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COMMISSION

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COMMISSION REGULATION (EU) No …/..

of XXX

establishing a network code
on demand connection

(Text with EEA relevance)

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THE EUROPEAN COMMISSION,

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 8 (6) (b) 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 order to provide system security within the interconnected transmission system, it is essential to establish a common understanding of the requirements for grid connection applicable to demand facilities and distribution systems, including closed distribution systems, relating to the maintenance, preservation and restoration of the security of the interconnected electricity transmission and distribution networks, with a high level of reliability and quality.

(3) Harmonised rules on grid connection for demand facilities and distribution systems should be set out in order to provide a clear legal framework, facilitate Union-wide trade in electricity, ensure system security, facilitate 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 cannot be ensured independently from the technical capabilities of all users. Historically, generation facilities have formed the backbone of providing technical capabilities. However, in this regard, demand users are expected to play a more pivotal role in the future. Regular coordination at the level of dynamic generation and demand, together with an adequate performance of equipment connected to their networks with robustness to face disturbances and to help to prevent any large disturbance or to facilitate restoration of the system after a collapse, are fundamental prerequisites.

(5) Regulatory authorities should consider the reasonable costs effectively incurred by system operators in the implementation of this Regulation when fixing or approving

[1] OJ L 211, 14.8.2009, p. 15.

transmission or distribution tariffs 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 of the European Parliament and of the Council[2] and with Article 14 of Regulation (EC) No 714/2009.

(6) Different synchronous electricity systems in the Union have different characteristics which need to be taken into account when setting the requirements for demand connection. 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.

(7) In view of the need to provide regulatory certainty, the requirements of this Regulation should apply to new demand facilities and new distribution systems, but should not apply to existing demand facilities and existing distribution systems unless the relevant regulatory authority or Member State decides otherwise on the basis of transparent criteria. In case a new demand facility or a new closed distribution system voluntarily offers on a contractual basis demand side response services to system operators, the equipment used to provide such services should fulfil the requirements described in this Regulation, either individually or as part of demand aggregation.

(8) The requirements should be based on the principles of non-discrimination and transparency as well as on the principle of optimisation between the highest overall efficiency and lowest total cost for all involved parties. Transmission system operators ('TSOs') and distribution system operators ('DSOs') including closed distribution system operators ('CDSOs') can take those differences into account when defining the requirements in accordance with the provisions of this Regulation.

(9) The requirements applicable to a demand facility connected to a TSO set out the capabilities of these interfaces and the necessary automated responses and data exchange. These requirements ensure the operability of the transmission network over system operational ranges and critical events.

(10) The requirements applicable to a DSO connected to a TSO set out the operational range of these systems and the necessary automated responses and data exchange. These requirements ensure the effective development and operability of the transmission system, and the capacity to utilise the generation and demand side response embedded in these networks over system operational ranges and critical events.

(11) The requirements applicable to a demand facility connected to a DSO set out the capabilities of these interfaces and the necessary automated responses and data exchange. These requirements ensure the operability of the transmission system, and the capacity to utilise the generation and demand side response embedded in these networks over system operational ranges and critical events.

(12) The requirements are applicable to the equipment used by a demand facility or a CDSO voluntarily offering on a contractual basis demand side response services to relevant system operators, including relevant TSOs. They ensure the capacity to utilise the demand side response over system operational ranges thereby minimizing critical

[2] Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC (OJ L 211, 14.08.2009, p. 55).

events, and include requirements necessary for wide spread intervention during system critical events.

(13) Demand side response is an important instrument for enabling optimal use of networks. It should be based on customers' actions or on their agreement for a third party to take action on their behalf. In this regard, the role of aggregators is key in bringing together demand capacities and need to have the responsibility and obligation to ensure the reliability of those services.

(14) It is important that the administrative burdens and costs associated with providing demand side response are kept within reasonable limits, notably as regards domestic consumers, who will play an increasingly important role in the transition to low carbon society and their uptake should not be unnecessarily burdened with administrative tasks.

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

(16) Ensuring appropriate reconnection after an incidental disconnection due to a network disturbance is important to the functioning of the interconnected system. Proper network protection is essential for maintaining system stability and security, particularly in case of disturbances to the system. Protection schemes can prevent aggravation of disturbances and limit their consequences.

(17) Voltage ranges should be harmonized between interconnected networks because voltage ranges 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 define voltage ranges could lead to widespread uncertainty in planning and operation of the system with respect to operation beyond normal operating conditions.

(18) Appropriate and proportionate compliance testing should be required by this Regulation so that system operators can ensure operational security.

(19) The relevant regulatory authorities and relevant system operators should ensure that the requirements for network connection are harmonised to the extent possible, in order to ensure full market integration. Where technical standards are established, these should be taken into particular consideration in the development of connection requirements.

(20) System operators should not specify technical requirements for equipment that hinder the free movement of goods in the internal market. Where system operators make technical specifications resulting in requirements for the placing on the market of equipment, the respective Member State should follow the procedure as stipulated in Articles 8 and 9 of Directive 98/34/EC.

(21) When additional harmonisation is proportionate, amendments of this regulation under the procedure established in Regulation (EC) No 714/2009 should be considered. Where ENTSO for Electricity or the Agency establish that, based on market developments or experience gathered in the application of this Regulation, further harmonisation is advisable to promote market integration, they shall propose draft amendments to this Regulation pursuant to Article 7 (1) of Regulation (EC) No 714/2009.

(22) Subject to approval by the relevant regulatory authority and on the basis of a cost-benefit-analysis, system operators and demand facility owners should be allowed to propose derogations for certain demand facilities or distribution systems.

(23) 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.

(24) 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 and scope

1. This Regulation establishes a Network Code, which lays down the requirements for grid connection of demand facilities and distribution systems, including closed distribution systems, to the interconnected system. It also lays down the requirements for the equipment used by demand facilities and closed distribution systems that offer demand side response services to relevant system operators, including TSOs. 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, to facilitate the offer of demand-side response services and to facilitate Union-wide trade in electricity.

2. It also lays down a common framework for demand connection contracts between transmission system operators and the demand facility owner or the distribution system operator.

3. The relevant system operator shall refuse to allow the connection of a new demand facility or a new distribution system, which does not comply with the requirements set out in this Regulation and which is not covered by a derogation granted by the regulatory authority pursuant to Article 53. The relevant system operator shall communicate such refusal, by means of a reasoned statement in writing, to the demand facility owner or distribution system operator.

4. This Regulation shall not apply to the transmission system and distribution systems, nor to parts of the transmission system or distribution systems, of a Member State which is not operated synchronously at the same frequency with either the Continental Europe, Nordic, Great Britain, Ireland or Baltic synchronous area.

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 No [000/2014 – CACM], Article 2 of Commission Regulation No [000/2014 – RfG], Article 2 of Commission Regulation (EU) No 543/2013[3], Article 2 of Directive 2009/72/EC and Article 2 of Directive 2012/27/EC shall apply.

In addition, the following definitions shall apply:

(1) 'block loading' means the maximum step active power loading of reconnected demand during system restoration after black-out;

(2) 'control room' means a relevant system operator’s centralised operation centre;

(3) 'demand aggregation' means a set of demand facilities which can operate as a single facility for the purposes of offering one or more demand side response services;

[3] Commission Regulation (EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets and amending Annex I to Regulation (EC) No 714/2009 of the European Parliament and of the Council (OJ L 163, 15.6.2013, p. 1).

(4) 'demand facility' means a facility which consumes electrical energy and is connected at one or more connection points to the transmission or distribution network. A distribution system, auxiliary supplies of a power generating module, and pump-storage power generating modules which have both generating and pumping operation mode, do not constitute a demand facility;

(5) 'demand side response active power control' means demand within a demand facility or closed distribution system that is accessible for modulation by the relevant system operator, which results in an active power modification;

(7) 'demand side response low frequency demand disconnection' means demand within a demand facility or closed distribution system that can be disconnected in case of low frequency;

(8) 'demand side response low voltage demand disconnection' means demand within a demand facility or closed distribution system that can be disconnected in case of low voltage;

(9) 'demand side response reactive power control' means reactive power or reactive power devices in a demand facility or closed distribution system that are accessible for modulation by the relevant system operator;

(10) 'demand side response system frequency control' means reduction or increase of the demand of electrical devices in response to frequency fluctuations, made by an autonomous response from the demand facility to diminish these fluctuations;

(11) 'demand side response transmission constraint management' means demand that is accessible for modulation by the relevant system operator to manage transmission constraints within the system;

(12) 'demand side response unit document' (DSRUD) means a document issued either by the demand facility owner or the distribution system operator to the relevant system operator for connections with demand side response above 1000V. The DSRUD is intended to contain information confirming that the demand unit with demand side response has demonstrated compliance with the technical criteria set out in the Commission Regulations adopted in accordance with Regulation (EC) No 714/2009 and provided the necessary data and statements including a statement of compliance;

(13) 'demand response very fast active power control' means demand within a demand facility or closed distribution system that can be modulated very fast in response to a frequency deviation, which results in a very fast active power modification;

(14) 'demand unit' means an indivisible set of installations which can be actively controlled by a demand facility owner or by a closed distribution system operator to moderate its electrical energy demand. If within a demand facility there is more than one unit consuming power that cannot be operated independently from each other or can reasonably be considered in a combined manner, then each of the combinations of these units shall be considered as one demand unit;

(15) 'distribution system connection' means the electrical plant and equipment present at the connection point, typically a substation, of a distribution system;

(16) 'low frequency demand disconnection' means an action where demand is disconnected during a low frequency event in order to recover the balance between demand and generation and restore system frequency to acceptable limits;

(17) 'low voltage demand disconnection' means a restoration action where demand is disconnected during a low voltage event in order to recover voltage to a sustainable level within acceptable limits;

(18) 'main plant' means at least one of the following equipment: motors, transformers, high voltage equipment at the connection point and process production plant;

(19) 'maximum export capability' means the maximum continuous active power which a demand facility, or distribution system, can feed into the network at the connection point as defined in the connection contract or as agreed between the relevant system operator and the demand facility owner or distribution system operator respectively;

(20) 'maximum import capability' means the maximum continuous active power which a demand facility or a distribution system can consume from the network at the connection point, as defined in the connection contract or as agreed between the relevant system operator and the demand facility owner or distribution system operator respectively;

(21) 'on load tap changer' means a device for changing the tap of a winding, suitable for operation while the transformer is energized or on load;

(22) 'on load tap changer blocking' means an action that blocks the on load tap changer[s] during a low voltage event in order to stop transformers from further tapping and suppressing voltages in an area;

(23) 'transmission connected closed distribution system' means a closed distribution system which has a connection point to a transmission system;

(24) 'transmission connected demand facility' means a demand facility which has a connection point to a transmission system;

(25) 'transmission connected distribution system' means a distribution system which has a connection point to a transmission system.

Article 3

Application to existing demand facilities or distribution systems

1. Existing demand facilities are not subject to the requirements of this Regulation, except where:

   (a) a regulatory authority or, where applicable, the Member State, decides to make an existing demand facility subject to all or some of the requirements of this Regulation, following a proposal from the relevant system operator based on a notification from a demand facility owner who intends to undertake substantial modernisation of an existing demand facility connected above 1000V;

   (b) a regulatory authority or, where applicable, the Member State decides to make an existing demand facility subject to all or some of the requirements of this Regulation, following a proposal from the relevant TSO in accordance with the criteria set out in paragraph 5.

