The Marine Transportation System (MTS), while essentially unknown to the general public, is extremely important to the economy of the world as we know it. Ninety five percent of goods transported are done so via the MTS.

For instance, the Port of NY/NJ supports over 500,000 jobs!

The placement of Wind Turbine Generators (WTGs) into the marine environment will result in changes to the MTS in those areas. The structures will affect maneuvering room due to the structures themselves and the increase in traffic density due to the funneling effect these structures will create.

The International Maritime Organization (IMO) recently amended its General Provisions on Ships' Routeing to address wind turbines impact on the safety of navigation, including any radar interference.

AMENDMENTS TO THE GENERAL PROVISIONS ON SHIPS' ROUTEING
(RESOLUTION A.572(14), AS AMENDED)

In section 3 (Responsibilities of Contracting Governments and recommended and mandatory practices) of the General provisions on ships' routeing, a new paragraph 3.14 is inserted, as follows:

> "3.14 In planning to establish multiple structures at sea, including but not limited to wind turbines, Governments should take into account, as far as practicable, the impact these could have on the safety of navigation, including any radar interference. Traffic density and prognoses, the presence or establishment of routeing measures in the area, and the manoeuvrability of ships and their obligations under the 1972 Collision Regulations should be considered when planning to establish multiple structures at sea. Sufficient manoeuvring space extending beyond the side borders of traffic separation schemes should be provided to allow evasive manoeuvres and contingency planning by ships making use of routeing measures in the vicinity of multiple structure areas.",

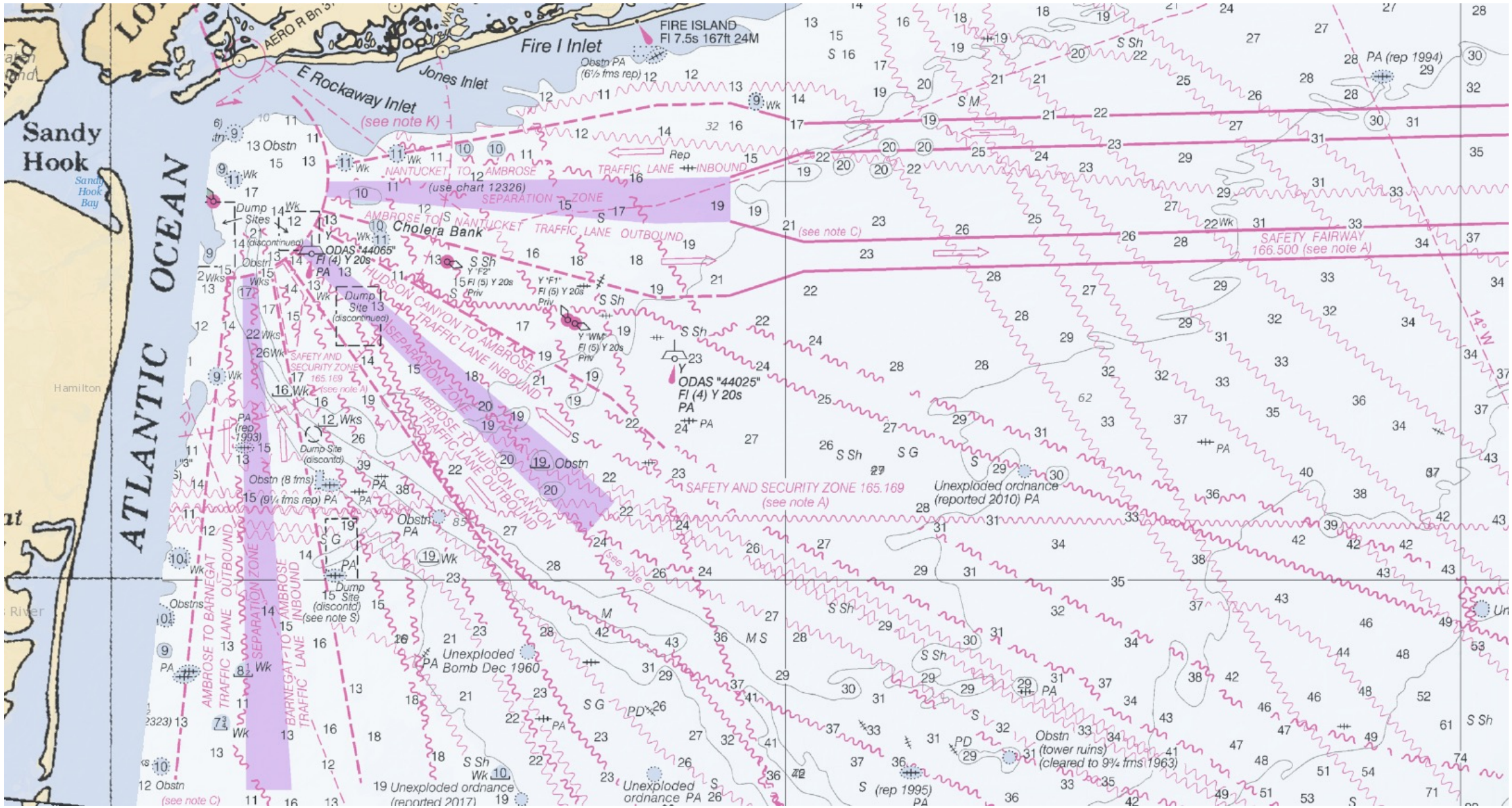
The safety of navigation and the protection of the environment is of paramount importance all. There is zero tolerance for damage to the environment from shipping. To that end, anything that potentially adds additional risk to the MTS must be thoroughly investigated to determine risk vs. reward and means to reduce and/or mitigate that risk.

