational users, harbor safety committees, regional fishery management councils and other entities, and factors associated with vessel handling characteristics, casualty data, environmental conditions and future trends.

(3) The NSRA should reference existing studies, standard industry practices, and guidelines from other recognized sources such as governmental agencies or

classification societies that may be applicable to the specific structure or the characteristics of the waterway. The United Kingdom Maritime and Coastguard Agency (MCA)'s "Methodology for Assessing the Marine Navigational Safety Risks and Emergency Response of Offshore Renewable Energy Installations" (August 2013) is a well-regarded source.

(4) The risk assessment approach should include a "change analysis" whereby the potential impacts of the structure can be considered and compared to the baseline situation. The risks associated with the proposed structures should be assessed and appropriate risk mitigation strategies developed and evaluated.

(5) More specific guidance for conducting risk assessments and examples of risk mitigation strategies are provided in enclosures (2) through (6). In order for the Coast Guard to analyze an NSRA and provide the LA with appropriate recommendations, it is critical that the NSRA:

(a) Utilizes recent AIS data;

(b) Describes the data used in the risk assessment;

(c) Explains any assumptions;

(d) Identifies all sources of information; and

(e) Provides anticipated routing changes to maritime traffic based on proposed wind turbine positions.

(6) In its evaluation of the risk assessment, the Coast Guard will consider the suitability of the approach and the appropriateness, reliability and validity of the data.

c. Impacts:

(1) As wind energy areas (WEAs) or other OREIs are developed, vessel traffic may be displaced or funneled into smaller areas. This increased vessel density may also cause the mixing of vessel types and speeds while also changing the geometry of interactions as vessels come within close range of each other. These changes may increase risk of collision, loss of property, loss of life, and environmental damage.

(2) When two or more WEAs or other OREIs are in close proximity to each other, developers should analyze the cumulative impacts to identify risk mitigations, such as routing measures and collision avoidance technologies, as part of their NSRA. Mitigations that minimize the disruption of traditional routes and the displacement of smaller vessels further offshore are beneficial for maintaining safe navigation of all vessels.

6. ROLES.

a. Role of the Coast Guard:

(1) Participate as a Cooperating Agency under NEPA when requested by the LA. The Coast Guard will serve as a subject matter expert for its 11 missions.

(2) Assess the safety of navigation in and adjacent to the proposed structure(s), and provide an analysis and recommended mitigation measures and conditions to the LA when projects may potentially interfere with navigation or Coast Guard missions. The Coast Guard will also provide any assistance as detailed in agreements with other Government agencies.

(3) Be available to the LA and developer to provide subject matter expertise in maritime safety, maritime security, and maritime mobility, national defense, and protection of natural resources.

(4) Attend or participate in public meetings as necessary to ensure stakeholder interests are understood by the Coast Guard.

(5) For projects falling under the requirements found in 42 U.S.C. §§ 4370m et seq, Fixing America's Surface Transportation Act (FAST-41) or Executive Order 13807 (One Federal Decision) the Coast Guard, as a Cooperating Agency, shall provide input to the LA in a timely manner to meet the LA's schedule as identified on the Federal Permitting Dashboard.

b. Role of the Lead Agency: Per reference (b) and as further defined in 40 CFR part 1501, the LA is responsible for complying with the requirements of NEPA and shall:

(1) Request the participation of each cooperating agency in the NEPA process at the earliest possible time;

(2) Use the environmental analysis and proposals of cooperating agencies with jurisdiction by law or special expertise, to the maximum extent possible consistent with its responsibility as lead agency;

(3) Meet with a cooperating agency upon request; and

(4) Provide applicable documents (for example, Site Assessment Plans and Construction and Operation Plans) as soon as available to cooperating agencies for their review.

c. Role of the Developer:

(1) File its application for a permit, lease, easement or right of way with the appropriate LA in accordance with its established regulations or procedures.

(2) As directed by the LA, conduct an NSRA to evaluate all potential navigation impacts potentially associated with the siting, construction, establishment, operation, maintenance, and/or decommissioning of a structure. Navigation impacts include, but are not limited to:

(a) Safety of navigation. Navigation safety would be affected by an offshore structure if it impairs or enhances the mariner's ability to determine their position, determine a safe course to steer, detect unseen dangers, determine risk of collision, and take action to avoid an OREI allusion;

(b) Changing the existing uses of the waterway where the structure(s) would be located that impact traditional maritime navigation corridors (traffic routes); and

(c) Affecting emergency responder missions.

(3) Address and utilize existing studies or any known standard industry practices that have been conducted or created for similar OREIs by other governments or agencies to determine any applicability of the studies or industry practices for their specific OREI.

(4) Assess the consequences of vessels deviating from normal routes or recreational craft entering shipping routes in order to avoid proposed sites. Special regard should be given to evaluating situations that could lead to safety of navigation being compromised (an increase in risk of collision, reduction in sea-room or water depth for maneuvering, etc.).

d. Stakeholder Involvement: The NSRA process should be conducted in cooperation and consultation with a wide range of Federal, State, Tribal entities and local agencies; local maritime industry representatives; and the general public. Specific groups to consider include representatives of the fishing industry; recreational boating; passenger vessels; tug and barge companies; large commercial vessels; pilots; port authorities; harbor safety committees; waterfront facility owners and operators; law enforcement personnel; emergency responders; environmental groups; and any other stakeholders for the waterway in which the OREI will be placed.

7. IMPLEMENTATION.

The following table provides generic milestones outlining the steps from a developer's initial application to the lead federal agency through the Coast Guard's development of a final package providing recommendations and possible mitigations to the lead federal agency.

MILESTONE	ACTION	REPONSIBLE OFFICE/AGENCY
1	Receive application, advise applicant of NVIC guidance and forward application to Commandant (CG-NAV-2) for review	Lead Agency (LA)
2	Forward copy of application to appropriate District and authorize BOEM to have direct liaison with the identified District and Sector	Commandant (CG-NAV-2)
3	Identify Sector and POC responsible to assist the District with reviewing the application, work with the LA, work with the applicant, and advise the District of any concerns.	District
4	Assist the District with coordinating the review of the application, conducting stakeholder engagement, working with the applicant to provide recommendations and possible mitigations to the District	Sector
5	Review, endorse and forward recommendations and proposed mitigations to Commandant (CG-NAV-2)	District
6	Review the District's recommendations and potential mitigations and develop a final package of Coast Guard recommendations and proposed mitigations for forwarding to the LA.	Commandant (CG-NAV-2)

8. DISCLAIMER. Each Coast Guard District Commander and Sector Commander has discretionary authority over how best to address specific safety and security concerns within their area of responsibility (AOR). Nothing in this NVIC is meant to override or subvert the discretion of the District Commander or Sector Commander when addressing the unique safety and security concerns for a proposed structure within their AOR. While the guidance in this NVIC may assist the Coast Guard, members of industry, the general public, and other Federal and State regulators in applying statutory and regulatory requirements, it is not a substitute for applicable legal requirements, nor is it a regulation itself. Therefore, it is not intended to, nor does it impose legally binding requirements on any party, including the Coast Guard, other Federal or State agencies, or the regulated community.

9. DISTRIBUTION. No paper distribution will be made of the Circular. An electronic version will be located on the following Commandant web sites; Internet: http://www.uscg.mil/hq/cg5/nvic/default.asp, and CGPortal: https://cgportal2.uscg.mil/library/directives/SitePages/Home.aspx.

10. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATION.

a. The development of this NVIC and the general policies contained within it have been thoroughly reviewed by the originating office in conjunction with the USCG Office of Environmental Management, and are categorically excluded (CE) under current DHS A3(c) from further environmental analysis, in accordance with Section V.B.(2) and Appendix A, Table 1 – List of DHS Categorical Exclusions of the National Environmental Policy Act (NEPA) Instruction Manual 023-01-001-01, Revision 01. This NVIC implements, without substantive change, the procedures, manuals and other guidance documents.

b. This NVIC will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, Tribal or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policies in this Circular must be individually evaluated for compliance with NEPA, Council on Environmental Policy NEPA regulations at 40 CFR Parts 1500-1508, DHS and NEPA policy, and all other applicable environmental mandates.

11 RECORDS MANAGEMENT CONSIDERATIONS. This Circular has been thoroughly reviewed during the directives clearance process, and it has been determined there are no further records scheduling requirements, in accordance with Federal Records Act, 44 U.S.C. Chapter 31, NARA requirements, and the USCG Information and Life Cycle Management Manual, COMDTINST M5212.12 (series). This NVIC does not have any significant or substantial change to existing records management requirements.

12. FORMS/REPORTS. None.

13. REQUEST FOR CHANGES. Questions or suggestions for improvement regarding this NVIC should be directed to Coast Guard Headquarters, Office of Navigation Systems (CG-NAV-2), using the contact information provided in the above letterhead.

MICHAEL D. EMERSON
Director, Marine Transportation Systems
U. S. Coast Guard

Encl: (1) Glossary and Acronyms
(2) Guidance on Conducting and Reviewing a Navigation Risk Safety Assessment
(3) Marine Planning Guidelines
(4) Example Risk Mitigation Strategies
(5) References and Resources
(6) Checklist for NSRA Development and Review
(7) Coast Guard District, Area and Headquarters Contact Info
(8) Coast Guard District and Area Command Boundaries

GLOSSARY AND ACRONYMS

Allision: The act of striking or collision of a moving vessel against a stationary object.

Aquaculture: Also known as fish or shellfish farming -- refers to the breeding, rearing, and harvesting of plants and animals in all types of water environments including ponds, rivers, lakes, and the ocean.

Area to Be Avoided (ATBA): A routing measure comprising an area within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which should be avoided by all vessels, or certain classes of vessels.

