GRID CODE – CONNECTIONS CODE

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Connections Code

1 Introduction

1.1 The terms and conditions on which connection to the transmission system is granted will be set out in a commercial agreement, entered into by the user and the transmission system operator (TSO). This is called the Connection Agreement (CA) and is contractual agreement between the TSO and the user for each individual connection point of the transmission system. Where a user has multiple connections on a single site then only a single CA is required.

1.2 The TSO by entering into a CA with a particular user must ensure that the quantity and quality of service to be in accordance with the criteria set out within this connections code, except if specifically varied by the relevant CA.

1.3 Users by entering into a CA with the TSO must ensure that they abide by the rules, procedures, technical specifications and equipment requirements as outlined in this code.

2 Objective

The connections code is designed to ensure that:

a) There are appropriate procedures for connection of, new or refurbished, user's plant and apparatus and that the basic rules for connection treat all users in a non-discriminatory fashion and in accordance with all statutory and licence obligations;

b) The minimum technical, design and operational criteria specified in this connections code are designed so that a new or modified connection to the transmission system shall:

- Not deteriorate the system operating conditions compared to the conditions defined in this connections code;
- Nor impose the same conditions on the transmission system or on the system of any other user:

3 Scope of application

3.1 This connections code shall apply to all parties that apply and those connected to the transmission system. This covers all those whose current or prospective activities which includes the following categories:

a) Power-generating facilities with power-generating module connected to the transmission system;

b) Power Park module (Wind and Solar Powered Generating Station with installed capacity ≥ 5 MW);

c) Generating module connected to the distribution system with capacity more than 5 MW;

d) Transmission-connected distribution facilities

e) The Transmission System Operator (TSO);

f) Distribution system operator (DSO);

g) Transmission-connected demand facility.

3.2 This Code, therefore, helps to ensure fair conditions of competition in the internal electricity market, to ensure system security and the integration of renewable electricity sources, and to facilitate Union-wide trade in electricity

3.3 This Code also lays down the obligations for ensuring that TSO makes appropriate use of the demand facilities' and distribution system' capabilities in a transparent and non-discriminatory manner to provide a level playing field.

3.4 The TSO shall refuse to allow the connection of a new transmission user's, which does not comply with the requirements set out in this Code and which is not covered by a derogation granted by the regulatory authority. The TSO shall communicate such refusal, by means of a reasoned statement in writing, to the transmission users and, unless specified otherwise by the regulatory authority, to the regulatory authority.

3.5 In case of demand facilities with more than one demand unit, these demand units shall together be considered as one demand unit if they cannot be operated independently from each other or can reasonably be considered in a combined manner

3.6 This Code shall not apply to:

a) power-generating modules that were installed to provide back-up power and operate in parallel with the system for less than five minutes per calendar month while the system is in normal system state. Parallel operation during maintenance or commissioning tests of that power-generating modul shall not count towards the five-minute limit;

b) power-generating modules that do not have a permanent connection point and are used by the system operators to temporarily provide power when normal system capacity is partly or completely unavailable;

c) storage devices except for pump-storage power-generating modules (which shall fulfil all the relevant requirements in both generating and pumping operation mode);

4 Application to existing transmission users

It is acknowledged that some existing plant and/or apparatus will, in part or in whole, be unable to comply with some of the minimum standards specified in this connections code, either because the plant was designed to different standards or because of deterioration against design specification. In order to continue to operate, the derogation must be sought and granted. For any equipment that met the prevailing standards at the time of installation and still meets these standards the granting of the derogation should be automatic. All other cases will be considered on a case by case basis.

4.1 If the existing power-generating facility owners have modified their power-generating facility to such an extent that its connection agreement must be substantially revised in accordance with the following procedure:

a) power-generating facility owners who intend to undertake the modernisation of a plant or replacement of equipment impacting the technical capabilities of the power-generating module shall notify their plans to the TSO in advance;

b) if the TSO considers that the extent of the modernisation or replacement of equipment is such that a new connection agreement is required, the system operator shall notify the regulatory authority and

c) the regulatory authority shall decide if the existing connection agreement needs to be revised or a new connection agreement is required and which requirements of this Code shall apply;

4.2 If an existing transmission-connected demand facility, an existing distribution system, or an existing transmission connected demand unit within a demand facility at a voltage level above 1kV, has been modified to such an extent that its connection agreement must be substantially revised in accordance with the following procedure:

a) demand facility owners, DSO, who intend to undertake the modernisation of a plant or replacement of equipment impacting the technical capabilities of the transmission-connected demand facility, the distribution system, or the demand unit shall notify their plans to the TSO in advance;

b) if the TSO considers that the extent of the modernisation or replacement of equipment is such that a new connection agreement is required, the system operator shall notify the regulatory authority and

c) the regulatory authority shall decide if the existing connection agreement needs to be revised or a new connection agreement is required and which requirements of this Code shall apply.

4.3 Regulatory authority decides to make an existing transmission-connected demand facility, an existing transmission-connected distribution facility, existing distribution system, or an existing demand unit subject to all or some of the requirements of this code following a proposal from the TSO in accordance with paragraphs 4.5, 4.6 and 4.7

4.4 For the purposes of this Code, a transmission-connected demand facility, a transmission-connected distribution facility, a distribution system, or a demand unit that is, or can be, used by a demand facility to provide demand response services to DSO or to TSO, shall be considered as existing if:

a) is already connected to the network until the date of entry into force of this Connection Code amended in 2018;; or

b) the demand facility owner, DSO has concluded a final and binding contract for the purchase of the main demand equipment or the demand unit by two years after the expiry of the transposition deadline. The demand facility owner, DSO must notify TSO of the conclusion of the contract within 30 months after the date of entry into force of this Connection Code amended in 2018

The notification submitted by the demand facility owner or DSO, to the TSO shall at least indicate the contract title, its date of signature and date of entry into force, and the specifications of the main demand equipment or the demand unit to be constructed, assembled or purchased.

The regulatory authority may determine whether the transmission-connected demand facility, the transmission-connected distribution facility, the DSO, or the demand unit is to be considered existing or new.

4.5 Following a public consultation 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 response, the TSO may propose to the regulatory authority to extend the application of this Code to existing transmission-connected demand facilities, existing transmission-connected distribution facilities, existing distribution system, or existing demand units used by a demand facility to provide demand response services to DSO or to TSO.

4.6 The regulatory authority shall decide on the extension of the applicability of this Code to existing transmission-connected demand facilities, existing transmission-connected distribution facilities, existing distribution system, or existing demand units, within six months of receipt of the report and the recommendation of the TSO. The decision of the regulatory authority shall be published

4.7 The TSO shall take account of the legitimate expectations of demand facility owners or DSO as part of the assessment of the application of this Code to existing transmission-connected demand facilities, existing transmission-connected distribution facilities, existing distribution system, or existing demand units

4.8 The TSO may assess the application of some or all of the provisions of this Code to existing transmission-connected demand facilities, existing transmission-connected distribution facilities, existing distribution system, or existing demand units, every three years in accordance with the requirements and process set out in paragraphs 4.5 to 4.6

5 Connection Procedure

The TSO must offer to enter into a CA with various categories of Users with reference to the following:

a) new connection points;

b) existing connection points;

c) modifications at a connection points;

5.1 Connection Agreements

5.1.1 General Conditions of CA

5.1.1.1 All users are subject to the same requirements for connection and by entering into a CA with the TSO they must ensure that they abide by the rules, procedures, technical specifications and equipment requirements as outlined in this connections code except if specifically varied by the relevant CA.

5.1.2 CA Specific Conditions

5.1.2.1 The CA must contain the specific conditions that have been agreed to for connection and access to the transmission network. Data and records exchanged must be part of the CA and, if applicable, must include but are not limited to some or all of the following:

a) Details of the connection point (ownership, configuration, list of associated assets, associated plant identification and nomenclature, fault levels, short circuit infeed's, impedances, switchgear ratings, nominal voltages, protection equipment type/fault clearance time/settings of relays, inter-tripping schemes, special automatic features etc.);

b) Bus-bar protection schemes and settings;

c) System splitting or islanding schemes that impact on a **power-generating facilities**;

d) Frequency and voltage sensitive **power-generating module** protection settings;

e) Registered capacity and the power transfer capability of associated **power-generating units;**

f) The agreed authorised demand that may be supplied to the **User;**

g) Details of the metering groups, metering arrangements and adjustments for losses where the actual metering equipment is not set in the **Connection Point;**

h) Details on requirements for CMTs, VMTs, contacts for protection, metering, interlocking etc;

i) Testing intervals for protection relay systems;

j) Agreed protocols for maintenance co-ordination;

k) Operational diagrams;

l) Site drawings – site connection;

m) Any site specific special conditions, derogations, exemptions etc;

n) Any specific priority, operational conditions and/or switching arrangements required for security reasons;

o) Any other data in text or diagram form that will be deemed necessary by both **parties.**

5.1.2.2 The standard of service to be provided at each connection point must be specified in the relevant **CA**, and will include a connection capacity such that in the normal operating state, the transmission system be capable of providing this capacity. If user wants to use higher capacity than capacity of the connection then it should make amending of the **CA**. Connection capacity with include changing individual peak demands and the necessity to withstand credible contingency events.

5.1.2.3 In **CA** can be specified connection revised capacity in order to be available during the single element outage. This connection capacity may be either:

a) zero;

b) a nominated proportion of the normal power transmission capacity;

c) the normal power transfer capacity.

5.1.2.4 In a **CA** may state the expected proportion of time that the normal capability will not be achieved, taking account of specific design, locational and seasonal influences that may affect performance and the random nature of element outages.

5.1.3 Connection Arrangements

5.1.3.1 The design of connections between the transmission system and users shall be in accordance with the principles set out in this connections code, subject to any modification agreed by the TSO.

5.1.3.2 During the 'application for connection' process the TSO will specify the voltage level to which a user will be connected in accordance with its normal practice for the type of load to be supplied. The TSO may specify a different connection voltage from normal in order to avoid potential disturbance caused by the user's apparatus to other users of the transmission system or for other technical reasons or may agree alternative methods for minimising the effects of disturbing loads.

5.1.3.3 If in the reasonable opinion of the TSO a connection would be more appropriately made to the distribution system then the TSO shall refer the application with the reasons for their decision to the DSO.

5.2 Connection Application & Approval Procedure

5.2.1 Timescales

Timescales set for review of Connection Application, are to be implemented as defined in Transmission Connection Charging Methodology.

5.2.2 Connection Application

5.2.2.1 For a new connection point or a modification to an existing connection point, each user must submit a formal connection application to the TSO, advising it of the type, magnitude, timing and all other relevant information. This information is required to enable the TSO to assess the application, including the power transmission capability that the system interconnection facilities should provide. It applies to both applicants for connection that need to be supplied with electric energy (demand facility owners) or to applicants who wish to export the generated electric energy for sale (generation facility owners). A DSO who requires a connection to the transmission system is a user.

5.2.2.2 During the initial phase the user will submit the standard planning data and the preliminary project planning data as specified in the planning code. Although this data will be treated by the TSO as confidential data it may be shared with other system operators if this is necessary to progress the application.

5.2.2.3 Where the design or technical details submitted in the application to connect do not satisfy the requirements specified by the TSO and are not in accordance with the provisions of this connections code then the user must inform the TSO when submitting the application.

5.2.2.4 Prior to the formal application being submitted the user may have undertaken a feasibility study with the TSO as outlined in the planning code. This is an optional exercise and the initial meeting will be provided as a free service by the TSO. However if the user requests the TSO to carry out more detailed or additional work then the TSO may make a reasonable charge in order to cover the costs of the work.

5.2.2.5 Data's and information included in the connection application, TSO will treat as confidential data's and information, which should not be disclosed and not be given to a third party, except if TSO may give details to another TSO, that according to its reasonable judgment is needed to do so for purposes of performing studies for system planning. These data's and information, can also be used to allow TSO to assess the effects of proposed equipment on transmission system performance to assess the level of any ancillary service that should be ensure for that connection point.

5.2.3 Offer to Connect

5.2.3.1 The TSO must, in response to connection application, shall provide the applicant with a completed offer within the timescales laid down in the Transmission Connection Charging Methodology.

5.2.3.2 When the TSO provides the Connection Offer, TSO must use its reasonable endeavours to advise the user of all risks and obligations in respect of the proposed connection, associated with any planning and environmental legislation.

5.2.3.3 Users provide any additional information in relation to the connection application that reasonably is required to assess the technical performance and costs involved in the offer.

5.2.3.4 If the connection application indicates, or the TSO has reasonable grounds to believe, that the facilities proposed to be connected will cause distortion of the waveform, fluctuation in voltage or unbalance between the three phases of the voltage at this or another connection point, then the TSO must notify the user of the reduced levels of such distorting effects that must be achieved before connection can occur. The TSO must also provide to the user all information that is reasonably required to allow the latter to design the facility to achieve these levels.

5.2.3.5 The TSO in preparing the connection offer must include provisions for remote control equipment and remote monitoring equipment required for system operation as specified in paragraph 7.3.4 of this connections code.

5.2.3.6 The connection offer must contain the proposed terms and conditions for connection to the transmission system in relation only to the connection assets and associated equipment plant and apparatus that are the responsibility of the user. The TSO has the responsibility in relation to alterations and/or extension works required to the rest of the transmission network.

5.2.3.7 The connection offer must be fair and reasonable and must be consistent with the transmission system security and planning standards of transmission system.

5.2.3.8 The connection offer may contain more than one option for connection to the transmission system and/or at different levels of service and with different terms and conditions.

5.2.3.9 Both the TSO and the user are entitled to negotiate in respect of the provision of the connection and any other matters relevant to the provision of the connection and if negotiations occur then such negotiations must be conducted in good faith.

5.2.3.10 For complex connections due to the size, nature, location or timing of the proposal, the TSO may decide that additional more extensive system studies are required in order to evaluate more fully the impact of the proposed user development on the transmission system. Where the TSO judges that such studies are necessary, the connection offer may indicate the areas that require more detailed analysis. Before such additional studies are carried out, the user shall indicate whether it wishes the TSO to undertake the work necessary to proceed to make a revised connection offer. In such case TSO may recover the reasonable cost of these studies from the user.

5.2.4 Finalizations of Connection Agreements

5.2.4.1 If a user wishes to accept an offer to connect, then the user must take the following steps:

a) Inform the TSO, in writing, that he accepts the offer within the time period stated in the offer which in any case must be no less than 30 days, after which it automatically lapses;

b) Within 30 days enter into a CA with the TSO;

5.2.4.2 The provision of the connection, by the TSO as detailed above, may be made subject to gaining any environmental and planning approvals for any necessary alterations or extension works to the transmission system. The Transmission Connection Charging Methodology will assign responsibilities of obtaining the approvals needed for environmental and planning work subject to the provisions of the Energy Law and Instructions from responsible Ministry)

6 Ownership – Commercial Boundaries

6.1 The Division of ownership

6.1.1 The division of ownership between plant and apparatus of TSO and users shall be under the technical boundary as specified in section 6.2 of this code. The commercial boundary in all cases will be the measuring point. The commercial boundaries

between transmission system **operator** and **distribution system operators** is assigned on the basis of **Energy Regulatory Office** Decision no. V_403_2012.

6.1.2 The user' will prepare a program that shows who is responsible for operation and maintenance of plant and apparatus circuit breakers in the connection point. The **TSO** will prepare operational schedule showing the boundaries of the property agreed. Both documents must be agreed by each party. The **TSO** and the user will retain copies of these documents. Changes in the boundary arrangements proposed by either party must be agreed in advance and will be recorded on the appropriate operational diagrams after agreement by the regulator.

6.1.3 The electric power supply between the parties shall be, in principle, a three-phase voltage of a value detailed in the **CA** of the connection point at a nominal frequency of 50Hz.

6.2 Technical boundary TSO Power-Generating Facilities

Technical boundary between TSO and Power generating facilities is connection point:

a) Between high voltage bus bar system and transformer bay of step up transformer;

b) In case where power generating facilities owner uses the transmission line for own expenses, the technical boundary between the **TSO** and the power generating facility will be treated as an transmission connected demand facilities (industrial customer) as set forth in the **Transmission Connection Charging Methodology**.

6.3 Technical boundary TSO - DSO

The technical boundary between **TSO** and **DSO** is connection point of:

a) Transformer bay of power transformers 220/35/10(20) kV and 110/35/10(20) kV to bus bar 35 kV, 10(20) kV.

b) Self-consumption bay (35 kV, 10(20) kV) in bus bars of medium voltage 35 kV, 10(20) kV.

While bus bars, and MV feeders including measurement bays belong to **DSO**.

6.4 Technical boundary TSO – Transmission-connected demand facility (Industrial customers)

Is the end of the insulator chain linked to the end portal of transmission lines. In cases where the industrial customer wants that except assets with defined boundary to

transfer ownership of TSO's and other assets then it will be defined in the Connection Agreement through a separate chapter within.

6.5 Special conditions

Above general rules should be followed, but for every case will depend on special conditions of the site, disposal of facilities, type of user installation etc. However, in every case the connection point and the commercial boundary will be described in the CA, and when needed, will be fully supported with respective diagrams.

6.6 Ownership and Operation

6.6.1 The user owns all the electrical equipment, plant and apparatus on the user side of the connection point and is responsible for the safe operation and maintenance of those assets according to Kosovan Laws, this grid code and CA.

6.6.2 The user's assets at the connection point, the system interconnection facilities and the metering and communication facilities and all associated plant and apparatus to which these rules relate, will be listed in detail in the CA.

The TSO owns all the electrical equipment – plant and apparatus – on the transmission network side of the connection point. The TSO will own, operate and maintain the HV substation at the connection point and all other connection assets which may be required for connection to the transmission network, according to the 'Rule on General Condition of Energy Supply', this grid code and the provisions of the CA.

7 Connection Conditions

7.1.1 The connection conditions specify the minimum technical, design and operational criteria which must be complied with by all users, connected to the transmission network and also the criteria with which the TSO must comply in relation to the part of the transmission network at each connection point.

7.1.2 All equipment at the ownership boundary shall meet the design principles contained within this grid code. Connections for entry to and exit from the transmission network shall incorporate a means of disconnection of the user's installation from the transmission network by the TSO.

7.1.3 The regulator can issue directions relieving the TSO or the users from compliance to the above provisions. This will be specifically detailed in the relevant CA, under the schedule "specific connection point derogations". Any other special terms or

conditions that apply to a specific connection point will be also included in this appendix.

7.2 Requirements on the TSO

7.2.1.1 The TSO shall own and maintain the transmission network and shall operate it in accordance with Operating security standards, their operating procedures and ENTSO-E requirements. This shall be carried out in accordance with the Electrical Standards Code for the Kosovan power system, any other relevant documents in use at the time for the planning, operation and security of the transmission system, the grid code, all internal procedures of the TSO and the terms of all applicable Kosovan Laws.

7.2.1.2 The TSO shall ensure that the function of system operation is performed and that the transmission system complies with the following technical, design and operational criteria at all connection points.

7.2.2 System Frequency

7.2.2.1 The frequency of the transmission network shall be nominally 50 Hz and shall be controlled within the limits as detailed in the frequency control standards in the Balancing Code.

7.2.2.2 User's plant must meet the requirements of the frequency control standards unless specifically detailed otherwise in the CA.

7.2.3 System Voltage

7.2.3.1 The voltage on the transmission network will normally remain within the limits detailed in the Balancing Code.

7.2.3.2 It should be noted that under fault conditions, the voltage may collapse transiently to zero at the point of fault until the fault is cleared.

7.2.4 Voltage Waveform Quality

7.2.4.1 All plant and apparatus connected to the transmission network and all users' facilities shall be capable of withstanding the following distortions of the voltage waveforms in respect of harmonic content, phase unbalance and voltage fluctuation:

a) Total harmonic distortion of 2%;

b) Under normal operating and planned outage conditions, the maximum negative phase sequence component of the phase voltage on the transmission system shall not exceed 1% for 99.5% of the operation time. Infrequent short duration peaks are permitted to a maximum value of 2% for phase unbalance.

c) Voltage fluctuation at the connection point shall not exceed the levels stated in the voltage control code (within the balancing code);

d) Voltage flicker at each connection point with a fluctuating load directly connected to the transmission system shall not exceed:
   - at 400kV and 220 kV, a short term flicker severity (Pst) of 0.8 Unit and a long term flicker severity (Plt) of 0.6 Unit;
   - at 110 kV and below, a short term flicker severity (Pst) of 1.0 Unit and a long term flicker severity (Plt) of 0.8 Unit:

7.2.4.2 If any of the above values are violated, then the TSO will investigate the cause of quality deviations and identify appropriate measures to eliminate the deviations.

