Attachment 10

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 future connection of multiple offshore wind offshore platforms ("OSPs") to allow power transfers between OSPs and ultimately onshore 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 Fourth 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. Operation and implementation of the OTN are not known at this time and therefore not addressed herein.

The costs related to OTN equipment and implementation should not be included in the OREC Purchase Price offered in this solicitation. Qualified Projects would connect to an OTN in the future only if so ordered or approved by the Board. At that time, additional pricing considerations related to OTN equipment and other factors will be established by the Board. OTN implementation may occur with or after COD. If OTN implementation occurs later than COD, the price adjustment associated with installing and operating the OTN equipment will be applied over the remaining OREC term. The timing of installing the OTN Ready platform space is at the developer's discretion, but there will not be a later pricing adjustment related to constructing the additional platform space if OTN implementation occurs.

List of Acronyms and Defined Terms

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.

Background

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

In addition to including one or more Projects with a radial HVDC connection to the onshore grid that are not OTN Ready, Applicants submitting HVDC Projects in the Fourth Solicitation may submit a Project option that is OTN Ready. OTN Readiness is limited to the reservation of space on Qualified Projects' OSPs to accommodate future installation of equipment (i.e. additions of OTN tie cables and operation).

The Fourth Solicitation OTN concept does not entail installation of OTN equipment. HVAC Projects submitted in the Fourth Solicitation shall not be OTN Ready.

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 incorporate other design criteria oriented around additional platform space in accordance with future proofing the OTN.

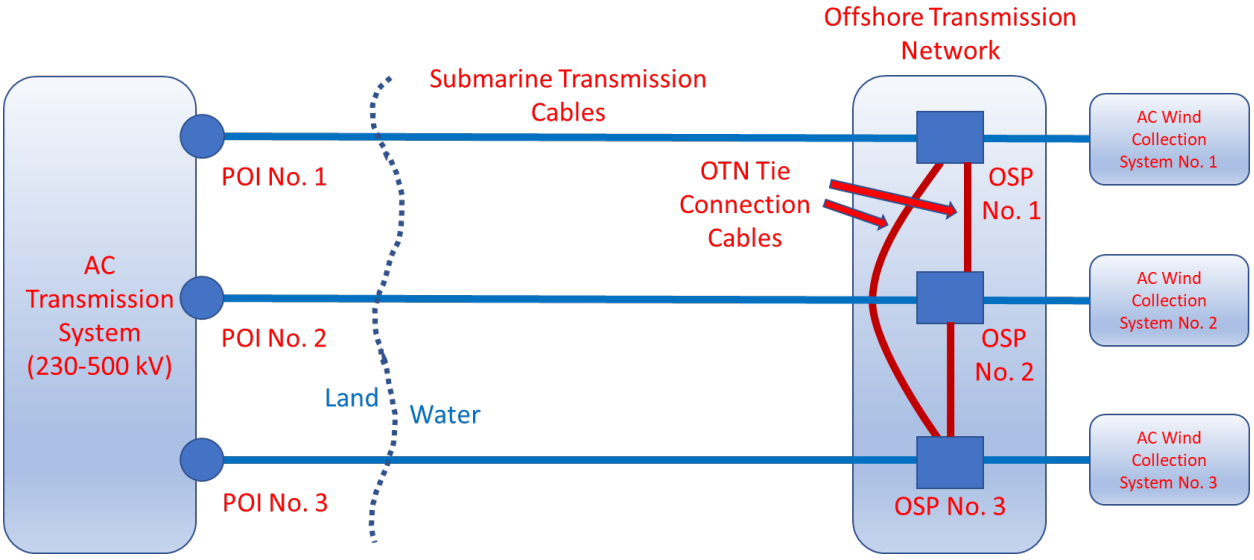
Projects submitted in the Fourth Solicitation are not required to include implementation of any aspect of an OTN other than the requirement to reserve OSP space set forth herein. The inclusion of additional space on OSPs to enable future OTN equipment is required by the Board for HVDC Projects as part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

An Applicant's OTN Ready design is required to meet the minimum requirements stated in this Attachment. Some amount of design variation among Applicants is expected.

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.

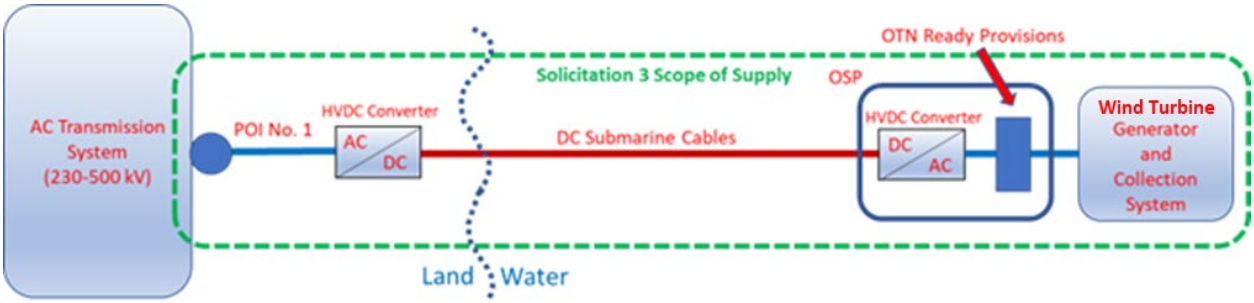
In the future, Qualified Projects may need to install AC equipment to facilitate at least two (2) connections to other offshore wind OSPs with related equipment rated at least 400 MW in order to connect to an OTN. Figure A10-1 provides an illustrative OTN concept configuration linking Qualified Project OSPs in multiple directions, providing two (2) additional generation outlets in addition to the radial HVDC connection.

Figure A10-1. 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 A10-2.

Figure A10-2. 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

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 A10-1. Note that this figure is an example showing three (3) 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.