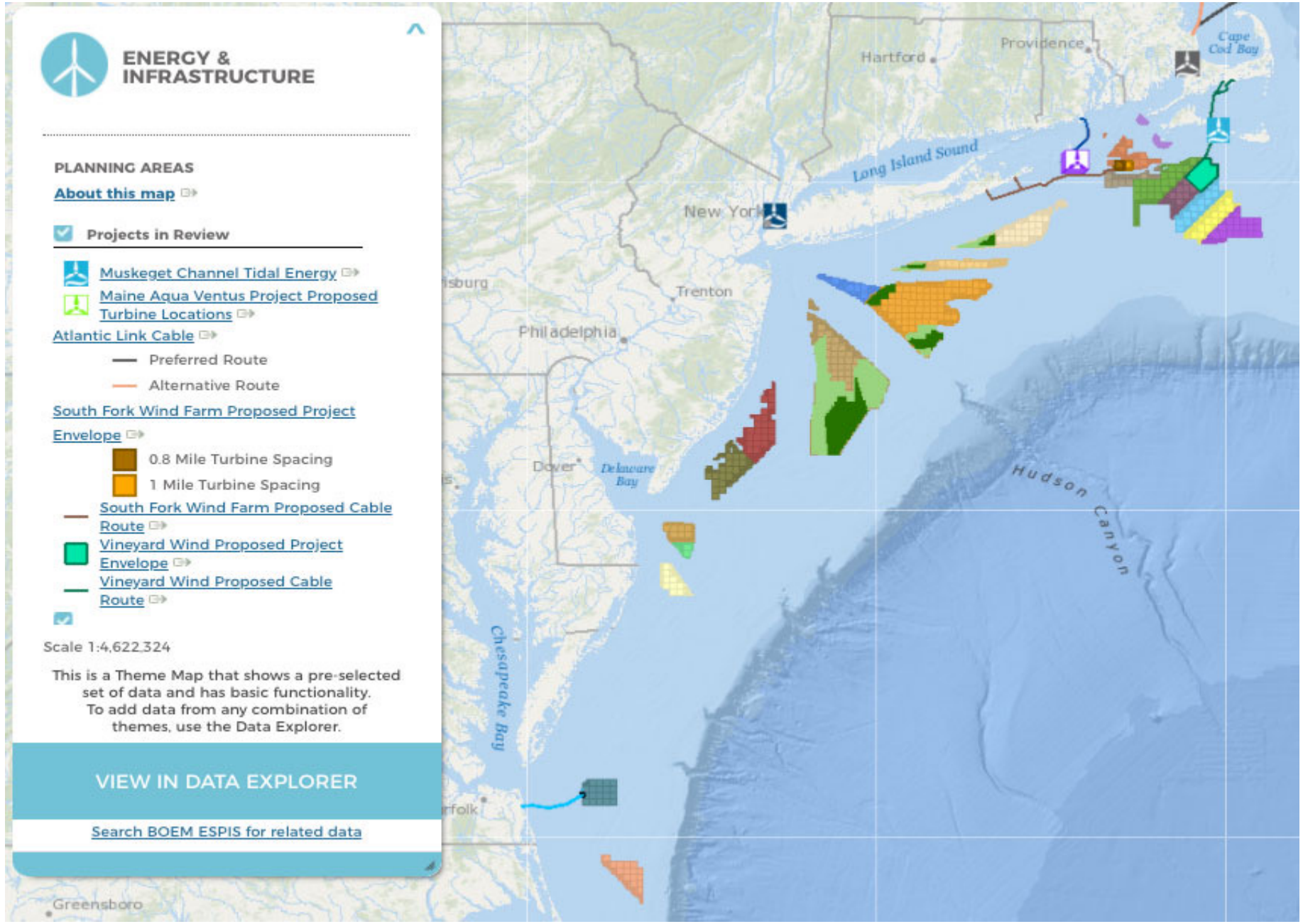
United Nations Convention on the Law of the Sea