7.3 General Requirements for All Users

7.3.1.1 Each user shall operate and maintain the plant and apparatus in its site and design new connected equipment or proposed modifications, in accordance with its statutory obligations under licence, the technical parameters of the connection point set forth in the CA, the prevailing Kosovan standards and procedures as referenced in the standard documents, good electricity industry practice and the terms of all applicable Kosovan Laws.

7.3.1.2 The user shall comply with all the provisions of this grid code and the prevailing standards, procedures and specifications for the security, planning, operation and maintenance of its site and the system interconnection facilities. Power-Generating facility owners must operate and maintain each of their power–generating facilities to ensure their sound technical operation in order to, as far as possible, guarantee the safety of the working staff and comply with the environmental laws and quotas.

7.3.1.3 Each power generating facilities must have the performance requirements as detailed in chapter 8 of this Code.

7.3.2 Active Power Demand

7.3.2.1 Active power demand shall not exceed the quantity specified in CA.

7.3.2.2 Users are obliged to accept and execute instructions and to implement the load shedding schedule in case of a serious or potentially serious fall in the electricity system frequency. Any load shedding will either be instructed by the TSO on the basis of a pre-arranged rota or will be automatically invoked by under frequency load shedding. The requirements will be specified in the CA.

7.3.3 Reactive Energy Demand

7.3.3.1 A user shall consume electric energy with a power factor of greater than 0.9 as measured at the connection point unless otherwise not agreed in the CA. The readings

from the commercial metering installation at the connection point shall be used to determine the actual power factor.

7.3.4 Protection and Control

7.3.4.1 Each connection between a user and the transmission network must be controlled by a circuit breaker capable of interrupting the maximum short circuit current at the connection point. This will be specified in CA. Document: Annual Analysis of Short Circuit Currents in the Transmission System gives values of short circuit current and the rating of the transmission circuit breakers at existing and committed connection points for future years.

7.3.4.2 The protections of power-generating modules, step-up transformers, busbars and power lines owned by the power-generating facility owners shall be in compliance with the requirements of the relevant Kosovan standards as referenced in the standard documents.

7.3.4.3 The setting of the relay protections against faults in the transmission network, owned by the power-generating facility owners but external to the power-generating moduls and step-up transformers, with respect to impedance, current and time shall be co-ordinated with the TSO.

7.3.4.4 The technical requirements for low frequency relays, covering frequency settings, measurement period settings, operating time, facility stages, output contacts and voltage supply requirements will be as specified in the CA.

7.3.4.5 The principle applied is that all power lines shall be protected by at least one protection designed for all types of faults. The normal arrangements at the different voltage levels are as follows:

a) for power lines of 400 kV two high speed main protections and one backup protection are provided:

b) for power lines of 110 kV and 220 kV main and backup protections are provided. Backup protection may be provided remotely;

7.3.4.6 The combination, type and functions of the relay protections shall be agreed between the user and the TSO.

7.3.4.7 The fault clearance times for faults on a user's equipment directly connected to the transmission network, from fault inception to the circuit arc extinction shall not be greater than the following:

a) 90 ms at 400 kV;

b) 100 ms at 220 kV;

c) 140 ms at 110 kV;

7.3.4.8 In the event that the above fault clearance times are not met as a result of failure of the main protection systems to operate, the users shall provide back-up protection. The TSO will also provide back-up protection and these back-up protections will be co-ordinated so as to provide discrimination - selectivity. Back-up protection shall operate to give a fault clearance time of no greater than 500 ms at voltages of 110 kV and above. Back-up protection may include protection against outage of breaker.

7.3.4.9 In case of any fault in connection equipment that connects the user facilities to the TSO system, the TSO and the user will ensure to each other the electrical signals that can be used for triggering of disconnection of the adequate circuit breaker to insulate the fault.

7.3.4.10 Users should also be aware that the protection arrangements on some networks may cause disconnection of one phase or two phases only of a three phase supply for certain types of fault.

7.3.4.11 No busbar protection, circuit-breaker fail protection relays, AC or DC wiring (other than power supplies or dc tripping associated with the user's plant and apparatus) shall be worked upon or altered, by or on behalf of, a user in the absence of a representative of, or written authority from the TSO.

7.3.5 Automatic Reclosing

7.3.5.1 Where automatic reclosure of TSO circuit breakers is required following faults on the user's system, automatic switching equipment shall be provided in accordance with the requirements specified in the CA.

7.3.5.2 The type of automatic reclosing - single phase, three-phase, control of synchronism or no voltage - for power lines connecting the user site with the transmission network shall be specified in CA.

7.3.5.3 The TSO will on request provide details of the auto-reclosing or sequential switching features in transmission system in order that the user may take this into account in the design of the user system, including protection arrangements.

7.3.6 Protection Settings

7.3.6.1 Protection and Relay Settings will be co-ordinated for existing, new and/or modified connections and subsequently updated across the connection point, as outlined in each CA, to ensure effective disconnection of faulty equipment. All data that is reasonably required must be recorded in CA and updated by both parties in the event of any data changes. This information must include as a minimum:

a) External and internal short circuit (the fault levels and fault infeeds assumed at the time the protection settings were specified);

b) Protection equipment type, fault clearance time, relay settings;

c) Differential protection setting for the generating modul/step up transformer unit/short distance lines;

d) Power-generating unit protection setting

- Asymmetric load (negative phase sequence),
- Over-/undervoltage at the alternator terminals,
- Inter-area oscillations,
- Inrush current,
- Protection against inadmissible shaft torsions
- Overfluxing (U/f),
- Invers power
- Rate of change of frequency, and
- voltage displacement.

e) Frequency and voltage sensitive power-generating modul protection settings;

f) Unit Transformer protection

g) Busbar protection;

h) Demand circuit protection

i) Back-up against protection and switchgear malfunction.

j) Any site-specific special automatic facilities;

k) Operation and safety diagrams;

l) Site drawings

7.3.6.2 The power-generating facility owner shall organise its protection and control devices in accordance with the following priority ranking (from highest to lowest):

a) network and power-generating modul protection

b) frequency control (active power adjustment);

c) power restriction; and

d) power gradient constraint;

7.3.6.3 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 **transmission-connected distribution system** respectively, in compliance with the following priority ranking, organised in decreasing order of importance:

a) transmission network protection;

b) transmission-connected demand facility or transmission-connected distribution system protection;

c) frequency control (active power adjustment);

d) Power restriction.

7.3.7 Protection Communications

7.3.7.1 Communications for acceleration of relay protection signals and remote tripping of circuit breakers shall be the subject of design and agreement between the user and the TSO.

7.3.7.2 For power lines connecting a power–generating facility to the transmission system two independent communication channels – independent from each other and at least one independent from the line to be protected – must be provided for relay protections installed at both ends of the connecting power line and the time for transmission of signals shall not be longer than 20 ms. These communication channels can be used, if required, for the remote switching out of adjacent switchgear under the action of the breaker fail protection.

7.3.7.3 OPGW - Optical Ground Wire, PLC[1] or some other form of communications media can be used to provide these facilities. The supply and installation of the communications equipment shall be a responsibility of the owner of the switchgear on which it is required to be fitted. In the event of rented communication facilities being used (TSO communication equipment are used), the responsibility for the costs shall be detailed in the CA.

7.3.8 Synchronising Device

7.3.8.1 Circuit breaker rated at 110 kV and higher must be equipped with check synchronising systems.

7.3.8.2 All power-generating modules must be equipped with precision automatic synchronising systems.

7.3.8.3 Synchronisation of power-generating modules shall be possible at frequencies within the ranges set out in Table 1, paragraph 8.1.1;

7.3.8.4 The TSO and the power-generating facility owner shall agree on the settings of synchronisation devices to be concluded prior to operation of the power-generating module. This agreement shall cover:

a) voltage;

[1] PLC – Power Line Currier

b) frequency;

c) phase angle range;

d) phase sequence;

e) deviation of voltage and frequency

7.3.8.5 With regard to synchronisation, when starting a power-generation module connected in transmission network, synchronisation shall be performed by the power-generating facility owner only after authorisation by the TSO.

7.3.9 Protection Dependability

The target performance for the system fault dependability index shall be not less than 99%. This is the measure of the ability of the protection to operate to initiate successful tripping of circuit breakers that are associated with the faulty item of apparatus.

7.3.10 Fault Recording Facilities

Where fault recording facilities are required by the TSO their technical requirements should conform to the fault analysis facility standards that are produced and revised by TSO.

7.3.11 Earthing

All transformers with star connection at the connection point (MV side) to be earthed through resistance in accordance with specific standards IEC otherwise specified in CA.

7.3.12 Fault Level Considerations

The short circuit rating of the user's equipment at the connection point shall be in compliance with the design fault level of the connection point.

7.3.13 System Monitoring

The user should provide the measuring quality standards such as voltage, current, frequency, active power and reactive power, transformer tap position outputs and status points from his system as specified in CA. The telemetry for remotely access RTU (or equivalent) in such a situation will be provided, installed and maintained by the TSO. Power Generating facility owner must provide the TSO with the necessary signals to remotely monitor in real time of their power-generating modules including power-generating modules with an output of 5 MW and greater connected to the distribution system. The TSO shall make publicly available the precise list of data required.

7.3.14 Communications

7.3.14.1 Where required by the TSO in order to ensure the monitoring and control of the transmission system communications between users and the TSO shall be established

in accordance with the relevant CA. These communications shall include some or all of the provisions detailed in the following:

a) Primary speech facility for transfer of communication (voice);

b) Backup or emergency speech facility using communication channels and power supplies completely independent from the primary facility;

c) Facsimile machine;

d) RTU2 telemetry for system monitoring as per paragraph 7.3.13;

e) Transmission of data in electronic form;

f) Email;

g) Transfer of data from main and backup meter as required by the metering code;

7.3.14.2 The actual requirements in each particular case will be detailed in the CA.

7.3.15 Site Related Conditions

The TSO and the user for each connection point shall agree connection site responsibility schedules that will include the following:

a) Ownership, control, operation and maintenance details at the connection point;

b) Operational diagram - to a defined format;

c) Site common drawings - to a defined format;

d) Schedule of HV plant and apparatus;

e) Schedule of telecommunication and telemetry equipment;

f) Metering installation details;

g) Site access arrangements (site visits);

h) Protection information;

i) Interlocking schemes;

j) Information for carrying out work on protection;

k) Maintenance arrangements

l) Safety management responsibilities:

7.3.16 Plant and Apparatus Identification

The TSO and the relevant user will follow the requirements of the plant and apparatus identification code (within the operations code).

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[2] RTU – Remote Terminal Unit

7.3.17 Record Keeping

Each **user** must maintain records for 5 years for each of their connection points for all items of primary plant, setting out details of the results of all technical performance and monitoring conducted under the provisions of the paragraphs 8.

7.3.18 Access

A **user** shall grant to the **TSO** all necessary permanent rights of way within his own site that are required for the construction, equipping, replacement, decommissioning, operation, testing, inspection and maintenance of the system, interconnection facilities, in accordance with the prevailing current Kosovan standards and procedures for HV system operation and maintenance.

8 Requirements for Power-Generating modules

8.1 General requirements

Power-generating facility owners shall operate and maintain their power-generating modules voltage control facilities, their power-generating modules frequency control facilities and the reactive power control of the network interconnection facilities, in strict adherence to this code and instructions received from the **TSO** for the operation and security of the transmission network.

8.1.1 Frequency ranges

8.1.1.1 With regard to frequency ranges:

a) a power generating module shall be capable of remaining connected to the network and operate within the frequency ranges and time periods specified in Table 1;

b) the **TSO** and the power generating facility owner may agree on wider frequency ranges, longer minimum times for operation or specific requirements for combined frequency and voltage deviations to ensure the best use of the technical capabilities of a power generating module, if it is required to preserve or to restore system security;

c) the power- generating facility owner shall not unreasonably withhold consent to apply wider frequency ranges or longer minimum times for operation, taking account of their economic and technical feasibility.

Table 1: This table shows the minimum time periods a power-generating modul has to be able to operate for different frequencies deviating from a nominal value without disconnecting from the network.

Frequency range	Time period for operation
47.5 Hz – 48.5 Hz	30 minutes
48.5 Hz – 49.0 Hz	60 minutes
49.0 Hz – 51.0 Hz	Unlimited
51.0 Hz – 51.5 Hz	30 minutes

8.1.2 Rate of change of frequency withstand capability

8.1.2.1 With regard to the rate of change of frequency withstand capability, a power-generating module shall be capable of staying connected to the network and operate at rates of change of frequency up to a value of -1.0 Hz/sec and +1.0 Hz/sec, other than triggered by rate-of-change-of-frequency-type of loss of mains protection.

8.1.2.2 Power-generating modules shall fulfil the following requirements relating to frequency stability:

a) with regard to active power controllability and control range, the power-generating module control system shall be capable of adjusting an active power setpoint in line with instructions given to the power-generating facility owner by the TSO.

b) The TSO shall establish the period within which the adjusted active power setpoint must be reached. The TSO shall specify a tolerance (subject to the availability of the prime mover resource) applying to the new setpoint and the time within which it must be reached;

c) manual local measures shall be allowed in cases where the automatic remote control devices are out of service.

d) The TSO shall notify the regulatory authority of the time required to reach the setpoint together with the tolerance for the active power;

8.1.3 Active power frequency response

8.1.3.1 With regard to the limited frequency sensitive mode – over frequency (LFSM-O), the following shall apply, as determined by the TSO for its control area in coordination with the TSOs of the same synchronous area to ensure minimal impacts on neighbouring areas:

a) the power-generating module shall be capable of activating the provision of active power frequency response according to figure 1 at a frequency threshold and droop settings specified by the TSO;

b) the frequency threshold shall be between 50,2 Hz and 50,5 Hz inclusive;

c) the droop settings shall be between 2 % and 12 %;

d) the power-generating module shall be capable of activating a power frequency response with an initial delay that is as short as possible. If that delay is greater than two seconds, the power-generating facility owner shall justify the delay, providing technical evidence to the TSO;

e) the TSO may require that upon reaching minimum regulating level, the power-generating module be capable of either:

- continuing operation at this level; or
- further decreasing active power output;

f) the power-generating module shall be capable of operating stably during LFSM-O operation. When LFSM-O is active, the LFSM-O setpoint will prevail over any other active power setpoints.

8.1.3.2 The power-generating module shall be capable of maintaining constant output at its target active power value regardless of changes in frequency, except where output follows the changes specified in the context of paragraphs 8.1.3.1 and 8.1.3.3 or paragraph 8.1.3.8 and 8.1.4.8 as applicable.

8.1.3.3 Admissible active power reduction from maximum output with falling frequency is allowed and shall not exceed a reduction rate of 2% of the maximum capacity at 50 Hz per 1 Hz frequency droop as illustrated by the full lines in Figure 2.

8.1.3.4 The admissible active power reduction from maximum output shall:

a) clearly specify the ambient conditions applicable;

b) take account of the technical capabilities of power generating modules.

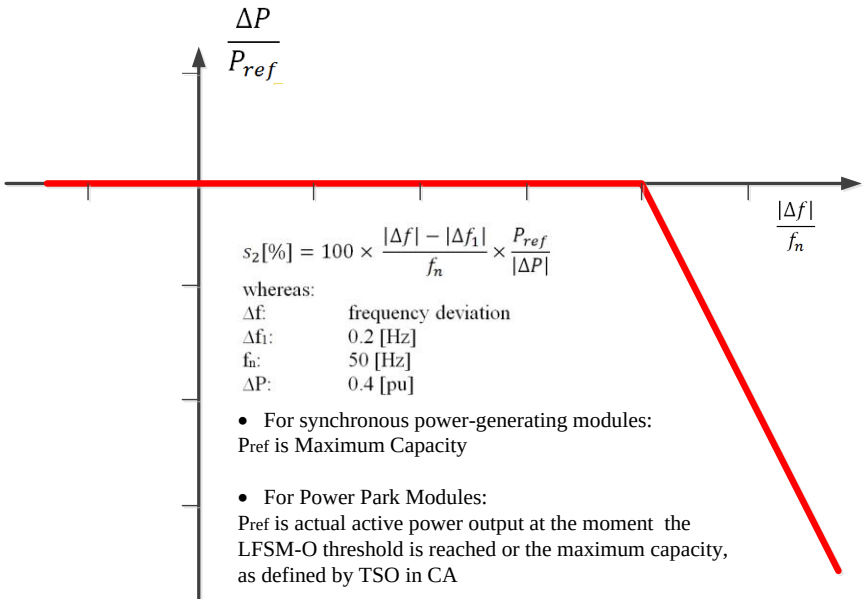

Figure 1.Active power frequency response capability of power-generating synchronous modules in LFSM-O. ΔP is the change in active power output from the power-generating module. At over-frequencies where Δf is above Δf1, the power-generating module has to provide a negative active power output change according to the droop S_2.

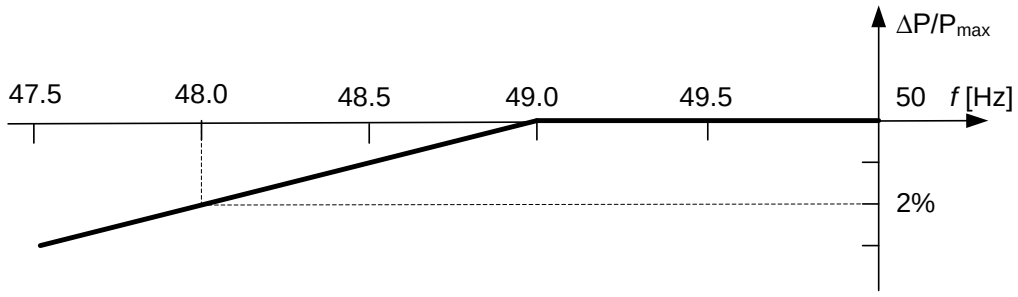

Figure 2: Admissible active power reduction

8.1.3.5 With regard to active power controllability and control range, the power-generating module control system shall be capable of adjusting an active power set-point in line with instructions given to the power-generating facility owner by the TSO.

8.1.3.6 The TSO shall establish the period within which the adjusted active power set-point must be reached. The TSO shall specify a tolerance (subject to the availability of the prime mover resource) applying to the new set-point and the time within which it must be reached;

8.1.3.7 Manual local measures shall be allowed in cases where the automatic remote control devices are out of service. The TSO shall notify the regulatory authority of the time required to reach the setpoint together with the tolerance for the active power;

8.1.3.8 With regard to limited frequency sensitive mode — under-frequency (LFSM-U) the following requirements shall apply to power-generating modules:

a) the power-generating module shall be capable of activating the provision of active power frequency response at a frequency threshold and with a droop specified by the TSO in coordination with the TSOs of the same synchronous area as follows:

- the frequency threshold specified by the TSO shall be between 49,8 Hz and 49,5 Hz inclusive,
- the droop settings specified by the TSO shall be in the range 2-12 %.

  This is represented graphically in figure 3;

b) the actual delivery of active power frequency response in LFSM-U mode shall take into account:

- ambient conditions when the response is to be triggered,

- the operating conditions of the power-generating module, in particular limitations on operation near maximum capacity at low frequencies
- the availability of the primary energy sources.

c) the activation of active power frequency response by the power-generating modul shall not be unduly delayed. In the event of any delay greater than two seconds, the power-generating facility owner shall justify it to the TSO;

d) in LFSM-U mode the power-generating module shall be capable of providing a power increase up to its maximum capacity;

e) stable operation of the power-generating module during LFSM-U operation shall be ensured;

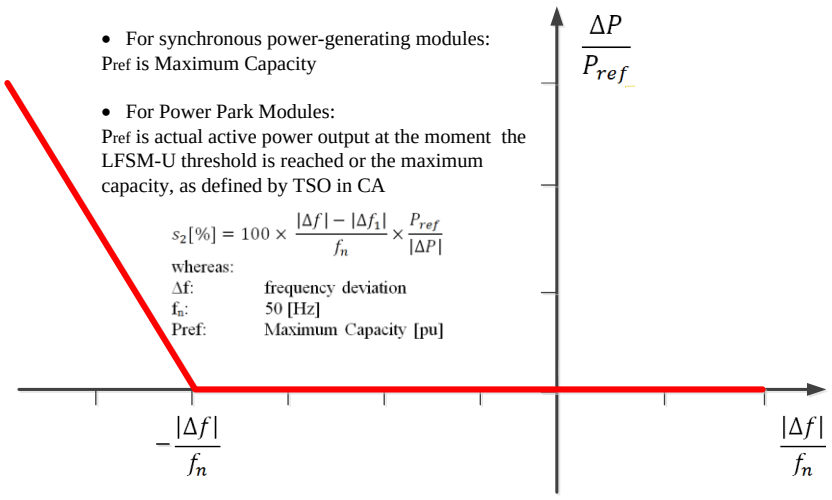

Figure 3.Active power frequency response capability of power-generating synchronous units in LFSM-U. ΔP is the change in active power output from the power-generating module. At underfrequencies where Δf is below Δf1, the power-generating module has to provide a positive active power output change according to the droop s_2.