2. Existing distribution systems are not subject to the requirements of this Regulation, except where a regulatory authority or, where applicable, the Member State decides to make an existing distribution system subject to all or some of the requirements of this Regulation, following a proposal from the relevant TSO in accordance with the criteria set out in paragraph 5.

3. A demand facility owner may totally or partially delegate to third parties (including but not restricted through an aggregator) tasks such as communicating with the relevant system operator or relevant TSO. Aggregators shall be treated as single users with the right to compile relevant documentation and demonstrate compliance of their aggregated demand facilities with the provisions of this Regulation. Demand facilities may act collectively through aggregators.

4. For the purposes of this Regulation, a demand facility or a distribution system shall be considered existing if:

   (a) it is already connected to the network on the date of entry into force of this Regulation; or

   (b) the demand facility owner or the distribution system operator has concluded a final and binding contract for the purchase of the main plant by [*two year after the entry into force of the Regulation*] and submits a notification to the relevant system operator confirming this circumstance by [*30 months after the entry into force of the Regulation*].

   (c) The confirmation submitted by the demand facility owner or the distribution system operator to the relevant system operator shall at least indicate the contract title, its date of signature and date of entry into force, and the specifications of the main plant to be constructed, assembled or purchased.

   (d) The Member State may provide that in specified circumstances the regulatory authority may determine whether the demand facility or the distribution system is to be considered existing or new.

5. Following a public consultation in accordance with Article 8 and in order to address significant factual changes in circumstances, such as the evolution of system requirements including penetration of renewable energy sources, smart grids, distributed generation or demand side response, the relevant TSO may propose to the regulatory authority concerned, or where applicable, the Member State to extend the applicability of this Regulation to existing demand facilities and distribution systems. For that purpose a sound and transparent quantitative cost-benefit analysis shall be carried out, in accordance with Article 34 paragraphs 1 to 5, which shall indicate:

   (a) the costs, in regard to existing demand facilities and distribution systems, of requiring compliance with this Regulation;

   (b) the socio-economic benefit resulting from applying the requirements set out in this Regulation; and

   (c) the potential of alternative measures to achieve the required performance.

6. Before undertaking the quantitative cost-benefit analysis referred to in paragraph 5, the relevant TSO shall:

   (a) carry out a preliminary qualitative comparison of costs and benefits; and

   (a) obtain approval from the regulatory authority concerned or, where applicable, the Member State.

7. The relevant TSO may assess the application of some or all of the provisions of this Regulation to existing demand facilities and distribution systems every three years. This assessment may relate to some or all of the existing demand facilities, determined on the basis of non-discriminatory criteria. In particular, the relevant TSO may assess the application of the provisions of this regulation to demand

facilities connected at or above a certain voltage level and/or facilities which are subject to substantial modernisation replacing major parts of the equipment.

8. The relevant TSO shall inform stakeholders before undertaking such assessment. The relevant TSO shall take account of the legitimate expectations of demand facilities owners and distribution system operators when assessing the application of this Regulation to existing demand facilities and distribution systems.

Article 4

Application to pump-storage power generating modules and industrial sites

1. This Regulation shall not apply to pump-storage power generating modules which have both generating and pumping operation mode.

2. Any pumping module within a pump-storage station, which only provides pumping mode, shall be subject to the requirements of this Regulation and shall be treated as a demand facility.

3. Notwithstanding the applicability of the requirements set forth in this Regulation, the system operator of an industrial site and the relevant system operator to whose the industrial site is connected to, may agree, in coordination with the relevant TSO and with respect to power generation modules which are embedded in industrial sites, on conditions for disconnection of critical loads from the relevant system. The objective of the agreement shall be to secure production processes of the industrial site in case of disturbed conditions in the relevant system.

Article 5

Regulatory aspects

1. Unless otherwise provided in this Regulation, where a relevant system operator or TSO is required or permitted to specify, define or agree on specific terms and conditions governing connection and access to systems or their methodologies, these terms and conditions or methodologies shall require approval by the responsible regulatory authorities in accordance with paragraphs (1), (6) and (10) of Article 37 of Directive 2009/72/EC and Article 14 of Regulation (EC) No 714/2009. For technical regulations pursuant to Article 1 (9) of Directive 98/34/EC, obligations pursuant to Article 8 of Directive 98/34/EC shall apply.

2. When applying the provisions of this Regulation, Member States, regulatory authorities and system operators shall:

   (a) apply the principles of proportionality and non-discrimination;

   (b) ensure transparency;

   (c) apply the principle of optimisation between the highest overall efficiency and lowest total costs for all parties involved;

   (d) respect the responsibility assigned to the relevant TSO to ensure system security, including as required by national legislation;

   (e) consult with relevant DSOs and take account of potential impacts on their system;

   (f) take into consideration agreed European standards and technical specifications.

3. Where this Regulation provides that the relevant TSO, the transmission connected demand facility owner and/or the distribution system operator shall agree, all mentioned parties shall seek agreement between them. If no agreement has been found within a reasonable timeframe, but in any case not later than [6 months] after the first proposal has been submitted by one party, each party may request the competent regulatory authority to issue a decision. The decision shall replace the required agreement.

4. Where this Regulation provides that the relevant system operator or TSO shall specify, define or agree on specific terms and conditions governing connection and access to systems or their methodologies, the initial definition shall be done within a reasonable timeframe, but in any case not later than [2 years] after the entry into force of this Regulation. Where approval of the definition requires regulatory approval pursuant to paragraph 1 of this Article, the deadline shall be deemed met if the submission for approval takes place within a reasonable timeframe, but no later than [2 years].

5. If the relevant system operator or TSO deems modifications to the initial definition under paragraph 3 to be necessary, a new assessment has to follow the same procedural requirements in paragraphs 1 to 3. At all stages of the procedure, due account shall be taken of legitimate expectations, if any, by demand facility owners, equipment manufacturers and other stakeholders based on the initial definition.

Article 6
Multiple TSOs

1. In Member States where more than one transmission system operator exists, this Regulation shall apply to all transmission system operators within that Member State.

2. Member States may under the national regulatory regime provide that the responsibility of a transmission system operator to comply with one or some obligations under this Regulation is assigned to one or more specific transmission system operators. In case of such assignment, this Regulation shall apply accordingly to the transmission system operators to which responsibilities have been assigned.

Article7
Recovery of costs

1. The costs borne by regulated system operators subject to network tariff regulation stemming from the obligations laid down in this Regulation, shall be assessed by the competent regulatory authorities. Costs assessed as reasonable, efficient and proportionate shall be recovered in accordance with Article 14 Regulation (EC) No 714/2009.

2. If requested by the competent regulatory authorities, regulated system operators shall, within three months of the request, provide the information necessary to facilitate assessment of the costs incurred.

Article 8
Consultation

1. Relevant system operators, TSOs or, where applicable, Member States responsible for proposing terms and conditions or methodologies in accordance with this

Regulation, and for the purpose of proposals under Article 3(5), shall consult stakeholders, including the relevant authorities of each Member State, on the draft proposals for terms and conditions or methodologies where set out in this Regulation. The consultation shall last for a period of not less than one month.

2. The relevant system operators or TSOs responsible for the proposal for terms and conditions or methodologies shall duly consider the views of stakeholders resulting from the consultation undertaken in accordance with paragraph 1, prior to its submission for regulatory approval or prior to publication in all other cases. In all cases, a clear and robust justification for including or not the views resulting from the consultation shall be developed in the submission and published in a timely manner before or simultaneously with the publication of the proposal for terms and conditions or methodologies.

Article 9
Stakeholder involvement

The Agency, in close cooperation with ENTSO for Electricity, shall organise stakeholder involvement regarding the requirements for grid connection of demand facilities and distribution systems, including closed distribution systems, and other aspects of the implementation of this Regulation. This shall include regular meetings with stakeholders to identify problems and propose improvements notably related to the demand connection requirements.

Article 10
Confidentiality obligations

1. Any confidential information received, exchanged or transmitted pursuant to this Regulation shall be subject to the conditions of professional secrecy laid down in paragraphs 2, 3 and 4.

2. The obligation of professional secrecy shall apply to any person subject to the provisions of this Regulation.

3. Confidential information received by the persons referred to in paragraph 2 in the course of their duties may not be divulged to any other person or authority, without prejudice to legally required provision of information covered by national law, the other provisions of this Regulation or other relevant Union law.

4. Without prejudice to cases covered by national or Union law, regulatory authorities, bodies or persons who receive confidential information pursuant to this Regulation may use it only for the purpose of carrying out their duties under this Regulation.

5. This provision does not prevent the Agency, the regulatory authorities, ENTSO for electricity, or the European Commission to mutually exchange, for the purpose of applying this Regulation, any information received pursuant to this Regulation.

Title II

Requirements

Article 11
General frequency requirements

1. All transmission connected demand facility owner and distribution system operators shall design their transmission connected demand facilities and distribution systems respectively to withstand the frequency ranges and time periods specified in Table 1.

Synchronous area	**Frequency range**	**Time period for operation**
Continental Europe	47.5 Hz – 48.5 Hz	To be defined by each TSO, but not less than 30 minutes
	48.5 Hz – 49.0 Hz	To be defined by each TSO, but not less than the period for 47.5 Hz – 48.5 Hz
	49.0 Hz – 51.0 Hz	Unlimited
	51.0 Hz – 51.5 Hz	30 minutes
Nordic	47.5 Hz – 48.5 Hz	30 minutes
	48.5 Hz – 49.0 Hz	To be defined by each TSO, but not less than 30 minutes
	49.0 Hz – 51.0 Hz	Unlimited
	51.0 Hz – 51.5 Hz	30 minutes
Great Britain	47.0 Hz – 47.5 Hz	20 seconds
	47.5 Hz – 48.5 Hz	90 minutes
	48.5 Hz – 49.0 Hz	To be defined by each TSO, but not less than 90 minutes
	49.0 Hz – 51.0 Hz	Unlimited
	51.0 Hz – 51.5 Hz	90 minutes
	51.5 Hz – 52.0 Hz	15 minutes
Ireland	47.5 Hz – 48.5 Hz	90 minutes
	48.5 Hz – 49.0 Hz	To be defined by each TSO, but not less than 90 minutes
	49.0 Hz – 51.0 Hz	Unlimited
	51.0 Hz – 51.5 Hz	90 minutes
Baltic	47.5 Hz – 48.5 Hz	To be defined by each TSO, but not less than 30 minutes
	48.5 Hz – 49.0 Hz	To be defined by each TSO, but not less than the period for 47.5 Hz – 48.5 Hz
	49.0 Hz – 51.0 Hz	Unlimited
	51.0 Hz – 51.5 Hz	To be defined by each TSO, but not less than 30 minutes

Table 1: Minimum time periods for which a transmission connected demand facility owner or a distribution system operator has to be capable of operating on different frequencies, deviating from a nominal value, without disconnecting from the network.

2. The distribution system operator or transmission connected demand facility owner, in coordination with the relevant TSO, may agree on wider frequency ranges or longer minimum times for operation. If wider Frequency ranges or longer minimum times for operation are technically feasible, the consent of the transmission connected demand facility owner or distribution system operator shall not be unreasonably withheld.