Coast Guard missions: The 11 Coast Guard missions are Marine safety; Search and rescue; Aids to navigation; Living marine resources (fisheries law enforcement); Marine environmental protection; Ice operations; Ports, waterways and coastal security; Drug interdiction; Migrant interdiction; Defense readiness; and other law enforcement (cited in 6 USC 468(a)).

Cooperating Agency: Under the National Environmental Policy Act (NEPA), the Lead Agency may invite other agencies to become Cooperating Agencies when considering the issuance of a lease, right of use and easement, or right of way for an offshore structure. As a Cooperating Agency there will be a relationship with the LA to provide expertise in the areas of maritime safety, maritime security, maritime mobility (management of maritime traffic, commerce, and navigation), national defense, and protection of natural resources and impacts to Coast Guard missions to assist in conducting and preparing NEPA analyses.

Environmental Impact Statement (EIS): An environmental impact statement is a document required by the National Environmental Policy Act (NEPA) for certain actions "significantly affecting the quality of the human environment."[1] An EIS is a tool to promote informed decision making by federal agencies while making detailed information available to agency leaders and the public. It describes the positive and negative environmental effects of a proposed action, and it usually also lists one or more alternative actions that may be chosen instead of the action described in the EIS. A Draft EIS (DEIS) is document made publicly available for comment before releasing a Final EIS (FEIS). The FEIS is prepared based on the comments received and announces the Proposed Action.

Lead Agency (LA) (may be referred to as the Lead Federal Agency). The public agency that has the principal responsibility to comply with NEPA. This is normally the agency that ultimately approves or permits development of an offshore structure.

Limited Access Area: Can be a safety zone or a security zone as defined in 33 CFR Part 165.

Marine and Hydrokinetic Energy Technologies (MHK): Marine and hydrokinetic energy technologies convert the energy of waves, tides, and river and ocean currents into electricity.

[1] CEQ NEPA Regulations, 40 C.F.R. § 1501.7. More information on scoping can be found in CEQ's guidance on scoping at https://ceq.doe.gov/

Navigation Safety Risk Assessment (NSRA): A comprehensive, systematic process for identifying hazards to navigation and their consequences that could be created by the proposed structure. Coordinated by the developer, it evaluates the magnitude of the risks associated with the hazards and identifies and evaluates the effectiveness of control measures that can be used to mitigate the risks.

National Environmental Policy Act (NEPA): A Federal statute (42 U.S.C. 4321-4370h) that requires all executive branch federal agencies to conduct environmental assessments that describe the potential environmental effects of their proposed action(s).

Ocean Thermal Energy Conversion (OTEC): Ocean thermal energy conversion is a marine renewable energy technology that uses the temperature gradients in the ocean to generate a baseload, or constant, source of electricity.

Offshore Renewable Energy Installation (OREI): A specific OREI placed in the navigable waters of the United States that creates electricity by using kinetic energy sources.

Packed boundaries or dense boundaries means a wind farm has more turbines on its edges than there are internally in the farm.

Regulated Navigation Area (RNA): A water area within a defined boundary for which regulations for vessels navigating within the area have been established in 33 CFR Part 165.

Renewable Energy Source: Source of energy used by an OREI such as, but not limited to, wind, geothermal, wave, current or solar.

Routing System: Any system of one or more routes or routing measures aimed at reducing the risk of casualties. It includes traffic separation schemes, two-way routes, recommended tracks, areas to be avoided, no anchoring areas, inshore traffic zones, roundabouts, precautionary areas, and deep-water routes.

Safety Zone: A Safety Zone is a water area, shore area, or water and shore area to which, for safety or environmental purposes, access is limited to authorized persons, vehicles, or vessels. It may be stationary and described by fixed limits or it may be described as a zone around a vessel in motion. 33 CFR Part 165.

Security Zone: A security zone is an area of land, water, or land and water which is so designated by the USCG Captain of the Port or District Commander for such time as is necessary to prevent damage or injury to any vessel or waterfront facility, to safeguard ports, harbors, territories, or waters of the United States or to secure the observance of the rights and obligations of the United States. 33 CFR Part 165.

Vessel: Every description of water craft, including non-displacement craft, Wing in Ground Effect craft (WIG) (International – 72 COLREGS only), and seaplanes, used or capable of being used, as a means of transportation on water.

Wave Generator: A wave power device that extracts energy directly from the motion of ocean waves or from pressure fluctuations below the surface.

Wind Park or Farm: A collection of renewable energy installations that use wind energy to create electricity.

ACRONYMS

ACRONYM	LONG TITLE
ACPARS	Atlantic Coast Port Access Route Study
AIS	Automatic Identification System
AOR	Area of Responsibility
BOEM	Bureau of Ocean Energy Management
BOEMRE	Bureau of Ocean Energy Management, Regulation and Enforcement
CFR	Code of Federal Regulations
CG-NAV-2	Office of Navigation Systems
COLREGS	Convention on the International Regulations for Preventing Collisions at Sea
COMDTINST	Commandant Instruction
CPA	Closest Point of Approach
CTE	Cross Track Error
EPAct	Energy Policy Act
FERC	Federal Energy Regulatory Commission
GW	Gigawatts
IMO	International Maritime Organization
MCA	United Kingdom Maritime and Coastguard Agency
MTS	Marine Transportation System
MW	Megawatts
NM	Nautical Mile
NOAA	National Oceanic and Atmospheric Administration
NSRA	Navigation Safety Risk Assessment
NVIC	Navigation and Vessel Inspection Circular
OCS	Outer Continental Shelf
PWSA	The Ports and Waterways Safety Act of 1972
U.S.C.	United States Code
U.S.	United States
USACE	United States Army Corps of Engineers
WEA	Wind Energy Area
WIG	Wing in Ground Effect Craft

ENCLOSURE (2) TO NAVIGATION AND VESSEL INSPECTION CIRCULAR 01-19

GUIDANCE ON CONDUCTING AND REVIEWING A NAVIGATION SAFETY RISK ASSESSMENT

A. Introduction. Navigation safety requires that mariners be able to determine their position, determine a safe course to steer, be alert to unseen dangers, be able to determine if risk of collision exists, and be able to take action to avoid collision.

Navigation safety would be impacted by an offshore structure if it impairs or enhances the mariner's ability to do any of the above.

In order to make appropriate recommendations on the impacts to navigation safety, the Coast Guard needs to know the characteristics and number of waterway users, the routes used, the channel dimensions, hydrographic conditions, and meteorological conditions in the area of the proposed structure.

B. Scope. In order to assess the impact on navigation safety, the developer should perform a systematic assessment of the risks to navigation safety associated with the proposed project leveraging existing studies, standard industry practices, or guidelines from other recognized sources such as governmental agencies or classification societies that may be applicable to their specific structure or the characteristics of the waterway. The developer should consider the marine planning guidelines in enclosure (3) during the area identification phase for both unsolicited and solicited development areas and when determining the siting of structures within existing leased areas. As part of the assessment, the developer should identify impacts on navigation safety and assess the change in risk associated with the proposed structure.

The developer should contact the Coast Guard and the Lead Agency early in the process to discuss the project and determine what information or previous assessments may be available and to identify and specific issues that may be important to address for the proposed area. See enclosures (7) and (8) for points of contact and their respective area of responsibility within the Coast Guard.

In addition, the risk assessment should identify and evaluate potential measures that could be implemented to mitigate increased risks associated with the proposed project. See enclosure (4) for examples. At a minimum, the risk assessment should consider the impact and significance of the appropriate factors (for example, vessel, waterway, environmental factors and traffic characteristics) as described below. Early and continued involvement of the affected stakeholders in the risk assessment process is strongly recommended.

In assessing a proposed structure's impact on vessel navigation and other safety concerns, the developer should address, at a minimum, the following:

1. Site and Installation Coordinates.

Developers should ensure that coordinates and subsequent variations of site perimeters and individual structures are made available, upon request, to interested parties at all relevant project stages. Coordinate data should be supplied as authoritative Geographical Information System (GIS) data, preferably in Environmental Systems Research Institute (ESRI) format. Metadata should facilitate the identification of the data creator, its date and purpose, and the

geodetic datum used. For mariners' use, appropriate data should also be provided with latitude and longitude coordinates in WGS84 datum.

2. Traffic Survey.

A recent (within 12 months of publication of the NSRA) traffic survey of the area for the proposed structure should be conducted. This survey should include all vessel types and cover at least 28 days duration but also take into account seasonal variations in traffic patterns. These variations should be determined in consultation with representative recreational and fishing vessel organizations, pilot organizations, and the commercial maritime industry and, where appropriate, port authorities. While recognizing that site-specific factors need to be taken into consideration, any such survey should, in general, assess, determine and identify:

a. Proposed structure location relative to areas used by any type of vessel;

b. Numbers, types (deep draft, shallow draft, fishing, recreation, high speed craft, ferries), sizes (length, beam, height, draft, tonnage), and other characteristics (speed capability, navigation carriage equipment, number of authorized passengers) of vessels presently using such areas;

c. Types of cargo carried by vessels presently using such areas;

d. Non-transit uses of the areas, for example, fishing, day cruising of leisure craft, racing, marine regattas and parades, aggregate mining;

e. Whether these areas contain transit routes used by coastal or deep-draft vessels, ferry routes, and fishing vessel routes;

f. Alignment and proximity of the site relative to adjacent shipping routes;

g. Whether the nearby area contains prescribed or recommended routing measures or precautionary areas;

h. Whether the site lies on or near a prescribed or conventionally accepted separation zone between two opposing routes or traffic separation scheme;

i. Proximity of the site to anchorage grounds or areas, safe haven, port approaches, and pilot boarding or landing areas;

j. The feasibility of allowing vessels to anchor within the vicinity of the structure field;

k. Proximity of the site to existing fishing grounds, or to routes used by fishing vessels to such grounds;

l. Whether the site lies within the limits of jurisdiction of a port and/or navigation authority;

m. Proximity of the site to offshore firing/bombing ranges and areas used for any marine or airborne military purposes;

n. Proximity of the site to existing or proposed offshore OREI/gas platform or marine aggregate mining;

o. Proximity of the site to existing or proposed structure developments;

p. Proximity of the site relative to any designated areas for the disposal of dredging material or ocean disposal site;

q. Proximity of the site to aids to navigation and/or Vessel Traffic Services (VTS) in or adjacent to the area and any impact thereon;

r. Researched opinion using computer simulation techniques with respect to the displacement of traffic, mixing of vessel types that were previously segregated; changes in traffic density and resultant change in vessels encounters; and, in particular, the creation of 'choke points' in areas of high traffic density;

s. Whether the site lies in or near areas that will be affected by variations in traffic patterns as a result of changes to vessel emission requirements; and

t. Seasonal variations in traffic.