8.1.4 Active Power Control

8.1.4.1 All synchronous gas turbines and hydro generating modules of capacity over 1 MW and thermal generating modules of over 5 MW must be equipped with turbine speed and active power automatic control systems.

8.1.4.2 The speed governor of each generating module must be capable of operating within the generating modules technical limits and in a frequency range defined in paragraph 8.1.1.

8.1.4.3 The speed governor in co-ordination with other control devices must control the generating module active power output with stability over the entire operating range of the generating module and must be able to maintain the set active power of the generating module with accuracy as follows:

a) For units of up to 20 MW- not less than ± 2% of rated power;

b) For units above 20 MW - not less than ± 1% of rated power.

8.1.4.4 All generating modules with a registered capacity of at least 10 MW must have the capability to provide secondary control, with the response timing and duration set out in the frequency control code (within the balancing code).

8.1.4.5 Each generating module with a registered capacity of at least 10 MW must be fitted with suitable equipment to receive LFC signals from TSO. The TSO will determine the selection and use of this function to ensure the overall Kosovan power system meets the requirements of the ENTSO-E rules and standards as set out under the frequency control code (within the balancing code).

8.1.4.6 The LFC system signalling criteria are as follows:

a) Accuracy 0.5 to 1.5% for active power measurement;

b) Accuracy 1.5 mHz for frequency measurement;

c) Regulation update time no more than two seconds;

d) Associated with the above the TSO SCADA/EMS system will continuously display the active power output, higher and lower operating limits and run up/ run down rates.

8.1.4.7 All generating modules with a registered capacity of 20 MW or more must be capable of providing primary load-frequency control respectively must operates in Frequency Sensitive Mode-(FSM) while operating at all times unless relieved of this obligation by the TSO under the terms of a derogation.

8.1.4.8 The power-generating module shall be capable of providing active power frequency response in accordance with the parameters specified by the TSO within the ranges shown in table 2 and figure 4. In specifying those parameters, the TSO shall take account of the following facts:

a) in case of overfrequency, the active power frequency response is limited by the minimum regulating level,

b) in case of underfrequency, the active power frequency response is limited by maximum capacity,

c) the actual delivery of active power frequency response depends on the operating and ambient conditions of the power-generating modul when this response is triggered, in particular limitations on operation near maximum capacity at low frequencies and available primary energy sources;

Table 2: Parameters for active power frequency response

Parameters		Ranges
Active power range related to maximum capacity $\frac{\lvert\Delta P_1\rvert}{P_{max}}$		1.5 - 10 %
Frequency response insensitivity	$\lvert\Delta f_i\rvert$	10 - 30 mHz
	$\frac{\lvert\Delta f_i\rvert}{f_n}$	0.02 - 0.06 %
Frequency response deadband		0 - 500 mHz
Droop s_1		2-12 %

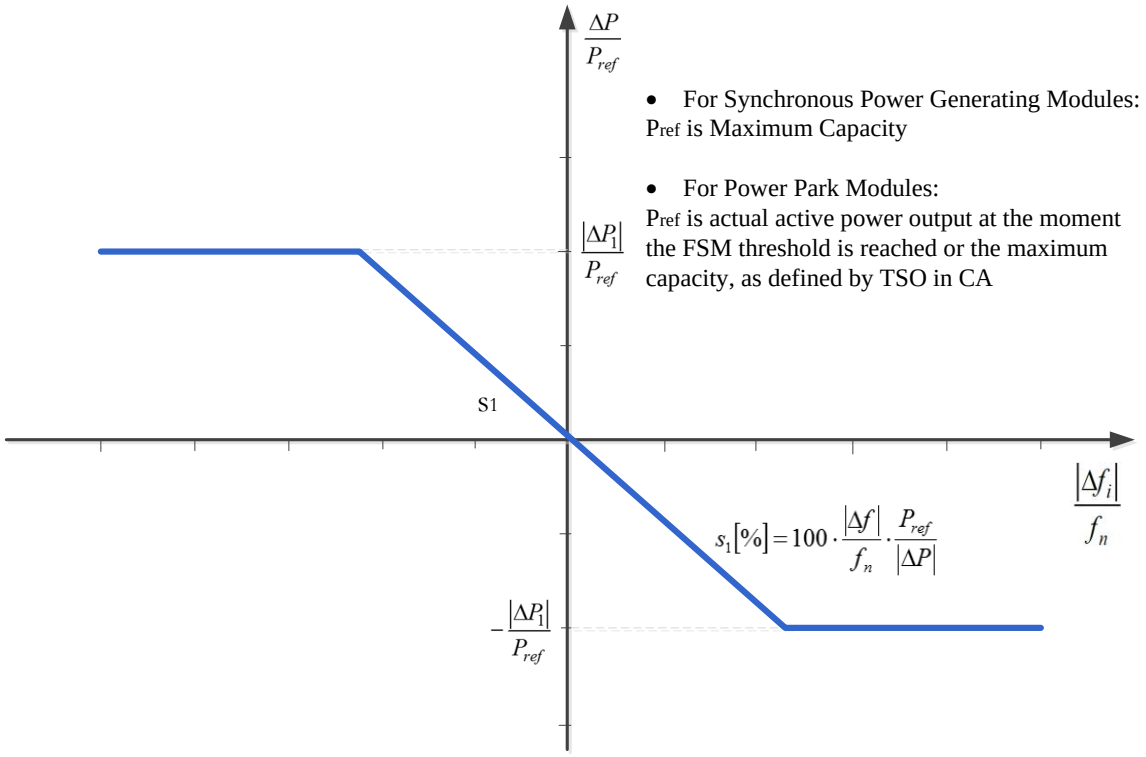

Figure 4. Active power frequency response capability of power-generating modules in FSM illustrating the case of zero deadband and insensitivity. P_{max} is the reference active power to which

ΔP is related. ΔP is the change in active power output from the power- generating modul. fn is the nominal frequency (50 Hz) in the network and Δf is the frequency deviation in the network.

d) The speed governor must be capable of being adjusted, on instruction by the TSO;

e) The frequency response deadband of frequency deviation and droop must be able to be reselected repeatedly;

f) In the event of a frequency step change, the power- generating modul shall be capable of activating full active power frequency response, at or above the full line shown in figure 5 in accordance with the parameters specified by the TSO (which shall aim at avoiding active power oscillations for the power- generating modul) within the ranges given in Table 3. The combination of choice of the parameters specified by the TSO shall take possible technology-dependent limitations into account;

g) The initial activation of active power frequency response required shall not be unduly delayed.

h) If the delay in initial activation of active power frequency response is greater than two seconds, the power- generating facility owner shall provide technical evidence demonstrating why a longer time is needed.

i) The power- generating modul shall be capable of providing full active power frequency response for a period of 15 and 30 minutes as specified by the TSO. In specifying the period, the TSO shall have regard to active power headroom and primary energy source of the power- generating modul;

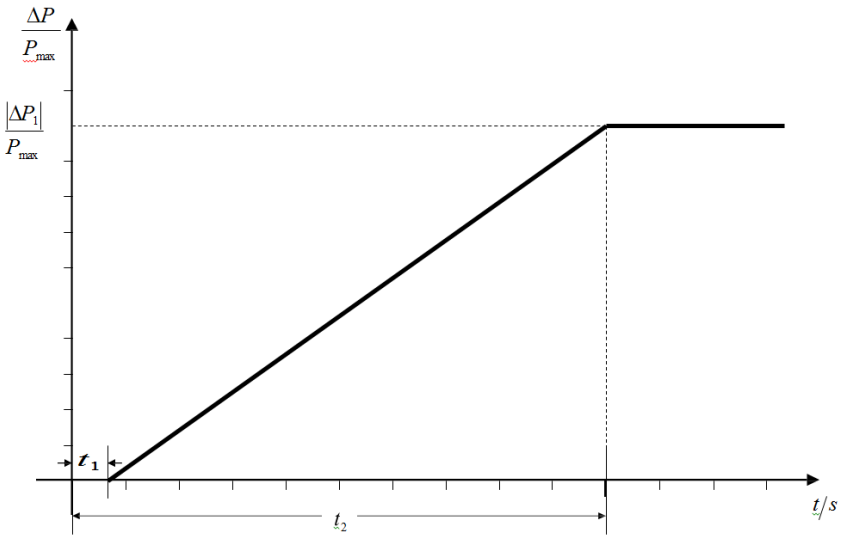

Figure 5.Active power frequency response capability/ Full activation

Table 3.Parameters for full activation of active power frequency response resulting from frequency step change (explanation for Figure 4).

Parameters	Values
Active power range related to maximum capacity (frequency response range) $\frac{\lvert\Delta P_1\rvert}{P_{max}}$	2-10%
Initial delay t_1	≤2 seconds
Full activation time t_2	≤30 seconds

j) with regard to frequency restoration control, the power-generating modul shall provide functionalities complying with specifications specified by the TSO, aiming at restoring frequency to its nominal value or maintaining power exchange flows between control areas at their scheduled values;

k) with regard to disconnection due to underfrequency, power-generating facilities capable of acting as a load, including hydro pump-storage power-generating facilities, shall be capable of disconnecting their load in case of underfrequency. The requirement referred to in this point does not extend to auxiliary supply;

l) with regard to real-time monitoring of Frequency Sensitive Mode (FSM):

- to monitor the operation of active power frequency response, the communication interface shall be equipped to transfer in real time and in a secured manner from the power-generating facility to the network control centre of the TSO, at the request of the TSO, at least the following signals: status signal of FSM (on/off), scheduled active power output, actual value of the active power output, actual parameter settings for active power frequency response, droop and dead-band;
- the TSO shall specify additional signals to be provided by the power-generating facility by monitoring and recording devices in order to verify the performance of the active power frequency response provision of participating power-generating modules.

8.1.5 Simulation models of power-generating modules

8.1.5.1 At the request of the TSO, the power-generating facility owner shall provide simulation models which properly reflect the behaviour of the power-generating module in both steady-state and dynamic simulations (50 Hz component) or in electromagnetic transient simulations.

8.1.5.2 The power-generating facility owner shall ensure that the models provided have been verified against the results of compliance tests referred to in paragraph 8.5.7 and 8.5.8 and shall notify the results of the verification to the TSO;

8.1.5.3 The models provided by the power-generating facility owner shall contain the following sub-models, depending on the existence of the individual components:

a) alternator and prime mover,

b) speed and power control,

c) voltage control, including, if applicable, power system stabiliser ('PSS') function and excitation control system,

d) power-generating module protection models, as agreed between the TSO and the power-generating facility owner, and

e) converter models for power park modules;

8.1.5.4 The request by the TSO referred to in point a) shall include:

a) the PSS/E format or similar in which models are to be provided,

b) the provision of documentation on a model's structure and block diagrams,

c) an estimate of the minimum and maximum short circuit capacity at the connection point, expressed in MVA, as an equivalent of the network;

8.1.5.5 The power-generating facility owner shall provide recordings of the power-generating modules performance to the TSO if requested. The TSO may make such a request, in order to compare the response of the models with those recordings;

8.1.6 Voltage stability requirements

8.1.6.1 All generating modules connected on 400 kV, 220 kV or 110 kV (through step up transformer) with regard to voltage ranges shall fulfil the following requirements:

a) power- generating module shall be capable of staying connected to the network and operating within the ranges of the network voltage at the connection point, expressed by the voltage at the connection point related to the reference 1 pu voltage, and for the time periods specified in Tables 4 and 5;

b) the TSO may specify shorter periods of time during which power- generating modules shall be capable of remaining connected to the network in the event of simultaneous overvoltage and under-frequency or simultaneous under-voltage and overfrequency;

Table 4.The minimum time periods within each generation module has to operate for voltages deviating from the nominal value at the connection point without disconnecting from the network for 220 kV and 110 kV voltage level

Voltage range	Time period for operation
0.85 pu – 0.90 pu	60 minutes
0.90 pu – 1.118 pu	Unlimited
1.118 pu – 1.15 pu	20 minutes

Table 5.The minimum time periods within each generation module has to operate for voltages deviating from the nominal value at the connection point without disconnecting from the network for 400 kV voltage level

Voltage range	Time period for operation
0.85 pu – 0.90 pu	60 minutes
0.90 pu – 1.05 pu	Unlimited
1.05 pu – 1.10 pu	20 minutes

8.1.6.2 The supply generated must have balanced phase voltages with harmonic distortion of no greater than 2%.

8.1.6.3 Each generating module and the power–generating facility in which is located that generating modules must be capable of continuous uninterrupted operation during the occurrence of the following factors:

a) Unbalanced load up to 10%;

b) Negative phase sequence current up to 5%.

8.1.6.4 All synchronous generating modules connected on 400 kV, 220 kV or 110 kV (through step up transformer) with regard to Fault-ride-through capability shall fulfil the following requirements:

a) Power- generating module shall be capable of staying connected to the network and continuing to operate stably after the power system has been disturbed by secured faults. That capability shall be in accordance with a voltage-against-time profile at the connection point for fault conditions specified by the TSO.

b) This voltage-against-time-profile shall be expressed by a lower limit of the course of the one of the three phase-to-phase voltages on the network voltage level at the Connection Point which sustains the lowest retained voltage during a symmetrical or asymmetrical fault, irrespective of the voltage drop of the other two phase-to-phase voltages, as a function of time before, during and after the fault. This lower limit illustrated by the red line is shown in figure 6 for asynchronous generation modules and by the green line in figure 7 for power park modules.

c) TSO shall specify and make publicly available the pre-fault and post-fault conditions for the fault-ride-through capability in terms of:

- the calculation of the pre-fault minimum short circuit capacity at the connection point;
- pre-fault active and reactive power operating point of the power- generating module at the connection point and voltage at the connection point; and
- calculation of the post-fault minimum short circuit capacity at the connection point.

d) At the request of a power- generating facility owner, the TSO or DSO or (as the case may be) shall provide the pre-fault and post-fault conditions to be considered for fault-ride-through capability as an outcome of the calculations at the connection point as specified in point h) regarding:

- pre-fault minimum short circuit capacity at each connection point expressed in MVA;
- pre-fault operating point of the power- generating module expressed in active power output and reactive power output at the connection point and voltage at the connection point; and
- post-fault minimum short circuit capacity at each connection point expressed in MVA

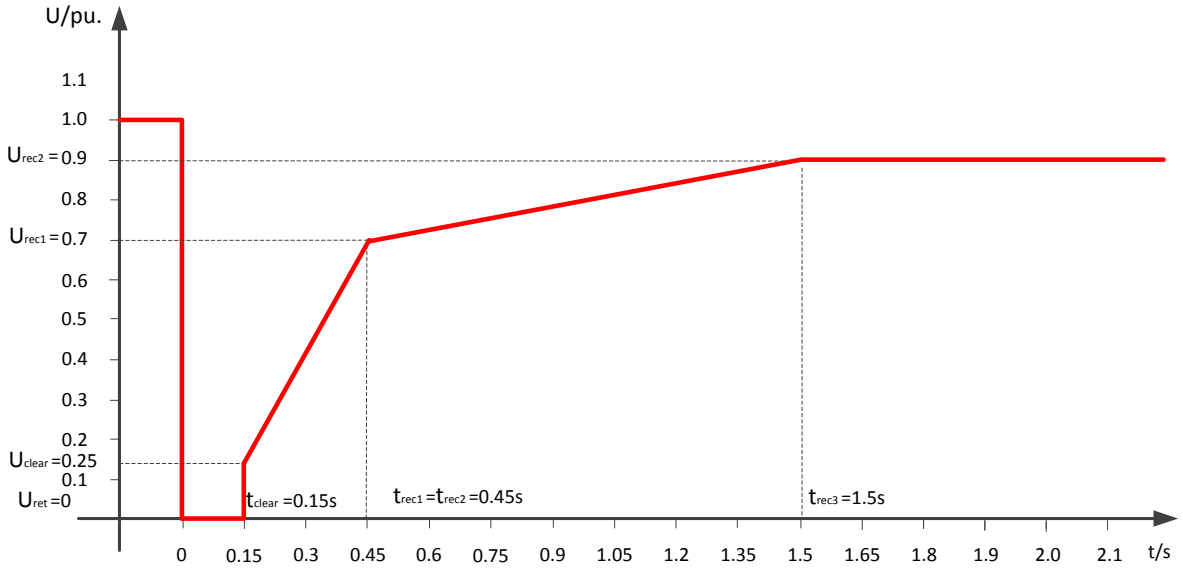

Figure 6: Fault-ride-through profile of a synchronous **power- generating module** connected in transmission network. The diagram represents the limit of a voltage-against-time profile of the voltage at the connection point, expressed as the ratio of its actual value and its reference 1 pu value before, during and after a fault. U_{ret} is the retained voltage at the connection point during a fault, t_{clear} is the instant when the fault has been cleared. U_{rec1}, $Urec_2$, t_{rec1}, t_{rec2} and t_{rec3} specify certain points of lower limits of voltage recovery and relevant times after fault clearance.

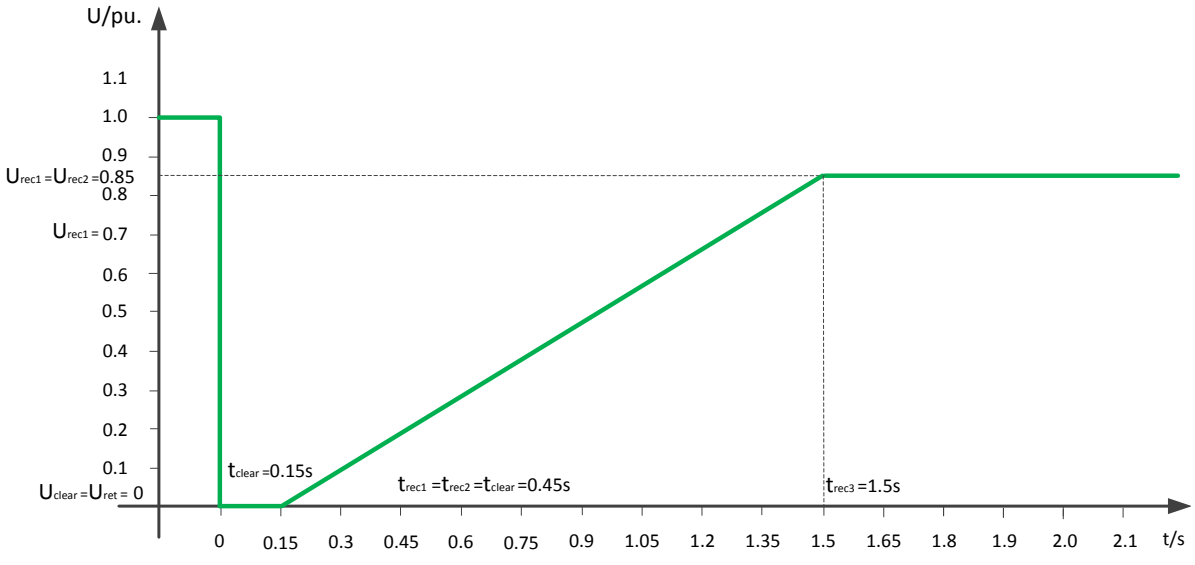

Figure 7: Fault-ride-through profile of a power park module connected in transmission network.

8.1.7 Loss of Synchronism Protection

Power-generating facilities are responsible for protection of their generating modules against asynchronous operation if generating modules become disconnected from the transmission system.

8.1.8 Plant Subject to Central Dispatch

All power-generation modules eligible for central dispatch must be fitted with LFC (equipment for secondary regulation). Specification for these will be as determined by the TSO.

8.1.9 Black start, Island Operation and Re-Synchronisation

8.1.9.1 For each power-generating module in CA will specified if required a black start capability. All power-generating modules with a black start capability will be made available under the terms of an ancillary services agreement, and meet the operational requirements set out in the contingency planning code.