Article 12
General voltage requirements

1. All transmission connected demand facility owners and transmission connected distribution system operators shall design their transmission connected demand facilities and transmission connected distribution systems respectively to withstand without damage the voltage range and time periods specified in Table 2.1 and Table 2.2.

Synchronous area	Voltage range	Time period for operation
Continental Europe	0.90 pu – 1.118 pu	Unlimited
	1.118 pu – 1.15 pu	To be defined by each TSO but not less than 20 minutes and not more than 60 minutes
Nordic	0.90 pu – 1.05 pu	Unlimited
	1.05 pu – 1.10 pu	60 minutes
Great Britain	0.90 pu – 1.10 pu	Unlimited
Ireland	0.90 pu – 1.118 pu	Unlimited
Baltic	0.85 pu – 0.90 pu	30 minutes
	0.90 pu – 1.12 pu	Unlimited
	1.12 pu – 1.15 pu	20 minutes

Table 2.1: The table shows the minimum time periods during which a transmission connected demand facility or a transmission connected distribution system must be capable of operating for voltages deviating from the nominal value at the connection point without disconnecting from the network where the voltage base for pu values is from 110kV to 300kV.

Synchronous area	Voltage range	Time period for operation
Continental Europe	0.90 pu – 1.05 pu	Unlimited
	1.05 pu – 1.10 pu	60 minutes
Nordic	0.90 pu – 1.05 pu	Unlimited
	1.05 pu – 1.10 pu	60 minutes
Great Britain	0.90 pu – 1.05 pu	Unlimited
	1.05 pu – 1.10 pu	15 minutes
Ireland	0.90 pu – 1.05 pu	Unlimited
Baltic	0.88 pu – 0.90 pu	20 minutes
	0.90 pu – 1.10 pu	Unlimited
	1.10 pu – 1.15 pu	20 minutes

Table 2.2 The table shows the minimum time periods during which a transmission connected demand facility or a transmission connected distribution system must be capable of operating for voltages deviating from the nominal value at the connection point without disconnecting from the network, where the voltage base for pu values is between and including 300kV to 400kV.

2. The voltage range at the connection point shall be expressed by the voltage at the connection point related to nominal per unit voltage.

3. The relevant TSO in Spain may require transmission connected demand facilities and transmission connected distribution systems to remain connected to the transmission system in the voltage range between 1.05 pu –1.0875 pu for an unlimited period.

4. If required by the relevant TSO, a transmission connected demand facility or a transmission connected distribution system shall be capable of automatic disconnection at specified voltages. The terms and settings for automatic disconnection shall be agreed between the relevant TSO and the transmission connected demand facility owner or the transmission connected distribution system operator.

Article 13
Short-circuit requirements

1. Based on the rated short-circuit withstand capability of its equipment, the relevant TSO shall define the maximum short-circuit current at the connection point that

the transmission connected demand facility or the transmission connected distribution system shall be capable of withstanding.

2. The relevant TSO shall deliver to the transmission connected demand facility owner or the transmission connected distribution system operator an estimate of the minimum and maximum short-circuit currents at the connection point as an equivalent of the network.

3. After an unplanned event, the relevant TSO shall inform the affected transmission connected demand facility owner or the affected transmission connected distribution system operator as soon as practicable and no later than a week after, of the changes above a threshold in the maximum short-circuit current that it shall be able to withstand from its network in accordance with paragraph 1.

4. The threshold shall be set by: either the transmission connected demand facility owner for their facility, or the transmission connected distribution system operator for their network.

5. Before a planned event, the relevant TSO shall inform the affected transmission connected demand facility owner or the affected transmission connected distribution system operator, as soon as practicable, of the changes above a threshold in the maximum short-circuit current that it shall be able to withstand from its network, in accordance with paragraph 1.

6. The threshold will be set by: either the transmission connected demand facility owner for their facility, or the transmission connected distribution system operator for their network.

7. The relevant TSO shall request information from a transmission connected demand facility owner or a transmission connected distribution system operator concerning the contribution in terms of short-circuit current from that facility or network. As a minimum this should be as an equivalent of the network for zero; positive and negative sequence.

8. After an unplanned event, the transmission connected demand facility owner or the transmission connected distribution system operator shall inform the relevant TSO, as soon as practicable but no later than one week, of the changes in short-circuit contribution above the threshold set by the relevant TSO.

9. Before a planned event, the transmission connected demand facility owner or the transmission connected distribution system operator shall inform the relevant TSO, as soon as practicable, of the changes in short-circuit contribution above a threshold set by the relevant TSO.

Article 14
Reactive power requirements

1. Transmission connected demand facilities and transmission connected distribution systems shall be capable of maintaining their steady-state operation at their connection point in a reactive power range specified by the relevant TSO, according to the following conditions:

   (a) for transmission connected demand facilities without onsite generation, the actual reactive power range specified by the relevant TSO for importing reactive power shall not be wider than 0.9 to 1 power factor of their maximum

import capability, except in situations where either technical or financial system benefits are proved and accepted by the relevant TSO;

(b) for transmission connected demand facilities with onsite generation, the actual reactive power range specified by the relevant TSO shall, except in situations where either technical or financial system benefits are proved and accepted by the relevant TSO, not be wider than:

(1) 0.9 power factor of the larger of their maximum import capability or maximum export capability in import; and

(2) 0.9 power factor of their maximum export capability in export.

(c) for transmission connected distribution systems, the actual reactive power range specified by the relevant system operator shall, except in situations where either technical or financial system benefits are proved by the relevant TSO and the distribution system operator through joint analysis, not be wider than

(1) 0.9 power factor of the larger of their maximum import capability or maximum export capability in import; and

(2) 0.9 power factor of their maximum export capability in export.

(d) the relevant TSO and the distribution system operator shall agree on the scope of the analysis, which shall address the possible solutions and determine the optimal solution for reactive power exchange between their systems, taking adequately into consideration the specific system characteristics, variable structure of power exchange, bidirectional flows and the reactive power capabilities in the distribution system;

(e) the relevant TSO may specify the use of metrics other than power factor to define equivalent reactive power capability ranges;

(f) the reactive power range requirement shall apply at the connection point.

2. The relevant TSO may specify that transmission connected distribution systems have the capability at the connection point to not export reactive power (at nominal voltage) at an active power flow of less than 25% of the maximum import capability.

3. Without prejudice to paragraph 1(a), the relevant TSO may require the ability of the transmission connected distribution system to actively control the exchange of reactive power at the connection point as part of a wider common concept for management of reactive power capabilities, for the benefit of the entire system. The relevant TSO and the transmission connected distribution system operator shall agree on a method to carry out this control, to ensure the justified level of security of supply for both parties. The justification shall include a roadmap in which the steps and the timeline for fulfilling the requirement are specified.

4. The distribution system operator may require to the relevant TSO to be considered for reactive power management.

Article 15
Protection requirements

1. The relevant TSO shall define the devices and settings required to protect the network in accordance with the characteristics of the transmission connected

demand facility or the transmission connected distribution system. The relevant TSO and the transmission connected demand facility owner or the transmission connected distribution system operator shall agree on protection schemes and settings relevant for the transmission connected demand facility or the transmission connected distribution system.

2. Electrical protection of the transmission connected demand facility or the transmission connected distribution system shall take precedence over operational controls while respecting system security, health and safety of staff and the public, as well as mitigating the damage to the transmission connected demand facility or the transmission connected distribution system.

3. Protection scheme devices may cover the following elements:

   (a) external and internal short circuit;

   (b) over- and under-voltage at the connection point;

   (c) over- and under-frequency;

   (d) demand circuit protection;

   (e) unit transformer protection; and

   (f) back-up schemes against protection and switchgear malfunction.

4. The relevant TSO and the transmission connected demand facility owner or the transmission connected distribution system operator shall agree on any changes to the protection schemes relevant for the transmission connected demand facility or the transmission connected distribution system, as well as relevant to the setting for the transmission connected demand facility or the transmission connected distribution system.

Article 16
Control requirements

1. The relevant TSO and the transmission connected demand facility owner or the transmission connected distribution system operator shall agree on the schemes and settings of the different control devices of the transmission connected demand facility or the transmission connected distribution system relevant for system security.

2. The agreement shall cover the following elements:

   (a) isolated (network) operation;

   (b) damping of oscillations;

   (c) disturbances to the network;

   (d) automatic switching to emergency supply and come-back to normal topology;

   (e) automatic circuit-breaker re-closure (on 1-phase faults).

3. The relevant TSO and the transmission connected demand facility owner or the transmission connected distribution system operator shall agree on any changes to the schemes and settings of the different control devices of the transmission connected demand facility or the transmission connected distribution system relevant for system security.

4. With regard to priority ranking of protection and control, the transmission connected demand facility owner or the transmission connected distribution system operator shall set the protection and control devices of its transmission connected demand facility or its distribution system connection respectively, in compliance with the following priority ranking, organized in decreasing order of importance:

   (a) network and demand facility or distribution network protection;

   (b) frequency control (active power adjustment); and

   (c) power restriction.

Article 17
Information exchange

1. Transmission connected demand facilities shall be equipped according to the standard defined by the relevant TSO to exchange information between the relevant TSO and the transmission connected demand facility with the defined time stamping. The relevant TSO shall make publicly available the defined standard.

2. Transmission connected distribution systems shall be equipped according to the standard defined by the relevant TSO to exchange information between the relevant TSO and the transmission connected distribution system with the defined time stamping. The relevant TSO shall make publicly available the defined standard.

3. The relevant TSO shall define the information exchange standards. The relevant TSO shall make publicly available the precise list of data required.

Article 18
Demand disconnection for system defence and demand reconnection

1. All transmission connected demand facilities and transmission connected distribution systems shall fulfil the following requirements related to automatic under-frequency control schemes:

   (a) each transmission connected distribution system operator and, where specified by the TSO, transmission connected demand facility owner, shall provide capabilities that enable automatic 'low frequency' disconnection of a defined proportion of their demand.

   (b) the automatic under-frequency control schemes shall be capable of disconnecting demand in stages for a range of operational frequencies.

   (c) the low frequency demand disconnection scheme shall be suitable for operation from a nominal AC input to be defined by the relevant system operator, and shall have the following functional capabilities:

      (1) frequency range: at least between 47-50 Hz, adjustable in steps of 5 mHz;

      (2) operating time: no more than 150 ms after triggering the frequency setpoint;

      (3) voltage lock-out: blocking of the scheme should be possible when the voltage is within a range of 30 to 90% of nominal voltage; and

      (4) direction of active power flow at the point of disconnection.

2. With regard to automatic under-frequency control schemes AC voltage supply, the voltage supply to the automatic under-frequency control schemes shall be derived from the network at the frequency signal measuring point, as defined in the low frequency demand disconnection scheme in paragraph 1(c), so that the frequency of the automatic under-frequency control schemes supply voltage is the same as the one of the network.

3. With regard to low voltage demand disconnection schemes, the following requirements shall apply:

   (a) the relevant TSO shall define, in coordination with the transmission connected distribution system operators, low voltage demand disconnection schemes for transmission connected distribution systems. For nested distribution networks, the geographical distribution shall be equitable to all the associated distribution system operators.

   (b) the relevant TSO shall define, in coordination with the transmission connected demand facility owner, low voltage demand disconnection schemes for a transmission connected demand facility.

   (c) based on the TSO's assessment concerning system security, the implementation of on load tap changer blocking and low voltage demand disconnection shall be binding for the transmission connected distribution system operators.

