

EirGrid and ESB Networks' Guideline for the Application to Existing Users of Commission Regulation (EU) 2016/631 establishing a network code on requirements for grid connection of generators (RfG), Commission Regulation (EU) 2016/1388 establishing a Network Code on Demand Connection (DCC) and Commission Regulation (EU) 2016/1447 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules (HVDC).

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1. Introduction to this guideline:

On the 14 April 2016, Commission Regulation (EU) 2016/631 establishing a network code on requirements for grid connection of generators (hereafter referred to as 'RfG') entered in force.

On the 7 September 2016, the Commission Regulation (EU) 2016/1388 establishing a network code on requirements for demand connection (hereafter referred to as 'DCC') entered in force.

On the 15 September 2016, Commission Regulation (EU) 2016/1447 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules (hereafter referred to as 'HVDC') entered in force.

The purpose of this document is to detail criteria which will be used by EirGrid and ESB Networks in relation to modernisation, refurbishment or equipment replacement for existing users which would require a user to comply in part or fully with the requirements of Commission Regulation (EU) 2016/631 establishing a network code on requirements for grid connection of generators (RfG), Commission Regulation (EU) 2016/1388 establishing a Network Code on Demand Connection (DCC) and Commission Regulation (EU) 2016/1447 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules (HVDC) (hereafter these three codes referred to as 'Connection Network Codes').

This guideline has been produced by EirGrid plc in its role as the Transmission System Operator in Ireland (hereafter referred to as 'TSO') and by ESB Networks Ltd in its role as Distribution System Operator (hereafter referred to as 'DSO'). References in this document to the Relevant System Operator (hereafter referred to as 'RSO') mean the operator of the system to which the user is connected to, i.e. either TSO or DSO.

2. Engagement with Stakeholders

This guideline was developed jointly between EirGrid and ESB Networks.

It was first put to stakeholders at the Distribution Code Review Panel (DCRP) Meeting on 25 October 2019, as a discussion paper and was presented under the title "Application of Connection Network Codes to Existing Users". That discussion paper and the Minutes of the DCRP were shared with all panel members 3 December 2019 and are available on the [ESB website](#).

On 19 November 2019, the same discussion paper was presented to the Joint Grid Code Review Panel (JGCRP). That discussion paper and the minutes of the JGCRP were shared with all panel members 3 December 2019, which are available on the [EirGrid website](#).

All stakeholders from both the DCRP and the JGCRP were given until 5pm on 20 December 2019 to submit responses to the discussion paper and the minutes. No responses were received.

3. Requirement to apply Connection Network Codes to existing Users:

The Connection Network Codes apply 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 reproduced below from 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.

4. 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 SOs have interpreted the requirements to apply the Connection Network Codes to existing users in different ways. Some SOs 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 and DSO gave significant consideration to the interpretation of Article 4 for each of the Connection Network Codes. It was essential that our interpretation complies with the requirements of the Codes, as well as being implementable and enforceable. As such, we will only apply the Connection Network Codes to an existing User when:

1. A modernisation of an existing User’s 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 are 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 in such a manner as 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 5 below.

Finally, in the case of faulted equipment, the Connection Network Codes will not be applied 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, the Connection Network Codes will be applied 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.

5. 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.

Please note that this example assumes that there is no other physical limitations which would prevent the Generation units from meeting the requirements for frequency requirements of the RfG.

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, its potential impacts and provide information/data as required. The relevant SO 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 a single connection point and an existing capacity of 75 MW is planning an extension of 25 MW. 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.

- This would also apply where the PPM extension is not a separate legal entity but acts as a separate market unit [for MW and frequency response in the case of distribution connected PPMs], within the market – for instance if it was processed as part of a different Gate or ECP batch, to the original.
- For such Distribution connected PPMs that are mandated to implement reactive power/voltage control setpoints, if technically feasible and practicable, it would be the preference of ESB Networks that the full PPM acts as one unit, when receiving such setpoints. However in the event that this is not technically feasible and practicable, then ESB Networks would accept implementation of individual reactive power/voltage control setpoints for one or both units.
- 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 ESB Networks and/or EirGrid Compliance and Testing Team as appropriate, 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 relevant SO 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:

Consider 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 relevant SO 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.

- h. A windfarm with an increased MEC by using some or all, of the installed turbine capacity on the site.

In this instance, in general, if there are no new physical assets, then it would not be expected that the new requirements would apply. Potential exceptions:

- a. the case where a new or substantially modified windfarm controller may be required to give effect to the implementation of the new MEC;
- b. the case where for instance a new larger grid transformer is required to accommodate the increased MEC. In this case, new requirements would apply to the new transformer.

6. Further information:

For further information in relation to this guideline and/or in relation to the Grid and Distribution Codes, please contact GridCode@eirgrid.com and DistCodePanel@esb.ie respectively.

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:

1. 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