8.1.9.2 Power-generating module shall fulfil the following requirements relating to black start capability:

a) power-generating facility owners shall, at the request of the TSO, provide a quotation for providing black start capability. The TSO may make such a request if it considers system security to be at risk due to a lack of black start capability in its control area;

b) a power-generating modul with black start capability shall be capable of starting from shutdown without any external electrical energy supply within a time frame specified by the TSO under the terms of an ancillary services agreement;

c) a power-generating modul with black start capability shall be able to synchronise within the frequency limits laid down in table 1 (paragraph 8.1.1) and, where applicable, voltage limits specified by the TSO or in tables 4 and 5 of paragraph 8.1.6.1;

d) a power-generating modul with black start capability shall be capable of automatically regulating dips in voltage caused by connection of demand;

e) a power-generating modul with black start capability shall:

- be capable of regulating load connections in block load,
- be capable of operating in LFSM-O and LFSM-U, as specified in paragraphs 8.1.3.1 and 8.1.3.8,
- control frequency in case of overfrequency and underfrequency within the whole active power output range between minimum regulating level and maximum capacity as well as at houseload level,

- be capable of parallel operation of a few power-generating modules within one island, and
- control voltage automatically during the system restoration phase;

8.1.9.3 Power-generating module shall fulfil the following requirements relating to Island Operation capability:

a) power-generating modul shall be capable of taking part in island operation if required by the TSO and:
   - the frequency limits for island operation shall be those established in accordance with paragraph 8.1.1 (table 1),
   - the voltage limits for island operation shall be those established in accordance with paragraph 8.1.6.1 (table 4 and 5) , where applicable;

b) power-generating modul shall be able to operate in FSM during island operation, as specified in paragraph 8.1.4.8. In the event of a power surplus, power-generating moduls shall be capable of reducing the active power output from a previous operating point to any new operating point within the P-Q-capability diagram. In that regard, the power-generating modul shall be capable of reducing active power output as much as inherently technically feasible, but to at least 55 % of its maximum capacity;

c) the method for detecting a change from interconnected system operation to island operation shall be agreed between the power-generating facility owner and the TSO. The agreed method of detection must not rely solely on the system operator's switchgear position signals;

d) power-generating modul shall be able to operate in LFSM-O and LFSM-U during island operation as specified in paragraphs 8.1.3.1 and 8.1.3.8.

8.1.9.4 Power-generating module shall fulfil the following requirements relating to quick re-synchronisation capability:

a) in case of disconnection of the power-generating modul from the network, the power-generating modul shall be capable of quick re-synchronisation in line with the protection strategy agreed between the TSO and the power-generating facility;

b) a power-generating modul with a minimum re-synchronisation time greater than 15 minutes after its disconnection from any external power supply must be designed to trip to houseload from any operating point in its P-Q-capability diagram. In this case, the identification of houseload operation must not be based solely on the system operator's switchgear position signals;

c) power-generating modul shall be capable of continuing operation following tripping to houseload, irrespective of any auxiliary connection to the external network. The minimum operation time shall be specified by the TSO, taking into consideration the specific characteristics of prime mover technology.

8.2 Requirements for synchronous power-generating modules

8.2.1 Reactive Power Control

8.2.1.1 With regard to reactive power capability, the TSO may specify supplementary reactive power to be provided if the connection point of a synchronous power- generating module is neither located at the high-voltage terminals of the step-up transformer to the voltage level of the connection point nor at the alternator terminals, if no step-up transformer exists. This supplementary reactive power shall compensate the reactive power demand of the high-voltage line or cable between the high-voltage terminals of the step-up transformer of the synchronous power- generating module or its alternator terminals, if no step-up transformer exists, and the connection point and shall be provided by the responsible owner of that line or cable.

8.2.1.2 The U-Q/P_{max}-profile, within the boundary of which Synchronous Power Generating modul shall be capable of providing Reactive Power at its Maximum Capacity is shown in Figure 8.

8.2.1.3 The synchronous power- generating module shall be capable of moving to any operating point within its U-Q/P_{max} profile in appropriate timescales to target values requested by the TSO in a range between 10 seconds and 1 minute.

8.2.1.4 With regard to reactive power capability below maximum capacity, when operating at an active power output below the maximum capacity ($P<P_{max}$), the synchronous power- generating modules shall be capable of operating at every possible operating point in the P-Q-capability diagram of the alternator of that synchronous power-generating module, at least down to minimum stable operating level. Even at reduced active power output, reactive power supply at the connection point shall correspond fully to the P-Q-capability diagram of the alternator of that synchronous power-generating module, taking the auxiliary supply power and the active and reactive power losses of the step-up transformer, if applicable, into account.

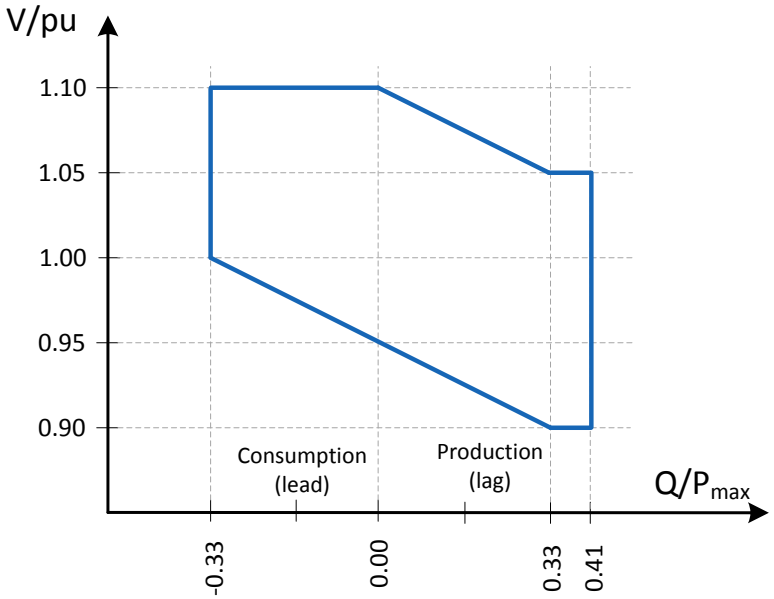

Figure 8: U-Q/P_{max}-profile of a synchronous power- generating module. The diagram represents boundaries of a U-Q/P_{max}-profile by the voltage at the connection point, expressed by the ratio of its actual value and it's the reference 1 pu value, against the ratio of the reactive power (Q) and the maximum capacity (P_{max}).

8.2.2 Excitation Systems

8.2.2.1 Each generating module must be capable of contributing to voltage control by continuous modulation of reactive power supplied to the transmission network.

8.2.2.2 All generating modules connected in transmission network, must be fitted with a continuously acting **automatic voltage regulator** (**AVR**) that may include stabilisers, to provide constant terminal voltage of the generating module, without instability over the entire operating range of the generating module. If required by the **CA**, will incorporate PSS (power stabilizer system) to attenuate power oscillations. **Automatic Voltage Regulator (AVR)** should compensate for any voltage decreases across a step up transformer of the generating module and also to provide a stable reactive power distribution between the synchronous generating module and network.

8.2.2.3 **Automatic Voltage Regulator** shall be capable of maintaining the voltage at the generating module terminals with an accuracy as follows:

a) for generating modules of up to 25 MVA – not less than ± 1% of rated voltage;

b) for generating modules above 25 MVA - not less than ± 0.5% of rated voltage

8.2.2.4 The excitation system must provide for increase (forcing) in the excitation current and voltage of a synchronous generating module as a factor at nominal load as follows:

a) hydro generating modules up to 25 MVA - min factor (ratio) 1.5 - min time 10 s;

b) hydro generating modules above 25 MVA - min factor 1.8 - min time 10 s;

c) thermal generating modules of up to 25 MVA - min factor 1.8 - min time 10 s;

d) thermal generating modules above 25 MVA - min factor 2.0 - min time 10 s.

8.2.2.5 The forcing parameters must be achieved at a generating module terminal voltage within the range of 90% to 110% of the nominal voltage and at a frequency range of 47.5 Hz to 51.5 Hz.

8.2.2.6 The speed of change in the voltage of the synchronous generating module shall not be lower than 2 relative units/sec using as reference the exciting voltage under nominal load of the synchronous generating module.

8.2.2.7 AVRs must provide for limitation of the following:

a) bandwidth limitation of the output signal to ensure that the highest frequency of response cannot excite torsional oscillations on other power-generating modules connected to the network;

b) an under-excitation limiter to prevent the AVR from reducing the alternator excitation to a level which would endanger synchronous stability;

c) an over-excitation limiter to ensure that the alternator excitation is not limited to less than the maximum value that can be achieved whilst ensuring that the synchronous power-generating module is operating within its design limits;

d) a stator current limiter; and

e) a PSS function to attenuate power oscillations, if the synchronous power-generating module size is above a value of maximum capacity specified by the TSO.

8.2.2.8 The excitation systems of generating modules involved in the restoration of the transmission network after severe system incidents, shall be able to regulate the excitation of the generating module in the absence of an external ac supply.

8.2.2.9 The TSO and the power-generating facility owner shall enter into an agreement regarding technical capabilities of the power-generating module to aid angular stability under fault conditions.

8.3 Requirements for power park modules

8.3.1 Power park modules with capacity ≥5 MW shall fulfil the requirements listed in paragraph 8.1.

8.3.1.1 For power park modules with capacity ≥5 MW the TSO or the DSO (as the case may be) in coordination with the TSO shall have the right to specify that a power park module be capable of providing fast fault current at the connection point in case of symmetrical (3-phase) faults, under the following conditions:

a) The power park module shall be capable of activating the supply of fast fault current either by:

- ensuring the supply of the fast fault current at the connection point, or
- measuring voltage deviations at the terminals of the individual units of the power park module and providing a fast fault current at the terminals of these units;

b) the TSO or the DSO (as the case may be) in coordination with the TSO shall specify:

- how and when a voltage deviation is to be determined as well as the end of the voltage deviation,
- the characteristics of the fast fault current, including the time domain for measuring the voltage deviation and fast fault current,
- the timing and accuracy of the fast fault current, which may include several stages during a fault and after its clearance;

8.3.1.2 With regard to the supply of fast fault current in case of asymmetrical (1-phase or 2-phase) faults, the TSO or the DSO (as the case may be) in coordination with the TSO shall have the right to specify a requirement for asymmetrical current injection.

8.3.1.3 Power park modules with capacity ≥5 MW shall fulfil the following additional requirements in relation to robustness:

a) the TSO shall specify the post-fault active power recovery that the power park module is capable of providing and shall specify:

- when the post-fault active power recovery begins, based on a voltage criterion;
- a maximum allowed time for active power recovery; and
- a magnitude and accuracy for active power recovery;

b) the specifications shall be in accordance with the following principles:

- interdependency between fast fault current requirements according to paragraph 8.3.1.1 and paragraph 8.3.1.2 and active power recovery;
- dependence between active power recovery times and duration of voltage deviations;
- a specified limit of the maximum allowed time for active power recovery;
- (adequacy between the level of voltage recovery and the minimum magnitude for active power recovery; and
- adequate damping of active power oscillations.

8.3.1.4 Power park modules with capacity ≥5 MW shall fulfil the following additional requirements in relation to frequency stability:

a) the TSO shall have the right to specify that power park modules be capable of providing synthetic inertia during very fast frequency deviations;

b) the operating principle of control systems installed to provide synthetic inertia and the associated performance parameters shall be specified by the TSO.

8.3.1.5 Power park modules with capacity ≥5 MW shall fulfil the following additional requirements in relation to voltage stability:

a) with regard to reactive power capability, the TSO or the DSO (as the case may be) may specify supplementary reactive power to be provided if the connection point of a power park module is neither located at the high-voltage terminals of the step-up transformer to the voltage level of the connection point nor at the convertor terminals, if no step-up transformer exists. This supplementary reactive power shall compensate the reactive power demand of the high-voltage line or cable between the high-voltage terminals of the step-up transformer of the power park module or its convertor terminals, if no step-up transformer exists, and the connection point and shall be provided by the responsible owner of that line or cable.

b) with regard to reactive power capability at maximum capacity:

- the TSO or the DSO (as the case may be) in coordination with the TSO shall specify the reactive power provision capability requirements in the context of varying voltage. To that end, it shall specify a U-Q/Pmax-profile that may take any shape within the boundaries of which the power park module shall be capable of providing reactive power at its maximum capacity;

c) with regard to reactive power capability, the TSO or the DSO (as the case may be) in coordination with the TSO shall have the right to specify the capability of a power park module with capacity ≥5MW to provide reactive power. The U-Q/P_{max}-profile within the boundary of which the Power Park Modules shall be capable of providing Reactive Power at its Maximum Capacity is shown in Figure 9:

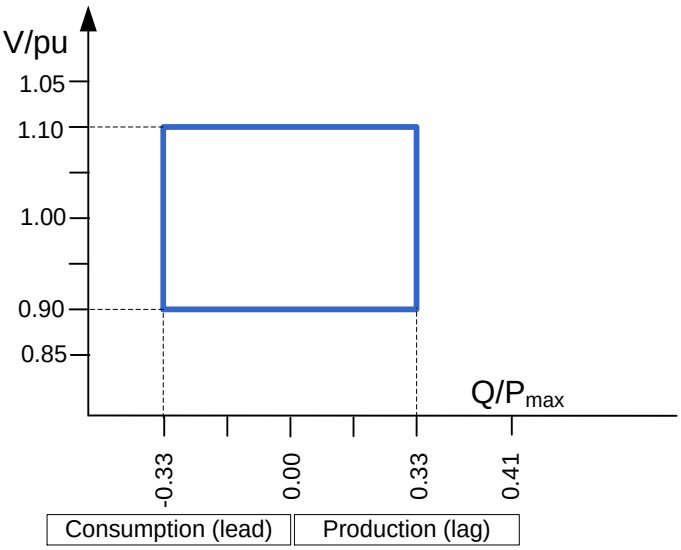

Figure 9: U-Q/P_{max}-profile of a Power Park module with capacity ≥5MW. The diagram represents boundaries of a U-Q/P_{max}-profile by the voltage at the connection point, expressed by the ratio of its actual value and it's the reference 1 pu value, against the ratio of the reactive power (Q) and the maximum capacity (P_{max}).

- The reactive power provision capability requirement applies at the connection point.

d) With regard to reactive power capability below maximum capacity:

- With regard to reactive power capability below maximum capacity (P<P_{max}), the P-Q/P_{max}-profile at the connection point, within the boundary of which Power Park Modules shall be capable of providing reactive power to a ratio of P/P_{max} of 0.1 pu.
- Below a ratio of P/Pmax of 0.1 pu, reactive power capability is not required. when operating at an active power output below maximum capacity (P<P_{max}), the power park module shall be capable of providing reactive power at any operating point inside its P-Q/P_{max}-profile illustrated in Figure 10, if all units of that power park module which generate power are technically available that is to say they are not out of service due to maintenance or failure, otherwise there may be less reactive power capability, taking into consideration the technical availabilities;
- the power park module shall be capable of moving to any operating point within its P-Q/P_{max} profile in appropriate timescales to target values requested by the TSO or the DSO (as the case may be) in a range of 10 seconds to 1 minute.

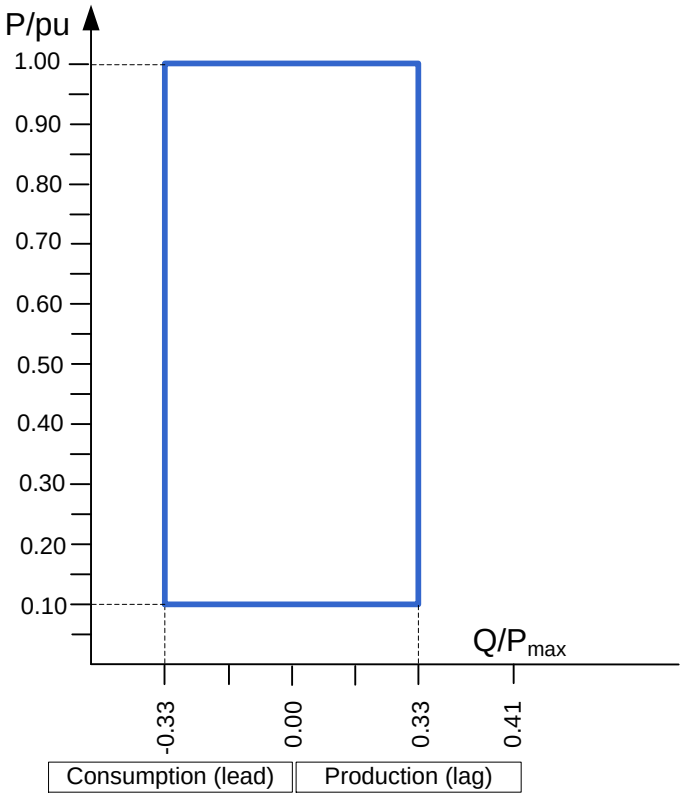

Figure 10: P-Q/P_{max}-profile of a power park module with capacity ≥5MW. The diagram represents boundaries of a P-Q/P_{max}-profile at the connection point by the active power, expressed by the ratio of its actual value and the maximum capacity pu, against the ratio of the reactive power (Q) and the maximum capacity (P_{max}).

e) with regard to reactive power control modes:

- the power park module shall be capable of providing reactive power automatically by either voltage control mode, reactive power control mode or power factor control mode;
- for the purposes of voltage control mode, the power park module shall be capable of contributing to voltage control at the connection point by provision of reactive power exchange with the network with a setpoint voltage covering 0.95 to 1.05 pu in steps no greater than 0.01 pu, with a slope having a range of at least 2 to 7 % in steps no greater than 0.5 %. The reactive power output shall be zero when the grid voltage value at the connection point equals the voltage setpoint;
- the setpoint may be operated with or without a deadband selectable in a range from zero to +-5 % of reference 1 pu network voltage in steps no greater than 0.5 %;

- following a step change in voltage, the power park module shall be capable of achieving 90 % of the change in reactive power output within a time t1 to be specified by the transmission system operator in the range of 1 to 5 seconds, and must settle at the value specified by the slope within a time t2 to be specified by the TSO or the DSO (as the case may be) in the range of 5 to 60 seconds, with a steady-state reactive tolerance no greater than 5 % of the maximum reactive power. The TSO or the DSO (as the case may be) shall specify the time specifications;
- for the purpose of reactive power control mode, the power park module shall be capable of setting the reactive power setpoint anywhere in the reactive power range, specified by points (a) and (b) of paragraph 8.3.1.5, with setting steps no greater than 5 MVAr or 5 % (whichever is smaller) of full reactive power, controlling the reactive power at the connection point to an accuracy within plus or minus 5 MVAr or plus or minus 5 % (whichever is smaller) of the full reactive power;
- for the purpose of power factor control mode, the power park module shall be capable of controlling the power factor at the connection point within the required reactive power range, specified by the TSO or the DSO (as the case may be) according to points (a) and (b) of paragraph 8.3.1.5, with a target power factor in steps no greater than 0.01. The TSO or the DSO (as the case may be) shall specify the target power factor value, its tolerance and the period of time to achieve the target power factor following a sudden change of active power output. The tolerance of the target power factor shall be expressed through the tolerance of its corresponding reactive power. This reactive power tolerance shall be expressed by either an absolute value or by a percentage of the maximum reactive power of the power park module;
- the TSO or the DSO (as the case may be), in coordination with the TSO and with the power park module owner, shall specify which of the above three reactive power control mode options and associated setpoints is to apply, and what further equipment is needed to make the adjustment of the relevant setpoint operable remotely;

f) with regard to prioritising active or reactive power contribution, the TSO shall specify whether active power contribution or reactive power contribution has priority during faults for which fault-ride-through capability is required. If priority is given to active power contribution, this provision has to be established no later than 150 ms from the fault inception;

g) with regard to power oscillations damping control, if specified by the TSO a power park module shall be capable of contributing to damping power oscillations. The

voltage and reactive power control characteristics of power park modules must not adversely affect the damping of power oscillations.

8.4 Operational notification procedure for connection of power-generating facilities in the transmission network

8.4.1 General Provision

8.4.1.1 The power-generating facility owner connected in transmission network shall demonstrate to the TSO that it has complied with the requirements set out in this Code by completing successfully the operational notification procedure for connection of each power-generating module described in paragraphs 8.4.2 to 8.4.6.

8.4.1.2 The TSO be shall clarify and make publicly available the details of the operational notification procedure.

8.4.2 Procedure for power-generating modules connected in transmission network

8.4.2.1 The operational notification procedure for connection of each new power-generating module in the transmission network shall comprise:

a) energisation operational notification ('EON');

b) interim operational notification ('ION'); and

c) final operational notification ('FON').

8.4.3 Energisation operational notification

8.4.3.1 An EON shall entitle the power-generating facility owner to energise its internal network and auxiliaries for the power-generating modules by using the grid connection that is specified for the connection point.

8.4.3.2 An EON shall be issued by the TSO, subject to completion of preparations including agreement on the protection and control settings relevant to the connection point between the TSO and the power-generating facility owner.

8.4.4 Interim operational notification

8.4.4.1 An ION shall entitle the power-generating facility owner to operate the power-generating module and generate power by using the grid connection for a limited period of time.