   (d) if the relevant TSO decides to implement a low voltage demand disconnection scheme, both on load tap changer blocking and low voltage demand disconnection' shall be installed in coordination with the relevant TSO.

   (e) the method for low voltage demand disconnection shall be implemented by relay or control room initiation.

   (f) the low voltage demand disconnection schemes shall have the following functional capabilities:

      (1) the low voltage demand disconnection scheme shall monitor the voltage by measuring all three phases;

      (2) blocking of the relays operation shall be based on direction of either active power or reactive power flow.

4. With regard to blocking of on load tap changers, the following requirements shall apply:

   (a) if required by the relevant TSO, the transformer at the transmission connected distribution system connection point shall be capable of automatic or manual on load tap changer blocking.

   (b) the relevant TSO shall specify the automatic on load tap changer blocking scheme.

5. All transmission connected demand facilities and transmission connected distribution systems shall fulfil the following requirements related to disconnection or reconnection of a transmission connected demand facility or a transmission connected distribution system:

   (a) with regard to the capability of reconnection after a disconnection, the relevant TSO shall define the conditions under which a transmission

connected demand facility or a transmission connected distribution system is entitled to reconnect to the transmission system. Installation of automatic reconnection systems shall be subject to prior authorization by the relevant TSO.

(b) with regard to reconnection of a transmission connected demand facility or a transmission connected distribution system, the transmission connected demand facility or the transmission connected distribution system shall be capable of synchronisation for frequencies within the ranges set out in Article 11(1). The relevant TSO and the transmission connected demand facility owner or the transmission connected distribution system operator shall agree on the settings of synchronization devices prior to connection of the transmission connected demand facility or the transmission connected distribution system, including voltage, frequency, phase angle range and deviation of voltage and frequency.

(c) a transmission connected demand facility or a transmission connected distribution system shall be capable of being remotely disconnected from the transmission system when required by the relevant TSO. If required, the automated disconnection equipment (for reconfiguration of the network in preparation for block loading) shall be defined by the relevant TSO. The relevant TSO shall define the time required for remote disconnection.

Article 19
General provisions for demand side response services

1. Demand side response services shall be distinguished based on, but not limited to, the following categories:

(a) remotely controlled:

(1) demand side response active power control;

(2) demand side response reactive power control; and

(3) demand side response transmission constraint management.

(b) autonomously controlled:

(1) demand side response system frequency control; and

(2) demand side response very fast active power control.

2. Demand facilities and closed distribution systems may provide demand side response services to relevant system operators, including relevant TSO. Demand side response services can include upward or downward modification of demand, independent if this is provided jointly or separately.

3. Once one of the demand side response services set forth in paragraph 1(a) is offered by a demand facility or a closed distribution system to the TSO, the demand offered for the demand side response service may also be available for either or both demand side response low frequency demand disconnection and demand side response low voltage demand disconnection.

4. This regulation does not preclude additional categories from being developed which are not covered by the categories described in paragraph 1.

Article 20

Specific provisions for demand side response active power control, reactive power control and transmission constraint management

1. Demand facilities and closed distribution systems may voluntarily offer on a contractual basis demand side response active power control, demand side response reactive power control, or demand side response transmission constraint management to relevant system operators, including relevant TSO.

2. The equipment used by demand facilities or closed distribution systems to offer demand side response active power control, demand side response reactive power control, or demand side response transmission constraint management, shall fulfil the following requirements, either individually or as part of demand aggregation:

   (a) be capable of operating across the frequency ranges specified in Article 11(1) and the extended range specified in Article 11(2). The demand facility owner or closed distribution system operator and the relevant system operator in coordination with the relevant TSO, may directly or indirectly agree (including but not restricted through an aggregator), to a reduced frequency range.

   (b) the equipment used by demand facilities and closed distribution systems providing demand side response with a connection point at or above 110kV shall be capable of operating across the voltage ranges specified in Article 12(1).

   (c) the equipment used by demand facilities and closed distribution systems providing demand side response with a connection point below 110kV shall be capable of operating across the normal operational voltage range of the system at the connection point, defined by the relevant system operator. This range shall lie within the range specified in Article 12(1) and shall, prior to regulatory approval, undergo a consultation of the relevant stakeholders pursuant to Article 8(1).

   (d) the demand facility owner or operator of the closed distribution system and the relevant system operator shall agree, directly or indirectly (including but not restricted through an aggregator), and in coordination with the relevant TSO, on the method of demand side response low frequency demand disconnection or demand side response low voltage demand disconnection. This agreement may result in:

      (1) decreasing power consumption by an instruction sent by the relevant system operator or the relevant TSO;

      (2) decreasing power consumption with a pre-alert signal sent by the relevant system operator or the relevant TSO; or

      (3) for voltage control, disconnection or reconnection of static compensation facilities controlled by the relevant system operator or the relevant TSO.

   (e) where the relevant system operator or the relevant TSO directly or indirectly (including but not restricted through an aggregator) command the modification of the power consumption, each demand facility owner or closed distribution system operator to which the command applies shall make arrangements that enable the modification of a part of its demand in response to an instruction by the relevant system operator or the relevant TSO, within the limits agreed with the demand unit and the demand facility owner settings. The demand

modification shall be net of embedded generation in the demand facility or closed distribution system, which operates connected to the transmission or the distribution network.

(f) where modification to the power consumption is specified via frequency and/or voltage control and pre-alert signal sent by the relevant system operator or the relevant TSO, each demand facility or closed distribution system concerned shall be equipped to receive directly or indirectly (including but not restricted through an aggregator) the instructions from the relevant system operator or the relevant TSO, to measure the frequency and/or voltage value for demand side response low frequency demand disconnection and low voltage demand disconnection respectively, to command the demand trip and to transfer the information. The relevant system operator shall make publicly available the technical specifications approved to enable this transfer of information. For equipment used by demand facilities below 110kV, these specifications shall, prior to regulatory approval, undergo a consultation of the relevant stakeholders pursuant to Article 8(1).

(g) for voltage control with disconnection or reconnection of static compensation facilities, each transmission connected demand facility or transmission connected closed distribution system shall be able to connect or disconnect its static compensation facilities, directly or indirectly (including but not restricted through an aggregator), in response to an order transmitted by the relevant TSO, or in the conditions set forth in the contract between the relevant TSO and the demand facility owner or the closed distribution system operator.

(h) the equipment used by the demand facility or the closed distribution system shall be capable of controlling power consumption from the network in a range equal or greater to the range contracted directly or indirectly (including but not restricted through an aggregator) by the relevant TSO.

(i) the equipment used by the demand facility or closed distribution system shall be equipped to receive the instructions, directly or indirectly, from the relevant system operator or the relevant TSO to modify its demand and to transfer the necessary information. The relevant system operator shall make publicly available the technical specifications approved to enable this transfer of information. For equipment used by demand facilities below 110kV, these specifications shall, prior to regulatory approval, undergo a consultation of the relevant stakeholders pursuant to Article 8(1).

(j) the equipment used by the demand facility or the closed distribution system shall be capable of adjusting its power consumption as expected within a time period defined by the relevant TSO. For the equipment used by demand facilities below 110kV, these specifications shall, prior to regulatory approval, undergo a consultation of the relevant stakeholders pursuant to Article 8(1).

(k) a demand facility or closed distribution system providing one or more types of demand side response services shall not be able to ignore or interrupt the full execution of an order issued by the relevant system operator, the aggregator or the relevant TSO to modify its power consumption unless a contractually agreed method is in place with the relevant system operator or relevant TSO for the replacement of their contribution (including the grouped demand facilities' contribution through an aggregator).

(l) once a modification to power consumption has taken place and for the duration of the requested modification, a demand facility or closed distribution system, shall only modify its demand if required by the relevant system operator or relevant TSO directly or indirectly (including but not restricted through an aggregator).

(m) instructions to modify power consumption may have immediate (less than 1 second) or delayed effects.

(n) the demand facility owner or the closed distribution system operator shall directly or indirectly (including but not restricted through an aggregator), notify to the relevant system operator or relevant TSO of the modification of demand side response capacity. The relevant system operator or relevant TSO shall specify the modalities of the notification.

(o) with regard to the rate-of-change-of-frequency withstand capability, the equipment used by demand facility or closed distribution system shall have the capability to not disconnect from the system due to the rate-of-change-of-frequency up to a value defined by the relevant TSO. The value of rate of change of frequency shall be based on a 500 ms average. For equipment used by demand facilities below 110kV, these specifications shall, prior to regulatory approval, undergo a consultation of the relevant stakeholders pursuant to Article 8(1).

Article 21

Specific provisions for demand side response system frequency control

1. Demand facilities and closed distribution systems may voluntarily offer on a contractual basis demand side response system frequency control to relevant system operators, including relevant TSO.

2. The equipment used by demand facilities or closed distribution systems to offer demand side response system frequency control shall fulfil the following requirements, either individually or as part of demand aggregation:

(a) the equipment used by demand facilities and closed distribution systems providing demand side response system frequency control with a connection point at or above 110kV shall be capable of operating across the voltage ranges specified in Article 12(1).

(b) the equipment used by demand facilities and closed distribution systems providing demand side response system frequency control with a connection point below 110kV shall be capable of operating across the normal operational voltage range of the network at the connection point, defined by the relevant system operator. This range shall lie within the range specified in Article 12(1) and shall, prior to regulatory approval, undergo a consultation of the relevant stakeholders pursuant to Article 8(1).

(c) the control system of the demand side response system frequency control shall be insensitive within a dead band around the nominal system frequency of 50.00 Hz, of a width to be defined by the relevant TSO in consultation with the TSOs in the synchronous area. For equipment used by demand facilities below 110kV, these specifications shall, prior to regulatory approval, undergo a consultation of the relevant stakeholders pursuant to Article 8(1).

(d) the demand side response system frequency control shall provide a response to deviations in network frequency across a frequency range, defined by the relevant TSO, in consultation with the TSOs in the synchronous area. For equipment used by demand facilities below 110kV, these specifications shall, prior to regulatory approval, undergo a consultation of the relevant stakeholders pursuant to Article 8(1).

(e) on return to frequency within the dead band defined in paragraph (c), a random time delay of up to 5 minutes shall be initiated before normal operation resumes.

(f) the maximum frequency deviation from nominal value of 50.00 Hz to respond to shall be defined by the relevant TSO in consultation with the TSOs in the synchronous area. For equipment used by demand facilities below 110kV, these specifications shall, prior to regulatory approval, undergo a consultation of the relevant stakeholders pursuant to Article 8(1).

(g) the controller of the equipment shall measure the actual system frequency. Measurements shall be updated at least every 0.2 seconds.

(h) with regard to the demand side response system frequency control's sensitivity and accuracy of the frequency measurement and the consequent modification of the demand, the equipment shall be able to detect a change in system frequency of 0.01 Hz, in order to give overall linear proportional system response. The equipment shall be capable of a rapid detection and response to changes in system frequency, to be defined by the relevant TSO in consultation with the TSOs in the synchronous area. An offset in the steady state measurement of frequency shall be acceptable up to 0.05 Hz.

(i) for system frequency above the dead band of nominal (50.00 Hz), the demand shall be raised and lowered for a system frequency below the dead band of nominal.