3. Offshore Above Water Structure. It should be determined:

a. Whether any features of the offshore above water structure, including auxiliary platforms outside the main generator site and cabling to the shore, could pose any type of difficulty or danger to vessels underway, performing normal operations, or anchoring. Such dangers would include clearances of wind turbine blades above the sea surface, the burial depth of cabling, and lateral movement of floating wind turbines.

b. Whether minimum safe (air) clearances between sea level conditions at Mean Higher High Water (MHHW) and wind turbine rotors are suitable for the vessels types identified in the traffic survey. Depths, clearances, and similar features of other structure types which might affect navigation safety and other Coast Guard missions should be determined on a case by case basis.

c. Whether any feature of the installation could create problems for emergency rescue services, including the use of lifeboats, helicopters and emergency towing vessels (ETVs). How rotor blade rotation and power transmission will be controlled by the designated services when this is required in an emergency.

d. Whether any noise or vibrations generated by a structure above and below the water column would impact navigation safety or affect other Coast Guard missions.

e. Whether the structure can withstand collision damage by vessels without toppling for a range of vessel types, speeds, and sizes.

4. Offshore Under Water Structure.

a. It should be determined whether minimum safe clearance over underwater devices has been determined for the deepest draft of vessels that could transit the area.

b. Developers will need to demonstrate an evidence-based, case-by-case approach which will include dynamic draft modeling in relation to charted water depth to ascertain the safe clearance over a device. The following approach should be adopted:

c. To establish a minimum clearance depth over devices, the developer needs to identify from the traffic survey the deepest draught of observed traffic. This will then require modeling to assess impacts of all external dynamic influences giving a calculated figure for dynamic draught. A 30% factor of safety for under keel clearance (UKC) should then be applied to the dynamic draft, giving an overall calculated safe clearance depth to be used in calculations.

The Charted Depth reduced by safe clearance depth gives a maximum height above seabed available from which turbine design height including any design clearance requirements can be established.

5. Assessment of Access to and Navigation Within, or Close to, a structure. To determine the extent to which navigation would be feasible within the structure site itself by assessing whether:

a. Navigation within the site would be safe—

(1) By all vessels; or

(2) By specified vessel types, operations and/or sizes.

(3) In all directions or areas; or

(4) In specified directions or areas.

(5) In specified tidal, weather or other conditions; and

(6) At any time, day or night.

b. Navigation in and/or near the site should be—

(1) Prohibited by specified vessel types, operations and/or sizes;

(2) Prohibited in respect to specific activities;

(3) Prohibited in all areas or directions;

(4) Prohibited in specified areas or directions;

(5) Prohibited in specified tidal or weather conditions;

(6) Prohibited during certain times of the day or night; or

(7) Recommended to be avoided.

Exclusion from the site could cause navigation, safety, or transiting problems for vessels operating in the area.

6. The Effect of Tides, Tidal Streams, and Currents. The developer should determine whether or not:

a. Maritime traffic flows and operations in the general area are affected by the depth of water in which the proposed structure is situated at various states of the tide, that is, whether the installation could pose problems at high water which do not exist at low water conditions, and vice versa.

b. Maritime traffic flows and operations in the general area are affected by existing currents in the area in which the proposed structure is situated.

c. Set and rate of the tidal stream, at any state of the tide, have a significant effect on vessels in the area of the structure site.

d. Current directions/velocities might aggravate or mitigate the likelihood of allision with the structure.

e. The maximum rate tidal stream runs parallel to the major axis of the proposed site layout, and, if so, its effect.

f. The set is across the major axis of the layout at any time, and, if so, at what rate.

g. In general, whether engine failure or other circumstance could cause vessels to be set into danger by the tidal stream or currents.

h. Structures themselves could cause changes in the set and rate of the tidal stream or direction and rate of the currents.

i. Structures in the tidal stream could be such as to produce siltation, deposition of sediment or scouring, any other suction or discharge aspects, which could affect navigable water depths in the structure area or adjacent to the area.

j. Structures would cause danger and/or severely affect the air column, water column, seabed and sub-seabed in the general vicinity of the structure.

7. Weather. The developer should conduct an analysis of expected weather conditions, water depths and sea states that might aggravate or mitigate the likelihood of allision with the structure. This analysis should also determine if:

a. The site, in all weather conditions, could present difficulties or dangers to vessels, which might pass in close proximity to the structure.

b. The structures could create problems in the area for vessels under sail, such as wind masking, turbulence, or sheer.

c. In general, taking into account the prevailing winds for the area, whether engine failure or other circumstances could cause vessels to drift into danger, particularly if in conjunction with a tidal set such as referred above.

d. Depending on the location of the structure and the presence of cold weather, sea ice and/or icing of the structure may cause problems. A thorough analysis of how the presence of the structure would mitigate or exacerbate icing.

e. An analysis of the ability for structures to withstand anticipated ice floes should be conducted by the applicant.

An analysis of the likelihood that ice may form on the structure, especially those types that have rotating blades such as a Wind Turbine Generator (WTG), should be conducted by the applicant, and should include an analysis of the ability of the structure to withstand anticipated ice accumulation on the structures, and potential for ice to be thrown from the blades, and the likely consequences of that happening and possible actions to mitigate that occurrence.

8. Configuration and Collision Avoidance. In the United States vessels will have the freedom to navigate through OREIs, subject to any limited access areas such as safety zones or security zones, regulated navigation areas, formal routing measures such as areas to be avoided, and their own risk assessments, which should take into account factors such as vessel size, maneuverability, environmental factors and competency of the Master and crew.

a. The Coast Guard will provide Search and Rescue (SAR) services in and around OREIs in US waters. Layout designs should allow for safe transit by SAR helicopters operating at low altitude in bad weather, and those vessels (including rescue craft) that decide to transit through them. Developers should conduct additional site specific assessments, if necessary, to build on any previous assessments to assess the proposed locations of individual turbine devices, substations, platforms and any other structure within OREI such as a wind farm or tidal/wave array. Any assessment should include the potential impacts the site may have on navigation and SAR activities. Liaison with the USCG is encouraged as early as possible following this assessment which should aim to show that risks to vessels and/or SAR helicopters are minimized and include proposed mitigation measures.

b. Each OREI layout design will be assessed on a case-by-case basis.

c. Risk assessments should build on any earlier work conducted as part of the NSRA and the mitigations identified as part of that process. Where possible, an original assessment should be referenced to confirm where information or the assessment remains the same or can be further refined due to the later stages of project development such as from phase 1 to 2. Risk assessments should present information to enable the USCG to adequately understand how the risks associated with the proposed layout have been reduced to As Low as Reasonably Practicable (ALARP).

d. In order to minimize risks to surface vessels and/or SAR helicopters transiting through an OREI, structures (turbines, substations etc.) should be aligned and in straight rows or columns. Multiple lines of orientation may provide alternative options for passage planning and for vessels and aircraft to counter the environmental effects on handling, that is, sea state, tides, currents, weather, visibility etc. Developers should plan for at least two lines of orientation unless they can demonstrate that fewer are acceptable.

e. Packed boundaries will be considered on a case-by-case basis as part of the risk assessment process. For opposite boundaries of adjacent sites due consideration should be given to the requirement for lines of orientation which allow a continuous passage of vessels and/or SAR helicopters through both sites. Where there are packed boundaries this will affect layout decisions for any possible future adjacent sites. The definition of 'adjacent' will be assessed on a case-by-case basis.

9. Visual Navigation. The developer should assess the extent to which:

a. Structures could block or hinder the view of other vessels underway on any route.

b. Structures could block or hinder the view of the coastline or of any other navigation feature such as aids to navigation, landmarks, or promontories, for example;

c. Structures and locations could limit the ability of vessels to maneuver in order to avoid collisions.

10. Communications, Radar and Positioning Systems. The developer should provide researched opinion of a generic and, where appropriate, site specific nature concerning whether or not:

a. Structures could produce interference such as shadowing, reflections or phase changes, marine positioning, navigation, or communications, including Automatic Identification Systems (AIS), whether ship borne, ashore, or fitted to any of the proposed structures.

b. Structures could produce radar reflections, blind spots, shadow areas or other adverse effects in the following interrelationships:

(1) Vessel to vessel;

(2) Vessel to shore;

(3) Vessel Traffic Service radar to vessel;

(4) Radio Beacons (RACONS) to/from vessel; and

(5) Aircraft and Air Traffic Control.

c. The structure, in general, would comply with current recommendations concerning electromagnetic interference.

d. The structure might produce acoustic noise or noise absorption or reflections which could mask or interfere with prescribed sound signals from other vessels or aids to navigation.

e. Structures, generators, and the seabed cabling within the site and onshore might produce electro-magnetic fields affecting compasses and other navigation systems.

f. The power and noise generated by a structure above or below the water would create physical risks that would affect the health of vessel crews.

