

# SONI discussion paper on the Application of Connection Network Codes to existing Users

---

6 November 2019



## Contents

1. Purpose of this discussion paper: .....	3
2. Requirement to apply Connection Network Codes to existing Users: .....	3
3. Application of Connection Network Codes to existing Users following modernisation or equipment replacement.....	4
4. Examples of the application of Connection Network Codes to existing Users following modernisation or equipment replacement: .....	5
5. Next steps: .....	6
Appendix 1 – Article 4 in DCC and HVDC Connection Network Codes: .....	7

## 1. Purpose of this discussion paper:

The purpose of this document is to outline the criteria proposed by the TSO in relation to a modernisation, refurbishment or equipment replacement for existing users which would require a user to comply in part or fully with the requirements of three Connection Network Codes.

The finalised criteria will need to be agreed with the UR. Following the UR approval, a full business process detailing each step of this process will be developed as part of the implementation of Article 4 of each of the Connection Network Codes.

## 2. Requirement to apply Connection Network Codes to existing Users:

The three European Connection Codes, Requirements for Generators (RfG), Demand Connection Code (DCC) and Requirements for High Voltage Direct Current systems and Direct Current-Connected Power Park Modules (HVDC), applied to new Users who connect to the Transmission and Distribution Systems on or after each of the respective effective dates. However, these connection network codes do not apply to existing users of the Transmission and Distribution Systems unless the user's plant is modified to such an extent that its connection agreement must be substantially revised in accordance with the procedure detailed in the each of the Connection Network Codes. An example of these requirements from the Connection Network Code is detailed below for the RfG.

- RfG Article 4 – Application to existing power-generating modules
  1. Existing power-generating modules are not subject to the requirements of this Regulation, except where:
    - a. A type C or type D power-generating module has been modified to such an extent that its connection agreement must be substantially revised in accordance with the following procedure:
      - i. Power-generating facility owners who intend to undertake the modernisation of a plant or replacement of equipment impacting the technical capabilities of the power-generating module shall notify their plans to the relevant system operator in advance;
      - ii. If the relevant system operator considers that the extent of the modernisation or replacement of equipment is such that a new connection agreement is required, the system operator shall notify the relevant regulatory authority or, where applicable, the Member State; and
      - iii. The relevant regulatory authority or, where applicable, the member State shall decide if the existing connection agreement needs to be revised or a new connection agreement is required and which requirements of this Regulation shall apply; or

**NOTE:** Article 4 – application to existing users for the DCC and HVDC Connection Network Codes is available in Appendix 1.

### **3. Application of Connection Network Codes to existing Users following modernisation or equipment replacement**

The Connection Network Codes are not prescriptive in terms of:

- What constitutes the “modernisation” or “refurbishment” of an existing User’s plant; or
- If the replacement of faulted plant, such a circuit breaker, requires the User to comply with the requirements of the relevant Connection Network Codes; or
- If the Connection Network Codes will only be applied where the equipment is being replaced as part of a scheduled or planned project.

As such, different TSOs have interpreted the requirements to apply the Connection Network Codes to existing users in different ways. Some TSOs have quantified “modernisation” in monetary terms, based on a fixed financial amount while others have based their interpretation on changes to the characteristics of the generation unit.

As part of the Connection Network Codes implementation, the TSO has given significant consideration to the interpretation of Article 4 for each of the three Connection Network Codes. It is essential that our interpretation complies with the requirements of the Codes, as well as being implementable and enforceable. As such, our proposal is that:

1. A modernisation of an existing users plant is characterised by a change in the capabilities of that User’s plant;
2. Only the requirements of the Connection Network Codes, which are relevant to the capabilities of the User’s plant that is changing, shall be applicable. This is essentially a proportional application of the Connection Network Codes based on the works being carried out by the User.

By applying the Connection Network Codes to existing Users in this way, it will ensure that the Connection Network Codes are applied to all Users in a fair and equitable manner.

As such, when a User is planning to carry out works on their plant, it is essential that the works are planned to meet the requirements of the Connection Network Codes.

A non-exhaustive list of examples of how the Connection Network Codes would be applied to Users in a number of different scenarios are described in section 3 below.

Finally, in the case of faulted equipment, it is not proposed to apply the Connection Network Codes where the replacement equipment has a short lead time, i.e. readily available. The reasons for this are:

- In the case where equipment has failed, in the vast majority of cases, Users will endeavour to return their plant to operational service as quickly as possible. In order to minimise the time that the Users plant is unavailable, the failed equipment is generally replaced with a like for like replacement or a replacement that is as close as possible to the faulted equipment.

- The replacement of faulted equipment is not planned works. As such, the user has not had the opportunity to plan to meet the Connection Network Codes' requirements, when sourcing the replacement.

However, in the case of faulted equipment, it is proposed to apply the Connection Network Codes where the replacement equipment has a long order lead time, e.g. equipment with order lead time of 6 months or more. The reason for this is that when ordering the replacement plant, the longer lead time will allow the user time to plan to meet the Connection Network Code requirements. However, it is envisaged that these will only make up a very small fraction of overall plant replaced under fault conditions each year.