Article 22

Specifics provisions for demand side response very fast active power control

1. The relevant TSO in coordination with the relevant system operator may agree with a demand facility owner or a closed distribution system operator (including but not restricted through an aggregator) on a contract for the delivery of demand side response very fast active power control.

2. If such an agreement takes place, the contract in paragraph 1 shall define:

(a) a change of active power related to the rate-of-change-of-frequency for that portion of its demand;

(b) the operating principle of this control system and the associated performance parameters; and

(c) the response time for very fast active power control, which shall not be longer than 2 seconds.

Article 23
Power quality

All transmission connected demand facility owners and transmission connected distribution system operators shall ensure that their connection to the network does not result in a determined level of distortion or fluctuation of the supply voltage on the network, at the connection point. The level of distortion shall not exceed that allocated to them by the relevant TSO.

Article 24
Simulation models

1. All transmission connected demand facilities, distribution systems and demand facilities above 1000V providing demand side response shall fulfil the following requirements related to the simulation models or equivalent information. Demand facilities and closed distribution systems (including but not restricted through an aggregator) connected below 1000V and providing demand side response services are allowed to use an equipment certificate.

2. Each TSO may require the simulation models or equivalent information showing the behaviour of the transmission connected demand facility, and/or the transmission connected distribution system in both steady and dynamic states.

3. Each TSO shall define the content and format of those simulation models; or equivalent information. The content and format shall include:

   (a) steady and dynamic states, including 50 Hz component;

   (b) electromagnetic transient simulations at the connection point;

   (c) structure and block diagrams.

4. For the purpose of dynamic simulations, the simulation model or equivalent information defined in paragraph 1(a) shall contain the following sub-models or equivalent information:

   (a) power control;

   (b) voltage control;

   (c) demand facility and transmission connected distribution system protection models;

   (d) the constituent demand types, i.e. electro technical characteristics of the demand; and

   (e) converter models.

5. Each relevant system operator or relevant TSO shall define the requirements for the recordings of transmission connected demand facilities and/or transmission connected distribution systems, in order to compare the response of the model with these recordings.

Title III

Operational notification procedure for connection

Chapter 1

Connection of new demand facilities and new distribution system connections

Article 25
General provisions

1. The following Articles in Title III, Chapter 1 shall apply to new demand facilities and new distribution system connections.

2. Each demand facility owner or distribution system operator to which one or more of the requirements in Title II apply, shall confirm to the relevant system operator its ability to satisfy the technical design and operational criteria as referred to in Title II of this Regulation.

3. The relevant system operator shall define and make publically available further details concerning the operational notification procedure.

Article 26
Procedures for demand units with demand side response within a demand facility connected at or below 1000V

1. The operational notification procedure for a new demand unit with demand side response, within a new demand facility connected at or below 1000V, shall comprise an installation document.

2. The installation document template will be provided by the relevant system operator, and the contents agreed with the relevant TSO.

3. Based on an installation document, the demand facility owner shall submit information, either directly or indirectly (including but not restricted through an aggregator) to the relevant system operator. The date of this submission shall be prior to the offer in the market of the capacity of the demand side response by the demand unit. The requirements set in the installation document shall differentiate between different types of connections and between the different categories of demand side response services.

4. For subsequent demand units with demand side response, separate independent installation documents shall be provided.

5. The content of the installation document of individual demand units may be aggregated (including, but not restricted through an aggregator) by the relevant system operator or relevant TSO.

6. The installation document shall contain the following items:

   (a) the location at which the demand unit with demand side response is connected to the network;

   (b) the maximum capacity of the demand side response installation in kW;

   (c) the type of demand side response services provided as defined in Article 19;

   (d) the demand unit certificate and the equipment certificates as relevant for the demand side response services, or if not available, equivalent information determined by the relevant system operator; and

   (e) the contact details of the demand facility owner or the aggregator.

7. In case of permanent removal of the demand side response services in the demand unit, the demand facility owner shall notify the relevant system operator either directly or indirectly. This information may be aggregated (including but not restricted through an aggregator) as specified by the relevant system operator or relevant TSO.

Article 27

Procedures for demand facilities and closed distribution systems providing demand side response services and connected above 1000V, transmission connected demand facilities and transmission connected distribution system connections

1. The operational notification procedure for the connection of a demand facility or closed distribution system offering demand side response services, a transmission connected distribution system and a transmission connected demand facility, shall allow for the use of an equipment certificate.

2. The equipment certificate process may be used to collate verified data and performance for one or more demand units. The relevant system operator shall accept equipment certificates to verify data and performance in place of part of the operational notification procedure. An equipment certificate may be used to demonstrate compliance with the operational notification procedure within the same demand facility and closed distribution system providing demand side response services, transmission connected demand facility, and transmission connected distribution systems.

3. The demand facility owner or distribution system operator may use equipment certificates as validated information about components of the demand facility or distribution system, but equipment certificates shall not be used to indicate total compliance. Upon request by the demand facility owner or distribution system operator, the relevant system operator shall make available what parts of a project, if applicable, are acceptable instead of the full compliance process, and define the procedure to make use of equipment certificates in this process.

Article 28

Procedures for demand units with demand side response within a demand facility connected above 1000V

1. The operational notification procedure for connection for a new demand unit with demand side response, within a demand facility connected above 1000V, shall comprise a demand side response unit document (DSRUD). The relevant system operator, in coordination with the relevant TSO, shall define the content required for the DSRUD. The content of the DSRUD shall require a statement of compliance with the information defined in Articles 39 to 48 for demand facilities. The demand facility owner shall provide the information required and submit it to the relevant system operator. Subsequent demand units with demand side response shall provide separate DSRUDs.

2. Based on the DSRUD, the relevant system operator shall issue a final operational notification to the demand facility owner.

3. The demand facility owner shall notify, directly or indirectly (including but not restricted through an aggregator), to the relevant system operator or relevant TSO

about the permanent removal of the demand unit providing demand side response within the demand facility.

Article 29
Procedures for transmission connected distribution system connections and transmission connected demand facilities

The operational notification procedure for the connection of each new transmission connected distribution system and transmission connected demand facility shall comprise:

(a) an energisation operational notification;

(b) an interim operational notification; and

(c) a final operational notification.

Article 30
Energisation operational notification for transmission connected distribution system connections and transmission connected demand facilities

1. An energisation operational notification shall entitle the transmission connected demand facility owner or the transmission connected distribution system operator to energise its internal network by using the network connection that is defined by the connection point.

2. The relevant TSO shall issue an energisation operational notification subject to the fulfilment of the requirements of the relevant TSO in the relevant operational procedures. The preparation shall include the agreement on the protection and control, relevant to the connection point between the relevant TSO and the demand facility owner or distribution system operator.

Article 31
Interim operational notification for transmission connected distribution system connections and transmission connected demand facilities

1. An interim operational notification shall entitle the transmission connected demand facility owner or the transmission connected distribution system operator to operate the transmission connected demand facility, transmission connected distribution system, and/or demand unit by using the network connection that is defined by the connection point for a limited period of time.

2. The relevant TSO shall issue an interim operational notification, subject to the completion of a data and study review process.

3. For the purposes of the completion of the data and study review in paragraph 2, the relevant TSO may request the following information from the transmission connected distribution system or the transmission connected demand facility:

(a) an interim statement of compliance;

(b) detailed technical data of the transmission connected demand facility or the transmission connected distribution system with relevance to the network connection, that is defined by the connection point, as specified by the relevant TSO;

(c) equipment certificates of demand facilities and/or distribution system connections where these are relied upon as part of the evidence of compliance;

(d) studies demonstrating expected steady-state and dynamic performance as required by Chapters 4 and 5 of Title IV; and

(e) details of intended practical method of completing compliance tests according to Chapters 2 and 3 of Title IV.

4. The maximum period for the transmission connected demand facility owner or the transmission connected distribution system operator to remain in the interim operational notification status shall not exceed 24 months. The relevant TSO shall be entitled to specify a shorter interim operational notification validity period. In that case, an interim operational notification extension shall be granted only if the demand facility owner or the distribution system operator demonstrates substantial progress towards full compliance of the demand unit. At the time of interim operational notification extension, the outstanding issues shall be explicitly identified.

5. Upon request for derogation, the relevant TSO may grant a prolongation to the demand facility owner or the distribution system operator of the 24-month period for the demand unit to remain in the interim operational notification. The request shall be made before the expiry of the 24-month period and in accordance with the derogation procedure specified in Title V.

Article 32

Final operational notification for transmission connected distribution system connections and transmission connected demand facilities

1. The final operational notification shall entitle the transmission connected demand facility owner or the transmission connected distribution system operator to operate the transmission connected demand facility or transmission connected distribution system by using the network connection that is defined by the connection point.

2. The relevant TSO shall issue the final operational notification upon prior removal of all incompatibilities identified for the purposes of the interim operational notification status and subject to the completion of the data and study review process.

3. For the purposes of the completion of data and study review, the relevant TSO may request the following information from the transmission connected distribution system operator or the transmission connected demand facility owner:

(a) a statement of compliance; and

(b) an update of the applicable technical data, simulation models and studies in Article 31 (3)(b),(c),(d) and (e), including the use of actual measured values during testing.

4. The relevant TSO shall issue the final operational notification if the request for derogation addressed by transmission connected demand facility owner or transmission connected distribution system operator is granted.

5. The transmission connected demand facility owner or the transmission connected distribution system operator whose request for derogation is rejected, shall not be connected until the transmission connected demand facility owner or the

transmission connected distribution system operator, and the relevant TSO agree upon a resolution removing the incompliance. If the non-compliance cannot be addressed, the relevant TSO shall issue an interim operational notification, for a new demand facility or a new distribution system connection, or a limited operational notification, for a failure in service or a change or modification.

Article 33

Limited operational notification for transmission connected distribution system connections and transmission connected demand facilities

1. A transmission connected demand facility owner or a transmission connected distribution system operator, to whom a final operational notification has been granted, shall as soon as practicable inform the relevant TSO of the following circumstances:

   (a) the temporary modification or loss of capability of the transmission connected demand facility or the transmission connected distribution system, which affects the performance of the transmission demand facility or the transmission connected distribution system to meet the requirements of Title II; or

   (b) about equipment failures leading to non-compliance with any relevant requirements.

2. Within 1 month after events set out in paragraph 1 take place, the transmission connected demand facility owner or the transmission connected distribution system operator shall apply to the relevant TSO for a limited operational notification, if they expect the events to persist for more than three months.

3. The relevant TSO shall issue a limited operational notification, which shall clearly identify the following:

   (a) the unresolved issues justifying the granting of the limited operational notification;

   (b) the responsibilities and timescales for the expected solution; and

   (c) an initial period of validity.

4. The initial period of validity, specified in paragraph 3(c), might be extended provided that evidence is submitted to demonstrate substantial progress in terms of achieving full compliance. The total period of validity of a limited operational notification shall not exceed 12 months.

5. A prolongation of the 12 months period for the transmission connected demand facility owner or the transmission connected distribution system operator to remain in the limited operational notification status may be granted upon request for derogation made to the relevant TSO.

6. The request shall be made before the expiry of the 12 months period and in accordance with the derogation procedure specified in Title V.

7. The relevant TSO may refuse the operation of the transmission connected demand facility or the transmission connected distribution system connection, if the limited operational notification ends without removal of the circumstances which caused its issuing. In such a case, the final operational notification shall automatically be invalid.