Article 60- Artificial islands, installations and structures in the exclusive economic zone

6. All ships must respect these safety zones and shall comply with generally accepted international standards regarding navigation in the vicinity of artificial islands, installations, structures and safety zones.

7. Artificial islands, installations and structures and the safety zones around them may not be established where interference may be caused to the use of recognized sea lanes essential to international navigation


ATLANTIC OCEAN
Sandy Hook
Sandy Hook Bay
Hamilton
Fire I Inlet
Jones Inlet
E Rockaway Inlet
(see note K)
AERO R Bn
FIRE ISLAND
Fl 7.5s 167ft 24M
Obstn PA
(6½ fms rep)
Cholera Bank
Dump Sites 2 (discontinued)
ODAS "44065"
Fl (4) Y 20s
PA
Dump Site 13 (discontinued)
Dump Site (disconta)
Dump Site 15 (disconta)
(see note S)
Obstn (8 fms)
(9¼ fms rep) PA
Obstn PA
Unexploded Bomb Dec 1960
19 Unexploded ordnance (reported 2017)
Unexploded ordnance PA
Obstn (tower ruins) (cleared to 9¾ fms 1963)
(rep 1995) PA
PA (rep 1994)
PA (rep 1993)
ODAS "44025"
Fl (4) Y 20s
PA
Unexploded ordnance (reported 2010) PA
SAFETY AND SECURITY ZONE 165.169 (see note A)
SAFETY FAIRWAY 166.500 (see note A)
NANTUCKET TO AMBROSE TRAFFIC LANE INBOUND
(use chart 12326)
SEPARATION ZONE
AMBROSE TO NANTUCKET TRAFFIC LANE OUTBOUND
HUDSON CANYON TO AMBROSE TRAFFIC LANE INBOUND
SEPARATION ZONE
AMBROSE TO HUDSON CANYON TRAFFIC LANE OUTBOUND
AMBROSE TO BARNEGAT TRAFFIC LANE OUTBOUND
SEPARATION ZONE
BARNEGAT TO AMBROSE TRAFFIC LANE INBOUND
14° W


ENERGY & INFRASTRUCTURE
PLANNING AREAS
About this map
Projects in Review
Muskeget Channel Tidal Energy
Maine Aqua Ventus Project Proposed Turbine Locations
Atlantic Link Cable
Preferred Route
Alternative Route
South Fork Wind Farm Proposed Project Envelope
0.8 Mile Turbine Spacing
1 Mile Turbine Spacing
South Fork Wind Farm Proposed Cable Route
Vineyard Wind Proposed Project Envelope
Vineyard Wind Proposed Cable Route
Scale 1:4,622,324
This is a Theme Map that shows a pre-selected set of data and has basic functionality. To add data from any combination of themes, use the Data Explorer.
VIEW IN DATA EXPLORER
Search BOEM ESPIS for related data
Hartford
Providence
Cape Cod Bay
Long Island Sound
New York
Trenton
Philadelphia
Dover
Delaware Bay
Chesapeake Bay
Hudson Canyon
Greensboro

ACPARS

(Atlantic Coast Port Access Route Study)

6. Cumulative Impacts of Wind Farms One of the primary objectives of conducting a PARS for the entire Atlantic Coast was assessing the cumulative impacts of multiple winds farms on the marine transportation system. As wind farms are developed, vessel traffic will be displaced and may also be funneled into smaller areas, increasing vessel density with a concurrent increase in risk of collision, loss of property, loss of life, and environmental damage. Evaluating the cumulative impacts is also important to understand the cascading effects of how one wind farm may change the routes and approaches to the next port or the next wind development area. Predicting how vessels would alter routes given new obstructions can be described in a qualitative manner; however, analytically determining cumulative impacts, and quantifying the resultant change in navigational risk remains beyond the capability of the WG.

