Summary of MARCO Submarine Cable Industry Sector----Specific Meeting

This document summarizes the major outcomes of the discussion of a group of representatives from the submarine cable industry at a sector----specific meeting convened by the Mid----Atlantic Council on the Ocean (MARCO) in Bedminster, NJ on July 15, 2014.

Review of Ocean Planning

Kris Ohleth of MARCO offered brief comments about the history of ocean planning in the Mid----Atlantic region and the activities of MARCO and the Mid----Atlantic Regional Planning Body (MidA RPB). The primary points of discussion and clarifications offered include the following:

- MARCO is a regional ocean partnership consisting of five Mid----Atlantic States: New York, New Jersey, Delaware, Maryland, and Virginia who share four regional ocean priorities: climate change adaptation, protection of important marine habitats, offshore renewable energy development, and water quality improvement. In addition, it recognizes ocean planning as a mechanism for convening diverse interests, fostering productive dialogue, and collecting important ocean use information. MARCO works collaboratively with the MidA RPB where possible to advance regional ocean planning. The two groups have significant overlapping membership.
- The MidA RPB consists of Federal, State, Tribal, and Fishery Management Council representatives who analyze how a suite of ocean uses intersect and work to improve coordination among those entities responsible for managing different uses.
- The MidA RPB has no authority for decision----making beyond the individual authorities of member entities. Each individual member entity retains all current permitting and regulatory authorities (e.g., BOEM retains offshore wind leasing authority).
- The MidA RPB is currently developing a suite of products to inform a decision in January 2015 about the structure and content of a regional ocean action plan. This action plan will necessarily include both process and planning elements, and will be adaptable over time. Drafts of these products will be published for public comment in late October 2014. The first iteration of the regional ocean action plan will be released in 2016.
- Based upon MARCO member states' shared regional priorities, a primary purpose of forming MARCO's Stakeholder Liaison Committee and impetus for scheduling a series of sector----specific meetings like this one is to gather input about the interest and needs of different industries and transmit that information to the MidA RPB to inform its planning processes.

A list of Frequently Asked Questions about the MidA RPB may help provide additional context about the relationship between MARCO, the Mid----Atlantic Regional Planning Body, and each

individual state and federal member entity. This list is available on the MidA RPB's website at http://www.boem.gov/MidA----RPB----FAQ/.

Overview of the Mid-Atlantic region submarine cables industry

Bob Wargo (telecommunications) & Bill Wall (energy) provided the background, connections, and differences between the telecommunications and power submarine cable industries. The submarine cable industry is interconnected, and is divided into a few sectors: cable owners, cable, amplifier and terminal manufacturers, installers and maintenance providers, consultants, and construction companies. For all sectors, the major difference in cabling is the size, requiring different shipboard equipment, although installation practices are similar.

Telecommunications Cables

History

The telecommunications submarine cable industry, which began in 1851, with a telegraph cable lain between England and France. Progress continued with inter----continental telephone cables and fiber optic cables, which are retired as technology changes and capacity needs increase. The current trend is 100 gigabits per second per wavelength, with higher density of wavelengths. As cables are taken out of service, they are generally not removed. More recently, states are including removal in the contracts. Some companies are setting up recovery and recycling processes, although new permits also affirm that the company won't do more environmental damage than good when recovering cable. Currently, 97----99% of international communications traffic is riding on these cables, and most companies have a restoration capability to route around outages.

Installation

Most cables since TAT----4/5 have been buried at a target burial depth of 1 – 2 meters to get below the sea bed. The standard depth in Asia is 3 meters. A typical telecommunications system (Network Management System) includes: 1. terminal equipment on shore in cable station, 2. Armored cable on shore, 3. Lightweight cable on ocean floor, and 4. Amplifiers are spliced in to amplify light. A typical installation requires a survey swath width of 2x the depth of the water, which allows room to go around ocean features, although cable is laid very accurately. Installation begins with a desktop study where many sources are investigated (NAVY, publicly available info, fisheries, and previous studies). Geomorphology of seabed and bathymetry is established. This is followed by a route survey. The seabed is surveyed and mapped so cables can be laid precisely on the ocean floor. During the permitting process, external agencies may express concern, which are often included as some form of mitigation measure in the permit to lay the cable.

Financing

Trans----oceanic cable can cost upwards of $200M to $500M, and a consortium (20----30) telecommunications companies will often jointly fund a new cable, each owning their proportionate share of the capacity.

Energy
Cables Installation
For energy cables, the GIS desktop study is very important, and they utilize a magnetometer for archeological information in national & international waters. Gravity cores and vibracores are used to determine seabed properties for cable burial, with a target burial depth of 4 --- 6 ft. A jet plow is used to bury the cables to the desired depth. Armory on energy cables can cause problems due to weight.

