POSITION PAPER

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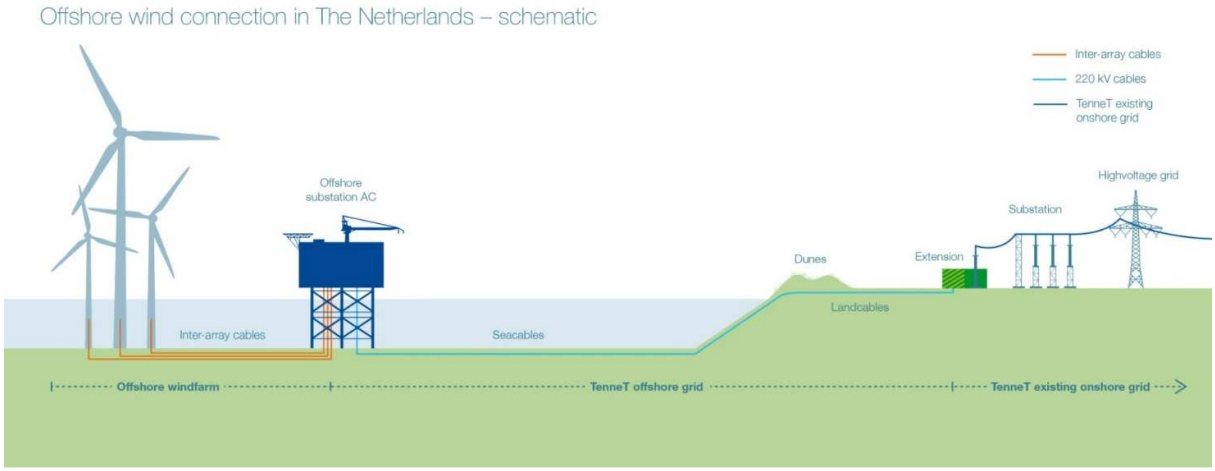
1. Background material

Literature used:
• Electricity Metering Code (Meetcode Elektriciteit) per 1 January 2015 • Electricity Grid Code (Netcode Elektriciteit) per 26 March 2014

2. Scope and considerations

Error! Reference source not found. shows the connection of an offshore wind farm to the onshore electricity grid. TenneT will supply and install the grid connection up to, and including, the offshore substation. The wind park, including the wind turbines and the array cables, up to the offshore Connection Point (CP)[1] at the switchgear installation on the offshore substation of TenneT, is to be supplied and installed by the owner of the Power Park Module (PPM[2]).



Schematic of the offshore electrical grid. Source: TenneT

Each inter array cable string connects a number of turbines of a PPM to the offshore substation. TenneT intends to standardise the offshore substations as much as possible for all five wind areas to be realised in the coming years in line with the Energy Agreement. This paper describes the metering requirements for these strings as proposed by TenneT to be applicable for all PPMs connected to TenneT offshore substations.

[1] The connection point (CP) between the offshore power park module (PPM) and TenneT is specified [Ref: position paper T3] at the cable termination of the inter-array cables and the switchgear installation on the platform.
[2] Ref: position paper T3

General

The Energy Agreement requires a 40% cost reduction for offshore wind to be realised over the period 2014-2024. Realisation of this cost reduction is expected to require a combination of measures[3], including - but not limited to standardisation of the offshore electrical infrastructure and larger capacity wind turbines within larger wind farms. TenneT contributes to this overall cost reduction target, through a strategic long term vision on the development of the offshore grid, focussing on the initial investments, but certainly also on operational expenses during the lifetime of its grid connections.

Technical

In Position Paper T.3 Point of Common Coupling[4], the position on the connection point between the offshore PPM and TenneT is described, specified at the cable termination of the inter array cables (owned by the PPM) and the switchgear installation on the platform (owned by TenneT). Regarding the Electricity Metering Code, accountable metering equipment should be installed at the connection points between the system operator and the connected party.

The system operator is obliged by law to facilitate the connection of this metering equipment to the instrument transformers of the high voltage equipment. With respect to safety, the general practice within TenneT is that TenneT installs the cables from the instrument transformers to the cabinet for the metering equipment.

According to the Grid Code and the Metering Code, the installation and maintenance of the metering equipment is the responsibility of the connected party, to be carried out by an independent certified metering company. The metering equipment should be installed according to the conditions of the Metering Code. Furthermore, the metering equipment should be maintained in a way that it fulfils the requirements of the code.

In accordance to the Grid and art. 1.2.3.1. of the Metering Code, the connected party is responsible to assign a certified body for metering (certified metering company). As the equipment preferably is installed as close as possible to the connection point, maintenance during the lifetime of the equipment in case of the offshore PPM will have to be done offshore. With the possibility of ten different PPM connecting to our platforms, this would imply different qualified parties involved for these offshore maintenance activities.

Implementation

Regarding the installation, commissioning and maintenance of the metering equipment, two solutions for operation of the switchgear bays can be defined:

1. The installation, commissioning and maintenance of the accountable metering equipment is organised by the different PPMs. With this option, multiple certified bodies will be involved offshore, for the yearly maintenance activities. These different parties all need to be trained and skilled for offshore working. In this way, the Metering Code is strictly followed.

[3] http://tki-windopzee.nl/files/2015-01/20141124_TKI_Roadmap.2015-2020_EZU_F%20(1).pdf
[4] TenneT, Position Paper (ONL 15-061 Point of Common Coupling).

2. TenneT takes care of the installation, commissioning and maintenance of the accountable metering equipment. In this way, TenneT will organise together with a single certified body for the planning and execution of the yearly maintenance activities. This might not strictly according to Metering Code practice[5], but the responsibility of assignment of the PPMs can be passed over to the system operator by entering in an agreement.

Regarding the metering at the connection points, the system operator and PPMs shall make arrangements and agreements as described above. These points will be addressed to in the 'Customer Connection Agreements (in Dutch: "Aansluit- en Transport Overeenkomst" (ATO)).

Next to these agreements, there are several other articles of the Metering Code that have to be adapted or deviated from to be suitable for offshore application. Necessary amendments to the Metering Codes will be taken into consideration.

3. Position TenneT

These considerations lead TenneT to the following position:

TenneT intends to centralise the organisation of the accountable metering requirements via one certified party, contracted by TenneT, responsible for the installation, commissioning and maintenance of the metering equipment. The responsibilities of the PPMs as connected party should be dealt with in a connection agreement.

4. Topic consultation

The expert meeting of 12-13 May, 2015 gives TenneT the opportunity to get feedback from developers on their position regarding "Metering". The main goal of this meeting will be to assess whether TenneT's views as documented within this position paper, and background data above, are shared by the industry.

[5] The Metering Code allows in case of two system operators that one of the parties assigns a certified body to take the metering responsibility. Strictly spoken, this rule does not apply in case of a system operator and common connected party.