Chapter 2

Cost benefit analysis

Article 34

Identification of costs and benefits of application of rules to existing demand facilities and existing distribution systems or for a request for a derogation

1. In order to assess the costs and benefits of the application of any requirement set out in this Regulation to existing demand facilities and existing distribution systems or in order to assess the costs and benefits of a request for derogation in accordance with Articles 53 or 54, the process described in Article 35 shall be initiated with a preparatory stage aimed at identifying cases of merit in accordance with the phases set out in paragraphs 2 to 9.

2. For the application of any requirement set out in this Regulation to existing demand facilities and existing distribution systems, and in order to assess the costs and benefits of a request for derogation in accordance with Article 54, in the preparatory stage, the relevant TSO shall undertake a qualitative comparison of costs and benefits related to the requirement under consideration for application to existing demand facilities and existing distribution systems which shall take into account available network-based or market-based alternatives. The relevant TSO may only proceed to undertake a quantitative cost-benefit analysis, as described in paragraphs 4 to 9, if the qualitative comparison indicates that the likely benefits exceed the likely costs. If, however, the cost is deemed high or the benefit is deemed low, then the relevant TSO may not proceed further.

3. In order to assess the costs and benefits of a request for derogation pursuant to Article 53, in the preparatory stage, the demand facility owner or distribution system operator shall undertake a qualitative comparison of costs and benefits related to the requested derogation which shall take into account available network-based or market-based alternatives, and shall submit this analysis to the relevant TSO. The relevant TSO shall comment on this qualitative analysis within three months. If the qualitative comparison does not indicate that the likely benefits exceed the likely costs, the TSO shall recommend that the demand facility owner or distribution system operator not proceed to a quantitative cost-benefit analysis, as described in paragraphs 4 to 7 and withdraw the request for derogation. After having received the comments, the power generating facility owner shall decide whether to proceed to a quantitative cost-benefit analysis.

4. Following an assessment under paragraph 2, the relevant TSO shall carry out a quantitative cost-benefit analysis of any requirement under consideration for application to existing demand facilities and existing distribution systems that has demonstrated potential benefits as a result of the preparatory stage according to paragraph 1. That cost-benefit analysis shall include, inter alia, a proposal for a transitional period for applying the requirement to existing demand facilities and existing distribution systems. That transitional period shall not be more than two years from the date of the decision of the regulatory authority or, where applicable, the Member State on the requirement’s applicability.

   Following an assessment under paragraph 3, the demand facility owner or distribution system operator may, taking into consideration the comments and recommendation from the relevant TSO, decide to carry out a quantitative cost-benefit analysis of any requirement under consideration for derogation from this

Regulation. That cost-benefit analysis shall be followed by a public consultation in accordance with Article 8 (1).

5. Demand facility owners, DSOs and CDSOs shall assist and contribute to the cost-benefit analysis and provide the data requested by the relevant TSO within three months of receiving a request, unless agreed otherwise. For the preparation of a cost-benefit-analysis by a demand facility owner or distribution system operator assessing a potential derogation pursuant to Article 53, the relevant TSO and if applicable DSO, including CDSO, or demand facility owners shall assist and contribute to the cost-benefit analysis and provide the data requested by the power generating facility owner within three months of receiving a request, unless agreed otherwise.

6. The cost-benefit analysis shall be in line with the following principles:

   (a) the relevant TSO, DSO, or demand facility owner shall base its cost-benefit analysis on one or more of the following calculating principles:

      (i) the net present value;

      (ii) the return on investment;

      (iii) the rate of return; and

      (iv) the time needed to break even;

   (b) the relevant TSO, DSO, or demand facility owner shall also quantify socio-economic benefits in terms of improvement in security of supply and shall include at least:

      (i) the associated reduction in probability of loss of supply over the lifetime of the modification;

      (ii) the probable extent and duration of such loss of supply; and

      (iii) the societal cost per hour of such loss of supply;

   (c) the relevant TSO, DSO, or demand facility owner shall quantify the benefits to the internal market in electricity, cross-border trade and integration of renewable energies, including at least:

      (i) the frequency response;

      (ii) the reserve holding;

      (iii) the reactive power provision;

      (iv) congestion management; and

      (v) defence measures;

   (d) the relevant TSO, DSO, or demand facility owner shall quantify the costs of applying the necessary rules to existing demand facilities and distribution systems, including at least:

      (i) the direct costs incurred in implementing a requirement;

      (ii) the costs associated with attributable loss of opportunity; and

      (iii) the costs associated with resulting changes in maintenance and operation.

7. Within three months of concluding the cost-benefit analysis, the relevant TSO, or for the purpose of derogations under Article 53 the demand facility owner or DSO, shall summarise the findings in a report which shall:

(a) include a recommendation on how to proceed;

(b) be subject to public consultation.

No later than six months after the end of the public consultation, the relevant TSO shall prepare a report explaining the outcome of the consultation and making a proposal on the applicability of the requirement under consideration to existing demand facilities and distribution systems. The report and proposal shall be notified to the regulatory authority or, where applicable, the Member State, and the demand facility owner and DSO or, where applicable, third party shall be informed on its content. For the purpose of derogations under Article 53, the demand facility owner or DSO shall prepare the report and proposal, which shall be notified to the regulatory authority and the relevant TSO shall be informed on its content.

8. The proposal made by the relevant TSO to the regulatory authority or, where applicable, the Member State on the applicability of any requirement of this Regulation to existing demand facilities and existing distribution systems according to Article 5(3) shall include the following:

(a) an operational notification procedure for demonstrating the implementation of the requirements by the demand facility owner and the distribution system operator;

(b) a transitional period for implementing the requirements which shall take into account the demand facility or the distribution system, and any underlying obstacles to the efficient implementation of the equipment modification/refitting.

9. The relevant regulatory authority shall decide on the case within three months of receipt of the report and the recommendation of the relevant TSO, DSO or demand facility owner.

The decision of the regulatory authority shall be published.

Title IV

Compliance

Chapter 1

Compliance monitoring

Article 35

Responsibility of the demand facility owner and the distribution system operator

1. A demand facility owner or a distribution system operator shall ensure that respectively the equipment used to offer demand side response services, the distribution system and/or the distribution system connection complies with the requirements applicable under this Regulation.

2. The Regulation shall be complied with for as long as demand side response services are provided. The demand facility owner shall notify (including but not restricted through an aggregator) the relevant system operator in advance of any decision to cease offering demand side response services.

3. Where obligations are fulfilled through aggregators, aggregators shall only be required to inform the relevant system operator of changes to the total services being offered, taking account of location specific services.

4. Where the requirements of this Regulation are defined by the relevant TSO or are for the purpose of operation by the relevant TSO, alternative tests or criteria for test result acceptance for these requirements may be agreed with the relevant TSO.

5. The demand facility owner or the distribution system operator may partially or totally delegate to third parties the task of gathering relevant documentation evidencing compliance.

6. Any intention to modify the technical capabilities of the demand facility, distribution system or distribution system connection which impacts on compliance with the requirements in Chapters 2-6 of Title IV of the Regulation shall be notified to the relevant system operator, directly or indirectly (including but not restricted through an aggregator) prior to pursuing such modification, within the timeframe provided by the relevant system operator.

7. Any operational incidents or failures of the demand facility or the distribution system connection that impacts on compliance with the requirements in Chapters 2-6 of Title IV of the Regulation shall be notified to the relevant system operator, directly or indirectly (including but not restricted through an aggregator), as soon as possible after the occurrence of such an incident.

8. Any foreseen test schedules and procedures to verify compliance of the demand facility or the distribution system connection with the requirements of this Regulation shall be notified to the relevant system operator within the timeframe defined by the relevant system operator and approved by the relevant system operator prior to their commencement.

9. The relevant system operator shall be facilitated its participation in such test and may record the performance of the demand facility, distribution system and/or distribution system connection.

Article 36
Tasks of the relevant system operator

1. The relevant system operator shall assess the compliance of a demand facility, distribution system or a distribution system connection with the requirements of this Regulation, throughout the lifetime of the demand facility, distribution system or distribution system connection. The demand facility owner or the distribution system operator shall be informed of the outcome such monitoring.

2. The relevant system operator may request that the demand facility owner or the distribution system operator carries out compliance tests and simulations throughout the lifetime of the demand facility, distribution system or distribution system connection. Any such request shall follow in particular according to a plan or general scheme for repeated tests and simulations or after any failure, modification or replacement of any equipment with possible impact on the compliance of the demand facility or the distribution system connection to the requirements under this Regulation.

3. The relevant system operator shall make publicly available the list of information and documents to be provided as well as the requirements to be fulfilled by the

demand facility owner or the distribution system operator in the context of the compliance process. Such list shall, notably, cover the following information, documents and requirements:

(a) all documentation and certificates to be provided by the demand facility owner or the distribution system operator;

(b) details of the technical data required from the demand facility, distribution system or distribution system connection with relevance to the system connection or operation;

(c) requirements for models for steady-state and dynamic system studies;

(d) timely provision of system data required to perform studies;

(e) studies by the demand facility owner or the distribution system operator for demonstrating expected steady-state and dynamic performance referring to the requirements set forth in Chapters 4 and 5 of Title IV of this Regulation;

(f) conditions and procedures including scope for registering equipment certificates; and

(g) conditions and procedures for use by the demand facility owner or the distribution system operator of relevant equipment certificates instead of part of the activity for compliance as described in this Regulation.

4. The relevant system operator shall make publicly available the allocation of responsibilities to the demand facility owner or the distribution system operator and to the system operator for compliance testing, certification and monitoring.

5. The relevant system operator may partially or totally delegate the performance of its compliance monitoring to third parties.

6. The relevant system operator shall not unreasonably withhold any of the operational notifications in Articles 30 to 32, if compliance tests or simulations cannot be performed as agreed between the relevant system operator and the demand facility owner or the distribution system operator due to reasons which are in the sole control of the relevant system operator or outside the sole control of the demand facility owner or the distribution system operator.

Article 37
Common provisions for compliance testing

1. Testing of the performance of individual demand facility or distribution system shall aim at demonstrating that the requirements of this Regulation have been complied with.

2. Notwithstanding the minimum requirements for compliance testing set out in this Regulation, the relevant system operator is entitled to:

(a) allow the demand facility owner or the distribution system operator to carry out an alternative set of tests, provided that those tests are efficient and suffice to demonstrate that a demand facility or a distribution system complies with the requirements of this Regulation;

(b) require the demand facility owner or the distribution system operator to carry out additional or alternative sets of tests in those cases where the information supplied to the relevant system operator in relation to compliance testing under

the provisions of Chapter 2 or 3 of Title IV, is not sufficient to demonstrate compliance with the requirements of this Regulation.

3. The demand facility owner or the distribution system operator is responsible for carrying out the tests in accordance with the conditions laid down in Chapter 2 or 3 of Title IV. The relevant system operator shall cooperate and not unduly delay the performance of the tests.

4. The relevant system operator may participate in the compliance testing either on site or remotely from the system operator's control centre. For that purpose, the demand facility owner or the distribution system operator shall provide suitable monitoring equipment to record all relevant test signals and measurements as well as ensure that the necessary representatives of the demand facility owner or the distribution system operator are available on site for the entire testing period. Signals specified by the relevant system operator shall be provided if, for selected tests, the system operator wishes to use its own equipment to record performance. The relevant system operator has sole discretion to decide about its participation.