The most expansive manoeuvre that a ship needs to be able to make, and for which sufficient space must therefore be allowed, is the ‘round turn’. A round turn requires six times the ship’s length. For a round turn to starboard, an additional deviation of 0.3 NM is necessary before a ship can begin the turn, because the captain will always first attempt to avoid making a round turn. The total amount of space required to starboard is therefore 0.3 NM + 6 ship’s lengths. A round turn to port can be initiated immediately. In addition, a safety zone is required, extending for a radius of 500 metres around a single object (e.g. a wind turbine). No shipping must be allowed to enter that zone. The required safe separation distances for shipping are therefore:

For ships 400m in length: 1.87 NM to starboard and 1.57 NM to port;
For ships 300m in length: 1.54 NM to starboard and 1.24 NM to port.

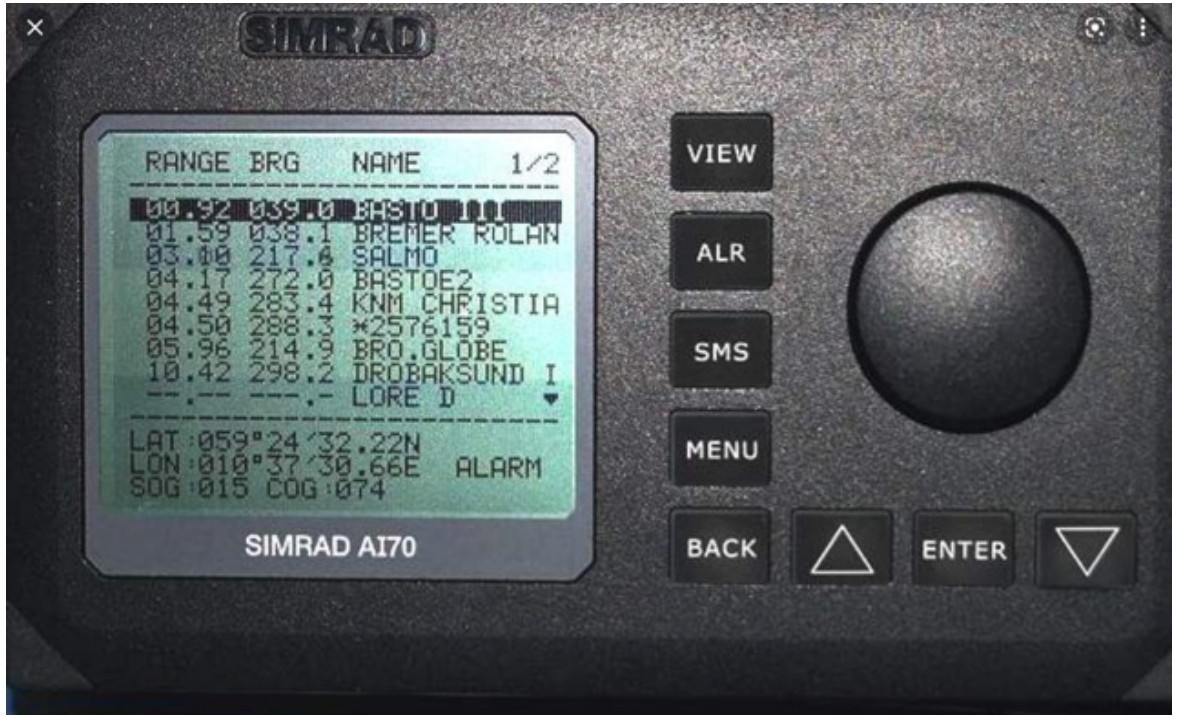
Conclusion 1: Wind turbines in the maritime environment affect marine vessel radar in a situation-dependent manner, with the most common impact being a substantial increase in strong, reflected energy cluttering the operator's display, leading to complications in navigation decision-making.