11. Risk of Collision, Allision, or Grounding. Based on the data collected per paragraph 2 above, an evaluation should be conducted to determine the risk of collision between vessels, risk of allision with structures, or grounding because of the establishment of a structure, including, but not limited to:

a. Likely frequency of collision (vessel to vessel);

b. Likely consequences of collision ("What if" analysis);

c. Likely location of collision;

d. Likely type of collision;

e. Likely vessel type involved in collision;

f. Likely frequency of allision (vessel to structure)

g. Likely consequences of allision ("What if" analysis);

h. Likely location of allision;

i. Likely vessel type involved in allision;

j. Likely frequency of grounding;

k. Likely consequences of grounding ("What if" analysis);

l. Likely location of grounding; and

m. Likely vessel type involved in grounding.

12. Emergency Response Considerations. To determine the impact on Coast Guard and other emergency responder missions, a developer should conduct assessments on the following emergency response missions that address, at a minimum, the following:

a. Search and Rescue (SAR):

(1) How many search and rescue cases has the USCG conducted in the proposed structure region over the last ten years?

(2) How many of these cases involved helicopter hoists?

(3) How many were at night or in poor visibility/low ceiling?

(4) How many of these cases involved aircraft (helicopter, fixed-wing) searches?

(5) How many times have commercial salvors (for example, BOAT US, SEATOW, commercial tugs) responded to assist vessels in the proposed structure region over the last ten years?

(6) What number of additional SAR cases is projected due to allision with the structures?

(7) Will the structure enhance SAR such as by providing a place of refuge or easily identifiable markings to direct SAR units?

b. Marine Environmental Protection/Response:

(1) How many marine environmental/pollution response cases has the USCG conducted in the proposed structure region over the last ten years?

(2) What type of pollution cases were they?

(3) What type and how many assets responded?

(4) How many additional pollution cases are projected due to allision with the structures?

13. Facility Characteristics. In addition to addressing the risk factors detailed above, the developer's NSRA should include a description of the following characteristics related to the proposed structure:

a. Marine Navigational Marking:

(1) How the overall site would be marked by day and by night, taking into account that there may be an ongoing requirement for marking on completion of decommissioning, depending on individual circumstances.

(2) How individual structures on the perimeter of and within the site, both above and below the sea surface, would be marked by day and by night.

(3) If the site would be marked by one or more Radar Beacons (RACONS) or an Automatic Identification System (AIS) transceiver, or both and if so, the AIS data the transceiver would transmit.

(4) If the site would be fitted with a sound signal, the characteristics of the sound signal, and where the signal or signals would be placed.

(5) If the structure(s) are to be fitted with aviation marks, how would they be screened from mariners or potential confusion with other navigational marks and lights be resolved.

(6) Whether the proposed site and its individual generators would comply in general with markings for such structures, as required by the Coast Guard or recommended by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA).

(7) Whether its plans to maintain its aids to navigation are such that the Coast Guard's availability standards are met at all times. Separate detailed guidance to meet any unique characteristics of a particular structure proposal should be addressed by the respective Coast Guard District Waterways Management Branch.

(8) The procedures that need to be put in place to respond to and correct discrepancies to the aids to navigation, within the timeframes specified by the Coast Guard.

(9) How the marking of the structure will impact existing Federal aids to navigation in the vicinity of the structure.

14. Design Requirements. The structure should be designed and constructed to satisfy the following recommended design requirements for emergency shut-down in the event of a search and rescue, pollution response, or salvage operation in or around a structure:

a. All above surface structures should be marked with clearly visible unique identification characters (for example, alpha-numeric labels). The identification characters should each be illuminated by a low-intensity light visible from a vessel, or be coated with a phosphorescent material, thus enabling the structure to be detected at a suitable distance to avoid a collision with it. The size of the identification characters in combination with the lighting or phosphorescence should be such that, under normal conditions of visibility and all known tidal conditions, they are clearly readable by an observer, and at a distance of at least 150 yards from the structure. It is recommended that, if lighted, the lighting for this purpose be hooded or baffled so as to avoid unnecessary light pollution or confusion with navigation aids. (Precise dimensions to be determined by the height of lights and necessary range of visibility of the identification numbers).

b. All generators and transmission systems should be equipped with control mechanisms that can be operated from an operations center of the installation.

c. Throughout the design process, appropriate assessments and methods for safe shutdown should be established and agreed to through consultation with the Coast Guard and other emergency support services.

d. The control mechanisms should allow the operations center personnel to fix and maintain the position of the WTG blades, nacelles and other appropriate moving parts as determined by the applicable Coast Guard command center. Enclosed spaces such as

nacelle hatches in which personnel are working should be capable of being opened from the outside. This would allow rescuers (for example, helicopter winch operator) to gain access if occupants are unable to assist or when a sea-borne approach is not possible. These spaces may be secured when no site personnel are present.

e. Access ladders, although designed for entry by trained personnel using specialized equipment and procedures for maintenance in calm weather, could conceivably be used in an emergency situation to provide refuge on the structure for distressed mariners. This scenario should therefore be considered when identifying the optimum position of such ladders and take into account the prevailing wind, wave, and tidal conditions.

15. Operational Requirements. Operations should be continuously monitored by the facility's owners/operators, ostensibly in an operations center. Recommended minimum requirements for an operations center are:

a. The operations center should be manned 24 hours a day.

b. The operations center personnel should have a chart indicating the Global Positioning System (GPS) position and unique identification numbers of each of the structure.

c. All applicable Coast Guard command centers (District and Sector) will be advised of the contact telephone number of the operations center.

d. All applicable Coast Guard command centers will have a chart indicating the position and unique identification number of each of the structures.

16. Operational Procedures.

a. Upon receiving a distress call or other emergency alert from a vessel that is concerned about a possible allision with a structure or is already close to or within the installation, the Coast Guard Search and Rescue Mission Coordinator (SMC) will establish the position of the vessel and the identification numbers of any structures visible to the vessel. The position of the vessel and identification numbers of the structures will be passed immediately to the operations center by the SMC.

b. The operations center should immediately initiate the shut-down procedure for those structures as requested by the SMC, and maintain the structure in the appropriate shut-down position, again as requested by the SMC, until receiving notification from the SMC that it is safe to restart the structure.

c. Communication and shutdown procedures should be tested satisfactorily at least twice each year.

d. After an allision, the structure owner should advise the Coast Guard if the structure should be deemed a hazard to navigation.

MARINE PLANNING GUIDELINES

1. **Introduction**: As discussed below, these guidelines are based upon, and nearly identical to, guidance established by the United Kingdom's MGN-371, "Safety of Navigation: Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response", (August 2008). These guidelines, and particularly minimum distance (buffer) recommendations designed by the United Kingdom, require intelligent application and must be evaluated and applied on a case-by-case basis.

2 Recommended Guidelines for General Assessment of Areas for Potential Development

a. Purpose. These guidelines are provided to assist offshore developers and marine planners with their evaluation of the navigation impacts of any projects with permanent fixed structures. The guidelines consider sea space necessary for ships to maneuver safely, and discuss other factors to be considered when determining appropriate separation distances for the siting of offshore structures near shipping routes and other multiple use areas.

These guidelines are not regulatory. They do not impact the boundaries of any existing leases for site characterization and site assessment activities, but do inform suitability of siting structures within a lease area. These guidelines should be considered during the area identification phase for both unsolicited and solicited development areas and when determining the siting of structures within existing areas. These guidelines also serve as one of the references to inform the NSRA conducted by developers. If the LA directs the applicant to perform a Navigation Safety Risk Assessment (NSRA), as a cooperating agency in the NEPA process the Coast Guard will review the developer's NSRA to prepare its recommendations and mitigations to be presented to the LA.

b. Discussion. There is no international standard that specifies minimum distances between shipping routes and fixed structures; however, it is widely accepted that fixed structures in the offshore environment should not interfere with navigation. Specifically, the following documents or input from the identified organizations were used in the development of the U.S. guidelines:

(1) United Kingdom Maritime and Coastguard Agency (MCA) Marine Guidance Note MGN-371, Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response Issues[2];

(2) The Confederation of European Shipmasters' Associations (CESMA);

(3) The World Shipping Council (WSC); and

(4) Federal Waterways and Shipping Administration (Germany) Guidelines for the Design, Marking and Operation of Wind Generators in the Area of Responsibility of the Federal Waterways and Shipping Directorates North-West and North to Guarantee the Safety and Efficiency of Vessel Traffic.

[2] The United Kingdom Maritime and Coastguard Agency published Marine Guidance Note MGN-543 in January 2016. The USCG views MGN 543 as a simplification of its predecessor, MGN 371, and does not deem it necessary or prudent to revise our MP Guidelines.

c. Planning Guidelines. This enclosure provides the general guidelines for the placement of structures near shipping routes and established ships routing measures, and other multiple use areas. These guidelines will result in the lowest level of acceptable risk reduction because they are based on minimum distances for the largest vessels to maneuver safely. Additional mitigation measures should be considered to achieve a low level of navigation safety risk.