8.4.4.2 An ION shall be issued by the TSO, subject to completion of the data and study review process as required by paragraph 8.4.4.3

8.4.4.3 With regard to the data and study review, the TSO shall have the right to request that the power-generating facility owner provide the following:

a) itemised statement of compliance;

b) detailed technical data on the power-generating module of relevance to the network connection as specified by the TSO;

c) equipment certificates issued by an authorised certifier in respect of power-generating modules, where they are relied upon as part of the evidence of compliance;

d) simulation models, as specified by paragraph 8.1.5 and required by the TSO;

e) studies demonstrating the expected steady-state and dynamic performance as required by paragraph 8.5.7 and 8.5.8;

f) details of intended compliance tests in accordance with paragraph 8.5.5 and 8.5.6.

8.4.4.4 The maximum period during which the power-generating facility owner may maintain ION status shall be 24 months. The TSO is entitled to specify a shorter ION validity period. An extension of the ION shall be granted only if the power-generating facility owner has made substantial progress towards full compliance. Outstanding issues shall be clearly identified at the time of requesting extension.

8.4.4.5 An extension of the period during which the power-generating facility owner may maintain ION status, beyond the period established in paragraph 8.4.4.4, may be granted if a request for a derogation is made to the TSO before the expiry of that period in accordance with the derogation procedure laid down in chapter 10 of this code.

8.4.5 Final operational notification

8.4.5.1 A FON shall entitle the power-generating facility owner to operate a power-generating modul by using the grid connection.

8.4.5.2 A FON shall be issued by the TSO, upon prior removal of all incompatibilities identified for the purpose of ION status and subject to completion of the data and study review process as required by paragraph 8.4.5.3

8.4.5.3 For the purposes of the data and study review, the power-generating facility owner must submit the following to the TSO:

a) an itemised statement of compliance; and

b) an update of applicable technical data, simulation models and studies as referred to in points (b), (d) and (e) of paragraph 8.4.4.3, including the use of actual measured values during testing.

8.4.5.4 If incompatibility is identified in connection with the issuing of the FON, a derogation may be granted upon a request made to the TSO, in accordance with the derogation procedure described in chapter 10 of this code. A FON shall be issued by the TSO if the power-generating module complies with the provisions of the derogation.

8.4.5.5 Where a request for a derogation is rejected, the TSO shall have the right to refuse to allow the operation of the power-generating module until the power-generating facility owner and the TSO resolve the incompatibility and the TSO considers that the power-generating module complies with the provisions of this Code.

8.4.5.6 If the TSO and the power-generating facility owner do not resolve the incompatibility within a reasonable time frame, but in any case not later than six months after the notification of the rejection of the request for a derogation, each party may refer the issue for decision to the regulatory authority.

8.4.6 Limited operational notification

8.4.6.1 Power-generating facility owners to whom a FON has been granted shall inform the TSO immediately in the following circumstances:

a) the facility is temporarily subject to either significant modification or loss of capability affecting its performance; or
b) Equipment failure leading to non-compliance with some relevant requirements.

8.4.6.2 The power-generating facility owner shall apply to the TSO for a LON, if the power-generating facility owner reasonably expects the circumstances described in paragraph 8.4.6.1 to persist for more than three months.

8.4.6.3 A LON shall be issued by the TSO and shall contain the following information which shall be clearly identifiable:

a) the unresolved issues justifying the granting of the LON;

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

c) a maximum period of validity which shall not exceed 12 months. The initial period granted may be shorter with the possibility of an extension if evidence is submitted to the satisfaction of the TSO demonstrating that substantial progress has been made towards achieving full compliance.

8.4.6.4 The FON shall be suspended during the period of validity of the LON with regard to the items for which the LON has been issued.

8.4.6.5 A further extension of the period of validity of the LON may be granted upon a request for a derogation made to the TSO before the expiry of that period, in accordance with the derogation procedure described in chapter 10 of this code.

8.4.6.6 The TSO shall have the right to refuse to allow the operation of the power-generating module, once the LON is no longer valid. In such cases, the FON shall automatically become invalid.

8.4.6.7 If the TSO does not grant an extension of the period of validity of the LON in accordance with paragraph 8.4.6.5 or if it refuses to allow the operation of the power-generating module once the LON is no longer valid in accordance with paragraph 8.4.6.6 the power-generating facility owner may refer the issue for decision to the regulatory authority within six months after the notification of the decision of the TSO.

8.5 Compliance monitoring and Testing of power-generating modules connected in transmission network

8.5.1 Responsibility of the power-generating facility owner

8.5.1.1 The power-generating facility owner shall ensure that each power-generating module complies with the requirements applicable under this Code throughout the lifetime of the facility

8.5.1.2 The power-generating facility owner shall notify to the TSO any planned modification of the technical capabilities of a power-generating module which may affect its compliance with the requirements applicable under this Code, before initiating that modification.

8.5.1.3 The power-generating facility owner shall notify the system operator of any operational incidents or failures of a power-generating module that affect its compliance with the requirements of this Code, without undue delay, after the occurrence of those incidents.

8.5.1.4 The power-generating facility owner shall notify the TSO of the planned test schedules and procedures to be followed for verifying the compliance of a power-generating module with the requirements of this Code, in due time and prior to their launch. The TSO shall approve in advance the planned test schedules and procedures. Such approval by the TSO shall be provided in a timely manner and shall not be unreasonably withheld.

8.5.1.5 The TSO may participate in such tests and record the performance of the power-generating module.

8.5.2 Task of the TSO

8.5.2.1 The TSO shall assess the compliance of a power-generating module with the requirements applicable under this Code, throughout the lifetime of the power-generating facility. The power-generating facility owner shall be informed of the outcome of this assessment.

8.5.2.2 The TSO shall have the right to request that the power-generating facility owner carry out compliance tests and simulations according to a repeat plan or general scheme or after any failure, modification or replacement of any equipment that may have an impact on the power-generating modules compliance with the requirements of this Code.

8.5.2.3 The power-generating facility owner shall be informed of the outcome of those compliance tests and simulations.

8.5.2.4 The TSO shall make publicly available a list of information and documents to be provided as well as the requirements to be fulfilled by the power-generating facility owner within the framework of the compliance process. The list shall cover at least the following information, documents and requirements:

a) all the documentation and certificates to be provided by the power-generating facility owner;
b) details of the technical data on the power-generating module of relevance to the grid connection;
c) requirements for models for steady-state and dynamic system studies;
d) timeline for the provision of system data required to perform the studies;
e) studies by the power-generating facility owner to demonstrate the expected steady-state and dynamic performance in accordance with the requirements set out paragraph 8.5.7 and 8.5.8;
f) conditions and procedures, including the scope, for registering equipment certificates; and
g) conditions and procedures for the use of relevant equipment certificates issued by an authorised certifier by the power-generating facility owner.

8.5.2.5 The TSO shall make public the allocation of responsibilities between the power-generating facility owner and the TSO for compliance testing, simulation and monitoring.

8.5.2.6 The TSO may totally or partially delegate the performance of its compliance monitoring to third parties. In such cases, the TSO shall continue ensuring compliance with Confidentiality obligations, including entering into confidentiality commitments with the assignee.

8.5.2.7 If compliance tests or simulations cannot be carried out as agreed between the TSO and the power-generating facility owner due to reasons attributable to the TSO, then the TSO shall not unreasonably withhold the operational notification referred to in paragraph 8.4.

8.5.2.8 The TSO must give for compliance monitoring at least one month's notice to the power-generating facility owner. This notice will give the time of commencement of the monitoring, its expected duration and the name of the responsible person who will conduct the monitoring. It will also include the reason for the monitoring and the nature of the any suspected non-compliance. Power-generating facility owner in response must grant them full access to the site and the necessary support to carry out the compliance monitoring.

8.5.2.9 The TSO officer shall comply with the compliance monitoring conditions, the site conditions and cause no damage to the facility. They can only interfere with the operation of the facility to the extent reasonably necessary and approved by the power-generating facility owner to carry out the agreed compliance monitoring.

8.5.2.10 The costs of an compliance monitoring carried out under paragraph 8.5 shall be paid by the TSO. However if testing demonstrates a significant deviation by the power-generating facility owner from the data provided and/or non-compliance to the required technical specifications as outlined in this connection code, the costs of the compliance monitoring will be met by the power-generating facility owner.

8.5.3 Common provisions for compliance testing

8.5.3.1 Testing of the performance of individual power-generating modules within a power-generating facility shall aim at demonstrating that the requirements of this Code have been complied with.

8.5.3.2 Notwithstanding the minimum requirements for compliance testing set out in this Code, the TSO is entitled to:

a) allow the power-generating facility owner to carry out an alternative set of tests, provided that those tests are efficient and suffice to demonstrate that a power-generating module complies with the requirements of this Code;
b) require the power-generating facility owner to carry out additional or alternative sets of tests in those cases where the information supplied to the TSO in relation to compliance testing under the provisions of paragraph 8.5.5 and 8.5.6, is not sufficient to demonstrate compliance with the requirements of this Code; and
c) require the power-generating facility owner to carry out appropriate tests in order to demonstrate a power-generating module's performance when operating on alternative fuels or fuel mixes. The TSO and the power-generating facility owner shall agree on which types of fuel are to be tested.

8.5.3.3 The power-generating facility owner is responsible for carrying out the tests in accordance with the conditions laid down in paragraph 8.5.5. and 8.5.6, The TSO shall cooperate and not unduly delay the performance of the tests.

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

8.5.3.5 The TSO may attach test equipment or monitoring equipment to plant of the power-generating facility owner or request the latter to attach such test equipment. In carrying out monitoring the TSO must not cause the performance of the monitored plant to be constrained in any way.

8.5.3.6 Each power-generating facility owner must co-operate with the TSO in testing the operation of equipment forming part of the protection system relating to a connection point at which that power-generating facility is connected to the transmission system and the TSO must conduct these tests as follows:

a) Prior to the plant at the relevant connection point being placed in service;
b) At intervals specified in the connection agreement;
c) If the TSO assumes that the defense system is not in compliance with the requirements of the Grid Code or CA.

8.5.4 Common provisions on compliance simulation

8.5.4.1 Simulation of the performance of individual power-generating modules within a power-generating facility shall aim at demonstrating that the requirements of this Code have been fulfilled.

8.5.4.2 Notwithstanding the minimum requirements set out in this Code for compliance simulation, the TSO may:

a) allow the power-generating facility owner to carry out an alternative set of simulations, provided that those simulations are efficient and suffice to demonstrate that a power-generating module complies with the requirements of this Code or with national legislation; and
b) require the power-generating facility owner to carry out additional or alternative sets of simulations in those cases where the information supplied to the TSO in relation to compliance simulation under the provisions paragraph 8.5.7 and 8.5.8 is not sufficient to demonstrate compliance with the requirements of this Code.

8.5.4.3 To demonstrate compliance with the requirements of this Code, the power-generating facility owner shall provide a report with the simulation results for each individual power-generating module within the power-generating facility. The power-generating

facility owner shall produce and provide a validated simulation model for a given power-generating module.

8.5.4.4 The TSO shall have the right to check that a power-generating module complies with the requirements of this Code by carrying out its own compliance simulations based on the provided simulation reports, simulation models and compliance test measurements.

8.5.4.5 The TSO shall provide the power-generating facility owner with technical data and a simulation model of the network, to the extent necessary to carry out the requested simulations in accordance with paragraph 8.1.5.

8.5.5 Compliance testing for synchronous power-generating modules

8.5.5.1 Power-generating facility owners shall undertake the compliance tests set out in paragraphs 8.5.5.2, 8.5.5.3, 8.5.5.4 and 8.5.5.6 in relation to synchronous power-generating modules. Where a power-generating module provides black start capability, power-generating facility owners shall also undertake the tests referred to in 8.5.5.5. Instead of the relevant test, the power-generating facility owner may use equipment certificates issued by an authorised certifier to demonstrate compliance with the relevant requirement. In that case, the equipment certificates shall be provided to the TSO.

8.5.5.2 The following requirements with regard to the LFSM-U response test shall apply:

a) it shall demonstrate that the power-generating module is technically capable of continuously modulating active power at operating points below maximum capacity to contribute to frequency control in case of a large frequency drop in the system;
b) the test shall be carried out by simulating appropriate active power load points, with low frequency steps and ramps big enough to trigger active power change of at least 10 % of maximum capacity, taking into account the droop settings and the deadband. If required, simulated frequency deviation signals shall be injected simultaneously into both the speed governor and the load controller references;
c) the test shall be deemed successful if the following conditions are fulfilled:
   - the test results, for both dynamic and static parameters, comply with a paragraph 8.1.3.8; and
   - undamped oscillations do not occur after the step change response.

8.5.5.3 The following requirements with regard to the FSM response test shall apply:

a) it shall demonstrate that the power-generating module is technically capable of continuously modulating active power over the full operating range between maximum capacity and minimum regulating level to contribute to frequency control. The steady-state parameters of regulations, such as droop and deadband and dy-

namic parameters, including robustness through frequency step change response and large, fast frequency deviations shall be verified;

b) the test shall be carried out by simulating frequency steps and ramps big enough to trigger the whole active power frequency response range, taking into account the settings of droop and deadband, as well as the capability to actually increase or decrease active power output from the respective operating point. If required, simulated frequency deviation signals shall be injected simultaneously into the references of both the speed governor and the load controller of the unit or plant control system;

c) the test shall be deemed successful if the following conditions are fulfilled:
   - the activation time of full active power frequency response range as a result of a frequency step change is no longer than required by paragraph 8.1.4.7;
   - undamped oscillations do not occur after the step change response;
   - the initial delay time complies with paragraph 8.1.4.7;
   - the droop settings are available within the range specified in paragraph 8.1.4.7 and the deadband (threshold) is not higher than the value specified in that paragraph; and
   - the insensitivity of active power frequency response at any relevant operating point does not exceed the requirements set out in paragraph 8.1.4.7.

8.5.5.4 With regard to the frequency restoration control test the following requirements shall apply:

a) the power-generating modules technical capability to participate in frequency restoration control shall be demonstrated and the cooperation of FSM and frequency restoration control shall be checked;

b) the test shall be deemed successful if the results, for both dynamic and static parameters, comply with the requirements of paragraph 8.1.4.8 point (k).

8.5.5.5 With regard to the black start capability test the following requirements shall apply:

a) for power-generating module with black start capability, this technical capability to start from shut down without any external electrical energy supply shall be demonstrated;

b) the test shall be deemed successful if the start-up time is kept within the time frame set out in point b) of paragraph 8.1.9.2.

8.5.5.6 With regard to the tripping to houseload test the following requirements shall apply:

a) the power-generating modules technical capability to trip to and stably operate on house load shall be demonstrated;

b) the test shall be carried out at the maximum capacity and nominal reactive power of the power-generating module before load shedding;

c) the TSO shall have the right to set additional conditions, taking into account paragraph 8.1.9.4

d) the test shall be deemed successful if tripping to house load is successful, stable houseload operation has been demonstrated in the time period set out in paragraph 8.1.9.4; and re-synchronisation to the network has been performed successfully.

8.5.5.7 With regard to the reactive power capability test the following requirements shall apply:

a) the power-generating module's technical capability to provide leading and lagging reactive power capability in accordance with paragraphs 8.2.1.2 and 8.2.1.4 shall be demonstrated;

b) the test shall be deemed successful if the following conditions are fulfilled:
- the power-generating module operates at maximum reactive power for at least one hour, both leading and lagging, at minimum stable operating level, at maximum capacity and an active power operating point between those maximum and minimum levels;
- the power-generating modules capability to change to any reactive power target value within the agreed or decided reactive power range shall be demonstrated.

8.5.5.8 Instead of the relevant test, the power-generating facility owner may use equipment certificates issued by an authorised certifier to demonstrate compliance with the relevant requirement. In such a case, the equipment certificates shall be provided to the TSO.

8.5.6 Compliance testing for power park modules connected in transmission network

8.5.6.1 Power-generating facility owners shall undertake LFSM-O response compliance tests in relation to power park modules. Instead of the relevant test, the power-generating facility owner may use equipment certificates issued by an authorised certifier to demonstrate compliance with the relevant requirement. In that case, the equipment certificates shall be provided to the TSO.

8.5.6.2 The LFSM-O response tests shall reflect the choice of control scheme selected by the TSO .

8.5.6.3 With regard to the LFSM-O response tests the following requirements shall apply:

a) the power park module's technical capability to continuously modulate active power to contribute to frequency control in case of increase of frequency in the system shall be demonstrated. The steady-state parameters of regulations, such as droop and deadband, and dynamic parameters shall be verified;

b) the test shall be carried out by simulating frequency steps and ramps big enough to trigger at least 10 % of maximum capacity change in active power, taking into

account the droop settings and the deadband. To perform this test simulated frequency deviation signals shall be injected simultaneously into the control system references;

c) the test shall be deemed successful in the event that the test results, for both dynamic and static parameters, comply with the requirements set out in paragraph 8.1.3.1.

8.5.6.4 With regard to the active power controllability and control range test the following requirements shall apply:

a) the power park module's technical capability to operate at a load level below the setpoint set by the by the TSO shall be demonstrated;

b) the test shall be deemed successful if the following conditions are fulfilled:

- the load level of the power park module is kept below the setpoint;
- the setpoint is implemented according to the requirements laid down in paragraph 8.1.2.2 point (a); and
- the accuracy of the regulation complies with the value that will specified according paragraph 8.1.2.2 point (b).

8.5.6.5 With regard to the LFSM-U response test the following requirements shall apply:

a) the power park module's technical capability to continuously modulate active power to contribute to frequency control in case of a large frequency drop in the system shall be demonstrated;

b) the test shall be carried out by simulating the frequency steps and ramps big enough to trigger at least 10 % of maximum capacity active power change with a starting point of no more than 80 % of maximum capacity, taking into account the droop settings and the deadband;

c) the test shall be deemed successful if the following conditions are fulfilled:

d) the test results, for both dynamic and static parameters, comply with the requirements laid down in paragraph 8.1.2.2 point (c); and

e) undamped oscillations do not occur after the step change response.

8.5.6.6 With regard to the FSM response test the following requirements shall apply:

a) the power park module's technical capability to continuously modulate active power over the full operating range between maximum capacity and minimum regulating level to contribute to frequency control shall be demonstrated. The steady-state parameters of regulations, such as insensitivity, droop, deadband and range of regulation, as well as dynamic parameters, including frequency step change response shall be verified;

b) the test shall be carried out by simulating frequency steps and ramps big enough to trigger the whole active power frequency response range, taking into account the droop settings and the deadband. Simulated frequency deviation signals shall be injected to perform the test;

c) the test shall be deemed successful if the following conditions are fulfilled:

- the activation time of the full active power frequency response range as a result of a frequency step change is no longer than that required by paragraph 8.1.4.7;
- undamped oscillations do not occur after the step change response;
- the initial delay is in line with paragraph 8.1.4.7;
- the droop settings are available within the ranges specified in paragraph 8.1.4.7
- and the deadband (threshold) is not higher than the value chosen by the TSO; and
- the insensitivity of active power frequency response does not exceed the requirement set out in paragraph 8.1.4.7.
- With regard to the frequency restoration control test the following requirements shall apply:

d) the power park module's technical capability to participate in frequency restoration control shall be demonstrated. The cooperation of both FSM and frequency restoration control shall be checked;

e) the test shall be deemed successful if the results for both dynamic and static parameters comply with the requirements of point (k) of paragraph 8.1.4.8.

8.5.6.7 With regard to the reactive power capability test the following requirements shall apply:

a) the power park module's technical capability to provide leading and lagging reactive power capability in accordance with points (b) and (d) of paragraph 8.3.1.5 shall be demonstrated;

b) it shall be carried out at maximum reactive power, both leading and lagging, and shall verify the following parameters:

- operation in excess of 60 % of maximum capacity for 30 min;
- operation within the range of 30-50 % of maximum capacity for 30 min; and
- operation within the range of 10-20 % of maximum capacity for 60 min;

c) the test shall be deemed successful if the following criteria are fulfilled:

d) the power park module operates for a duration no shorter than the requested duration at maximum reactive power, both leading and lagging, in each parameter specified in paragraph 8.5.6.7 point (b);

e) the power park module's capability to change to any reactive power target value within the agreed or decided reactive power range is demonstrated; and

f) no protection action takes place within the operation limits specified by the reactive power capacity diagram.

8.5.6.8 With regard to the voltage control mode test the following requirements shall apply:

a) the power park module's capability to operate in voltage control mode referred to in the conditions set out in points (d) of paragraph 8.3.1.5 shall be demonstrated;

b) The voltage control mode test shall verify the following parameters:

- the implemented slope and deadband according to points (e) of paragraph 8.3.1.5;
- the accuracy of the regulation;
- the insensitivity of the regulation; and
- the time of reactive power activation;

c) The test shall be deemed successful if the following conditions are fulfilled:

- the range of regulation and adjustable droop and deadband complies with the agreed or decided characteristic parameters set out in to points (e) of paragraph 8.3.1.5;
- the insensitivity of voltage control is not higher than 0,01 pu, in accordance with to points (e) of paragraph 8.3.1.5; and
- following a step change in voltage, 90 % of the change in reactive power output has been achieved within the times and tolerances specified to points (e) of paragraph 8.3.1.5.