Future
Wind energy will bring in multiple power cable systems laid offshore. In New Jersey, there could be up to 23 wind energy lines, and the grid will need to be adapted to manage additional energy. Wind farms will be in shallow waters, with current plans for NJ in less than 100 ft of water.

Energy and Telecommunications
Laws & Regulations
Acquiring a submarine cable permit can take several months to over a year, and some contingencies will come from the comments sought from NMFS, USCG, etc.
BOEM oversees permitting for oil and gas and wind energy, but not for submarine cables.
While the FCC grants a landing license for telecommunications cables, the states, in partnership with the Army Corps of Engineers, will grant submerged land lease permits for up to 3 nautical miles off their coasts. Challenges arise as different states and ACE districts have different interpretations of how far out they have jurisdiction.

Cable breaks can be caused by various sources, including: commercial fishing, anchoring (illegal and improperly stowed), dredging, marine construction, and natural hazards such as typhoons or earthquakes/tsunamis. US laws protect cables for willful or negligent damage, but laws are old and fines are minimal, so the Coast Guard often won't pursue charges for low fines.

Cable Routes
Most routes are known, however, there is some talk about routes from South America to Asia to Australia and North America to Australia, as well as an Arctic route. To determine the routes, companies gather as much available data as possible from portal and past surveys, etc. In most cases, this information is not sufficient and hydrographic studies are needed. Surveys need to be completed prior to the installation of the cable. Telecommunications companies involved in undersea cables frequently use GIS and can superimpose their proposed routes to ID possible hazards for the route surveys.

Seismic surveys (airgun technology, used in oil and gas exploration) penetrate the seabed and are much stronger than what is used in the cables industry, which does not use air guns. Cable survey penetrates 6----10 feet, and is more localizes and high frequency.

Some information about cable routes must be selectively disclosed (e.g. fishermen, who need to know). Cable companies disclose information by request, such as sharing charts with fishermen and distributing to ports. Contact Bob if two industries need to share information.

Final Thoughts
Future changes for submarine cable industry will be centered around upgrades to existing systems, and won't add too much to the Atlantic Basin.
The industry's major concern regarding ocean planning is that they do not want the process to make it harder to do their jobs.

Mid-Atlantic Ocean Data Portal

Tony MacDonald of Monmouth University and the Mid----Atlantic Ocean Data Portal Team provided an overview of the MARCO Mid----Atlantic Ocean Data Portal (Portal) data and applications. All Portal data is available to the public, and they are working to add additional data such as Recreational and AIS data used for fisheries mapping. The information placed on the portal can be used to understand interactions in ocean uses, such as those between fishing, wind energy areas, and navigation. The overlap in use data identifies management hotspots.

NASCA and NOAA are working on non----disclosure agreement to map submarine cable data route position lines. They are working on guidelines to share datasets for the Marine Cadastre and the regional portals. Due to proprietary information concerns, only select Cadastre staff will have access to raw data. Data will be seen on Portals but will not be downloadable; line data will not be able to be extracted. Will also remove the data related to the near----shore landing sites. Attached attributes will include information about the (1) owner, (2) emergency contact, and (3) planning contact.

Al Lombana provided an overview of the Portal, showing participants how to Register for Data Portal, and sharing training course information with the Portal Tutorials. Using the interactive Marine Planner, you can save maps in bookmarks or request specific maps, which are all printable.

Next Steps

- The meeting summary will be distributed to the meeting participants for comment, and the commentary will be forwarded to the RPB.

- Set MARCO Portal to help researchers understand who to contact to retrieve information about submarine cables. "Call before you dig."
- Participants are encouraged to provide comments on the MidA RPB's public materials that will be released in late October 2014. They are also encouraged to attend a public listening session planned for early November in one of five Mid----Atlantic locations. These listening sessions are an opportunity to industry representatives and other stakeholders to convey the importance of the submarine cables industry and ask questions about the RPB's process in a productive forum. Information about the public listening sessions is available on the MidA RPB's website at http://www.boem.gov/MidA----RPB----Meetings/.

Resources

International Cable Protection Committee (ICPC): http://www.iscpc.org/

History Resources:

- Atlantic Cable – broad history of submarine telecomm history: http://atlantic----cable.com/
- http://www.history----magazine.com/cable.html
- Washington Post article: http://www.washingtonpost.com/blogs/the----switch/wp/2014/07/11/what----a----quarter----century----of----internet----growth----looks----like----underwater/

How to fix a damaged cable: http://www.washingtonpost.com/blogs/the----switch/files/2014/07/bote1.gif