3. Recommended Navigation Safe Distances

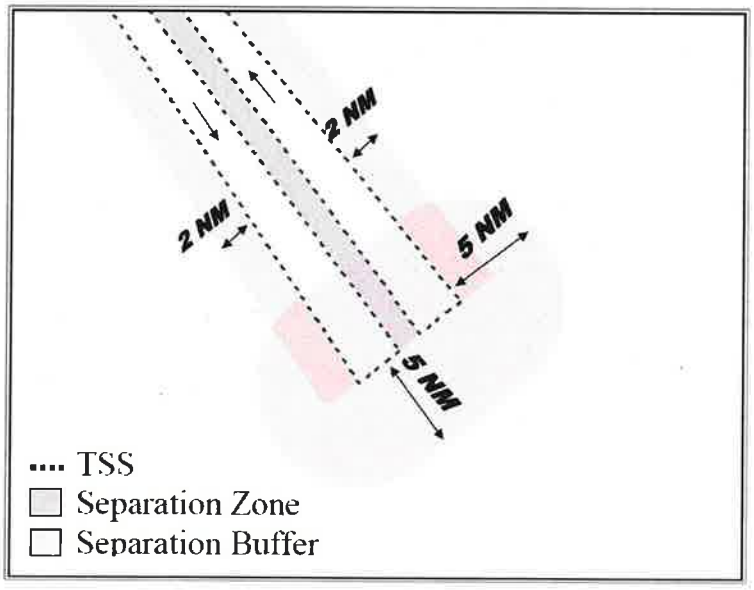
a. Port Approaches and Traffic Separation Schemes (TSS).

(1) Planning Guidelines:

(a) 2NM from the parallel outer or seaward boundary of a traffic lane. (Assumes 300 to 400m vessels); and

(b) 5NM from the entry/exit (terminations) of a TSS.

Note. These recommendations are based on generic deep draft vessel maneuvering characteristics and are consistent with existing European guidelines. They account for the ***minimum*** distances for larger vessels to maneuver in emergency situations.



Note. The 5 NM mile separation buffer from the terminus of a TSS is necessary to provide vessels sufficient sea room in an area where several vessels may be converging and diverging from and to multiple directions.

b. Coastwise or Coastal Shipping Routes. Vessels that tend to follow the coastline are typically smaller vessels that cannot safely transit too far offshore due to sea state limitations. The necessary sea space for vessels to navigate safely is determined by the size and maneuverability of vessels, and density of vessel traffic. When determining routes

near shore the depth of water and location of underwater obstructions must be considered, especially if vessel routes will be displaced by the introduction of fixed structures. Towing vessels towing astern on a wire are of particular concern. In this configuration their footprint may be large, maneuvering ability may be constrained, and the catenary of the tow wire may dictate significantly larger water depths than the drafts of the tug or barge.

(1) Planning Guidelines:

(a) Identify a navigation safety corridor to ensure adequate sea area for vessels to transit safely;

(b) Provide inshore corridors for coastal ships and tug/barge operations;

(c) Minimize displacement of routes further offshore;

(d) Avoid displacing vessels where it will result in mixing vessel types; and

(e) Identify and consider cumulative and cascading impacts of multiple OREIs, such as wind farms.

c. Offshore Deep Draft Routes. Offshore deep draft routes can be more flexible in terms of the location of the routes. It is still necessary to have adequate sea area for safe navigation, but less critical to preserve existing routes to achieve safe conditions.

(1) Planning Guidelines:

(a) Avoid creating an obstruction or hazard on both sides of an existing route; and

(b) If not practicable to avoid structures or hazards on both sides of a route, a navigation safety corridor should be of sufficient size to provide for the safe transit of the largest vessels. Large ocean-gong ships often operate a high speeds that effect maneuvering response time. This should be accounted for when making the determination.

d. Navigation safety corridors. Navigation safety corridors identify the amount of area necessary for vessels to safely transit along a route under all situations. These corridors are not considered routing measures by the Coast Guard or the International Maritime Organization (IMO), but are a tool to delineate areas where no offshore development should be considered. These corridors should not be confused with fairways, two-way routes or Traffic Separation Schemes which are routing measures that identify specific inshore traffic areas. Density plots (aka heat maps) of Automatic Identification System (AIS) information are useful in determining the location of a route, but are less useful in determining the appropriate size of a route where multiple vessels may be required to pass one another safely. Navigation safety corridors should be given priority consideration over other potential uses of the same water space. In determining the appropriate size of navigation safety corridors, the following factors must be considered for the largest and least maneuverable vessels expected to use a route:

(1) Cross Track Error (CTE). CTE is the difference between the intended and actual track. Factors leading to a vessel deviating from intended track include:

(a) Environmental Forces - include wind, currents and sea state:

1) Wind forces can set a vessel in the downwind direction. The impacts of the wind will vary according to the size and shape of the vessel;

2) Currents, particularly cross currents, can significantly affect the maneuverability of a vessel and space required to navigate safely; and

3) Sea state, including size and direction of waves, can cause vessels to pitch, heave and roll. Yawing motions could result in the vessel drifting off course. Following seas can impact the ability of the vessel to steer a steady course.

(b) Swept Path - (the sum of various factors to determine the total width of the tug and barge path) will depend on the abilities of the vessel operator and the maneuvering characteristics of the vessel and are a secondary cause of CTE:

1) Vessel Operator Response - the time for the vessel operator to recognize deviation from an intended track and to take corrective action; and

2) Vessel Response - the speed that the vessel responds to rudder and main engines.

(2) Closest Point of Approach (CPA). CPA is the safe distance at which a vessel can pass a fixed or moving object accounting for existing conditions. In complying with the International Regulations for Preventing Collisions at Sea 1972 (COLREGS), the Captain of a vessel is required to consider all dangers of navigation and collision and any special circumstances, including limitations of the vessels involved, which may make a departure from the COLREGS necessary to avoid immediate danger per Rule 2, Responsibility. When determining an appropriate CPA, all factors of weather, maneuvering capability, visibility, etc. must be considered, as well as potential emergency situations. Under ideal conditions with low sea states, good visibility and good communications between vessels to arrange a passing agreement, a CPA of ½ to 1 NM may be acceptable. Under less ideal weather and sea conditions and/or higher vessels speeds, a CPA of 2 NM or more may be necessary to ensure safe passage. By increasing the planned CPA, the chance of a collision or allision will be decreased.

(3) Density of Traffic. The amount of traffic along a route will dictate the likelihood of vessels sharing sea space in meeting, overtaking or crossing situations. With good communications and early actions, vessels can make arrangements to limit the number of vessels interacting with each other. However, there will be times when multiple vessels converge on the same location, such as in a cluster of OREIs, and additional sea space is necessary to maneuver safely and maintain safe CPAs for all vessels. The longer the route is constrained, the more likely multiple vessels will meet along a route. Crossing traffic such as fishing vessels or offshore support vessels transiting to/from offshore installations will further complicate vessel interactions. A navigation safety corridor should be designed to accommodate an

appropriate number of vessels passing abeam of one another and other vessel operations in the area. In low density situations such as offshore, a minimum of two vessels may be appropriate. For moderate vessel density situations a minimum of three vessels should be used for planning purposes.

Note. The factors are interrelated and should be considered in the context of the most probable weather and sea state conditions. The types of operations requiring the most sea space for maneuvering under normal and emergency situations should be used as the reference point.

e. Other site specific considerations:

(1) Potential contributions to risk:

(a) High density traffic areas with converging or crossing routes. Similar to port entrances, areas where vessels are approaching from different directions into a smaller area will produce complex vessel interactions and increase navigation safety risk. This could occur in natural choke points or off shore of a cape, peninsula or other obstruction that vessels must go around;

(b) Obstructions/hazards on opposite side of a route. If hazards or obstructions are present on the opposite side of a route from a development area, the impact will be the constriction of vessel traffic and reduced time for vessel operators to determine the risk of collision and take avoiding action in a close quarters situation;

(c) Severe weather/sea state conditions. Severe weather and sea state conditions can impact visibility, maneuverability and navigation, all of which would negatively impact navigation safety;

(d) Severe currents. Severe currents will impact maneuverability of a vessel and ability to maintain intended track, thus negatively impact navigation safety;

(e) Mixing of vessel types. Smaller or slow moving vessels will tend to avoid major shipping lanes containing larger, faster moving vessels. When these vessels are displaced into the routes of other vessel types the number of overtaking situations will increase, thereby increasing risk, particularly if sea space is limited;

(f) Complexity of vessel interactions. In areas where interactions are more complex, impacts due to new obstructions could be amplified. Complexity can be driven by a number of factors, such as those previously discussed above where routes are converging/crossing or mixing of vessel types. Complexity could also be driven by other operations being conducted in the area such as fishing, recreational traffic or pilot boarding areas;

(g) Large distances along a route. The longer the distance of obstructions along a route, the greater the risk. Increased distance equates to increased exposure to the hazard; and

(h) Undersized routing measures. If an existing TSS or other routing measure was not designed to accommodate existing or future density and size of vessels, additional separation may be appropriate.

(2) Potential mitigations of risk:

(a) Mitigating factors include aids to navigation, pilotage, vessel traffic services, precautionary areas, areas to be avoided, anchorages, limited access areas, and other routing measures. Mitigating factors can be used to lower risk in many ways, such as increasing predictability of vessel traffic, increasing local knowledge and expertise, increasing situational awareness, or improving navigation. Proper marking and lighting of the structures of a wind farm can be used for navigation purposes improving the ability to fix a vessel's position;

(b) Low traffic density. Low traffic density will decrease vessel interactions and allow for more space for transiting vessels to maneuver;

(c) Predominantly smaller vessels. If only smaller vessels call on a port or if large vessel transits are very infrequent, smaller planning distances may be appropriate; especially if other mitigations are in place for the large vessel transits, such as tug escorts or moving safety zones;

(d) Distance from ports, shoals and other obstructions. If there are large distances to other hazards vessels will be able to adjust their route to ensure safe transits; and

(e) Aids to Navigation. Enhanced Aids to Navigation may assist vessels in more accurately determining their position as well as identifying potential hazards.