8.5.6.9 With regard to the reactive power control mode test the following requirements shall apply:

a) the power park module's capability to operate in reactive power control mode, in accordance with to points (e) of paragraph 8.3.1.5, shall be demonstrated;

b) the reactive power control mode test shall be complementary to the reactive power capability test;

c) the reactive power control mode test shall verify the following parameters:

- the reactive power setpoint range and increment;
- the accuracy of the regulation; and

- the time of reactive power activation.

d) the test shall be deemed successful if the following conditions are fulfilled:

- the reactive power setpoint range and increment are ensured in accordance with to points (e) of paragraph 8.3.1.5; and
- the accuracy of the regulation complies with the conditions set out in to points (e) of paragraph 8.3.1.5.

8.5.6.10 With regard to the power factor control mode test the following requirements shall apply:

a) the power park module's capability to operate in power factor control mode in accordance with to points (e) of paragraph 8.3.1.5 shall be demonstrated;

b) the power factor control mode test shall verify the following parameters:

- the power factor setpoint range;
- the accuracy of the regulation; and
- the response of reactive power due to step change of active power;

c) the test shall be deemed successful if the following conditions are cumulatively fulfilled:

- the power factor setpoint range and increment are ensured in accordance with to points (e) of paragraph 8.3.1.5;
- the time of reactive power activation as a result of step active power change does not exceed the requirement laid down in to points (e) of paragraph 8.3.1.5; and
- the accuracy of the regulation complies with the value specified in to points (e) of paragraph 8.3.1.5.

8.5.6.11 With regard to the tests referred to in paragraphs 8.5.6.8, 8.5.6.9 and 8.5.6.10, the TSO may select only one of the three control options for testing.

8.5.7 Compliance simulation for synchronous power-generating modules

8.5.7.1 Synchronous power-generating modules shall be subject to the compliance simulations detailed in paragraphs 8.5.7.2 to 8.5.7.5. Instead of all or part of those simulations, the power-generating facility owner may use equipment certificates issued by an authorised certifier, which must be provided to the TSO.

8.5.7.2 With regard to the LFSM-U response simulation the following requirements shall apply:

a) the power-generating modules capability to modulate active power at low frequencies in accordance with paragraph 8.1.4.7 shall be demonstrated;

b) the simulation shall be carried out by means of low frequency steps and ramps reaching maximum capacity, taking into account the droop settings and the deadband;

c) the simulation shall be deemed successful in the event that:

- the simulation model of the power-generating modul is validated against the compliance test for LFSM-U response described in of paragraph 8.5.5.2; and

- compliance with the requirement of paragraph 8.1.3.8 is demonstrated.

8.5.7.3 With regard to the FSM response simulation the following requirements shall apply:

a) the power-generating modules capability to modulate active power over the full frequency range in accordance with paragraph 8.1.4.7shall be demonstrated;

b) the simulation shall be carried out by simulating frequency steps and ramps big enough to trigger the whole active power frequency response range, taking into account the droop settings and the deadband;

c) the simulation shall be deemed successful in the event that:

- the simulation model of the power-generating module is validated against the compliance test for FSM response described in paragraph 8.5.5.3; and

- the compliance with the requirement of paragraph 8.5.8 is demonstrated.

8.5.7.4 With regard to the island operation simulation the following requirements shall apply:

a) the power-generating modules performance during island operation referred to in the conditions set out in paragraph 8.1.4.7 shall be demonstrated;

b) the simulation shall be deemed successful if the power-generating module reduces or increases the active power output from its previous operating point to any new operating point within the P-Q-capability diagram within the limits paragraph 8.1.9.3, without disconnection of the power-generating module from the island due to over- or under-frequency.

8.5.7.5 With regard to the reactive power capability simulation the following requirements shall apply:

a) the power-generating modules capability to provide leading and lagging reactive power capability in accordance with the conditions set out in paragraphs 8.2.1.2 and 8.2.1.4 shall be demonstrated;

b) the simulation shall be deemed successful if the following conditions are fulfilled:

- the simulation model of the power-generating module is validated against the compliance tests for reactive power capability described paragraph 8.5.5.7; and

- compliance with the requirements of paragraphs 8.2.1.2 and 8.2.1.4 is demonstrated.

8.5.7.6 With regard to the power oscillations damping control simulation the following requirements shall apply:

a) it shall be demonstrated that the power-generating modules performance in terms of its control system ('PSS function') is capable of damping active power oscillations in accordance with the conditions set out in paragraph 8.2.2;

b) the tuning must result in improved damping of corresponding active power response of the AVR in combination with the PSS function, compared to the active power response of the AVR alone;

c) the simulation shall be deemed successful if the following conditions are cumulatively fulfilled:

- the PSS function damps the existing active power oscillations of the power-generating module within a frequency range specified by TSO. That frequency range shall include the local mode frequencies of the power-generating module and the expected network oscillations; and

- a sudden load reduction of the power-generating module from 1 pu to 0,6 pu of the maximum capacity does not lead to undamped oscillations in active or reactive power of the power-generating module

8.5.7.7 With regard to the simulation of fault-ride-through capability of synchronous power-generating modules, the following requirements shall apply:

a) the power-generating modules capability to provide fault-ride-through in accordance with the conditions set out in paragraph 8.1.6.4 shall be demonstrated;

b) the simulation shall be deemed successful if compliance with the requirement laid down in paragraph 8.1.6.4 is demonstrated.

8.5.8 Compliance simulation for power park modules connected in transmission network

8.5.8.1 Power park modules are subject to the compliance simulations in paragraphs 8.5.8.2 to 8.5.8.5. Instead of all or part of those simulations, the power-generating facility owner may use equipment certificates issued by an authorised certifier, which must be provided to the TSO.

8.5.8.2 With regard to the LFSM-O response simulation the following requirements shall apply:

a) the power park module's capability to modulate active power at high frequency in accordance with paragraph 8.1.3.1 shall be demonstrated;

b) the simulation shall be carried out by means of high frequency steps and ramps reaching minimum regulating level, taking into account the droop settings and the deadband;

c) the simulation shall be deemed successful in the event that:

- the simulation model of the power park module is validated against the compliance test for LFSM-O response set out in paragraph 8.5.6.3; and
- compliance with the requirement laid down in paragraph 8.1.3.1 is demonstrated.

8.5.8.3 With regard to the fast fault current injection simulation the following requirements shall apply:

a) the power park module's capability to provide fast fault current injection in accordance with the conditions set out in paragraph 8.3.1.1 shall be demonstrated;

b) the simulation shall be deemed successful if compliance with the requirement laid down in paragraph 8.3.1.1 is demonstrated.

8.5.8.4 With regard to the fault-ride-through simulation capability power park modules, the following requirements shall apply:

a) the power park module's capability to ride through faults in accordance with the conditions set out in paragraph 8.1.6.4 shall be demonstrated by simulation;

b) the simulation shall be deemed successful if compliance with the requirement laid down in paragraph 8.1.6.4 is demonstrated.

8.5.8.5 The following requirements with regard to the post fault active power recovery simulation shall apply:

a) the power park module's capability to provide post fault active power recovery in accordance with the conditions set out in paragraph 8.3.1.3 shall be demonstrated;

b) the simulation shall be deemed successful if compliance with the requirement laid down in paragraph 8.3.1.3 is demonstrated.

8.5.8.6 With regard to the LFSM-U response simulation the following requirements shall apply:

a) the power park module's capability to modulate active power at low frequencies in accordance with paragraph 8.1.3.8 shall be demonstrated;

b) the simulation shall be carried out by simulating low frequency steps and ramps reaching maximum capacity, taking into account the droop settings and the deadband;

c) the simulation shall be deemed successful in the event that:

- the simulation model of the power park module is validated against the compliance test for LFSM-U response set out in paragraph 8.5.6.5; and

- compliance with the requirement laid down in paragraph 8.1.3.8 is demonstrated.

8.5.8.7 With regard to the FSM response simulation the following requirements shall apply:

a) the power park module's capability to modulate active power over the full frequency range as referred to in paragraph 8.1.4.7 shall be demonstrated;

b) the simulation shall be carried out by simulating frequency steps and ramps big enough to trigger the whole active power frequency response range, taking into account the droop settings and the deadband;

c) the simulation shall be deemed successful in the event that:

- the simulation model of the power park module is validated against the compliance test for FSM response set out in paragraph 8.5.6.6; and

- compliance with the requirement laid down in paragraph 8.1.4.7 is demonstrated.

8.5.8.8 With regard to the island operation simulation, the following requirements shall apply:

a) the power park module's performance during island operation in accordance with the conditions set out in paragraph 8.1.9.3 shall be demonstrated;

b) the simulation shall be deemed successful in the event that the power park module reduces or increases the active power output from its previous operating point to any new operating point, within the P-Q-capability diagram and within the limits set out in paragraph 8.1.9.3, without disconnection of the power park module from the island due to over- or underfrequency.

8.5.8.9 With regard to the simulation of the capability of providing synthetic inertia, the following requirements shall apply:

a) the model of the power park module's capability of providing synthetic inertia to a low frequency event as set out in paragraph 8.3.1.4 shall be demonstrated;

b) the simulation shall be deemed successful if the model demonstrates that it complies with the conditions set out in paragraph 8.3.1.4.

8.5.8.10 With regard to the reactive power capability simulation, the following requirements shall apply:

a) the power park module shall demonstrate that it can provide leading and lagging reactive power capability as set out in points (b) and (d) of paragraph 8.3.1.5;

b) the simulation shall be deemed successful if the following conditions are cumulatively fulfilled:

- the simulation model of the power park module is validated against the compliance tests for reactive power capability set out in paragraph 8.5.6.7; and

- compliance with the requirements laid down in points paragraph 8.3.1.4 is demonstrated.

8.5.8.11 With regard to the power oscillations damping control simulation, the following requirements shall apply:

a) the model of the power park module shall demonstrate that it can provide active power oscillations damping capability accordance with point (g) of paragraph 8.3.1.5;

b) the simulation shall be deemed successful in the event that the model demonstrates compliance with the conditions described in point (g) of paragraph 8.3.1.5.

8.5.8.12 In addition to the compliance simulations for power park modules with capacity ≥5MW connected in distribution network set out in paragraph 8.5.8, power park modules connected in transmission network are subject to the fault-ride-through capability of power park modules compliance simulation.

8.5.8.13 Instead of all or part of the simulations mentioned in paragraph 8.5.8.12, the power-generating facility owner may use equipment certificates issued by an authorised certifier, which must be provided to the TSO.

8.5.8.14 The model of the power park module connected in transmission network shall demonstrate that it is suitable for simulating the fault-ride-through capability in accordance with paragraph 8.1.6.4.

8.5.8.15 The simulation shall be deemed successful if the model demonstrates compliance with the conditions set out in paragraph 8.1.6.4.

8.6 Disconnection and Reconnection of power-generating modules

8.6.1 Voluntary Disconnection

8.6.1.1 Power-generating facility owners are entitled to require voluntary permanent disconnection of their power-generating modules from the transmission system.

8.6.1.2 The power-generating facility owner must bear all the costs directly attributable to the voluntary disconnection and decommissioning.

8.6.1.3 The TSO will undertake the decommissioning procedures and will notify other users in the event that it believes the terms and conditions of the relevant CA-s could be affected by procedures for disconnection;

8.6.2 Involuntary Disconnection

8.6.2.1 The TSO may decide to disconnect a power-generating modules from the transmission system due to any of the following circumstances:

a) Pursuant to orders issued with the necessary level of authority;

b) During an emergency;

c) In accordance with Kosovan Laws;

d) In accordance with the provisions of the relevant CA;

e) In the event of a system incident causing the tripping of the **power-generating module**:

8.6.2.2 In all cases of disconnection the TSO must undertake a review and then provide a report to the relevant generating facility owner advising of the circumstances requiring such action.

8.6.2.3 Generally there will be no compensation to generating facility owner for lost revenue due to involuntary disconnection without advance notice in most circumstances. Examples of such circumstances are as follows:

a) Prevention of imminent danger to the health and security of people or facilities;

b) Accident in the **power–generating facility** or the connection facilities;

c) Non-fulfilment by the plant operating staff of an order given by the **TSO**;

d) Other circumstances beyond the control of the **TSO** not resulting from any intentional action or violation of the contract on their part and not subject to planning:

8.6.2.4 The TSO will compile a report that will be submitted to the regulator who will decide if further action is required.

8.6.3 Reconnection of power-generating modules

8.6.3.1 The TSO must ensure that a power- generation facilities are reconnected to the transmission system at a reasonable cost to the power- generation facilities owner as soon as practicable if:

a) The **TSO** reasonably satisfied that the emergency that caused the **power-generating module** e to be disconnected no longer exists;

b) The TSO is reasonably satisfied that there no longer exists a reason for the disconnection under the grid code or Kosovan Laws or the relevant CA;

c) A breach of the **CA**, giving rise to disconnection, has been remedied and the power- generation facilities owner has taken all necessary steps to prevent the reoccurrence of the breach and has delivered binding undertakings to the **TSO** that the breach will not re-occur:

9 Requirements for Demand User's

9.1 Frequency requirements

9.1.1 Transmission-connected demand facilities and distribution systems shall be capable of remaining connected to the network and operating at the frequency ranges same as is specified in table 1, paragraph 8.1.1.

9.1.2 The transmission-connected demand facility owner or the DSO may agree with the TSO 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 DSO shall not be unreasonably withheld.

9.2 Voltage requirements

9.2.1 Transmission-connected demand facilities and transmission-connected distribution systems shall be capable of remaining connected to the network and operating at the voltage ranges and time periods specified in table 6 and table 7

9.2.2 If required by the 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 TSO and the transmission-connected demand facility owner or the DSO.

9.2.3 With regard to transmission-connected distribution systems with a voltage below 110 kV (MV 35 kV, 20 kV, 10 kV and 6.3 kV) at the connection point, will be subject to the Distribution Code. DSO shall design the capability of their equipment, connected at the same voltage as the voltage of the connection point to the transmission system, to comply with this voltage range set in Distribution Code.

Table 6.The minimum time periods during which a transmission-connected demand facilities and transmission-connected distribution systems has to operate for voltages deviating from the nominal value at the connection point without disconnecting from the network for 220 kV and 110 kV voltage level

Voltage range	Time period for operation
0.90 pu – 1.118 pu	Unlimited
1.118 pu – 1.15 pu	60 minutes

Table 7.The minimum time periods during which a transmission-connected demand facilities and transmission-connected distribution systems has to operate for voltages deviating from the nominal value at the connection point without disconnecting from the network for 400 kV voltage level

Voltage range	Time period for operation
0.90 pu – 1.118 pu	Unlimited
1.05pu – 1.10 pu	60 minutes

9.3 Short Circuit requirements

9.3.1 Based on the rated short-circuit withstand capability of its transmission network elements, the TSO shall specify 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.

9.3.2 The 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 to be expected at the connection point as an equivalent of the network.

9.3.3 After an unplanned event, the TSO shall inform the affected transmission-connected demand facility owner or the affected transmission-connected distribution system operator as soon as possible and no later than one week after the unplanned event, of the changes above a threshold for the maximum short-circuit current that the affected transmission-connected demand facility or the affected transmission-connected distribution system shall be able to withstand from the TSO network in accordance with paragraph 9.3.1.

9.3.4 The threshold set in paragraph 9.3.3 shall either be specified by the transmission-connected demand facility owner for its facility, or by the transmission-connected distribution system operator for its network.

9.3.5 Before a planned event, the TSO shall inform the affected transmission-connected demand facility owner or the affected transmission-connected distribution system operator, as soon as possible and no later than one week before the planned event, of the changes above a threshold for the maximum short-circuit current that the affected transmission-connected demand facility or the affected transmission connected distribution system shall be able to withstand from the TSO network, in accordance with paragraph 9.3.1.

9.3.6 The threshold set in paragraph 9.3.5 shall either be specified by the transmission-connected demand facility owner for its facility, or by the transmission-connected distribution system operator for its network.

9.3.7 The 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, the equivalent units of the network shall be delivered and demonstrated for zero, positive and negative sequences.

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

9.3.9 Before a planned event, the transmission-connected demand facility owner or the transmission-connected distribution system operator shall inform the TSO, as soon as possible and no later than one week before the planned event, of the changes in short-circuit contribution above the threshold set by the TSO.

9.4 Reactive power requirements

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

a) For transmission-connected demand facilities, the actual reactive power range specified by the TSO for importing and exporting reactive power shall not be wider than 48 % of the larger of the maximum import capacity or maximum export capacity (0,9 power factor import or export of active power), except in situations where either technical or financial system benefits are demonstrated, for transmission-connected demand facilities, by the transmission-connected demand facility owner and accepted by the TSO;

b) For transmission-connected distribution systems, the actual reactive power range specified by the TSO for importing and exporting reactive power shall not be wider than:

- 48 % (i.e. 0,9 power factor) of the larger of the maximum import capability or maximum export capability during reactive power import (consumption); and
- 48 % (i.e. 0,9 power factor) of the larger of the maximum import capability or maximum export capability during reactive power export (production); Except in situations where either technical or financial system benefits are proved by

the TSO and the transmission-connected distribution system operator through joint analysis;

c) The TSO and the transmission-connected 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;

d) The TSO may establish the use of metrics other than power factor in order to set out equivalent reactive power capability ranges;

e) The reactive power range requirement values shall be met at the connection point;

f) By way of derogation from point (e), where a connection point is shared between a power- generating modul and a demand facility, equivalent requirements shall be met at the point defined in connection agreements or national law.

9.4.2 Without prejudice to point (b) of paragraph 9.4.1, the TSO may require the transmission-connected distribution system to actively control the exchange of reactive power at the connection point for the benefit of the entire system. The 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.

9.4.3 In accordance with paragraph 9.4.2 the transmission-connected distribution system operator may require the TSO to consider its transmission-connected distribution system for reactive power management.

9.5 Demand disconnection and demand reconnection

9.5.1 All transmission-connected demand facilities and transmission-connected distribution systems shall fulfil the following requirements related to low frequency demand disconnection functional capabilities:

a) 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 specified proportion of their demand. ;

b) the low frequency demand disconnection functional capabilities shall allow for disconnecting demand in stages for a range of operational frequencies;

c) the low frequency demand disconnection functional capabilities shall allow for operation from a nominal Alternating Current ('AC') input, shall meet the following requirements:

- frequency range from 49.0 to 48.0 Hz;
- Amount of demand corresponding to 8% of the total load shall be disconnected at 49.0 Hz;
- In total, an amount of demand corresponding to 48% of the total load shall be disconnected between 49.0 and 48.0 Hz.
- The number of disconnection steps shall be 6 (including the step triggered at 49.0 Hz),
- For each step, an amount of demand corresponding to 8% of total load shall be disconnected at maximum.
- Additional df/dt function in low frequency demand disconnection relays is allowed in the range 49.8 – 49.0 Hz.
- No intentional time delay shall be set in low frequency demand disconnection relays.
- Maximum disconnection delay shall be 150 ms including breakers operation time

d) voltage lock-out: blocking of the functional capability shall be possible when the voltage is within a range of 30 to 90 % of reference 1 pu voltage;

e) provide the direction of active power flow at the point of disconnection;

9.5.2 With regard to low voltage demand disconnection functional capabilities, the following requirements shall apply:

a) the TSO may specify, in coordination with the transmission-connected distribution system operators, low voltage demand disconnection functional capabilities for the transmission-connected distribution facilities;

b) the TSO may specify, in coordination with the transmission-connected demand facility owners, low voltage demand disconnection functional capabilities for the transmission-connected demand facilities;

c) based on the TSO's assessment concerning system security, may implement on load tap changer blocking and low voltage demand disconnection. In cases where the transformers are owned by the transmission-connected demand facility owners, at the request of the TSO, the application of no-load tap changer blocking and low voltage demand disconnection shall be binding for the transmission-connected demand facility owners;

d) if the TSO decides to implement a low voltage demand disconnection functional capability, the equipment for both on load tap changer blocking and low voltage demand disconnection shall be installed in coordination between TSO and DSO;

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

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

- the low voltage demand disconnection functional capability shall monitor the voltage by measuring all three phases;
- blocking of the relays' operation shall be based on direction of either active power or reactive power flow.

