Commission Regulation (EU) 2016/1447 of 26 August 2016 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules (Text with EEA relevance)

COMMISSION REGULATION (EU) 2016/1447

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THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003[(1)], and in particular Article 6(11) thereof,

Whereas:

(1) The swift completion of a fully functioning and interconnected internal energy market is crucial to maintaining security of energy supply, increasing competitiveness and ensuring that all consumers can purchase energy at affordable prices.

(2) Regulation (EC) No 714/2009 sets out non-discriminatory rules governing access to the network for cross-border exchanges in electricity with a view to ensuring the proper functioning of the internal market in electricity. In addition Article 5 of Directive 2009/72/EC of the European Parliament and of the Council[(2)] requires that Member States or, where Member States have so provided, regulatory authorities ensure, inter alia, that objective and non-discriminatory technical rules are developed which establish minimum technical design and operational requirements for the connection to the system. Where requirements constitute terms and conditions for connection to national networks, Article 37(6) of the same Directive requires regulatory authorities to be responsible for fixing or approving at least the methodologies used to calculate or establish them. In order to provide system security within the interconnected transmission system, it is essential to establish a common understanding of the requirements for High-Voltage Direct Current (HVDC) systems and direct current-connected power park modules (DC-connected power park modules). Those requirements that contribute to maintaining, preserving and restoring system security in order to facilitate proper functioning of the internal electricity market within and between synchronous areas, and to achieve cost efficiencies, should be regarded as cross-border network issues and market integration issues.

(3) Harmonised rules for grid connection for HVDC systems and DC-connected power park modules should be set out in order to provide a clear legal framework for grid connections, facilitate Union-wide trade in electricity, ensure system security, facilitate

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the integration of renewable electricity sources, increase competition and allow more efficient use of the network and resources, for the benefit of consumers.

(4) System security depends partly on the technical capabilities of HVDC systems and DC-connected power park modules. Therefore regular coordination at the level of the transmission and distribution networks and adequate performance of the equipment connected to the transmission and distribution networks with sufficient robustness to cope with disturbances and to help to prevent any major disruption or to facilitate restoration of the system after a collapse are fundamental prerequisites.

(5) Secure system operation is only possible if there is close cooperation between owners of HVDC systems and DC-connected power park modules and system operators. In particular, the functioning of the system under abnormal operating conditions depends on the response of the HVDC systems and DC-connected power park modules to deviations from the reference 1 per unit (pu) values of voltage and nominal frequency. In the context of system security, the networks and the HVDC systems and DC-connected power park modules should be considered as one entity from a system engineering point of view, given that those parts are interdependent. Therefore, as a prerequisite for grid connection, relevant technical requirements should be set for HVDC systems and DC-connected power park modules.

(6) Regulatory authorities should consider the reasonable costs effectively incurred by system operators in the implementation of this Regulation when fixing or approving transmission or distribution tariffs or their methodologies or when approving the terms and conditions for connection and access to national networks in accordance with Article 37(1) and (6) of Directive 2009/72/EC and with Article 14 of Regulation (EC) No 714/2009.

(7) Different synchronous electricity systems in the Union have different characteristics which need to be taken into account when setting the requirements for HVDC systems and DC-connected power park modules. It is therefore appropriate to consider regional specificities when establishing network connection rules as required by Article 8(6) of Regulation (EC) No 714/2009.

(8) In view of the need to provide regulatory certainty, the requirements of this Regulation should apply to new HVDC systems and new DC-connected power park modules but should not apply to HVDC systems and DC-connected power park modules already existing or at an advanced stage of planning but not yet completed unless the relevant regulatory authority or Member State decides otherwise based on evolution of system requirements and a full cost-benefit analysis, or where there has been substantial modernisation of those facilities.

(9) Due to its cross-border impact, this Regulation should aim at the same frequency-related requirements for all voltage levels, at least within a synchronous area. That is necessary because, within a synchronous area, a change in frequency in one Member State would immediately impact frequency and could damage equipment in all other Member States.

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(10) To ensure system security, it should be possible for HVDC systems and DC-connected power park modules in each synchronous area of the interconnected system to remain connected to the system for specified frequency and voltage ranges.

(11) Voltage ranges should be coordinated between interconnected systems because they are crucial to secure planning and operation of a power system within a synchronous area. Disconnections because of voltage disturbances have an impact on neighbouring systems. Failure to specify voltage ranges could lead to widespread uncertainty in planning and operation of the system with respect to operation beyond normal operating conditions.

(12) Appropriate and proportionate compliance testing should be introduced so that system operators can ensure operational security. In accordance with Article 37(1)(b) of Directive 2009/72/EC, regulatory authorities are responsible for ensuring that system operators are compliant with this Regulation.

(13) The regulatory authorities, Member States and system operators should ensure that, in the process of developing and approving the requirements for network connection, they are harmonised to the extent possible, in order to ensure full market integration. Established technical standards should be taken into particular consideration in the development of connection requirements.

(14) A process for derogating from the rules should be set out in this Regulation to take into account local circumstances where exceptionally, for example, compliance with those rules could jeopardise the stability of the local network or where the safe operation of an HVDC system or DC-connected power park module might require operating conditions that are not in line with this Regulation.