(3) Other Critical Routes. This refers to routes that may not be obvious when looking at regular traffic patterns and may involve specific or unique requirements of particular vessels:

(a) Natural Deepwater Approaches. Natural deep water approaches may not be used by the majority of vessels but may be necessary for some vessels to enter or depart port at present or in the future.

(b) Unique Transits. Other requirements such as sea space, draft, etc. necessary for the safe transit of infrequent, but important vessel transits, such as periodic provisioning of remote communities.

EXAMPLE RISK MITIGATION STRATEGIES

Mitigation and safety measures will be applied as appropriate to the level and type of risk determined during the Environmental Impact Statement (EIS) process.

Construction / Decommissioning

1. Developers should forecast vessel traffic estimates with the respective port authorities.
2. Cautionary notation on nautical charts during periods of activity at the construction site.
3. Assess prospective cabling plan and compare to known fishing grounds and anchorages.

Operation Phase

4. Promulgation of information and warnings through Local Notices to Mariners and Broadcast Notice to Mariners as well as other media.
5. Continuous communications watch using multi-channel VHF, including Digital Selective Calling (DSC).
6. The Coast Guard may implement Safety zones, Regulated Navigation Areas, or other mitigating measures of appropriate configuration for the project area.
7. Designation of the site as an area to be avoided (ATBA).
8. Implementation of routing measures within or near the development.
9. Monitoring by radar, AIS, closed circuit television (CCTV) or any combination of the three.
10. Appropriate means to notify and provide evidence of the infringement of safety zones or ATBAs.
11. Determine minimum distance of structures from shipping routes.
12. Marking, lighting, radar reflectors, radio beacons, AIS transponders, or other aids to navigation.
13. Any other measures and procedures considered appropriate in consultation with other stakeholders.

REFERENCES AND RESOURCES

Aids to Navigation Manual – Administration, COMDTINST M16500.7A, Ch. 4, sec. G - https://media.defense.gov/2017/Mar/29/2001724016/-1/-1/0/CIM_16500_7A.PDF

Atlantic Coast Port Access Route Study, Final Report dated 8 July 2015 - https://www.navcen.uscg.gov/?pageName=PARSReports

Establishing a framework for marine spatial planning and integrated coastal management - http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0133:FIN:EN:PDF

EU Action Plan to revitalize the marine and maritime economy http://ec.europa.eu/maritimeaffairs/policy/sea_basins/atlantic_ocean/index_en.htm

EU Marine Spatial Planning http://www.openchannels.org/sites/default/files/literature/Maritime%20Spatial%20Planning%2C%20EU%20Policy%20Update%2C%20April%202015.pdf

MARAD Marine Highways - http://www.marad.dot.gov/ships-and-shipping/dot-maritime-administration-americas-marine-highway-program/

MarineCadastre.gov - http://marinecadastre.gov/

Marine Planning to Operate and Maintain the Marine Transportation System (MTS) and Implement National Policy, COMDTINST 16003.2B - https://media.defense.gov/2019/Jul/10/2002155400/-1/-1/0/CI_16003_**2B**.PDF

Massachusetts Ocean Management Plan http://www.mass.gov/eea/waste-mgnt-recycling/coasts-and-oceans/mass-ocean-plan/

Memorandum of Agreement between the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) – U.S. Department of the Interior and the U.S. Coast Guard – U.S. Department of Homeland Security dated 27 July 2011; http://www.boem.gov/Renewable-Energy-Program/MOA_USCG_BOEMRE_July_27_2011-pdf.aspx

Memorandum of Agreement between the United States Army Corps of Engineers (USACE) and the United States Coast Guard dated 08 November 2013; http://www.usace.army.mil/Portals/2/docs/civilworks/mous/reg001.pdf

Memorandum of Understanding between the Federal Energy Regulatory Commission (FERC) and the U.S. Coast Guard – U.S. Department of Homeland Security dated 6 March 2013; http://www.ferc.gov/legal/mou/mou-uscg-03-2013.pdf

Methodology for Assessing Risks to Ship Traffic from Offshore Wind Farms - http://corporate.vattenfall.se/globalassets/sverige/verksamhet/energikallor/5-kriegers-flak-risk-assessment_11335732.pdf

Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of Offshore Renewable Energy Installations (OREI) - http://www.gov.uk/mca

Mid-Atlantic Ocean Data Portal - http://midatlanticocean.org/data-portal/

Mid-Atlantic Regional Council on the Ocean (MARCO) - http://midatlanticocean.org/

National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, 83 Stat. 852) -

National Ocean Council marine planning data - http://www.data.gov/ocean/

National Ocean Economics Program - http://www.oceaneconomics.org/download/

New York 10 year Ocean Action Plan - http://www.dec.ny.gov/lands/84428.html

New York Department of State Offshore Atlantic Ocean Study - https://www.dos.ny.gov/opd/programs/offshoreResources/

New York Offshore Atlantic Ocean Study – comprehensive dataset of physical, biological, geographic, and socioeconomic information for the Atlantic Ocean waters offshore New York. http://docs.dos.ny.gov/communitieswaterfronts/ocean_docs/NYSDOS_Offshore_Atlantic_Ocean_Study.pdf

Northeast Ocean Data Portal - https://www.northeastoceandata.org/

Northeast Regional Ocean Council (NROC) - http://northeastoceancouncil.org/

Ocean SAMP - http://seagrant.gso.uri.edu/oceansamp/pdf/Practitioner_Guide.pdf

Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response Issues (MGN-543) https://www.gov.uk/government/publications/mgn-543-mf-safety-of-navigation-offshore-renewable-energy-installations-oreis-uk-navigational-practice-safety-and-emergency-response

Offshore Renewable Energy Installations (OREIs): Guidance to Mariners Operating in the Vicinity of UK OREIs (MGN-372) – https://www.gov.uk/government/publications/mgn-372-guidance-to-mariners-operating-in-vicinity-of-uk-oreis

Oregon Ocean Information resources - http://www.oregonocean.info/index.php/home/downloads

OREI navigation safety, impact on shipping - https://www.gov.uk/offshore-renewable-energy-installations-impact-on-shipping

Rhode Island Sea Grant's website on the Rhode Island Special Areas Mapping Project (SAMP) http://seagrant.gso.uri.edu/showcase/index.html

The Ports and Waterways Safety Act (PWSA) of 1972 (Public Law 92-340, 86 Stat. 424)

USN training zones - http://aftteis.com/

West Coast Ocean Data Portal - http://portal.westcoastoceans.org/

Worker Health and Safety on Offshore Wind Farms
http://onlinepubs.trb.org/onlinepubs/sr/SR310.pdf

CHECKLIST FOR NSRA DEVELOPMENT AND REVIEW

If the LA directs the applicant to perform a Navigation Safety Risk Assessment (NSRA), the Coast Guard will use this checklist to review the developer's NSRA and to prepare its recommendations and mitigations to be presented to the LA

ISSUE	YES/NO	COMMENTS
1. SITE AND INSTALLATION COORDINATE		
Has the developer ensured that coordinates and subsequent variations of site perimeters and individual structures are made available, upon request, to interested parties at all, relevant project stages?	Y - N	
Has the coordinate data been supplied as authoritative Geographical Information System (GIS) data, preferably in Environmental Systems Research Institute (ESRI) format? Metadata should facilitate the identification of the data creator, its date and purpose, and the geodetic datum used. For mariners' use, appropriate data should also be provided with latitude and longitude coordinates in WGS84 datum.	Y - N	
2. TRAFFIC SURVEY		
Was the traffic survey conducted within 12 months of the NSRA?	Y - N	
Does the survey include all vessel types?	Y - N	
Is the time period of the survey at least 28 days duration?	Y - N	
Does the survey include consultation with recreational vessel organizations?	Y - N	
Does the survey include consultation with fishing vessel organizations?	Y - N	
Does the survey include consultation with pilot organizations?	Y - N	
Does the survey include consultation with commercial vessel organizations?	Y - N	
Does the survey include consultation with port authorities?	Y - N	
Does the survey include proposed structure location relative to areas used by any type of vessel?	Y - N	
Does the survey include numbers, types, sizes and other characteristics of vessels presently using such areas?	Y - N	
Does the survey include types of cargo carried by vessels presently using such areas?	Y - N	
Does the survey identify non-transit uses of the areas (for example, fishing, day cruising of leisure craft, racing, marine regattas and parades, aggregate mining)?	Y - N	

Does the survey include whether these areas contain transit routes used by coastal or deep-draft vessels, ferry routes, and fishing vessel routes?	Y - N	
Does the survey include alignment and proximity of the site relative to adjacent shipping routes	Y - N	
Does the survey include whether the nearby area contains prescribed or recommended routing measures or precautionary areas?	Y - N	
Does the survey include whether the site lies on or near a prescribed or conventionally accepted separation zone between two opposing routes or traffic separation scheme?	Y - N	
Does the survey include the proximity of the site to anchorage grounds or areas, safe haven, port approaches, and pilot boarding or landing areas?	Y - N	
Does the survey include the feasibility of allowing vessels to anchor within the vicinity of the structure field?	Y - N	
Does the survey include the proximity of the site to existing fishing grounds, or to routes used by fishing vessels to such grounds?	Y - N	
Does the survey include whether the site lies within the limits of jurisdiction of a port and/or navigation authority?	Y - N	
Does the survey includes the proximity of the site to offshore firing/bombing ranges and areas used for any marine or airborne military purposes?	Y - N	
Does the survey includes the proximity of the site to existing or proposed offshore OREI/gas platform or marine aggregate mining?	Y - N	
Does the survey includes the proximity of the site to existing or proposed structure developments?	Y - N	
Does the survey includes the proximity of the site relative to any designated areas for the disposal of dredging material or ocean disposal site?	Y - N	
Does the survey includes the proximity of the site to aids to navigation and/or Vessel Traffic Services (VTS) in or adjacent to the area and any impact thereon?	Y - N	
Does the survey include a researched opinion using computer simulation techniques with respect to the displacement of traffic, mixing of vessel types that were previously segregated; changes in traffic density and resultant change in vessels encounters; and, in particular, the creation of 'choke points' in areas of high traffic density?	Y - N	
Does the survey include whether the site lies in or near areas that will be affected by variations in traffic patterns as a result of changes to vessel emission requirements?	Y - N	
Does the survey include seasonal variations in traffic?	Y - N	