Article 38
Common provisions on compliance simulation

1. Simulation of the performance of individual demand facility or distribution system shall aim at demonstrating that the requirements of this Regulation have been fulfilled.

2. Simulations shall be run in the following circumstances:

   (a) a new connection is required

   (b) a further development, replacement or modernisation of equipment takes place; or

   (c) alleged incompliance by the relevant system operator with the requirements of this Regulation.

3. Notwithstanding the minimum requirements set out in this Regulation for compliance simulation, the relevant system operator may:

   (a) allow the demand facility owner or the distribution system operator to carry out an alternative set of simulations, provided that those simulations are efficient and suffice to demonstrate that a demand facility or a distribution system complies with the requirements of this Regulation or with national legislation; and

   (b) require the demand facility owner or the distribution system operator to carry out additional or alternative sets of simulations in those cases where the information supplied to the relevant system operator in relation to compliance simulation under the provisions of Chapter 5 or 6 of Title IV, is not sufficient to demonstrate compliance with the requirements of this Regulation.

4. To demonstrate compliance with the requirements of this Regulation, the demand facility owner or the distribution system operator shall provide a report with the simulation results for each individual demand facility or distribution system. The demand facility owner or the distribution system operator shall produce and provide a validated simulation model for a given demand facility or distribution system. The scope of the simulation models is set out in Article 24(1) and (2).

5. The relevant system operator may check that a demand facility or a distribution system complies with the requirements of this Regulation by carrying out its own compliance simulations based on the provided simulation reports, simulation models and compliance test measurements.

6. The relevant system operator shall provide the demand facility owner or the distribution system operator with technical data and a simulation model of the system, to the extent necessary to carry out the requested simulations in accordance with Chapter 5 or 6 of Title IV.

Chapter 2

Compliance testing for transmission connected distribution systems

Article 39

Compliance testing for disconnection for system defence and reconnection

1. The transmission connected distribution systems shall comply with the relevant TSO requirements for system defence and reconnection referred in Article 18 and shall be subject to the following compliance tests.

2. With regard to testing of the capability of reconnection after an incidental disconnection due to a network disturbance, reconnection shall be achieved through a reconnection procedure, preferably by automation, authorized by the relevant TSO.

3. With regard to synchronization testing, if required by the relevant TSO, the transmission connected distribution system shall demonstrate the synchronisation facilities. This test shall verify the settings of the synchronisation devices. It shall cover the following matters: voltage, frequency, phase angle range, deviation of voltage and frequency.

4. With regard to remote disconnection testing, the transmission connected distribution system shall be capable of remote disconnection at the connection point[s] from the transmission system when required by the relevant TSO within the time specified by the relevant TSO.

5. With regard to low frequency demand disconnection testing, the distribution system operator shall be able to demonstrate the capability of automatic low frequency disconnection of a percentage of demand to be specified by the relevant TSO, in coordination with adjacent TSOs, where equipped as defined in Article 18.

6. With regard to low frequency demand disconnection relays testing, the low frequency relays shall be tested to demonstrate, in accordance with Article 18(1) and (2), their functional capability for operation from a nominal AC supply input. This AC supply input shall be specified by the relevant TSO.

7. With regard to low voltage demand disconnection scheme testing, the low voltage demand disconnection scheme shall be tested to demonstrate, in accordance with Article 18(3), that their operation can be performed in a single action.

8. The equipment certificate may be being used instead as part of the tests in paragraph 1, provided that it is registered with the relevant TSO.

Article 40

Compliance testing for information exchange

1. With regard to information exchanges between the relevant TSO and the transmission connected distribution system, the transmission connected distribution system operator shall demonstrate to the relevant TSO the technical capability to comply with the standard defined in Article 17.

2. The equipment certificate may be used instead as part of the test in paragraph 1, provided that it is registered with the relevant TSO.

Chapter 3

Compliance testing for transmission connected demand facilities and closed distribution systems

Article 41

Compliance testing for disconnection for system defence and reconnection

1. The transmission connected demand facility as specified by the relevant TSO shall comply with the requirements for system restoration referred to in Article 18 and shall be subject to the following compliance tests.

2. With regard to testing of the capability of reconnection after an incidental disconnection due to a network disturbance, reconnection shall be achieved through a reconnection procedure, preferably by automation, authorized by the relevant TSO.

3. With regard to synchronization testing where required by the relevant TSO, the transmission connected demand facility shall be equipped with the necessary synchronisation facilities. This test shall cover the following matters: voltage, frequency, phase angle range, deviation of voltage and frequency.

4. With regard to remote disconnection testing, the transmission connected demand facility shall be capable of remote disconnection at the connection point[s] from the transmission system when required by the relevant TSO.

5. With regard to low frequency demand disconnection scheme tests, the low frequency demand disconnection shall be tested to demonstrate, in accordance with Article 18(1) and (2), their functional capability for operation from a nominal AC input. This AC input shall be specified by the relevant TSO.

6. With regard to low voltage demand disconnection schemes, the low voltage demand disconnection scheme shall be tested to demonstrate, in accordance with Article 18(3)(c) that their operation can be performed in a single action.

7. The equipment certificate may be used instead as part of the tests in paragraph 1, provided that it is registered with the relevant TSO.

Article 42

Compliance testing of demand side response for demand facilities or closed distribution systems

1. With regard to the demand modification test:

   (a) the demand facility, or aggregated demand facilities, or closed distribution system shall demonstrate their technical capability to modify their demand

consumption, after receiving an order from the relevant TSO, within the range, duration and time frame previously agreed and established in accordance with Article 20. This demonstration can be delegated to an aggregator.

(b) the test shall be carried out preferably either by an order or alternatively by simulating the receipt of an order from the relevant system operator and adjusting the power demand of the demand facility or the closed distribution system;

(c) the test shall be deemed passed, provided that the conditions defined by the relevant system operator pursuant to Article 20(2) (f) (g), (i), (j), (k), and (m) are cumulatively fulfilled; and

(d) an equipment certificate may be used instead in place of subparagraph (b), provided that it is registered with the relevant system operator.

2. With regard to the disconnection or reconnection of static compensation facilities test:

(a) the demand facility or closed distribution system shall demonstrate to the relevant system operator its technical capability to disconnect and/or reconnect its static compensation facilities when receiving an order from the relevant system operator, in the time frame expected in accordance with Article 20;

(b) the test shall be carried out by simulating the receipt of an order from the relevant system operator and subsequently disconnecting the static compensation facilities and by simulating the receipt of an order from the relevant system operator and subsequently reconnecting these facilities; and

(c) the test shall be deemed passed, provided that the conditions defined by the relevant system operator pursuant to Article 20(2)(h), (i), (j), (k) and (m) are cumulatively fulfilled.

Article 43
Compliance testing for information exchanges

1. With regard to information exchanges between the relevant TSO and the transmission connected demand facilities in real time or periodically, the transmission connected demand facility shall demonstrate the technical capability to comply with the standard defined by the relevant TSO pursuant to Article 17.

2. An equipment certificate may be used instead as part of the tests in paragraph 1, provided that it registered with the relevant system operator.

Chapter 4

Compliance simulations for transmission connected distribution systems

Article 44
Compliance simulations for reactive power ranges of transmission connected distribution systems

1. A steady-state load flow simulation model of the network of the transmission connected distribution system shall be used to calculate the reactive power demand under different load conditions and under different generation conditions. A combination of steady-state minimum and maximum load and generation conditions resulting in the lowest and highest reactive power demand shall be part of the

simulations. Calculating the reactive power export at an active power flow of less than 25% of the maximum import capability at the connection point shall be part of the simulations.

2. The relevant TSO may specify the method for compliance simulation of the active control of reactive power in Article 14(1)(c).

3. The simulation shall be deemed passed if the results prove compliance with the requirements in Article 14(1)(a),(b) and (c).

Chapter 5

Compliance simulations for demand facilities

Article 45
Compliance simulations for reactive power ranges of transmission connected demand facilities

1. With regard to transmission connected demand facilities without onsite generation, reactive power demand compliance simulations shall be carried out in the following conditions:

   (a) the transmission connected demand facility without onsite generation shall demonstrate its reactive power capability at the connection point;

   (b) a load flow simulation model of the transmission connected demand facility shall be used to calculate the reactive power demand under different load conditions. Minimum and maximum load conditions resulting in the lowest and highest reactive power demand at the connection point shall be part of the simulations;

   (c) the simulation is deemed passed if the simulations demonstrate compliance with the requirements in Article 14(1)(a).

2. With regard to the transmission connected demand facilities with onsite generation, reactive power compliance simulations shall be carried out in the following conditions:

   (a) the simulation shall be deemed passed if the simulations demonstrate compliance with the requirements described in Article 14(1)(a).

   (b) a load flow simulation model of the system of the transmission connected demand facility shall be used to calculate the reactive power demand under different load conditions and under different generation conditions. A combination of minimum and maximum load and generation conditions resulting in the lowest and highest reactive power capability at the connection point shall be part of the simulations.

Article 46
Compliance simulations for very fast active power control of demand facilities or closed distribution systems

1. The model of the demand facility or the closed distribution system shall demonstrate its capability to simulate very fast active power control capability to a low frequency event in the conditions in Article 22.

2. The simulation shall be deemed passed provided that the model demonstrates compliance with the conditions in Article 22.

Chapter 6

Compliance monitoring

Article 47

Compliance monitoring for transmission connected distribution systems

With regard to compliance monitoring of the reactive power requirements of transmission connected distribution systems:

(a) the reactive power shall be measured at each connection point;

(b) the connection point of the transmission connected distribution system shall be equipped with necessary equipment to measure the active and reactive power, in accordance with Article 14; and

(c) the relevant system operator shall specify the time schedule for compliance monitoring.

Article 48

Compliance monitoring for transmission connected demand facilities

With regard to compliance monitoring of the reactive power requirements of transmission connected demand facilities:

(a) the reactive power shall be measured at the connection point;

(b) the connection point of the transmission connected demand facility shall be equipped with necessary equipment to measure the active and reactive power, in accordance with Article 14; and.

(c) the relevant system operator shall specify the timeframe for compliance monitoring.

Chapter 7

Non-binding guidance and monitoring of implementation

Article 49

Non-binding guidance on implementation

1. No later than [*6 months after the entry into force of this Regulation*], the ENTSO for Electricity shall prepare and thereafter every two years provide non-binding written guidance to its members and other system operators concerning the elements of this Regulation requiring national decisions. The ENTSO for Electricity shall publish this guidance on its website.

2. ENTSO for Electricity shall consult stakeholders when providing non-binding guidance.

3. The non-binding guidance shall explain the technical issues, conditions and interdependencies which need to be considered when complying with the requirements of this Regulation at National level.

Article 50
Monitoring

1. ENTSO for Electricity shall monitor the implementation of this Regulation in accordance with paragraph 8 of Article 8 of Regulation (EC) No 714/2009. Monitoring shall cover in particular the following matters:

   (a) identification of any divergences in the National implementation of this Regulation; and

   (b) assessment of whether the choice of values and ranges in the requirements applicable to demand facilities and distribution systems under this Regulation continues to be valid.