#### **4. Examples of the application of Connection Network Codes to existing Users following modernisation or equipment replacement:**

a. Application of the RfG to an existing PPM following a repowering:

Consider the case of an existing Non-RfG PPM with 35 wind turbines, where the wind turbines have reached their end of life and are due for replacement, along with the PPM control system and auxiliary systems. Due to the extent of the refurbishment, the PPM would be re-classed as an RfG Generation Unit and would be subject to the full requirements of the RfG for PPMs.

b. Application of the RfG to an existing gas-fired generation unit, following the replacement of the generation unit's governor:

The Generation Unit has identified an issue with their governor and has decided to put a program in place to replace the governor. In this case, the Generation Unit would only be classed as an RfG Generation Unit for the RfG requirements that are concerned or related to with the operation of the governor, e.g. frequency response.

c. Application of RfG to a Wind-Powered PPM, following an upgrade of its control system:

Upgrades of control systems of Wind-Powered PPMs are extremely complex. The upgrade may impact all or some of the Wind-Powered PPM's capabilities. Hence, it is vital the PPM owner contact the relevant SO as early as possible to discuss the control system upgrade and its potential impacts. The TSO will then be able to determine which RfG requirements will be applicable to the PPM, post the completion of the control system upgrade.

d. Application of the RfG to an existing PPM that is undergoing an extension

An existing Non-RfG PPM with an existing capacity of 75 MW is planning an extension of 25 MW. If the PPM extension is a separate legal entity with its own control system and MEC as well as acting as a separate unit within the Market. In this case, the original 75 MW PPM would remain as an existing non-RfG Generation Unit, while the 25 MW extension would be an RfG Generation Unit and would be subject to the RfG requirements.

In the case, where the existing PPM and the PPM extension are part of a single legal entity with a single MEC and act as one unit within the Market, a detailed discussion with the Compliance

and Testing Team would be required to determine what elements of the Grid Code and RfG are applicable, and what testing is required to demonstrate compliance.

- e. Application of the DCC to an existing Demand User following the installation of new connection points to the transmission system:

An existing 110 kV demand user, with four 110 kV transmission connected transformers to the 110 kV transmission system, which feeds a demand of 40 MW, decides for redundancy reasons to increase the number of transmission-connected transformers from four to six. These two new connection points would be subject to the DCC but the existing four connection points would remain subject to the requirements for the existing demand users under the Grid Code.

**NOTE:** In cases where a Demand User has multiple connection points, as described above, the overall operational capabilities of the Demand User will need to be discussed with the TSO prior to the energisation of the new connection points.

- f. Application of the DCC to an existing Demand facility following the emergency replacement of an existing circuit breaker due to a fault:

A Demand facility connected to the transmission system via a 110 / 10 kV single transformer. If the Demand customer's 10 kV circuit breaker developed a fault, it would need to be replaced. Under these circumstances, the replacement of the 10 kV circuit breaker can be viewed as replacement of faulted equipment. As such the Demand facility would not be subject to the DCC requirements.

- g. Application of the HVDC connection Network Code to an existing HVDC interconnector following HVDC control system upgrade:

Consider an existing HVDC interconnector, which undergoes an upgrade of the control system for the HVDC link. Upgrades of control systems are extremely complex with some capabilities being upgraded or amended, while other will remain unchanged. In cases like this, it is essential the HVDC interconnector owner contacts the TSO as early as possible to discuss which capabilities will be impacted by the control system upgrade, so that it can be determined which HVDC Connection Network Code requirements will be applicable to the HVDC Interconnector, post the completion of the control system upgrade.

## 5. Next steps:

SONI welcome feedback on this proposal. Responses should be submitted to SONI at [gridcode@soni.ltd.uk](mailto:gridcode@soni.ltd.uk) by 5pm on Friday, 20<sup>th</sup> of December.

Following the receipt of any comments, SONI will prepare and submit a formal proposal to the UR for approval.

## Appendix 1 – Article 4 in DCC and HVDC Connection Network Codes:

DCC Article 4 – Application to existing transmission –connected demand facilities, existing transmission-connected distribution facilities, existing distribution systems and existing demand units used to provide demand response services:

1. Existing transmission-connected demand facilities, existing transmission-connected distribution facilities, existing distribution system and existing demand units that are or can be used by a demand facility or a closed distribution system to provide demand response services to a relevant system operator or relevant TSO, are not subject to the requirements of this Regulation, except where:
  - a. An existing transmission-connection demand facility, an existing transmission-connected distribution facility, an existing distribution system, or an existing demand unit within a demand facility at a voltage level below 1000 V or a closed distribution system connection at a voltage level above 1000 V, has been modified to such an extent that its connection agreement must be substantially revised in accordance with the following procedure:
    - i. Demand facility owners, DSOs, or CDSOs who intend to undertake the modernisation of a plant or replacement of equipment impacting the technical capabilities or the transmission – connected demand facility, the transmission-connected distribution facility, the distribution system, or the demand unit shall notify their plans to the relevant system operator in advance;
    - ii. If the relevant system operator considers that the extent of the modernisation or replacement of equipment is such that a new connection agreement is required, the system operator shall notify the relevant regulatory authority or, where applicable, the Member State; and
    - iii. The relevant regulatory authority or, where applicable, the Member State shall decide if the existing connection agreement needs to be revised or a new connection agreement is required and which requirements of this Regulation shall apply; or

HVDC Article 4 – Application to existing HVDC systems and HVDC-connected power park modules:

2. Except for articles 26, 31, 33 and 50, existing HVDC systems and existing DC-connected power-park modules are not subject to the requirements of this Regulation, unless:
  - a. The HVDC system or DC-connected power park module has been modified to such an extent that its connection agreement must be substantially revised in accordance with the following procedure:
    - i. The HVDC system or DC-connected power park module owner who intend to undertake the modernisation of a plant or replacement of equipment impacting the technical capabilities of the HVDC system or DC-connected power park module shall notify their plans to the relevant system operator in advance;
    - ii. If the relevant system operation considers that the extent of the modernisation or replacement of equipment is such that a new connection agreement is required, the system

operator shall notify the relevant regulatory authority or, where applicable, the Member State; and

The relevant regulatory authority or, where applicable, the Member State shall decide if the existing connection agreement needs to be revised or a new connection agreement is required and which requirements of this Regulation shall apply; or