

Attachment 11

**Offshore Transmission Network Preparation Requirements**

This attachment covers technical parameters that Applicants should follow in order to have their proposed offshore wind Project(s) ready for development of a potential future offshore transmission network (“OTN”). The OTN reflects the potential connection of multiple offshore wind offshore platforms (“OSPs”) to allow power transfers between OSPs and ultimately onshore points of interconnection (“POIs”). The POIs may be in New Jersey, in other mid-Atlantic states, and, perhaps, downstate New York. The OTN preparation requirements set forth herein are intended to enable Qualified Projects approved in the Third Solicitation to connect to a future OTN in order to improve economic performance while minimizing future incremental costs and promoting environmental and grid resilience objectives.

Qualified Projects would connect to an OTN in the future only if so ordered by the Board. At that time, additional pricing considerations related to OTN equipment and other factors will be established by the Board.

**List of Acronyms and Defined Terms**

**Alternating Current (“AC”).**

**Good Utility Practice**, the practices, standards, and methods commonly used by electric utilities and related organizations engaged in the transmission of electric energy in the United States. It includes generally accepted practices and designs focused on reliability, robustness, and resiliency of infrastructure, operational excellence, and adherence to professional, regulatory, and community practices. Further definition of this term can be found in the various Open Access Transmission Tariffs used by independent system operators (“ISOs”) and regional transmission organizations (“RTOs”).

**High Voltage Direct Current (“HVDC”).**

**Offshore Platform (“OSP”)**, the platform anchored to the seabed that is used to house Qualified Project collection and HVDC transmission equipment, auxiliary power supplies, submarine cable connections, and related protection, control, monitoring, and communication equipment.

**Offshore Transmission Network (“OTN”)**, an interconnected offshore transmission system in which individual OSPs are linked by submarine cables to create a means for power to flow between adjacent OSPs in addition to HVDC cables connecting the OSPs to the onshore transmission network.

**OTN Ready**, involves the reservation of space on Qualified Projects’ OSPs to accommodate future additions of OTN tie cables and operation.

**Qualified Project**, a Project that is approved by the Board to be funded through ORECs.

## **DRAFT FOR PUBLIC COMMENT**

### **Background**

Qualified Projects approved by the Board in the Third Solicitation will be connected to the onshore AC transmission system via individual radially-connected HVDC cable systems. These radial HVDC-based systems will be designed to transmit offshore wind power from offshore collection and converter station platforms to the Larrabee Collector Station on the onshore AC transmission system.

In addition to including a radial HVDC connection to the onshore grid, Projects submitted in the Third Solicitation must also be “Offshore Transmission Network Ready” (“OTN Ready”). OTN Readiness involves the reservation of space on Qualified Projects’ OSPs to accommodate future additions of OTN tie cables and operation.

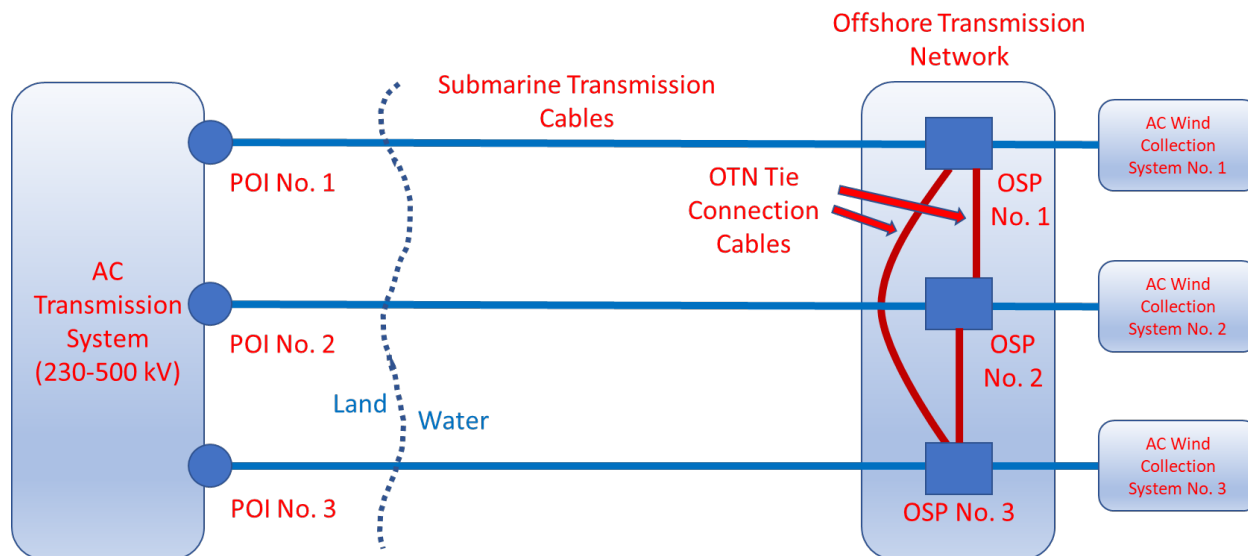
Since OTN implementation is years away, it is reasonable to envision a future system based not only on Qualified Projects as currently planned, but also on how transmission and offshore wind generation technology may evolve. This requires envisioning a future system based on today’s knowledge of offshore wind generation and HVDC transmission technologies. “Future proofing” the OTN to contemplate technology progress should therefore affect an Applicant’s identification of platform space to support the OTN. Basic OTN characteristics include the selection of technology, voltage and power levels, and related equipment based on an assumed operating configuration. In this Attachment, Board Staff provides Applicants with general OTN design criteria to inform the minimum amount of additional platform space to enable an OTN Ready Project to connect to an OTN in the future. Applicants may feel free to incorporate other design criteria oriented around additional platform space in accord with future proofing the OTN.