Recommendation 1: The Bureau of Ocean Energy Management and other relevant federal agencies (e.g., members of the federal Wind Turbine Radar Interference Mitigation Working Group) should pursue any practicable opportunities to fill gaps in understanding of wind turbine generator impacts on marine vessel radars operated in and adjacent to wind farms, giving attention to…

- comprehensive test planning, data collection, and evaluation over a range of expected, operational conditions;
- innovative and collaborative approaches to facilitate data collection, such as the establishment of a marine vessel radar “sensor integration lab” for all classes or types of marine vessel radars and the development of a validated modeling and simulation capability;
- research, development, and characterization of a reduced radar-cross-section wind turbine generator for marine vessel radar;
- improvements to operator training models based on verification with physics- based models anchored by field collected data;
- data collection and analysis using prototype systems, preceding the full deployment of vertical axis wind turbines, if and when they become economically feasible for offshore applications, as a means of characterizing their impacts to marine vessel radars; and
- data collection and analysis on floating wind turbine generators, which may pose additional challenges for marine vessel radars through their wave-induced movement that will likely provide a less-consistent radar return overall and may also increase clutter and complicate Doppler return interpretation

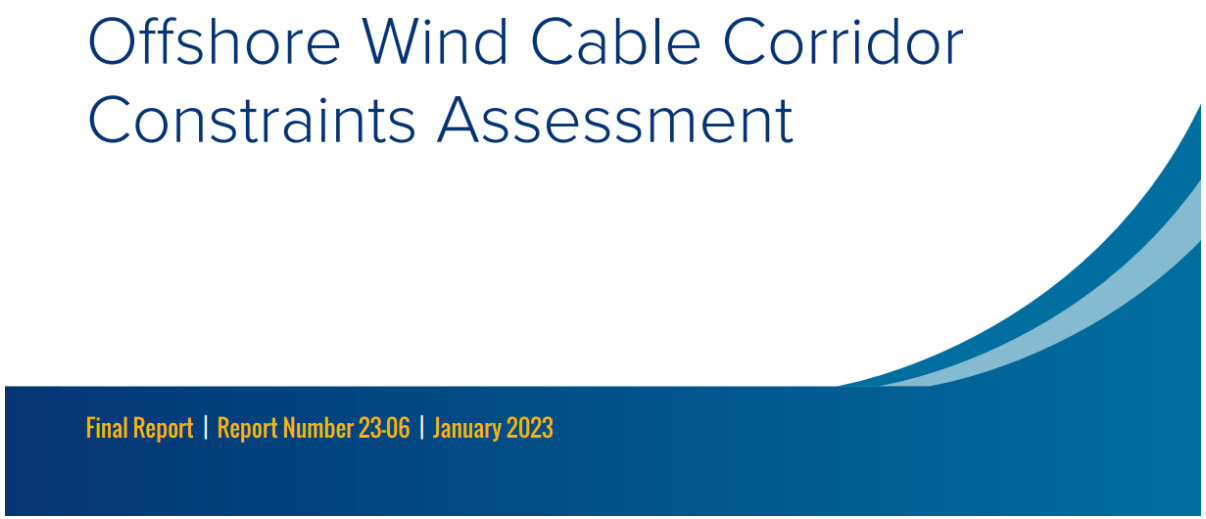
Minimum Display Requirements

Class A AIS units **must present a minimum of three lines of 16 alphanumeric characters** sufficient to obtain a target vessel's identity and position, using target bearing, range, and ship name.



CABLE ROUTING

- Another huge issue
  - Potential free for all
    - Every operator responsible to get the power they produce to shore vs. offshore hubs that direct power ashore via fewer large capacity cables (AC vs. DC)
    - Cooperation of the utility companies ashore (infrastructure and connection points)
    - The routes the cables will take (environmental, commercial and safety issues)



M-TWG Cabling Workshop - New York State Maritime Technical Working Group (nymtwg.com)

The Offshore Wind Cable Corridor Constraints Assessment documents the effort to increase the understanding of challenges and opportunities relevant to OSW development through the collaboration of the Cable Working Group (CWG); engagement of agencies and stakeholders; and analysis of environmental, technical, and stakeholder opportunities, concerns, impacts, and risks of potential undersea and overland cable corridors and associated landings. The CWG includes NYSERDA, the New York State Department of Environmental Conservation (NYSDEC), Department of State (NYSDOS), Department of Transportation (NYSDOT), Office of General Services (NYSOGS), and Department of Public Service (NYSDPS). CWG comprises the State agency partners critical to the OSW cable regulatory process. The scope of this assessment does not address all aspects of potential cable corridors but focuses on issues most likely to present risks and opportunities relevant to achieving 9 GW of OSW by 2035. The scope of the assessment does not substitute for a site-specific analysis of feasibility or impacts or prescribe any analysis of alternative routes required as part of any regulatory review process. The study area consists of four areas for bringing OSW energy to the New York City (NYC) and Long Island transmission grid: South Shore, Long Island Sound, New York Harbor Approach Areas, and the Landfall and Overland Area.