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

a) the transformers at connection point between TSO and DSO, TSO and transmission-connected demand facility owner shall be capable of automatic or manual on load tap changer blocking;

b) the TSO shall specify the automatic on load tap changer blocking functional capability.

c) 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:

- with regard to the capability of reconnection after a disconnection, the TSO shall specify 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 authorisation by the TSO;

- 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 table 1, paragraph 8.1.1 of this Code. The TSO and the transmission-connected demand facility owner or the transmission-connected distribution system operator shall agree on the settings of synchronisation 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;
- transmission-connected demand facility or a transmission-connected distribution facility shall be capable of being remotely disconnected from the transmission system when required by the TSO. If required, the automated disconnection equipment for reconfiguration of the system in preparation for block loading shall be specified by the TSO. The TSO shall specify the time required for remote disconnection.

9.6 Simulation models of demand facilities

9.6.1 Transmission-connected demand facilities and transmission-connected distribution systems shall fulfil the requirements set out in paragraphs 9.6.3 and 9.6.4 related to the simulation models or equivalent information.

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

9.6.3 TSO shall specify 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.

9.6.4 For the purpose of dynamic simulations, the simulation model or equivalent information referred to in paragraph 9.6.3 point a) shall contain the following sub-models or equivalent information:

a) power control;

b) voltage control;

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

d) the different types of demand, that is to say electro technical characteristics of the demand; and

e) Converter models.

9.6.5 TSO shall specify the requirements of the performance of the recordings of transmission-connected demand facilities or transmission-connected distribution facilities, or both, in order to compare the response of the model with these recordings.

9.7 Operational notification procedure for connection of demand user's

9.7.1 General provisions

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

a) an energisation operational notification (EON);

b) an interim operational notification (ION);

c) a final operational notification (FON).

9.7.1.2 Each transmission-connected demand facility owner or transmission-connected distribution system operator to which one or more of the requirements in chapter 9 apply shall demonstrate to the TSO that it has complied with the requirements set out in chapter 9 of this Code by completing successfully the operational notification procedure for connection of each transmission-connected demand facility and each transmission-connected distribution system described in paragraphs 9.7.2 to 9.7.5.

9.7.1.3 The TSO shall specify and make publicly available further details concerning the operational notification procedure.

9.7.2 Energisation operational notification for demand user's

9.7.2.1 An EON shall entitle the transmission-connected demand facility owner or transmission-connected distribution system operator to energise its internal network and auxiliaries by using the grid connection that is specified for the connection point.

9.7.2.2 An EON shall be issued by the TSO, subject to completion of preparations including agreement on the protection and control settings relevant to the connection point between the TSO and the transmission-connected demand facility owner or transmission-connected distribution system operator.

9.7.3 Interim operational notification for demand user's

9.7.3.1 An ION shall entitle the transmission-connected demand facility owner or transmission-connected distribution system operator to operate the transmission-connected demand facility, or the transmission-connected distribution system by using the grid connection for a limited period of time.

9.7.3.2 An ION shall be issued by the TSO, subject to completion of the data and study review process as required by paragraph 9.7.3.3

9.7.3.3 With regard to the data and study review, the TSO shall have the right to request that the transmission-connected demand facility owner or transmission-connected distribution system operator provide the following:

a) an itemised statement of compliance;

b) detailed technical data of the transmission-connected demand facility, the transmission-connected distribution facility or the transmission-connected distribution system relevant to the grid connection as specified by the TSO;

c) equipment certificates issued by an authorised certifier in respect of transmission-connected demand facilities, transmission-connected distribution facilities and transmission-connected distribution systems, where these are relied upon as part of the evidence of compliance;

d) simulation models, as specified in paragraph 9.6 and required by the TSO;

e) studies demonstrating expected steady-state and dynamic performance as required in paragraphs 9.11.2, 9.12.1 and 9.12.2;

f) details of intended practical method of completing compliance tests according to paragraph 9.10.

9.7.3.4 The maximum period during which the transmission-connected demand facility owner or transmission-connected distribution system operator may maintain ION status shall be 24 months. The TSO is entitled to specify a shorter ION validity period. An extension of the ION shall be granted only if the transmission-connected demand facility owner or transmission-connected distribution system operator has made substantial progress towards full compliance. Outstanding issues shall be clearly identified at the time of requesting extension.

9.7.3.5 An extension of the period during which the transmission-connected demand facility owner or transmission-connected distribution system operator may maintain ION status, beyond the period established in paragraph 9.7.3.4, may be granted if a request for a derogation is made to the TSO before the expiry of that period in accordance with the derogation procedure laid down in chapter 10.

9.7.4 Final operational notification for demand user's

9.7.4.1 A FON shall entitle the transmission-connected demand facility owner or transmission-connected distribution system operator to operate the transmission-connected demand facility, or the transmission-connected distribution system by using the network connection.

9.7.4.2 A FON shall be issued by the TSO, upon prior removal of all incompatibilities identified for the purposes of the ION status and subject to the completion of the data and study review process as required by paragraph 9.7.4.

9.7.4.3 For the purposes of the data and study review, the transmission-connected demand facility owner or transmission-connected distribution system operator must submit the following to the TSO:

a) an itemised statement of compliance; and

b) an update of the applicable technical data, simulation models and studies as referred to in points (b), (d) and (e) of paragraph 9.7.3.3, including the use of actual measured values during testing.

9.7.4.4 If incompatibility is identified in connection with the issuing of the FON, a derogation may be granted upon a request made to the TSO, in accordance with the derogation procedure described in chapter 10 of this code. A FON shall be issued by the TSO if the transmission-connected demand facility, or the transmission-connected distribution system complies with the provisions of the derogation.

9.7.4.5 Where a request for a derogation is rejected, the TSO shall have the right to refuse to allow the operation of the transmission-connected demand facility, or the transmission-connected distribution system until the transmission-connected demand facility owner or transmission-connected distribution system operator and the TSO resolve the incompatibility and the TSO considers that the transmission-connected demand facility, or the transmission-connected distribution system complies with the provisions of this Code.

9.7.4.6 If the TSO and the transmission-connected demand facility owner or transmission-connected distribution system operator do not resolve the incompatibility within a reasonable time frame, but in any case not later than six months after the notification of the rejection of the request for a derogation, each party may refer the issue for decision to the regulatory authority.

9.7.5 Limited operational notification for new demand user's

9.7.5.1 Transmission-connected demand facility owners or transmission-connected distribution system operators to whom a FON has been granted, shall inform the TSO, no later than 24 hours after the incident has occurred, of the following circumstances:

a) the facility is temporarily subject to either significant modification or loss of capability affecting its performance; or

b) equipment failure leading to non-compliance with some relevant requirements.

c) A longer time period to inform the TSO can be agreed with the transmission-connected demand facility owner or transmission-connected distribution system operator depending on the nature of the changes.

9.7.5.2 The transmission-connected demand facility owner or transmission-connected distribution system operator shall apply to the TSO for a limited operational notification (LON), if the transmission connected demand facility owner or transmission-connected distribution system operator expects the circumstances described in paragraph 1 to persist for more than three months.

9.7.5.3 A LON shall be issued by the TSO and shall contain the following information which shall be clearly identifiable:

a) the unresolved issues justifying the granting of the LON;

b) the responsibilities and timescales for expected solution; and

c) a maximum period of validity which shall not exceed 12 months. The initial period granted may be shorter with the possibility of an extension if evidence is submitted to the satisfaction of the TSO demonstrating that substantial progress has been made towards achieving full compliance.

9.7.5.4 The FON shall be suspended during the period of validity of the LON with regard to the items for which the LON has been issued.

9.7.5.5 A further extension of the period of validity of the LON may be granted upon a request for a derogation made to the TSO before the expiry of that period, in accordance with the derogation procedure described in chapter 10.

9.7.5.6 The TSO shall have the right to refuse to allow the operation of the transmission-connected demand facility, or the transmission-connected distribution system once the LON is no longer valid. In such cases, the FON shall automatically become invalid.

9.7.5.7 If the TSO does not grant an extension of the period of validity of the LON in accordance with paragraph 9.7.5.5 or if it refuses to allow the operation of the transmission-connected demand facility, or the transmission-connected distribution system once the LON is no longer valid in accordance with paragraph 9.7.5.6, the

transmission-connected demand facility owner or transmission-connected distribution system operator may refer the issue for decision to the regulatory authority within six months after the notification of the decision of the TSO.

9.8 Connection of demand units used by a demand facility to provide demand response services to TSO

9.8.1 General provisions

9.8.1.1 Demand response services provided to system operators shall be distinguished based on the following categories:

a) remotely controlled:
- demand response active power control;
- demand response reactive power control;
- demand response transmission constraint management.

b) autonomously controlled:
- demand response system frequency control;
- demand response very fast active power control.

9.8.1.2 Demand facilities may provide demand response services to the TSOs. Demand response services can include, jointly or separately, upward or downward modification of demand.

9.8.1.3 The categories referred to in paragraph 9.8.1.1 are not exclusive and this Code does not prevent other categories from being developed. This Code does not apply to demand response services provided to other entities than TSOs.

9.8.2 Specific provisions for demand units with demand response active power control, reactive power control and transmission constraint management

9.8.2.1 Demand facilities may offer demand response active power control, demand response reactive power control, or demand response transmission constraint management to TSO.

9.8.2.2 Demand units with demand response active power control, demand response reactive power control, or demand response transmission constraint management shall comply with the following requirements, either individually or, where it is not part of a transmission-connected demand facility, collectively as part of demand aggregation through a third party:

a) be capable of operating across the frequency ranges specified in paragraph 9.1.1 and the extended range specified in paragraph 9.1.2;

b) be capable of operating across the voltage ranges specified in paragraph 9.2.3 if connected at a voltage level at or above 110 kV;

c) be capable of operating across the normal operational voltage range of the system at the connection point, specified by the TSO, if connected at a voltage level below 110 kV. This range shall take into account Distribution Code requirements;

d) be capable of controlling power consumption from the network in a range equal to the range contracted, directly or indirectly through a third party, by the TSO;

e) be equipped to receive instructions, directly or indirectly through a third party, from the TSO to modify their demand and to transfer the necessary information. The TSO shall make publicly available the technical specifications approved to enable this transfer of information. For demand units connected at a voltage level below 110 kV, these specifications shall, prior to approval by the regulatory authority, be subject to consultation with the relevant stakeholders;

f) be capable of adjusting its power consumption within a time period specified by the TSO. For demand units connected at a voltage level below 110 kV, these specifications shall, prior to approval by the regulatory authority;

g) be capable of full execution of an instruction issued by the TSO to modify its power consumption to the limits of the electrical protection safeguards, unless a contractually agreed method is in place with the TSO for the replacement of their contribution (including aggregated demand facilities' contribution through a third party);

h) once a modification to power consumption has taken place and for the duration of the requested modification, only modify the demand used to provide the service if required by the TSO to the limits of the electrical protection safeguards, unless a contractually agreed method is in place with the TSO for the replacement of their contribution (including aggregated demand facilities' contribution through a third party). Instructions to modify power consumption may have immediate or delayed effects;

i) notify the TSO of the modification of demand response capacity. The TSO shall specify the modalities of the notification;

j) where the TSO, directly or indirectly through a third party, command the modification of the power consumption, enable the modification of a part of its demand in response to an instruction by the TSO, within the limits agreed with the demand facility owner and according to the demand unit settings;

k) have the withstand capability to not disconnect from the system due to the rate-of-change-of-frequency up to a value specified by the TSO. With regard to this withstand capability, the value of rate-of-change-of-frequency shall be calculated over a 500 ms time frame. For demand units connected at a voltage

level below 110 kV, these specifications shall, prior to approval by the Regulatory Authority, be subject to consultation with the relevant stakeholders.

l) where modification to the power consumption is specified via frequency or voltage control, or both, and via pre-alert signal sent by the TSO, be equipped to receive, directly or indirectly through a third party, the instructions from the TSO, to measure the frequency or voltage value, or both, to command the demand trip and to transfer the information. The TSO shall specify and publish the technical specifications approved to enable this transfer of information. For demand units connected at a voltage level below 110 kV, these specifications shall, prior to approval by the Regulatory Authority, be subject to consultation with the relevant stakeholders.

9.8.2.3 For voltage control with disconnection or reconnection of static compensation facilities, each transmission-connected demand facility shall be able to connect or disconnect its static compensation facilities, directly or indirectly, either individually or commonly as part of demand aggregation through a third party, in response to an instruction transmitted by the TSO, or in the conditions set forth in the contract between TSO and the demand facility owner.

9.8.3 Specific provisions for demand units with demand response system frequency control

9.8.3.1 Demand facilities may offer demand response system frequency control to TSOs.

9.8.3.2 Demand units with demand response system frequency control shall comply with the following requirements, either individually or, where it is not part of a transmission-connected demand facility, collectively as part of demand aggregation through a third party:

a) be capable of operating across the frequency ranges specified in paragraph 9.1.1 and the extended range specified in paragraph 9.1.2;

b) be capable of operating across the voltage ranges specified in paragraph 9.2.3 if connected at a voltage level at or above 110 kV;

c) be capable of operating across the normal operational voltage range of the system at the connection point, specified by the TSO, if connected at a voltage level below 110 kV. This range shall take into account existing standards, and shall, prior to approval by the Regulatory Authority, be subject to consultation with the relevant stakeholders;

d) be equipped with a control system that is insensitive within a dead band around the nominal system frequency of 50,00 Hz, of a width to be specified by the TSO in consultation with the TSOs in the synchronous area. For demand units connected at a voltage level below 110 kV, these specifications shall, prior to approval by the Regulatory Authority, be subject to consultation with the relevant stakeholders;

e) be capable of, upon return to frequency within the dead band specified in paragraph 2(d), initiating a random time delay of up to 5 minutes before resuming normal operation. The maximum frequency deviation from nominal value of 50,00 Hz to respond to shall be specified by the TSO in coordination with the TSOs in the synchronous area. For demand units connected at a voltage level below 110 kV, these specifications shall, prior to approval by the Regulatory Authority, be subject to consultation with the relevant stakeholders. The demand shall be increased or decreased for a system frequency above or below the dead band of nominal (50,00 Hz) respectively;

f) be equipped with a controller that measures the actual system frequency. Measurements shall be updated at least every 0,2 seconds;

g) be able to detect a change in system frequency of 0,01 Hz, in order to give overall linear proportional system response, with regard to the demand response system frequency control's sensitivity and accuracy of the frequency measurement and the consequent modification of the demand. The demand unit shall be capable of a rapid detection and response to changes in system frequency, to be specified by the TSO in coordination with the TSOs in the synchronous area. An offset in the steady-state measurement of frequency shall be acceptable up to 0,05 Hz.

9.8.4 Specific provisions for demand units with demand response very fast active power control

9.8.4.1 TSO may agree with a demand facility owner (including, but not restricted to, through a third party) on a contract for the delivery of demand response very fast active power control.

9.8.4.2 If the agreement referred to in paragraph 9.8.4.1 takes place, the contract referred to in paragraph 9.8.4.1 shall specify:

a) a change of active power related to a measure such as 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;

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

9.8.5 Operational notification procedure for demand units with demand response

9.8.5.1 The operational notification procedure for demand units used by a demand facility to provide demand response to TSO shall be distinguished between:

d) demand units within a demand facility connected at a voltage level of or below 1 kV;
e) demand units within a demand facility connected at a voltage level above 1 kV.

9.8.5.2 Each demand facility owner, providing demand response to a TSO, shall confirm to the TSO, directly or indirectly through a third party, its ability to satisfy the technical design and operational requirements as referred in paragraph 9.8 of this Code.

9.8.5.3 The demand facility owner shall notify, directly or indirectly, through a third party, the TSO, in advance of any decision to cease offering demand response services and/or about the permanent removal of the demand unit with demand response. This information may be aggregated as specified by the TSO.

9.8.5.4 The TSO shall specify and make publicly available further details concerning the operational notification procedure.

9.8.5.5 The operational notification procedure for a demand unit within a demand facility connected at a voltage level of or below 1 kV shall comprise an installation document.

9.8.5.6 The installation document template shall be provided by the TSO, either directly or indirectly through a third party.

9.8.5.7 Based on an installation document, the demand facility owner shall submit information, directly or indirectly through a third party, to the TSO. The date of this submission shall be prior to the offer in the market of the capacity of the demand 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 response services.

9.8.5.8 For subsequent demand units with demand response, separate installation documents shall be provided.

9.8.5.9 The content of the installation document of individual demand units may be aggregated by the TSO.

9.8.5.10 The installation document shall contain the following items:

a) the location at which the demand unit with demand response is connected to the network;
b) the maximum capacity of the demand response installation in kW;
c) the type of demand response services;
d) the demand unit certificate and the equipment certificate as relevant for the demand response service, or if not available, equivalent information;
e) the contact details of the demand facility owner, or the third party aggregating the demand units from the demand facility.

9.8.5.11 The operational notification procedure for a demand unit within a demand facility or a closed distribution system connected at a voltage level above 1 kV shall comprise a demand response unit document (DRUD). The TSO, shall specify the content required for the DRUD. The content of the DRUD shall require a statement of compliance which contains the information in paragraph 9.10 to 0 for demand facilities, but the compliance requirements in paragraph 9.10 to 0 for demand facilities can be simplified to a single operational notification stage as well as be reduced. The demand facility owner shall provide the information required and submit it to the TSO. Subsequent demand units with demand response shall provide separate DRUDs.

9.8.5.12 Based on the DRUD, the TSO shall issue a FON to the demand facility owner.

9.9 Compliance of demand facilities

9.9.1 Responsibility of the demand facility owner and distribution system operator

9.9.1.1 Transmission-connected demand facility owners and DSO shall ensure that their transmission-connected demand facilities, transmission-connected distribution systems comply with the requirements provided for in this Code.

9.9.1.2 Where the requirements of this Code are applicable to demand units used by a demand facility to provide demand response services to TSO, the demand facility owner may totally or partially delegate to third parties tasks such as communicating with the TSO and gathering the documentation from the demand facility owner, the DSO evidencing compliance.

9.9.1.3 Third parties 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 Code. Demand facilities providing demand response services to the TSO may act collectively through third parties.

9.9.1.4 Where obligations are fulfilled through third parties, third parties shall only be required to inform the TSO of changes to the total services being offered, taking account of location specific services.

9.9.1.5 Where the requirements are specified by the TSO, or are for the purpose of the operation of the TSO system, alternative tests or requirements for test result acceptance for these requirements may be agreed with the TSO.

9.9.1.6 Any intention to modify the technical capabilities of the transmission-connected demand facility, the distribution system, or the demand unit, which has impact on compliance with the requirements provided for in paragraph 9.10 to 0, shall be notified to the TSO, directly or indirectly through a third party, prior to pursuing such modification, within the time frame provided by the TSO.

9.9.1.7 Any operational incidents or failures of the transmission-connected demand facility, the distribution system or the demand unit, which have an impact on compliance with the requirements provided for in paragraph 9.10 to 0, shall be notified to the TSO, directly or indirectly through a third party, as soon as possible after the occurrence of such an incident.

9.9.1.8 Any planned test schedules and procedures to verify compliance of the transmission-connected demand facility, the distribution system, or the demand unit, with the requirements of this Code, shall be notified to the TSO within the time frame specified by the TSO.

9.9.1.9 The TSO may participate in such tests and may record the performance of the transmission-connected demand facility, the distribution system, and the demand unit.

9.9.2 Tasks of the TSO

9.9.2.1 The TSO shall assess the compliance of a transmission-connected demand facility, a transmission-connected distribution facility, a distribution system, or a demand unit, with the requirements of this Code throughout the lifetime of the transmission-connected demand facility, the transmission-connected distribution facility, the distribution system, or the demand unit. The demand facility owner, or the DSO shall be informed of the outcome of this assessment.

9.9.2.2 The compliance of a demand unit used by a demand facility to provide demand response services to TSO, shall be jointly assessed by the TSO and if applicable in coordination with the third party involved in demand aggregation.

9.9.2.3 The TSO shall have the right to request that the demand facility owner, the DSO carries out compliance tests and simulations according to a repeat plan or general scheme or after any failure, modification or replacement of any equipment that may have an impact on the compliance of the transmission-connected demand facility, the distribution system, or the demand unit with the requirements of this Code. The demand facility owner, the DSO shall be informed of the outcome of those compliance tests and simulations.

9.9.2.4 provided as well as the requirements to be fulfilled by the demand facility owner or the DSO in the frame of the compliance process. The list shall cover at least the following information, documents and requirements:

a) all documentation and certificates to be provided by the demand facility owner, the DSO;
b) details of the technical data required from the transmission-connected demand facility, the distribution system, or the demand unit, with relevance to the grid connection or operation;

c) requirements for models for steady-state and dynamic system studies;
d) timeline for the provision of system data required to perform the studies;
e) studies by the demand facility owner, the DSO for demonstrating expected steady-state and dynamic performance referring to the requirements set forth in paragraphs 9.11.1, 9.11.2 and 9.11.3;
f) conditions and procedures including scope for registering equipment certificates;
g) conditions and procedures for the use of relevant equipment certificates issued by an authorised certifier by the demand facility owner, or by the DSO.