Projects submitted in the Third Solicitation are not required to include implementation of any aspect of an OTN other than the requirements set forth herein to reserve OSP space. The inclusion of additional space on OSPs to enable future OTN equipment is required by the Board as part of the Third Solicitation. The basic specifications herein should be followed in estimating the required space for a Project to be OTN Ready.

If a Qualified Project connects to an OTN in the future, additional equipment will need to be added to the OSP, which may include, but is not limited to HVDC converters, AC collection system switchgear and related equipment, and associated protection, control, communications, and monitoring systems. Applicants are free to include additional platform space beyond the minimum required to meet the design criteria stated herein, in which case the Board requests the identification of the associated assumptions where they differ significantly from the general OTN design criteria set forth herein.

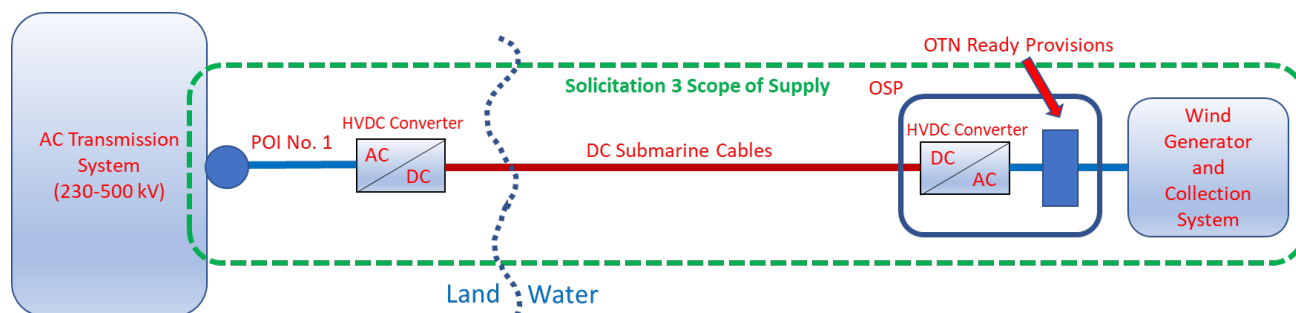
In the future, Qualified Projects may need to install AC equipment to facilitate at least two connections to other offshore wind OSPs with related equipment rated at least 400 MW in order to connect to an OTN. Figure A11-1 provides an illustrative OTN concept configuration linking Qualified Project OSPs in multiple directions, providing two additional generation outlets in addition to the radial HVDC connection.

Figure A11-1. OTN Concept Linking Three Offshore Wind Projects



The placement of the OTN Ready provisions in the overall scope of the transmission system is shown in Figure A11-2.

Figure A11-2. OTN Ready Scope



### OTN Ready Basic Specifications

Board Staff has developed the following OTN Ready requirements based on the assumption that Qualified Projects' HVDC export cables will have ratings of at least 1,200 MW. In line with this preliminary design concept, an OTN is envisioned with at least the following basic specifications:

- a. Nominal operating voltage: 230 kV AC
- b. Nominal frequency: 60 Hz
- c. OTN tie cable continuous power transfer capability: at least 400 MW
- d. Number of connections to adjacent OSPs: At least 2
- e. Nominal distance assumed between OSPs: 20 to 40 statute miles

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The following assumptions and specifications are provided to assist Applicants in determining how much additional OSP space to include in their Project designs:

- OTN Ready projects are designed to be integrated into an overall offshore wind transmission and export system with basic configuration as shown in Figure A11-1. Note that this figure is an example showing three offshore wind projects. The OTN may interconnect more offshore wind projects depending on locations, power capabilities, and POIs.
- The design of each OSP should include space and provisions for future installation of all equipment needed for integration of the OTN. This includes spatial, operational, weight, maintenance, and equipment removal/replacement considerations.
- The OTN's configuration and circuit breaker arrangements should be in accordance with Good Utility Practice.

### **Interconnection Plan Requirements Related to OTN-Ready Design**

The following information must be included in the Interconnection Plan submitted as part of the Application in accordance with Section 3.13 of the SGD:

- Applicants are required to confirm that their Project designs will accommodate the requirements described above in order to enable a Qualified Project to connect to an OTN.
- Applicants are required to identify how much additional OSP space has been allocated for potential future installation of equipment related to OTN implementation.
- Applicants must affirm that the additional OSP space will be reserved for this use.