3. OFFSHORE ABOVE WATER STRUCTURE		
Does the NSRA denote whether any features of the offshore above water structure, including auxiliary platforms outside the main generator site and cabling to the shore, could pose any type of difficulty or danger to vessels underway, performing normal operations, or anchoring? Such dangers would include clearances of wind turbine blades above the sea surface, the burial depth of cabling, and lateral movement of floating wind turbines.	Y - N	
Does the NSRA denote whether minimum safe (air) clearances between sea level conditions at Mean Higher High Water (MHHW) and wind turbine rotors are suitable for the vessels types identified in the traffic survey? Depths, clearances, and similar features of other structure types which might affect navigation safety and other Coast Guard missions should be determined on a case by case basis.	Y - N	
Does the NSRA denote whether any feature of the installation could impede emergency rescue services, including the use of lifeboats, helicopters and emergency towing vessels (ETVs)?	Y – N	
Does the NSRA denote how rotor blade rotation and power transmission, etc., will be controlled by the designated services when this is required in an emergency?	Y - N	
Does the NSRA denote whether any noise or vibrations generated by a structure above and below the water column would impact navigation safety or affect other Coast Guard missions?	Y - N	
Does the NSRA denote the ability of a structure to withstand collision damage by vessels without toppling for a range of vessel types, speeds, and sizes?	Y - N	
4. OFFSHORE UNDER WATER STRUCTURE		
Does the NSRA denote whether minimum safe clearance over underwater devices has been determined for the deepest draft of vessels that could transit the area?	Y - N	
Has the developer demonstrated an evidence-based, case-by-case approach which will include dynamic draft modeling in relation to charted water depth to ascertain the safe clearance over a device?	Y - N	

To establish a minimum clearance depth over devices, has the developer identified from the traffic survey the deepest draft of observed traffic? This will then require modeling to assess impacts of all external dynamic influences giving a calculated figure for dynamic draft. A 30% factor of safety for under keel clearance (UKC) should then be applied to the dynamic draft, giving an overall calculated safe clearance depth to be used in calculations.	Y - N	
NOTE: The Charted Depth reduced by safe clearance depth gives a maximum height above seabed available from which turbine design height including any design clearance requirements can be established.		
5. ASSESSMENT OF ACCESS TO AND NAVIGATION WITHIN, OR CLOSE TO, A STRUCTURE. Has the developer determined the extent to which navigation would be feasible within the structure site itself by assessing whether:		
Navigation within the site would be safe? • By all vessels or • By specified vessel types, operations and/or sizes? • In all directions or areas; or • In specified directions or areas? • In specified tidal, weather or other conditions; and • At any time, day or night?	Y - N	
Navigation in and/or near the site should be • Prohibited by specified vessel types, operations and/or sizes; • Prohibited in respect to specific activities; • Prohibited in all areas or directions; • Prohibited in specified areas or directions; • Prohibited in specified tidal or weather conditions; • Prohibited during certain times of the day or night; or • Recommended to be avoided?	Y - N	
Does the NSRA contain enough information for the Coast Guard to determine whether or not exclusion from the site could cause navigation, safety, or transiting problems for vessels operating in the area?	Y - N	
6. THE EFFECT OF TIDES, TIDAL STREAMS, AND CURRENTS. Does the NSRA contain enough information for the Coast Guard to determine whether or not:		
Current maritime traffic flows and operations in the general area are affected by the depth of water in which the proposed structure is situated at various states of the tide, that is, whether the installation could pose problems at high water which do not exist at low water conditions, and vice versa?	Y - N	

Current maritime traffic flows and operations in the general area are affected by existing currents in the area in which the proposed structure is situated?	Y - N	
The set and rate of the tidal stream, at any state of the tide, would have a significant effect on vessels in the area of the structure site?	Y - N	
Current directions/velocities might aggravate or mitigate the likelihood of allision with the structure?	Y - N	
The maximum rate tidal stream runs parallel to the major axis of the proposed site layout, and, if so, its effect?	Y - N	
The set is across the major axis of the layout at any time, and, if so, at what rate?	Y - N	
In general, whether engine failure or other circumstance could cause vessels to be set into danger by the tidal stream or currents?	Y - N	
Structures themselves could cause changes in the set and rate of the tidal stream or direction and rate of the currents?	Y - N	
Structures in the tidal stream could produce siltation, deposition of sediment or scouring, any other suction or discharge aspects, which could affect navigable water depths in the structure area or adjacent to the area?	Y - N	
Structures would cause danger and/or severely affect the air column, water column, seabed and sub-seabed in the general vicinity of the structure?	Y - N	
7. WEATHER. Does the NSRA contain a sufficient analysis of expected weather conditions, water depths and sea states that might aggravate or mitigate the likelihood of allision with the structure, so that Coast Guard can properly assess the applicant's determinations of whether:		
The site, in all weather conditions, could present difficulties or dangers to vessels, which might pass in close proximity to the structure?	Y - N	
The structures could create problems in the area for vessels under sail, such as wind masking, turbulence, or sheer?	Y - N	
In general, taking into account the prevailing winds for the area, whether engine failure or other circumstances could cause vessels to drift into danger, particularly if in conjunction with a tidal set such as referred above?	Y - N	
Depending on the location of the structure and the presence of cold weather, sea ice and/or icing of the structure may cause problems? A thorough analysis of how the presence of the structure would mitigate or exacerbate icing?	Y - N	
An analysis of the ability for structures to withstand anticipated ice floes should be conducted by the applicant?	Y - N	

An analysis of the likelihood that ice may form on the structure, especially those types that have rotating blades such as a Wind Turbine Generator (WTG), should be conducted by the applicant, and should include an analysis of the ability of the structure to withstand anticipated ice accumulation on the structures, and potential for ice to be thrown from the blades, and the likely consequences of that happening and possible actions to mitigate that occurrence?	Y - N	
8. CONFIGURATION AND COLLISION AVOIDANCE		
The Coast Guard will provide Search and Rescue (SAR) services in and around OREIs in US waters. Layout designs should allow for safe transit by SAR helicopters operating at low altitude in bad weather, and those vessels (including rescue craft) that decide to transit through them. Has the developer conducted additional site specific assessments, if necessary, to build on any previous assessments to assess the proposed locations of individual turbine devices, substations, platforms and any other structure within OREI such as a wind farm or tidal/wave array? Any assessment should include the potential impacts the site may have on navigation and SAR activities. Liaison with the USCG is encouraged as early as possible following this assessment which should aim to show that risks to vessels and/or SAR helicopters are minimized and include proposed mitigation measures.	Y - N	
Each OREI layout design will be assessed on a case-by-case basis.	Y - N	
Risk assessments should build on any earlier work conducted as part of the NSRA and the mitigations identified as part of that process. Where possible, an original assessment should be referenced to confirm where information or the assessment remains the same or can be further refined due to the later stages of project development. Risk assessments should present information to enable the USCG to adequately understand how the risks associated with the proposed layout have been reduced to As Low As Reasonably Practicable (ALARP).	Y - N	
In order to minimize risks to surface vessels and/or SAR helicopters transiting through an OREI, structures (turbines, substations) should be aligned and in straight rows or columns. Multiple lines of orientation may provide alternative options for passage planning and for vessels and aircraft to counter the environmental effects on handling i.e. sea state, tides, currents, weather, visibility. Developers should plan for at least two lines of orientation unless they can demonstrate that fewer are acceptable.	Y - N	

Packed boundaries will be considered on a case-by-case basis as part of the risk assessment process. For opposite boundaries of adjacent sites due consideration should be given to the requirement for lines of orientation which allow a continuous passage of vessels and/or SAR helicopters through both sites. Where there are packed boundaries this will affect layout decisions for any possible future adjacent sites. The definition of 'adjacent' will be assessed on a case-by-case basis.	Y - N	
9. VISUAL NAVIGATION. Does the NSRA contain an assessment of the extent to which:		
Structures could block or hinder the view of other vessels underway on any route?	Y - N	
Structures could block or hinder the view of the coastline or of any other navigational feature such as aids to navigation, landmarks, promontories?	Y - N	
Structures and locations could limit the ability of vessels to maneuver in order to avoid collisions?	Y - N	
10. COMMUNICATIONS, RADAR AND POSITIONING SYSTEMS. Does the NSRA provide researched opinion of a generic and, where appropriate, site specific nature concerning whether or not:		
Structures could produce interference such as shadowing, reflections or phase changes, with marine positioning, navigation, or communications, including Automatic Identification Systems (AIS), whether ship borne, ashore, or fitted to any of the proposed structures?	Y - N	
Structures could produce radar reflections, blind spots, shadow areas or other adverse effects in the following interrelationships: • Vessel to vessel; • Vessel to shore; • Vessel Traffic Service radar to vessel; • Radio Beacons (RACONS) to/from vessel; and • Aircraft and Air Traffic Control?	Y - N	
Structures, in general, would comply with current recommendations concerning electromagnetic interference?	Y - N	
Structures might produce acoustic noise or noise absorption or reflections which could mask or interfere with prescribed sound signals from other vessels or aids to navigation?	Y - N	
Structures, generators, and the seabed cabling within the site and onshore might produce electro-magnetic fields affecting compasses and other navigation systems?	Y - N	
The power and noise generated by structures above or below the water would create physical risks that would affect the health of vessel crews?	Y - N	