9.9.2.5 The TSO shall make public the allocation of responsibilities to the demand facility owner or the DSO and to the system operator for compliance testing, simulation and monitoring.

9.9.2.6 The TSO may totally or partially delegate the performance of its compliance monitoring to third parties. In such cases, the TSO shall continue ensuring compliance with entering into confidentiality commitments with the assignee.

9.9.2.7 If compliance tests or simulations cannot be carried out as agreed between the TSO and the demand facility owner, or the DSO due to reasons attributable to the TSO, then the TSO shall not unreasonably withhold the operational notification referred in paragraphs 9.1 to 9.8.

9.10 Compliance Testing of demand facilities

9.10.1 Common provisions for compliance testing

9.10.1.1 Testing of the performance of a transmission-connected demand facility, or a demand unit with demand response active power control, demand response reactive power control or demand response transmission constraint management, shall aim at demonstrating that the requirements of this Code have been complied with.

9.10.1.2 Notwithstanding the minimum requirements for compliance testing set out in this Code, the TSO is entitled to:

a) allow the demand facility owner or the DSO 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; and
b) require the demand facility owner or the DSO to carry out additional or alternative sets of tests in those cases where the information supplied to the TSO in relation to compliance testing under the provisions of paragraphs 9.10.2 to 9.10.6, is not sufficient to demonstrate compliance with the requirements of this Code.

9.10.1.3 The demand facility owner or the DSO is responsible for carrying out the tests in accordance with the conditions laid down in paragraph 9.10. The TSO shall cooperate and not unduly delay the performance of the tests.

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

9.10.2 Compliance testing for disconnection and reconnection of transmission-connected distribution facilities

9.10.2.1 The transmission-connected distribution facilities shall comply with the requirements for disconnection and reconnection referred in paragraph 9.5 and shall be subject to the following compliance tests.

9.10.2.2 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, authorised by the TSO.

9.10.2.3 With regard to the synchronisation test, the technical synchronisation capabilities of the transmission-connected distribution facility shall be demonstrated. This test shall verify the settings of the synchronisation devices. This test shall cover the following matters: voltage, frequency, phase angle range, deviation of voltage and frequency.

9.10.2.4 With regard to the remote disconnection test, the transmission-connected distribution facility's technical capability for remote disconnection at the connection point or points from the transmission system when required by the TSO and within the time specified by the TSO shall be demonstrated.

9.10.2.5 With regard to the low frequency demand disconnection test, the transmission-connected distribution facility's technical capability of low frequency demand disconnection of a percentage of demand as is specified in paragraph 9.5 shall be demonstrated.

9.10.2.6 With regard to the low frequency demand disconnection relays test, the transmission-connected distribution facility's technical capability to operate from a nominal AC supply input shall be demonstrated in accordance with paragraph 9.5.1 and 9.5.2. This AC supply input shall be specified by the TSO.

9.10.2.7 With regard to the low voltage demand disconnection test, the transmission-connected distribution facility's technical capability to operate in a single action with on load tap changer blocking in paragraph 9.5.3 shall be demonstrated in accordance with paragraph 9.5.2

9.10.2.8 An equipment certificate may be used instead of part of the tests provided for in paragraph 9.10.2.1, on the condition that it is provided to the TSO

9.10.3 Compliance testing for information exchange of transmission-connected demand facilities

9.10.3.1 With regard to information exchange between the TSO and the transmission-connected demand facility owner in real time or periodically, the transmission-connected demand facility's technical capability to comply with the information exchange standard established pursuant to paragraph 7.3.14 shall be demonstrated.

9.10.3.2 An equipment certificate may be used instead of part of the tests provided for in paragraph 9.10.3.1, on the condition that it is provided to the TSO.

9.10.4 Compliance testing for disconnection and reconnection of transmission-connected demand facilities

9.10.4.1 The transmission-connected demand facilities shall comply with the requirements for disconnection and reconnection referred to in paragraph 9.5 and shall be subject to the following compliance tests.

9.10.4.2 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, authorised by the TSO.

9.10.4.3 With regard to the synchronisation test, the technical synchronisation capabilities of the transmission-connected demand facility shall be demonstrated. This test shall verify the settings of the synchronisation devices. This test shall cover the following matters: voltage, frequency, phase angle range, deviation of voltage and frequency.

9.10.4.4 With regard to the remote disconnection test, the transmission-connected demand facility's technical capability for remote disconnection at the connection point or points from the transmission system when required by the TSO and within the time specified by the TSO shall be demonstrated.

9.10.4.5 With regard to the low frequency demand disconnection relays test, the transmission-connected demand facility's technical capability to operate from a nominal AC input

shall be demonstrated in accordance with paragraphs 9.5.1 and 9.5.2. This AC supply input shall be specified by the TSO.

9.10.4.6 With regard to the low voltage demand disconnection test, the transmission-connected demand facility's technical capability to operate in a single action with on load tap changer blocking in paragraphs 9.5.3 shall be demonstrated in accordance with paragraphs 9.5.2.

9.10.4.7 An equipment certificate may be used instead of part of the tests provided for in paragraph 1, on the condition that it is provided to the TSO.

9.10.5 Compliance testing for information exchange of transmission-connected demand facilities

9.10.5.1 With regard to information exchange between the TSO and the transmission-connected demand facility owner in real time or periodically, the transmission-connected demand facility's technical capability to comply with the information exchange standard established pursuant to paragraph 7.3.14 shall be demonstrated.

9.10.5.2 An equipment certificate may be used instead of part of the tests provided for in paragraph 9.10.5.1, on the condition that it is provided to the TSO.

9.10.6 Compliance testing for demand units with demand response active power control, reactive power control and transmission constraint management

9.10.6.1 With regard to the demand modification test:

a) the technical capability of the demand unit used by a demand facility to provide demand response active power control, demand response reactive power control or demand response transmission constraint management to modify its power consumption, after receiving an instruction from the DSO or TSO, within the range, duration and time frame previously agreed and established in accordance with paragraph 9.8.2, shall be demonstrated, either individually or collectively as part of demand aggregation through a third party;

b) the test shall be carried out either by an instruction or alternatively by simulating the receipt of an instruction from the DSO or TSO 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 specified by the DSO or TSO pursuant to paragraph 9.8.2.2 points (d)(f)(g)(h)(k) and (l) are fulfilled;

d) an equipment certificate may be used instead of part of the tests provided for in paragraph 9.10.6.1 point (b), on the condition that it is provided to the DSO or TSO as the case may be.

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

a) the technical capability of the demand unit used by a demand facility owner or closed distribution system operator to provide demand response active power control, demand response reactive power control or demand response transmission constraint management to disconnect or reconnect, or both, its static compensation facility when receiving an instruction from the DSO or TSO, in the time frame expected in accordance with paragraph 9.8.2, shall be demonstrated, either individually or collectively as part of demand aggregation through a third party;

b) the test shall be carried out by simulating the receipt of an instruction from the DSO or TSO and subsequently disconnecting the static compensation facility, and by simulating the receipt of an instruction from the DSO or TSO and subsequently reconnecting the facility;

c) the test shall be deemed passed, provided that the conditions specified by the DSO or TSO as the case may be, pursuant to paragraph 9.8.2.2 points (d)(f)(g)(h)(k) and (l) are fulfilled.

9.11 Compliance Simulation of demand facilities

9.11.1 Common provisions on compliance simulations

9.11.1.1 Simulation of the performance of a transmission-connected demand facility, a transmission-connected distribution facility, or a demand unit with demand response very fast active power control within a demand facility shall result in demonstrating whether the requirements of this Code have been fulfilled or not.

9.11.1.2 Simulations shall be run in the following circumstances:

a) a new connection to the transmission system is required;

b) a new demand unit used by a demand facility or a closed distribution system to provide demand response very fast active power control to a TSO has been contracted in accordance with paragraph 9.8.4;

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

d) alleged incompliance by the TSO with the requirements of this Code.

9.11.1.3 Notwithstanding the minimum requirements for compliance simulation set out in this Code, the TSO is entitled to:

a) allow the demand facility owner or the DSO 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 Code or with national legislation; and

b) require the demand facility owner or the DSO to carry out additional or alternative sets of simulations in those cases where the information supplied to the TSO in relation to compliance simulation under the provisions of paragraphs 9.11.2, 9.11.3 and 9.11.4, is not sufficient to demonstrate compliance with the requirements of this Code.

9.11.1.4 The transmission-connected demand facility owner or the transmission-connected distribution system operator shall provide a report with the simulation results for each individual transmission-connected demand facility or transmission-connected distribution facility. The transmission-connected demand facility owner or the transmission-connected distribution system operator shall produce and provide a validated simulation model for a given transmission-connected demand facility or transmission-connected distribution facility. The scope of the simulation models is set out in paragraphs 9.6.1 and 9.6.2

9.11.1.5 The TSO shall have the right to check that a demand facility or a distribution system complies with the requirements of this Code by carrying out its own compliance simulations based on the provided simulation reports, simulation models and compliance test measurements.

9.11.1.6 The TSO shall provide the demand facility owner or the DSO with technical data and a simulation model of the network, to the extent necessary to carry out the requested simulations in accordance with paragraphs 9.11.2, 9.11.3 and 9.11.4.

9.11.2 Compliance simulations for transmission-connected distribution facilities

9.11.2.1 With regard to the reactive power capability simulation of a transmission-connected distribution facility:

a) a steady-state load flow simulation model of the network of the transmission-connected distribution system shall be used in order to calculate the reactive power exchange under different load and generation conditions;

b) a combination of steady-state minimum and maximum load and generation conditions resulting in the lowest and highest reactive power exchange shall be part of the simulations;

c) 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 in accordance with paragraph 9.4.

9.11.2.2 The TSO may specify the method for compliance simulation of the active control of reactive power set out in paragraph 9.4.2

9.11.2.3 The simulation shall be deemed passed if the results demonstrate compliance with the requirements set out in paragraph 9.4.

9.11.3 Compliance simulations for transmission-connected demand facilities

9.11.3.1 With regard to the reactive power capability simulation of a transmission-connected demand facility without onsite generation:

a) the transmission-connected demand facility without onsite generation's reactive power capability at the connection point shall be demonstrated;

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

c) the simulation shall be deemed passed if the results demonstrate compliance with the requirements set out in paragraph 9.4.1 and 9.4.2

9.11.3.2 With regard to the reactive power capability simulation of a transmission-connected demand facility with onsite generation:

a) a load flow simulation model of the transmission-connected demand facility shall be used to calculate the reactive power exchange under different load conditions and under different generation conditions;

b) 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;

c) the simulation shall be deemed passed if the results demonstrate compliance with the requirements set out in paragraph 9.4.1 and 9.4.2

9.11.4 Compliance simulations for demand units with demand response very fast active power control

9.11.4.1 The model of the demand unit used by a demand facility owner to provide demand response very fast active power control shall demonstrate the technical capability of the demand unit to provide very fast active power control to a low frequency event in the conditions set out in paragraph 9.8.4.

9.11.4.2 The simulation shall be deemed passed provided that the model demonstrates compliance with the conditions set out in paragraph 9.8.4.

9.12 Compliance monitoring

9.12.1 Compliance monitoring for transmission-connected distribution facilities

With regard to compliance monitoring of the reactive power requirements applicable to transmission-connected distribution facilities:

a) the transmission-connected distribution facility shall be equipped with necessary equipment to measure the active and reactive power, in accordance with paragraph 9.4; and

b) the TSO shall specify the time frame for compliance monitoring.

9.12.2 Compliance monitoring for transmission-connected demand facilities

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

a) the transmission-connected demand facility shall be equipped with necessary equipment to measure the active and reactive power, in accordance with paragraph 9.4; and

b) the TSO shall specify the time frame for compliance monitoring.

10 Derogations

Regulatory may, at the request of: power-generating facility owner, a demand facility owner, DSO or TSO, grant: power-generating facility owner, demand facility owners, DSO and TSO derogations from one or more provisions of this Code for new and existing transmission-connected demand facilities, transmission-connected distribution facilities, distribution system and demand units in accordance with paragraphs 10.1 to 10.3.

10.1 General Provisions

10.1.1 Regulatory authority shall specify, after consulting TSO, power-generating facility, demand facility owners, DSO, and other stakeholders whom it deems affected by this Code, the criteria for granting derogations pursuant to paragraphs 10.2 and 10.3. It shall publish those criteria on its website and notify them to the Energy Community within nine months of the expiry of the transposition deadline of this Code. The Energy Community may require to regulatory authority to amend the criteria if it considers that they are not in line with this Code. This possibility to review and amend the criteria for granting derogations shall not affect the derogations already granted which shall continue to apply until the scheduled expiry date as detailed in the decision granting the exemption.

10.1.2 If the regulatory authority deems that it is necessary due to a change in circumstances relating to the evolution of system requirements, it may review and amend at most once every year the criteria for granting derogations in accordance with paragraph 10.1.1. Any changes to the criteria shall not apply to derogations for which a request has already been made

10.1.3 The regulatory authority may decide that: power-generating modules, transmission-connected demand facilities, transmission-connected distribution facilities, distribution system and demand units for which a request for a derogation has been filed pursuant to paragraphs 10.2 or 10.3. do not need to comply with the requirements of this Code from which a derogation has been sought from the day of filing the request until the regulatory authority's decision is issued.

10.2 Request for a derogation by a power-generating facility owner, demand facility owner or distribution system operator

10.2.1 Power-generating facility owners, demand facility owners and DSO, may request a derogation to one or several requirements of this Code for power-generating modules within their facilities, transmission-connected demand facilities, transmission-connected distribution facilities, distribution system, or demand units used by a demand facility to provide demand response services to DSO and to TSO

10.2.2 A request for a derogation shall be filled with the TSO or DSO as the case may be and include:

a) an identification of the power-generating facility owner ,demand facility owner, the DSO and a contact person for any communications;
b) a description of the power-generating module or modules, transmission-connected demand facility, the transmission-connected distribution facility, the distribution system, or the demand unit for which a derogation is requested;
c) a reference to the provisions of this Code from which a derogation is requested and a detailed description of the requested derogation;
d) demonstration that the requested derogation would have no adverse effect on cross-border trade

10.2.3 Within two weeks of receipt of a request for a derogation, the TSO or DSO (as the case may be) shall confirm to the power-generating facility owner, demand facility owner or to the DSO, whether the request is complete. If the TSO or DSO (as the case may be) considers that the request is incomplete, power-generating facility owner, the demand facility owner or the DSO shall submit the additional required information

within one month from the receipt of the request for additional information. If the power-generating facility owner, demand facility owner or if the DSO does not supply the requested information within that time limit, the request for a derogation shall be deemed withdrawn

10.2.4 If a request for a derogation concerns power-generating module connected to distribution system, the DSO assessment must be accompanied by an assessment of the request for a derogation by the TSO. The TSO shall provide its assessment within two months of being requested to do so by the DSO.

10.2.5 The DSO shall, in coordination with the TSO, assess the request for a derogation, taking into account the criteria determined by the regulatory authority pursuant to paragraph 10.1.

10.2.6 Within six months of receipt of a request for a derogation, the TSO or DSO (as the case may be) shall forward the request to the regulatory authority and submit the assessment(s) prepared in accordance with paragraphs 10.2.4 and 10.2.5. That period may be extended by one month where the TSO or DSO (as the case may be) seeks further information from the power-generating facility owner, demand facility owner or from the DSO and by two months where the DSO requests the TSO to submit an assessment of the request for a derogation

10.2.7 The regulatory authority shall adopt a decision concerning any request for a derogation within six months from the day after it receives the request. That time limit may be extended by three months before its expiry where the regulatory authority requires further information from the power-generating facility owner, demand facility owner or from the DSO or from any other interested parties. The additional period shall begin when the complete information has been received

10.2.8 For the power-generating facility owner TSO or DSO (as the case may be), shall submit any additional information requested by the regulatory authority within two months of such request. If the TSO or DSO (as the case may be) does not supply the requested information within that time limit, the request for a derogation shall be deemed withdrawn unless, before its expiry. Demand facility owner or the DSO shall submit any additional information requested by the regulatory authority within two months of such request. If the power-generating facility owner, demand facility owner or if the DSO does not supply the requested information within that time limit, the request for a derogation shall be deemed withdrawn unless, before its expiry:

a) the regulatory authority decides to provide an extension; or

b) the power-generating facility owner, demand facility owner or the DSO informs the regulatory authority by means of a reasoned submission that the request for a derogation is complete.

10.2.9 The regulatory authority shall issue a reasoned decision concerning a request for a derogation. Where the regulatory authority grants a derogation, it shall specify its duration

10.2.10 The regulatory authority shall notify its decision to the power-generating facility owner, relevant demand facility owner and to the DSO and TSO (as the case may be),

10.2.11 Regulatory authority may revoke a decision granting a derogation if the circumstances and underlying reasons no longer apply or upon a reasoned recommendation of the Commission or reasoned recommendation by the Secretariat and the Energy Community Regulatory Board pursuant to paragraph 10.4.2.

10.2.12 For demand units within a demand facility at a voltage level of or below 1 kV, a request for a derogation under paragraph 10.2 may be made by a third party on behalf of the demand facility owner or prospective owner, or prospective operator. Such a request may be for a single demand unit or multiple demand units within the same demand facility. In the case of the latter, and provided the cumulative maximum capacity is specified, the third party may substitute the details required by point (a) of paragraph 10.2.2 with their details.

10.3 Request for a derogation by a TSO or by a DSO

10.3.1 TSO or DSO may request derogations for power-generating modules, transmission-connected demand facilities, transmission-connected distribution facilities, distribution system, or demand units within a demand facility conected or to be connected to their network

10.3.2 TSO or DSO shall submit its requests for a derogation to the regulatory authority. Each request for a derogation shall include:

a) identification of the TSO or DSO (as the case may be) , and a contact person for any communications;
b) a description of the power-generating modules, transmission-connected demand facility, the transmission-connected distribution facility, the distribution system, or the demand unit for which a derogation is requested and the total installed capacity and number of power-generating modules, transmission-connected demand facilities, transmission-connected distribution facilities, distribution system, or demand units;

c) the requirement or requirements of this Code for which a derogation is requested, with a detailed description of the requested derogation;
d) detailed reasoning, with all relevant supporting documents;
e) demonstration that the requested derogation would have no adverse effect on cross-border trade;

10.3.3 Where the request for a derogation is submitted by DSO, the regulatory authority shall, within two weeks from the day after receipt of that request, ask the TSO to assess the request for a derogation in the light of the criteria determined by the regulatory authority. pursuant to paragraph 10.1

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

10.3.5 Within six months of receipt of a request for a derogation, the TSO shall submit to the regulatory authority its assessment, including any relevant documentation. The six-month time limit may be extended by one month where the TSO seeks further information from the DSO

10.3.6 The regulatory authority shall adopt a decision concerning a request for a derogation within six months from the day after it receives the request. Where the request for a derogation is submitted by the DSO, the six-month time limit runs from the day following receipt of the TSO's assessment pursuant to paragraph 10.3.5

10.3.7 The six-month time limit referred to in paragraph 10.3.6 may, before its expiry, be extended by an additional three months where the regulatory authority requests further information from the TSO 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 TSO shall provide any additional information requested by the regulatory authority within two months from the date of the request. If the TSO does not provide the requested additional information within that time limit, the request for a derogation shall be deemed withdrawn unless, before expiry of the time limit:

a) the regulatory authority decides to provide an extension; or
b) the TSO informs the regulatory authority by means of a reasoned submission that the request for a derogation is complete

10.3.8 The regulatory authority shall issue a reasoned decision concerning a request for a derogation. Where the regulatory authority grants derogation, it shall specify its duration.

10.3.9 The regulatory authority shall notify its decision to the TSO requesting the derogation, and the Secretariat and the Energy Community Regulatory Board

10.3.10 Regulatory authority may lay down further requirements concerning the preparation of requests for a derogation by TSO. In doing so, regulatory authorities shall take into account the delineation between the transmission system and the distribution system at the national level and shall consult with DSO, demand facility owners and stakeholders, including manufacturers.

10.3.11 Regulatory authority may revoke a decision granting a derogation if the circumstances and underlying reasons no longer apply or upon a reasoned recommendation of the Commission or reasoned recommendation by the the Secretariat and the Energy Community Regulatory Board pursuant to paragraph 10.4.2.

10.4 Monitoring of derogations

10.4.1 The Secretariat and the Energy Community Regulatory Board shall monitor the procedure of granting derogations with the cooperation of the regulatory authoritiy. The Regulatory authority shall provide the Secretariat and the Energy Community Regulatory Board with all the information necessary for that purpose.

10.4.2 The Secretariat and the Energy Community Regulatory Board may issue a reasoned recommendation to regulatory authority to revoke a derogation due to a lack of justification.

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