2. The Agency, in cooperation with ENTSO for Electricity, shall produce by [*twelve months after the entry into force of this Regulation*] a list of the relevant information to be communicated by ENTSO for Electricity to the Agency in accordance with paragraph 9 of Article 8 and paragraph 1 of Article 9 of Regulation (EC) No 714/2009. This list of relevant information is without prejudice to the Agency's right to request from ENTSO for Electricity additional information necessary to fulfil its tasks under paragraph 1 of Article 9 of Regulation (EC) No 714/2009. ENTSO for Electricity shall maintain a comprehensive, standardised format, digital data archive of the information required by the Agency.

3. Relevant system operators and relevant TSOs shall submit to ENTSO for Electricity the information required to perform the tasks referred to in paragraphs 1 and 2.

4. Where ENTSO for Electricity or the Agency establish areas subject to this Regulation where, based on market developments or experience gathered in the application of this Regulation, further harmonisation of the requirements under this Regulation is advisable to promote market integration, they shall propose draft amendments to this Regulation pursuant to Article 7 (1) of Regulation (EC) No 714/2009.

Title V

Derogations

Article 51
Power to grant derogations

Regulatory authorities or, where applicable, the Member State, may, at the request of a demand facility owner, a distribution system operator, or a relevant system operator or relevant TSO, grant demand facility owners, distribution system operators, relevant system operators or relevant TSOs derogations from one or more requirements of this Regulation for new and existing demand facilities or distribution systems in accordance with Articles 52 to 54.

Article 52
General provisions

1. Each regulatory authority or, where applicable, the Member State shall specify, after consulting the parties concerned, including system operators, the criteria for granting derogations pursuant to Article 53. It shall publish those criteria and notify them to

the Commission by [*6months* following the entry into force of this Regulation]. The Commission may require the regulatory authority or, where applicable, the Member State to amend the criteria if it considers that they are not in line with this Regulation or its objectives.

2. If the regulatory authority or, where applicable, the Member State deems that it is necessary due to a change in circumstances, it may review and amend at most once every year the criteria for granting derogations in accordance with the process in paragraph 1.

3. The regulatory authority or, where applicable, the Member State may decide that demand facilities and distribution systems for which a request for derogation has been filed pursuant to Articles 53 or 54 do not need to comply with the requirements of this Regulation from the day of filing the request until the regulatory authority's or, where applicable, the Member State's decision is issued.

Article 53

Request for derogation by a demand facility owner or distribution system operator

1. Demand facility owners or distribution system operators may request derogations for demand facilities or distribution systems within their facilities.

2. Demand facility owner or distribution system operator shall file their requests for derogations with the relevant system operator. The relevant system operator shall ensure that such requests can be made by third parties. Each request for derogation shall include:

   (a) an identification of the demand facility owner or the distribution system operator, and a contact person for any communications;

   (b) a description of the demand facilities or distribution systems for which a derogation is requested;

   (c) a reference to the requirement or requirements of this Regulation from which a derogation is requested and a detailed description of the requested derogation;

   (d) detailed reasoning, with relevant supporting documents;

   (e) the demonstration that the requested derogation would have no adverse effect on cross-border trade;

   (f) a cost-benefit analysis pursuant to the requirements of Article 34(4) and (5). If applicable, the cost-benefit analysis shall be carried out in coordination with the relevant TSO and any adjacent DSO or DSOs.

3. Within two weeks of receipt of a request for derogation, the relevant system operator shall confirm to the demand facility owner or the distribution system operator whether the request is complete. If the relevant system operator considers that the request is incomplete, the demand facility owner or the distribution system operator shall submit the additional required information within one month from the receipt of the request for additional information.

4. The relevant system operator shall, in coordination with the relevant TSO and any affected adjacent DSO or DSOs, assess the request for derogation and the provided cost-benefit analysis, taking into account the criteria determined by the regulatory authority or, where applicable, the Member State pursuant to Article 52.

5. Within six months of receipt of a request for derogation, the relevant system operator shall forward the request to the regulatory authority or, where applicable the Member State, and submit the assessment prepared in accordance with paragraph 4. That period may be extended by one month where the relevant system operator seeks further information from the demand facility owner or the distribution system operator and by two months where the relevant system operator requests the relevant TSO to submit an assessment of the request for derogation.

6. The regulatory authority or, where applicable, the Member State shall adopt a decision concerning any request for derogation within three months from the day after it is received. That time limit may be extended by three months before its expiry where the regulatory authority or, where applicable, the Member State requires further information from the demand facility owner, or the distribution system operator or from any other interested parties. The additional period shall begin when the complete information has been received.

   The demand facility owner or the distribution system operator shall submit any additional information requested by the regulatory authority or, where applicable, the Member State within two months of such request. If the demand facility owner or the distribution system operator does not supply the requested information within that time limit, the request for derogation shall be deemed withdrawn unless, before its expiry:

   (a) the regulatory authority or, where applicable, the Member State decides to provide an extension; or

   (b) the demand facility owner or the distribution system operator informs the regulatory authority or, where applicable, the Member State by means of a reasoned submission that the request for derogation is complete.

7. The regulatory authority or, where applicable, the Member State shall issue a reasoned decision concerning a request for derogation. Where the regulatory authority or, where applicable, the Member State grants derogation, it shall specify its duration.

8. The regulatory authority shall notify its decision to the relevant demand facility owner or distribution system operator, the relevant system operator, the relevant TSO and the Agency.

9. A regulatory authority or, where applicable, the Member State may revoke a decision granting a derogation if the circumstances and underlying reasons no longer apply or upon reasoned recommendation of the Commission or reasoned recommendation by the Agency pursuant to Article 56 (2) of this Regulation.

Article 54

Request for derogation by a relevant system operator or relevant TSO

1. Relevant system operators or relevant TSO may request derogations for demand facilities or distribution systems connected or to be connected to their system.

2. Relevant system operators or relevant TSO shall file their requests for derogation with the regulatory authority or, where applicable, the Member State. Each request for derogation shall include:

   (a) identification of the relevant system operator or relevant TSO, and a contact person for any communications;

(b) a description of the demand facilities or the distribution systems for which a derogation is requested;

(c) the requirement or requirements of this Regulation for which a derogation is requested, with a detailed description of the requested derogation;

(d) detailed reasoning, with all relevant supporting documents;

(e) the demonstration that the requested derogation would have no adverse effect on cross-border trade;

(f) a cost-benefit analysis pursuant to the requirements of Article 34(4) and (5). If applicable, the cost-benefit analysis shall be carried out in coordination with the relevant TSO and any adjacent DSO or DSOs.

3. Where the request for derogation is filed by a relevant DSO or CDSO, the regulatory authority or, where applicable, the Member State shall, within two weeks from the day after receipt of that request, ask the relevant TSO to assess the request for derogation in the light of the criteria determined by the regulatory authority or, where applicable, the Member State pursuant to Article 52.

4. Within two weeks from the day after the receipt of such request for assessment, the relevant TSO shall confirm to the relevant DSO or CDSO whether the request for derogation is complete. If the relevant TSO considers that it is incomplete, the relevant DSO or CDSO shall submit the required additional information within one month from the receipt of the request for additional information.

5. Within six months of receipt of a request for derogation, the relevant TSO shall submit to the regulatory authority or, where applicable, the Member State its assessment, including any relevant documentation. This time limit may be extended by one month where the relevant TSO seeks further information from the relevant DSO or from the relevant CDSO.

6. The regulatory authority or, where applicable, the Member State shall adopt a decision concerning a request for derogation within three months of receipt of the request by the relevant TSO. Where the request for derogation is filed by the relevant DSO or CDSO, the three-month time limit runs from the day following receipt of the relevant TSO's assessment pursuant to paragraph 5.

7. The three-month time limit referred to in paragraph 6 may, before its expiry, be extended by an additional three months where the regulatory authority or, where applicable, the Member State requests further information from the system operator requesting the derogation or from any other interested parties. That additional period shall run from the day following the date of receipt of the complete information.

The system operator shall provide any additional information requested by the regulatory authority or, where applicable, the Member State within two months from the date of the request. If the system operator does not provide the requested additional information within that time limit, the request for derogation shall be deemed withdrawn unless, before expiry of the time limit:

(a) the regulatory authority or, where applicable, the Member State decides to provide an extension; or

(b) the system operator informs the regulatory authority or, where applicable, the Member State by means of a reasoned submission that the request for derogation is complete.

8. The regulatory authority or, where applicable, the Member State shall issue a reasoned decision concerning a request for derogation. Where the regulatory authority grants derogation, it shall specify its duration.

9. The regulatory authority or, where applicable, the Member State shall notify its decision to the system operator requesting the derogation, the relevant TSO and the Agency.

10. Regulatory authorities or, where applicable, the Member State, may lay down further requirements concerning the preparation of requests for derogation by system operators. In doing so, regulatory authorities or, where applicable, the Member State, shall take into account the delineation between the transmission system and the distribution system at the national level and shall consult with system operators, demand facility owners and stakeholders, including manufacturers pursuant to Article 8 (1).

11. A regulatory authority or, where applicable, the Member State may revoke a decision granting a derogation if the circumstances and underlying reasons no longer apply or upon reasoned recommendation of the Commission or reasoned recommendation by the Agency pursuant to paragraph 3 of Article 56 of this Regulation.

Article 55

Register of derogations from the requirements of this Regulation

1. Each regulatory authority or, where applicable, the Member State shall maintain a register of all derogations it has granted or refused and shall provide the Agency with an updated and consolidated register at least once every six months, a copy of which shall be given to ENTSO for Electricity.

2. The register shall contain, in particular:

   (a) the requirement or requirements for which a derogation is granted or refused;

   (b) the content of the derogation;

   (c) the consequences resulting from granting the derogation; and

   (d) the reasons for granting or refusing the derogation.

Article 56

Monitoring of derogations from requirements of this Regulation

1. The Agency shall monitor the derogation process with the cooperation of the regulatory authorities or relevant authorities of the Member State. Those regulatory authorities or relevant authorities of the Member State shall provide the Agency with all the information necessary for that purpose.

2. The Agency may issue a reasoned recommendation to a regulatory authority to revoke derogation due to a lack of justification. The Commission may issue a reasoned recommendation to a regulatory authority or relevant authority of the Member State to revoke derogation due to a lack of justification

3. The Commission may request the Agency to report on the application of paragraphs (1) and (2) and to provide reasons for requesting or not requesting derogations to be revoked.

Title VI

Final provisions

Article 57
Amendment of contracts and general terms and conditions

1. All relevant clauses in contracts and general terms and conditions relating to the grid connection of new demand facilities and new distribution systems shall be brought into compliance with the requirements of this Regulation.

2. All relevant clauses in contracts and relevant clauses of general terms and conditions relating to the grid connection of existing demand facilities and existing distribution systems shall be amended in order to comply with the requirements of this Regulation. The relevant clauses shall be amended within three years following the decision of the regulatory authority or Member State as referred to in Article 5(6). The requirement for amendment shall apply regardless of whether the relevant contracts or general terms and conditions provide for such an amendment.

3. Member States and regulatory authorities shall ensure that National contracts between transmission system operators and demand facilities owners or distribution system operators relating to grid connection requirements for demand facilities or distribution systems, in particular in National Network Codes, reflect the requirements set out in this Regulation.

Article 58
Entry into force

1. This Regulation shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Union.

2. Without prejudice to point (b) of Article 5(2), Article 5(1), (3) and (4), Article 49, Article 50, Article 52 and Title IV this Regulation shall apply from *3 year period after publication*. This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the Commission
The President