11. RISK OF COLLISION, ALLISION, OR GROUNDING. Does the NSRA, based on the data collected per paragraph 2 above, provide an evaluation that was conducted to determine the risk of collision between vessels, risk of allisions with structures, or grounding because of the establishment of a structure, including, but not limited to		
• Likely frequency of collision (vessel to vessel); • Likely consequences of collision ("What if" analysis); • Likely location of collision; • Likely type of collision; • Likely vessel type involved in collision; • Likely frequency of allision (vessel to structure) • Likely consequences of allision ("What if" analysis); • Likely location of allision; • Likely vessel type involved in allision; • Likely frequency of grounding; • Likely consequences of grounding ("What if" analysis); • Likely location of grounding; and • Likely vessel type involved in grounding?	Y - N	
12. EMERGENCY RESPONSE CONSIDERATIONS. In order to determine the impact on Coast Guard and other emergency responder missions, has the developer conducted assessments on the Search and Rescue and the Marine Environmental Protection emergency response missions?		
• Search and Rescue (SAR): The Coast Guard will assist in gathering and providing the following information: The number of search and rescue cases the USCG has conducted in the proposed structure region over the last ten years. • The number of cases involving helicopter hoists. • The number of cases performed at night or in poor visibility/low ceiling • The number of cases involving aircraft (helicopter, fixed-wing) searches. • The number of cases performed by commercial salvors (for example, BOAT US, SEATOW, commercial tugs) responding to assist vessels in the proposed structure region over the last ten years. • Has the developer provided an estimate of the number of additional SAR cases projected due to allisions with the structures? • Will the structure enhance SAR such as by providing a place of refuge or easily identifiable markings to direct SAR units?	Y - N	

Marine Environmental Protection/Response: • How many marine environmental/pollution response cases has the USCG conducted in the proposed structure region over the last ten years? • What type of pollution cases were they? • What type and how many assets responded? • How many additional pollution cases are projected due to allisions with the structures?	Y - N	
13. FACILITY CHARACTERISTICS. In addition to addressing the risk factors detailed above, does the developer's NSRA include a description of the following characteristics related to the proposed structure:		
Marine Navigational Marking?	Y - N	
How the overall site would be marked by day and by night, taking into account that there may be an ongoing requirement for marking on completion of decommissioning, depending on individual circumstances?	Y - N	
How individual structures on the perimeter of and within the site, both above and below the sea surface, would be marked by day and by night?	Y - N	
If the site would be marked by one or more Radar Beacons (RACONS) or, an Automatic Identification System (AIS) transceiver, or both and if so, the AIS data it would transmit?	Y - N	
If the site would be fitted with a sound signal, the characteristics of the sound signal, and where the signal or signals would be sited?	Y - N	
If the structure(s) are to be fitted with aviation marks, how would they be screened from mariners or potential confusion with other navigational marks and lights be resolved?	Y - N	
Whether the proposed site and/or its individual generators would comply in general with markings for such structures, as required by the Coast Guard?	Y - N	
Whether its plans to maintain its aids to navigation are such that the Coast Guard's availability standards are met at all times. Separate detailed guidance to meet any unique characteristics of a particular structure proposal should be addressed by the respective District Waterways Management Branch?	Y - N	
The procedures that need to be put in place to respond to and correct discrepancies to the aids to navigation, within the timeframes specified by the Coast Guard?	Y - N	
How the marking of the structure will impact existing Federal aids to navigation in the vicinity of the structure?	Y - N	

14. DESIGN REQUIREMENTS. Is the structure designed and constructed to satisfy the following recommended design requirements for emergency shut-down in the event of a search and rescue, pollution response, or salvage operation in or around a structure?		
All above surface structure individual structures should be marked with clearly visible unique identification characters (for example, alpha-numeric labels such as "A1," "B2."). The identification characters should each be illuminated by a low-intensity light visible from a vessel, or be coated with a phosphorescent material, thus enabling the structure to be detected at a suitable distance to avoid a collision with it. The size of the identification characters in combination with the lighting or phosphorescence should be such that, under normal conditions of visibility and all known tidal conditions, they are clearly readable by an observer, and at a distance of at least 150 yards from the structure. It is recommended that, if lighted, the lighting for this purpose be hooded or baffled so as to avoid unnecessary light pollution or confusion with navigation aids. (Precise dimensions to be determined by the height of lights and necessary range of visibility of the identification numbers).	Y - N	
All generators and transmission systems should be equipped with control mechanisms that can be operated from an operations center of the installation.	Y - N	
Throughout the design process, appropriate assessments and methods for safe shutdown should be established and agreed to through consultation with the Coast Guard and other emergency support services.	Y - N	
The control mechanisms should allow the operations center personnel to fix and maintain the position of the WTG blades, nacelles and other appropriate moving parts as determined by the applicable Coast Guard command center. Enclosed spaces such as nacelle hatches in which personnel are working should be capable of being opened from the outside. This would allow rescuers (for example, helicopter winch-man) to gain access if occupants are unable to assist or when sea-borne approach is not possible.	Y - N	
Access ladders, although designed for entry by trained personnel using specialized equipment and procedures for maintenance in calm weather, could conceivably be used in an emergency situation to provide refuge on the structure for distressed mariners. This scenario should therefore be considered when identifying the optimum position of such ladders and take into account the prevailing wind, wave, and tidal conditions.	Y - N	

15. OPERATIONAL REQUIREMENTS. Will the operations be continuously monitored by the facility's owners or operators, ostensibly in an operations center? Does the NSRA identify recommended minimum requirements for an operations center such as:		
The operations center should be manned 24 hours a day?	Y - N	
The operations center personnel should have a chart indicating the Global Positioning System (GPS) position and unique identification numbers of each of the structure?	Y - N	
All applicable Coast Guard command centers (District and Sector) will be advised of the contact telephone number of the operations center?	Y - N	
All applicable Coast Guard command centers will have a chart indicating the position and unique identification number of each of the structures?	Y - N	
16. OPERATIONAL PROCEDURES. Does the NSRA provide for the following operational procedures?		
Upon receiving a distress call or other emergency alert from a vessel that is concerned about a possible allision with a structure or is already close to or within the installation, the Coast Guard Search and Rescue Mission Coordinator (SMC) will establish the position of the vessel and the identification numbers of any structures visible to the vessel. The position of the vessel and identification numbers of the structures will be passed immediately to the operations center by the SMC.	Y - N	
The operations center should immediately initiate the shut-down procedure for those structures as requested by the SMC, and maintain the structure in the appropriate shut-down position, again as requested by the SMC, until receiving notification from the SMC that it is safe to restart the structure.	Y - N	
Communication and shutdown procedures should be tested satisfactorily at least twice each year.	Y - N	
After an allision, the applicant should submit documentation that verifies the structural integrity of the structure	Y - N	

US COAST GUARD DISTRICT, AREA AND HEADQUARTERS CONTACT INFORMATION

US Coast Guard District Commands

Tel: (617) 223-8480
COMMANDER (dp) U. S. COAST GUARD
First Coast Guard District
Capt. John Foster Williams Bldg
408 Atlantic Avenue
Boston, MA 02110-3350

Tel: (757) 398-6000
COMMANDER (dp) U. S. COAST GUARD
Fifth Coast Guard District
431 Crawford Street Federal Bldg.
Portsmouth, VA 23704-5004

Tel: (305) 415-6670
COMMANDER (dp) U. S. COAST GUARD
Seventh Coast Guard District
Brickell Plaza Federal Bldg
909 SE First Avenue
Miami, FL 33131-3050

Tel: (504) 671-2174
COMMANDER (dp) U. S. COAST GUARD
Eighth Coast Guard District
Hale Boggs Federal Building 500
Poydras Street, Suite 1240
New Orleans, LA 70130-3310

Tel: (216) 902-6001
COMMANDER (dp) U. S. COAST GUARD
Ninth Coast Guard District
1240 East 9th Street
Cleveland, OH 44199-2060

Tel: (510) 437-3968
COMMANDER (dp) U. S. COAST GUARD
Eleventh Coast Guard District
Coast Guard Island Bldg 52
Alameda, CA 94501-5100

Tel: (206) 220-7237
COMMANDER (dp) U. S. COAST GUARD
Thirteenth Coast Guard District
Jackson Federal Bldg 915 Second Avenue
Seattle, WA 98174-1067

Tel: (808) 541-2121
COMMANDER (dp) U. S. COAST GUARD
Fourteenth Coast Guard District
Prince Kalanianaole Federal
Bldg 9th Floor 300 Ala Moana Boulevard
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Tel: (907) 463-2065
COMMANDER (dp) U. S. COAST GUARD
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US Coast Guard Area and Headquarters Commands

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Coast Guard Atlantic Area
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Portsmouth, VA 23704-5004

Tel: (202) 372-1566
COMMANDANT (CG-NAV-2)
U.S. Coast Guard Stop 7418
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Washington, DC 20593-7418

Tel: (510) 437-3522
COMMANDER (PAC-54)
U. S. COAST GUARD
Coast Guard Pacific Area
Coast Guard Island Bldg. 51-6
Alameda, CA 94501-5100

US COAST GUARD DISTRICT AND AREA COMMAND BOUNDARIES

The following illustration represents each Coast Guard District's and Area's area of responsibility. For a precise listing of their boundaries, refer to 33 CFR Part 3, Coast Guard Areas, Districts, Sectors, Marine Inspection Zones and Captain of the Port Zones.