(15) In the case of DC-connected power park modules, new modules could, in the future form part of a meshed off-shore grid connecting to more than one synchronous area. In this case, certain technical requirements should be set in order to maintain system security and ensure that future meshed networks can be developed cost-effectively. However, for certain requirements, DC-connected power park modules should only be required to fit the equipment needed for system security at the time it becomes necessary.

(16) Therefore, the owners of DC-connected power park modules which are, or will be, connected to one synchronous area with a radial connection should have the possibility to apply, via an expedited process, for derogations to requirements that will only be needed where the power park modules become connected to a meshed grid and which take account of case-by-case circumstances. They should also be informed as early as possible whether they qualify for a derogation for the purposes of their investment decision-making.

(17) Subject to approval by the relevant regulatory authority, or other authority where applicable in a Member State, system operators should be allowed to propose derogations for certain classes of HVDC systems and DC-connected power park modules.

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(18) This Regulation has been adopted on the basis of Regulation (EC) No 714/2009 which it supplements and of which it forms an integral part. References to Regulation (EC) No 714/2009 in other legal acts should be understood as also referring to this Regulation.

(19) The measures provided for in this Regulation are in accordance with the opinion of the Committee referred to in Article 23(1) of Regulation (EC) No 714/2009,

HAS ADOPTED THIS REGULATION:

TITLE I

GENERAL PROVISIONS

Article 1

Subject matter

This Regulation establishes a network code which lays down the requirements for grid connections of high-voltage direct current (HVDC) systems and DC-connected power park modules. It, therefore, helps to ensure fair conditions of competition in the internal electricity market, to ensure system security and the integration of renewable electricity sources, and to facilitate Union-wide trade in electricity.

This regulation also lays down the obligations for ensuring that system operators make appropriate use of HVDC systems and DC-connected power park modules capabilities in a transparent and non-discriminatory manner to provide a level playing field throughout the Union.

Article 2

Definitions

For the purposes of this Regulation, the definitions in Article 2 of Regulation (EC) No 714/2009, Article 2 of Commission Regulation (EU) 2015/1222[3] Article 2 of Commission Regulation (EU) No 543/2013[4], Article 2 of Commission Regulation (EU) 2016/631[5], Article 2 of Commission Regulation (EU) 2016/1388[6] and Article 2 of Directive 2009/72/EC shall apply. In addition, the following definitions shall apply:

(1) ‘HVDC system’ means an electrical power system which transfers energy in the form of high-voltage direct current between two or more alternating current (AC) buses and comprises at least two HVDC converter stations with DC transmission lines or cables between the HVDC converter stations;

(2) ‘DC-connected power park module’ means a power park module that is connected via one or more HVDC interface points to one or more HVDC systems;

(3) ‘embedded HVDC system’ means an HVDC system connected within a control area that is not installed for the purpose of connecting a DC-connected power park module at the time of installation, nor installed for the purpose of connecting a demand facility;

(4) ‘HVDC converter station’ means part of an HVDC system which consists of one or more HVDC converter units installed in a single location together with buildings,

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reactors, filters, reactive power devices, control, monitoring, protective, measuring and auxiliary equipment;

(5) ‘HVDC interface point’ means a point at which HVDC equipment is connected to an AC network, at which technical specifications affecting the performance of the equipment can be prescribed;

(6) ‘DC-connected power park module owner’ means a natural or legal entity owning a DC-connected power park module;

(7) ‘maximum HVDC active power transmission capacity’ (P_{max}) means the maximum continuous active power which an HVDC system can exchange with the network at each connection point as specified in the connection agreement or as agreed between the relevant system operator and the HVDC system owner;

(8) ‘minimum HVDC active power transmission capacity’ (P_{min}) means the minimum continuous active power which an HVDC system can exchange with the network at each connection point as specified in the connection agreement or as agreed between the relevant system operator and the HVDC system owner;

(9) ‘HVDC system maximum current’ means the highest phase current, associated with an operating point inside the U-Q/P_{max}-profile of the HVDC converter station at maximum HVDC active power transmission capacity;

(10) ‘HVDC converter unit’ means a unit comprising one or more converter bridges, together with one or more converter transformers, reactors, converter unit control equipment, essential protective and switching devices and auxiliaries, if any, used for the conversion.

Article 3

Scope of application

1 The requirements of this Regulation shall apply to:

a HVDC systems connecting synchronous areas or control areas, including back-to-back schemes;

b HVDC systems connecting power park modules to a transmission network or a distribution network, pursuant to paragraph 2;

c embedded HVDC systems within one control area and connected to the transmission network; and

d embedded HVDC systems within one control area and connected to the distribution network when a cross-border impact is demonstrated by the relevant transmission system operator (TSO). The relevant TSO shall consider the long-term development of the network in this assessment.

2 Relevant system operators, in coordination with relevant TSOs, shall propose to competent regulatory authorities the application of this Regulation for DC-connected power park modules with a single connection point to a transmission network or distribution network which is not part of a synchronous area for approval in accordance with Article 5. All other power park modules which are AC-collected but are DC-connected to a synchronous area are considered DC-connected power park modules and fall within the scope of this Regulation.

3 Articles 55 to 59, 69 to 74 and 84 shall not apply to HVDC systems within one control area referred to in points (c) and (d) of paragraph 1 where: